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THE STUDENT'S FLORA
OF THE
BRITISH ISLANDS.
THE STUDENT'S FLORA

of the

British Islands

by

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PREFACE.

The object of this work is to supply students and field-botanists with a fuller account of the Flowering Plants and Vascular Cryptogams of the British Islands than the manuals hitherto in use aim at giving.

For the plants regarded as composing the British Flora proper, I have mainly followed the *London Catalogue of British Plants*, 7th ed., 1874; being fully satisfied that I should thus best serve the interests of British Botany. The difficult task of determining which of the many doubtfully indigenous or naturalized plants should be regarded as British by adoption or otherwise has in the successive editions of this Catalogue been settled by the two botanists most competent to form an opinion by many years of research and by matured judgment—Messrs. H. C. Watson and J. Boswell. It is true, I may think that some of the Species they have introduced have less claims than some they have rejected, but this applies to very few cases indeed.

The Ordinal, Generic, and Specific characters are to a great extent original, and drawn from living or dried specimens or both. After working them out, I have consulted the usual British and Continental Floras, and collated the descriptions throughout with Mr. Boswell’s (an author usually quoted by his earlier name of Syme) edition of *English Botany*, of the descriptions in which work I cannot speak in terms of too high praise. By this method of re-description, whilst I believe I have avoided some errors of my predecessors, I have no doubt made others of my own; such creep into all endeavours to describe most or all of the organs of

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many Species: and if I have made many such blunders, a part may be attributable to the fact that various Genera were described amidst constant interruptions, and all under pressure of official duties.

The terminology employed is as simple as is attainable with a due regard to precision of language. In the choice of terms I have followed Oliver's *Lessons in Elementary Botany*; usually avoiding such as are used in single Orders only, or are of special signification in single Orders or Genera. For modifications of the fruit the choice of terms presents great difficulty; and I have therefore very much confined myself to such as are required to avoid periphrasis, as capsule, drupe, berry, utricle, follicle, pod, &c. (about which there is no ambiguity), and to achene for the dry indehiscent 1-seeded carpels of apocarpous fruits. For Grasses, Compositeæ, &c., the term fruit is itself sufficiently explicit, its nature being explained in the Ordinal description. The term nutlet for the parts of the fruit of Boragineæ and Labiateæ I have borrowed from Asa Gray.

The Keys to the Genera are naturally arranged, but in Umbelliferae I have added an artificial key, as being useful for the determination of a Genus before the whole Order has been studied. I have given no keys to the Species, preferring curt diagnoses which embrace the more important characters of the plant; finding, moreover, from experience, that such keys promote very superficial habits among students.

For the areas and elevations inhabited by the plants of the British Isles I am mainly indebted to Mr. Watson's admirable works. The areas occupied more or less continuously by the Species are here defined by the counties, which thus indicate their limits. Where the words "northwards" and "southwards" are used it implies that the plant ranges to Shetland in the former case, and to both Cornwall and Kent in the latter. In this Edition I have in all cases mentioned Ireland when the Species inhabits that country; and when rare or local in Ireland, its limits are taken from the *Cybele Hibernica* of More and Moore, a standard work. I have in like manner definitely mentioned the Channel Islands. I have been urged by very competent botanists to include the Faroe Islands, as really more British geographically than are the Channel Islands; but, if I did so, Iceland should also be included, and on the whole I have thought it
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best to retain the old limits of the British Flora. The extra-British distributions I worked out myself for most of the British plants, making large use of Nyman's *Sylloge* (ed. 2).

Of the altitudes, I have chosen the highest the species attains, and indicated the region where this is attained; when no elevation is given, the Species is not known to ascend to 1,000 feet, and may be assumed to be a "low-ground" plant. To the doubtfully indigenous Species I have often added Watson's opinion as to whether they are "aliens," "colonists," or "denizens," &c. It may be well to repeat here his definitions of these terms, premising that by "native" is meant that the Species has not been introduced by human agency:—*

"A denizen is a Species suspected to have been introduced by man, and which maintains its habitat. A colonist is one found only in ground adapted by man for its growth and continuous maintenance. An alien has presumably been introduced by human agency."

The estimates of the numbers of Genera in the Orders, and of Species in the Genera, are taken from the *Genera Plantarum*; they serve to indicate to the student the relative extent of these groups. The indications of their affinities and properties are necessarily extremely brief. The etymologies of the generic names I have endeavoured to reduce to really useful limits. Only such English names as are pretty well known are given, and for these I have in many cases been guided by Dr. Alexander Prior's *Popular Names of British Plants*, a very good book.

In the First and Second Editions I recorded my obligations to Professor Oliver, Mr. Baker, Professor Dickson, Mr. G. Griffiths, and the Rev. E. J. Linton, for valuable observations and suggestions; to Mr. Baker especially for aid in classifying the critical forms of *Rubus, Rosa*, and *Hieracium*.

In this, the Third Edition, I have introduced many improvements in the classification and characters of the Orders, Genera, and Tribes, adopted in

* The vagueness of these definitions is unavoidable; and their correct application in many cases is exceedingly difficult. Few who have not gone into the subject have an idea of how many plants would disappear from our Flora were the soil left undisturbed by man and the lower animals which he rears. I think it probable that both the Shepherd's-Purse and the common form of the Dandelion would be amongst the first to be suppressed.
Bentham's and my *Genera Plantarum*. I have also made changes in the limits of the Species of certain Genera, and of their subordinate forms, in which matter I have often had regard to suggestions and materials laid before me by Mr. Baker (who has again revised the sheets as they passed through the press), and Mr. Nicholson; and for the first forty-one Orders to notes made for me by Mr. Ball, F.R.S. These last have a special value, due to Mr. Ball's critical knowledge of so many European Floras, and his excellent judgment. I have further profited by the last edition (8th) of Professor Babington's accurate and critical Manual, and have collated the whole with the second edition of Nyman's *Sylloge Flora Europææ*, and of Newbould's and Baker's edition of Watson's *Cybele*. To Mr. Arthur Bennett, F.L.S., of Croydon, I am indebted for revising the Genus *Potamogeton*, and for notes upon *Carices*.

The collation of the British Flora with Nyman's *Sylloge* has not been satisfactory throughout, because of the wide divergence of the views there upheld regarding the Species of such Genera as *Rubus*, *Rosa*, &c., from those held by English botanists. This is doubtless due to the fact that characters which are constant and strong in one country become vague and even evanescent in others; insomuch that I am led from examination and study to believe that, in respect of the subdivision of the European forms of such Genera into Species, Sub-species, and Varieties, the materials in Britain may give one result, those in France another, in Scandinavia a third, and in Germany a fourth.

I am disposed to think that the term Sub-species (which represents a stage of evolution between Species and Variety) should be given to many forms considered by some as Species and as Varieties by others; and that this would facilitate the better understanding especially of the larger critical Genera. The various forms of fruticose *Rubi*, for example, whether all treated as Species, or all as Varieties, present to me a mere chaos; whereas, when treated as Sub-species and Varieties, however imperfectly, they fall into comprehensible groups, whose cross affinities may thus be more clearly enunciated.

Lastly, I have ventured to introduce into this Edition, under the description of the flowers of various Genera, characters concerned in the process
of fertilization,—as, whether wind-fertilized (anemophilous), insect-fertilized (entomophilous), or self-fertilized; also whether honey is secreted in the flower; and whether the stamens and stigma ripen together (homo-gamous), or the anthers first (proterandrous), or the stigma first (proterogynous). For most of the information under these heads I am indebted especially to the observations of Hermann Müller, supplemented by those of Sir John Lubbock and Mr. Alfred Bennett. Our knowledge of these subjects is incomplete and rudimentary: any student may add to it; but great caution is required, for I suspect that individual Species are subject to considerable variation in these respects.

Royal Gardens, Kew,
June 1, 1884.
SYNOPSIS OF THE NATURAL ORDERS
(ADAPTED TO THE BRITISH GENERA).

The arrangement of Dicotyledons here adopted adheres very closely to the Jussieuian as modified by De Candolle, which, notwithstanding its many defects (inseparable from a linear arrangement), is, I think, as good as any of those subsequently proposed,* and has the great advantage of being that most generally adopted in the Universities and Schools of Great Britain and America, and in systematic works everywhere. Its great defect is the necessity of an Apetalous division, embracing a heterogenous mass of Orders, which are incapable of being naturally grouped. Some of these are obviously allied to Polypetalous or Monopetalous Orders, but cannot be placed in contiguity with them without interfering with their other and closer alliances; some again present cross affinities with two or more distant Orders; and the greater proportion have no recognized near affinities. Under these circumstances, and seeing how much the retention of the Apetalous division facilitates the often difficult task of finding the Natural Order of a plant, it appears to be premature to depart from the Jussieuian system.

SUBL-KINGDOM I. Phænogamous or Flowering plants. Plants provided with stamens, and ovules which after fertilization become seeds containing an embryo.

CLASS I. Dicotyledonous or Exogenous plants. Stem with bark, pith, and interposed wood; when perennial increasing in diameter annually by a layer of wood added to the outside of the old wood, and another of bark added to the inside of the old bark. Leaves with usually netted

* Of these the principal are: that of Brongniart, adopted in the Paris Schools; of Endlicher, in many of the German Schools; of Fries, by various botanists in Scandinavia; and of Lindley ("The Vegetable Kingdom"), which has been partially followed in England and Ind.a alone.
veins. Flowers with the organs mostly in fours or fives. Embryo with opposite or whorled cotyledons.

Sub-class I. Angiospermous Dicotyledons. Flowers usually provided with a distinct perianth. Ovules contained in closed carpels, through the tissues of which the pollen-tube passes to effect fertilization. Embryo with 2 cotyledons

Division I. Polypetalæ.

Flowers with both calyx and corolla (dichlamydeous). Petals free.—See also the exceptional Monopetalæ.

Exceptions. Flowers wanting either calyx or corolla occur in: 1 Ranunculaceæ; 6 Cruciferae (5 Cardamine, 16 Senebiera, and 17 Lepidium); 9 Violaceæ (apetalous forms of Viola); 12 Caryophylleæ (8 Arenaria & Cherleria, 9 Sagina); 26 Rosaceæ (8 Alchemilla, 10 Poterium); 27 Saxifragææ (2 Chrysosplenium); 30 Haloragidæ; 31 Lythraceæ (2 Peptis); 32 Onagraceæ (2 Ludwigia).

Petals more or less connate or coherent occur in: 5 Fumariaceæ; 10 Polygalaceæ; 13 Portulacaceæ; 13* Tamariscinaceæ; 16 Malvaceæ; 20 Iricineæ; 23 Crassulaceæ (2 Cotyledon); 33 Cucurbitaceæ.

Sub-division I. Thalamifloræ. Stamens inserted on the receptacle (hypogynous), free from the calyx, or on a disk that terminates the pedicel. Ovary superior.

Exceptions. Stamens apparently perigynous or epigynous in 3 Nymphaeaceæ (1 Nymphaeæ) and in some 12 Caryophylleæ.

* Ovary apocarpous, carpels 1 or more; ovules sutural or basal. (See also 16 Malvaceæ and 19 Geraniaceæ.)

1. Ranunculaceæ. Flowers regular or irregular. Stamens indefinite; anthers basified, opening by slits. Seeds albuminous.—Herbs with alternate leaves (except Clematis). (p. 1.)

2. Berberidaceæ. Flowers regular, 3-merous. Stamens definite, opposite the petals; anthers basified, opening by recurved valves. Seeds albuminous.—Shrubs; leaves alternate; flowers often showy. (p. 14.)

** Ovary syncarpous, 1-celled (except 3 Nymphaeaceæ), or 2-celled by a membranous septum; ovules parietal, rarely basal.

3. Nymphaeaceæ. Flowers regular. Stamens indefinite; anthers basified. Ovary many-celled; ovules scattered over the walls of the cells; stigmas sessile. Seeds albuminous.—Water-herbs; flowers showy. (p. 15.)

4. Papaveraceæ. Flowers regular, 2-merous. Stamens indefinite; anthers basified. Ovules parietal or on the surfaces of partial dissepiments; style 1 or stigmas sessile. Seeds albuminous.—Herbs; juice milky; leaves alternate, exstipulate; flowers usually showy. (p. 16.)
in 2 bundles. Ovary 1-celled; ovules many parietal, or 1 (by suppression)
basal; style 1 or 0. Seeds albuminous.—Weak herbs with exstipulate
alternate leaves; flowers usually small. (p. 19.)

usually 6, 4 longer than the others. Ovary 1–2-celled, of 2 carpels; ovules
parietal; style 1 or 0. Seeds exalbúminous.—Herbs; leaves exstipulate,
alternate; flowers usually small and ebracteate. (p. 22.)

Stamens indefinite. Ovary 1-celled, of 2–6 carpels, at length open
at the top; ovules parietal; stigma sessile. Seeds exalbúminous.—
Herbs; leaves alternate, stipules glandular or 0; flowers small, greenish.
(p. 44.)

indefinite. Ovary 1-celled, of 3 carpels; ovules parietal; styles 3. Seeds
albuminous.—Shrubs; leaves usually stipulate; flowers yellow or red,
showy; petals fugaceous. (p. 45.)

Ovary 1-celled; ovules parietal; style 1. Capsule 3-valved, loculicidal.
Seeds albuminous.—Herbs; leaves alternate, stipulate; flowers often
showy. (p. 47.)

each. Ovary 1-celled, of 2–5 carpels; ovules parietal; style 1.—A littoral
herb; leaves opposite; exstipulate; flowers small. (p. 51.)

*** Ovary syncarpous, 1-celled; placenta free-central or basal.

12. Caryophyllaceae. Flowers regular. Sepals and petals 4 or 5 each.
Stamens 8 or 10. Ovules many; styles 2–5. Seeds albuminous; embryo
curved.—Herbs; leaves opposite, stipulate or not; flowers usually small
and pink or white. (p. 52.)

Stamens 3 or more. Ovules 2 or more; style 1, 2–3-fid. Seeds albuminous;
embryo curved.—Herbs; leaves opposite or alternate, quite entire; flowers
small. (p. 69.)

Stamens 4 or more. Ovules 2 or more; styles 3–4.—Shrubs; leaves
minute, exstipulate; flowers small. (p. 70.)

**** Ovary syncarpous, 2- or more-celled; placentas axile.

adnate to the staminal sheath. Stamens 8; anthers 1-celled. Ovary
2-celled, 2-ovuled; style 1.—Herbs; leaves alternate or subopposite,
exstipulate; flowers small, usually blue. (p. 50.)

3–4 or twice as many, free. Ovary 2–5-celled; styles 2–5. Seeds ribbed;
albumen scanty or 0.—Water-herbs; leaves opposite, stipulate; flowers
minute. (p. 71.)
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15. Hypericinææ. Flowers regular. Sepals and petals 5 each. Staminæ many, united in bundles. Ovary more or less completely 3-5-celled, cells many-ovuled; styles 3-5. Seeds exalbuminous.—Herbs or shrubs; leaves opposite, often gland-dotted, exstipulate; flowers often showy, yellow. (p. 71.)

16. Malvaceæ. Flowers regular. Sepals 5, valvate, persistent. Petals 5, twisted in bud, adnate to the staminal tube. Staminæ monadelphous; anthers 1-celled. Ovary many-celled, cells 1-ovuled (in British genera). Albumen scanty or 0; embryo crumpled.—Herbs or shrubs; leaves alternate, stipulate; flowers often showy. (p. 74.)


18. Linææ. Flowers regular. Sepals 4-5. Petals 4-5, convolute in bud. Staminæ usually 4-5. Ovary 3-5-(-10-) celled, cells 1-2-ovuled; styles 3-5. Seeds albuminous.—Herbs; leaves opposite or alternate, narrow, quite entire, exstipulate; flowers usually showy. (p. 77.)

19. Geraniaceæ. Flowers regular or not. Sepals 3-5. Petals 3-5, imbricate in bud. Staminæ definite. Ovary 3-5-lobed and -celled; cells 1-many-ovuled; styles 1 or more. Albumen scanty or 0; cotyledons plaited or convolute.—Herbs; leaves opposite or alternate, usually stipulate; flowers often showy. (p. 79.)


SUB-DIVISION II. Calycifloræ. Staminæ inserted on the calyx or disk (perigynous or epigynous).—See also the exceptional Thalamifloræ.

Exceptions. Staminæ hypogynous in 27 Saxifragææ (3 Parnassia), and in 29 Diosmæææ; epipetalous in some 28 Crassulaceææ; almost hypogynous in some 25 Leguminæææ.

* Ovary superior (except some 26 Rosaceææ and 27 Saxifragææ). Staminæ perigynous.

22. Celastrinææ. Flowers regular. Calyx 4-5-lobed, and petals 4-5, both imbricate in bud. Staminæ 4-5, inserted on the disk. Ovary 3-5-celled, cells with 2 erect ovules. Seeds arillate; cotyledons foliaceous.—Trees or shrubs; leaves various; flowers small. (p. 87.)

23. Rhamnææ. Flowers regular. Calyx 4-5-lobed, valvate in bud. Petals 4-5, minute. Staminæ 1 opposite each petal, inserted on the calyx-tube at the edge of the disk. Ovary 3-celled; ovule 1, erect in each cell.
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—Shrubs; leaves alternate or opposite, stipules small; flowers inconspicuous. (p. 87.)

24. SAPINDACEAE, Tribe ACERINEAE. Flowers regular. Calyx 4–9-lobed, and petals 4–9, both imbricate in bud. Stamens 8–12, inserted on the disk. Ovary 2-lobed and -celled; cells 2-ovuled. Fruit a samara; cotyledons plaited.—Trees or shrubs; leaves opposite; flowers rather small, green. (p. 88.)

25. LEGUMINOSAE. Flowers irregular, papilionaceous. Stamens 10, subhypogynous or inserted on the calyx-tube, all or 9 of them combined. Ovary of 1 carpel. Fruit a legume. Albumen 0.—Herbs or shrubs; leaves usually alternate compound and stipulate; flowers often showy. (p. 113.)

26. ROSACEAE. Flowers regular. Calyx 4–5-lobed (rarely 8–9-) lobed, imbricate or valvate in bud. Petals 4–5 (rarely 8–9 or 0), imbricate in bud. Stamens usually indefinite, inserted on the calyx-tube or disk, incurved in bud. Ovary of 1 or more free or connate 1- or more-ovuled carpels. Fruit various. Albumen 0.—Herbs or shrubs; leaves usually alternate, stipulate; flowers often showy. (p. 138.)

28. CASSIDACEAE. Flowers regular. Calyx 4–12-lobed. Petals 4–12. Stamens twice as many as the petals (except 1 Tillaea). Carpels follicular, usually 5, separate.—Herbs; leaves succulent, exstipulate; flowers small. (p. 145.)

29. DROSERACEAE. Flowers regular. Sepals and petals 5, imbricate in bud. Stamens as many, hypogynous or perigynous. Ovary 1-celled; ovules many, parietal. Fruit capsular. Seeds albuminous.—Glandular hairs; leaves small, white or pink. (p. 149.)


** Ovary inferior. Stamens epigynous.

30. HALORAGACEAE. Flowers usually apetalous and 1-sexual. Calyx-lobes 2–4, valvate in bud, or 0. Stamens 1 or more, definite. Ovary 1–4-celled, cells 1-ovuled. Seeds albuminous.—Herbs, often marsh or aquatic; leaves opposite alternate or whorled, exstipulate; flowers very inconspicuous. (p. 151.)

32. ONAGRARIEAE. Flowers usually regular. Calyx-lobes 2 or 4, valvate in bud. Petals 2 or 4, twisted in bud. Stamens definite. Ovary 1–4-celled, cells 1–many-seeded. Seeds exalbuminous.—Herbs; leaves opposite or alternate, exstipulate; flowers often showy. (p. 155.)

34. Umbelliferae. Flowers usually regular. Calyx-lobes 5 or 0. Petals 5. Stamens 5, incurved in bud. Ovary 2-celled; styles 2; ovules solitary. Fruit of 2 separable indehiscent dry carpels. Seeds albuminous.—Herbs; leaves alternate; flowers usually umbelled, small. (p. 161.)

35. Araliaceae. Flowers of Umbelliferae, but Shrubs or trees; ovary of often more than 2 carpels. Fruit of inseparable usually fleshy carpels. Leaves alternate; flowers usually green. (p. 186.)


Division II. Monopetalae or Gamopetalae.

Flowers with both calyx and corolla (dichlamydeous). Petals more or less connate into a 2- or more-lobed corolla.—See also various monopetalous genera under the exceptional Polypetalae.

Exceptions. Petals free in 43 Ericaceae (11 Pyrola and 12 Monotropa) and 45 Plumbaginaceae. Corolla absent in 47 Oleaceae (2 Fraxinus), and 46 Primulaceae (4 Glaux).

1. Ovary inferior.—See also 46 Primulaceae (8 Samolus).

* Stamens epipetalous; see also 42 Campanulaceae (1 Lobelia).

37. Caprifoliaceae. Flowers regular or not. Corolla-lobes valvate or imbricate in bud. Ovary 1–5-celled, cells 1- or more-ovuled. Seeds albuminous.—Shrubs, rarely herbs; leaves opposite, exstipulate; flowers usually showy. (p. 188.)

38. Rubiaceae, Tribe Stellatae. Flowers regular. Corolla-lobes valvate in bud. Ovary 2-celled; cells 1-ovuled. Seeds albuminous.—Herbs; leaves whorled or opposite, exstipulate; flowers small or minute. (p. 191.)


41. Compositae. Flowers in involucrate heads. Corolla-lobes valvate. Stamens 4–5; anthers usually connate. Ovary 1-celled; ovule 1, erect. Seeds exalbuminous.—Herbs, rarely shrubs; leaves various, exstipulate; flowers small or minute. (p. 200.)
**Stamens inserted on the top of the ovary.**

42. 

**Campanulaceæ.** Flowers regular or irregular. Stamens 5, separate or connate. Ovary 2–8-celled, cells many-ovuled.—Herbs; juice milky; leaves alternate, exstipulate; flowers usually showy. (p. 243.)

43. **Ericaceæ, Suborder Vaccinieæ.** Flowers regular. Stamens 8 or 10. Ovary 4–5-celled.—Small shrubs; leaves alternate, exstipulate. (p. 249.)

2. 

Ovary superior. Stamens epipetalous (hypogynous in 43 Ericaceæ, 47 Oleineæ (2 Fraxinus), 54 Plantagineæ (2 Littorella), and 45 Plumbagineæ).

* Corolla regular. Stamens 8 or 10, rarely 5 or 6; anthers usually opening by pores. Ovary 4–6-celled.

43. **Ericaceæ, Suborder Ericeæ.** Leafy shrubs or trees, rarely herbs. (p. 248.)

44. **Monotropeæ.** Leafless parasitic herbs. (p. 257.)

**Corolla regular. Stamens 4–5, opposite the corolla-lobes. Ovary 1-celled; placenta central.**

45. **Plumbagineæ.** Styles or style-arms 5. Utricle 1-seeded.—Maritime, rarely alpine, scapigerous herbs; flowers small. (p. 257.)

46. **Primulaceæ.** Style 1. Stigma capitate. Capsule 5–10-valved or circumsciss, many-seeded.—Herbs; flowers often showy. (p. 260.)

***Corolla regular. Stamens 2, 4, or 5, alternate with the corolla-lobes. Ovary 2-celled. Leaves opposite (except Menyanthes).**

47. **Oleaceæ.** Calyx 4-fid or 0. Corolla 4-lobed or 0. Stamens 2. Ovary 2-celled, cells 2–3-ovuled. Fruit a drupe or samara.—Trees or shrubs; leaves opposite, exstipulate. (p. 267.)

48. **Apoecynaceæ.** Calyx 4–5 fid. Corolla 4–5-lobed, twisted in bud. Stamens 4–5; anthers basifixed. Carpels 2, free below. Fruit of 2 follicles.—Shrubs; leaves opposite, quite entire; flowers often showy. (p. 268.)

49. **Gentianaceæ.** Calyx 4–8-fid. Corolla 4–8-lobed, twisted in bud. Stamens 4–8; anthers versatile. Ovary 1-celled; ovules many, parietal. Fruit usually capsular.—Herbs; leaves opposite, quite entire (alternate, 3-foliolate in Menyanthes); flowers often showy. (p. 269.)

****Corolla regular or subregular. Stamens 4–5, alternate with the corolla-lobes. Ovary 2–4-celled. Leaves alternate or radical.**

50. **Polemoniaceæ.** Calyx 5-lobed. Corolla 5-lobed, twisted in bud. Stamens 5. Ovary 3-celled; stigma 3-fid. Fruit capsular.—Herbs; leaves pinnate, exstipulate; flowers showy. (p. 274.)

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Fruit of 4 nutlets.—Hispid or scabrid herbs; leaves alternate, quite entire, exstipulate; flowers often showy. (p. 275.)

52. CONVOLVULACEÆ. Sepals 5. Corolla 5-lobed, plaited and twisted in bud. Stamens 5. Ovary 2-celled, cells 2-ovuled; stigmas 2-fid or styles 2.—Herbs; leaves alternate, simple (0 in Cuscuta); flowers often showy. (p. 283.)

53. SOLANACEÆ. Calyx 5-fid. Corolla 5-lobed, imbricate, plaited or valvate in bud. Stamens 5, often cohering. Ovary 2-celled; ovules many, axile. Fruit a capsule or berry.—Herbs; leaves alternate or radical; flowers inconspicuous. (Littorella is altogether anomalous.) (p. 288.)

54. PLANTAGINEÆ. Sepals 4. Corolla scarious, 4-lobed, imbricate in bud. Stamens 4; anthers pendulous. Ovary 2-celled; ovules many, axile. Capsule 1-4-celled.—Herbs; leaves alternate or radical; flowers small or large. (p. 290.)

55. SCROPHULARINEÆ. Calyx 4–5-merous. Corolla often 2-lipped, 4–5-lobed. Stamens 4, didynamous, rarely 2 or 5. Ovary 2-celled; ovules many, axile.—Herbs; leaves various; flowers often showy. (p. 290.)

56. OROBANCHACEÆ. Sepals 4 or 5, free or connate. Corolla gaping. Stamens 4, didynamous. Ovary 1-celled; ovules many, parietal.—Herbs, with alternate scales instead of leaves; flowers rather large, brown or coloured. (p. 308.)

57. LENTIBULARINEÆ. Calyx 2–5-partite. Corolla 2-labiate. Stamens 2. Capsule 2-valved, many-seeded.—Marsh or water-plants; flowers rather large for the plant. (p. 310.)

58. VERBENACEÆ. Calyx cleft or toothed. Corolla tubular, often 2-lipped. Stamens 4. Ovary not lobed, 2–4-celled; cells 1-ovuled. Fruit a drupe, berry, or of 1–4 nutlets.—Flowers small or showy. (p. 313.)

59. LABIATE. Calyx 5-cleft or 2-lipped. Corolla usually 2-lipped. Stamens 2 or 4, didynamous. Ovary of 2 2-lobed 2-celled 2-ovuled carpels. Fruit of 1–4 1-seeded nutlets.—Flowers in opposite cymes forming false whorls. (p. 313.)

Division III. Incompletae.

(Monochlamydeæ and Achlamydeæ.)

Corolla and often calyx absent.—(Petals present in some 60 Illecebraceæ. For various apetalous genera see Exceptions to the Polypetalæ and Monopetalæ.)
* Flowers not in catkins. Perianth single, inferior (0 in Euphorbia).

60. Illecebraceae. Flowers 2-sexual. Calyx herbaceous or coriaceous, persistent round the fruit. Stamens perigynous, opposite the sepals. Ovary 1-celled; styles 2–3; ovules 1–2. Utricle 1-seeded. Albumen floury, embryo various.—Herbs; leaves opposite, stipulate (except Scleranthus); flowers minute. (p. 333.)

61. Chenopodiaceae. Flowers 1–2 sexual. Calyx 3–5-lobed, herbaceous, persistent round the fruit. Stamens 1–5, opposite the sepals. Ovary 1-celled; ovule amphitropous. Utricle 1-seeded, indehiscent. Albumen floury or fleshy; embryo annular or spiral.—Herbs; leaves opposite or alternate, exstipulate, or stems leafless and jointed; flowers green, inconspicuous. (p. 335.)

62. Polygonaceae. Flowers usually 2-sexual. Sepals 3–6, green or coloured. Stamens 5–8, perigynous or hypogynous. Fruit usually enclosed in the sepals. Ovules erect, orthotropous. Albumen floury; embryo curved.—Herbs; leaves alternate; stipules sheathing; flowers small. (p. 343.)

64. Thymelaeaceae. Flowers 2 sexual. Calyx tubular; lobes 4–5. Stamens definite, inserted in the tube. Ovules pendulous, anatropous. Albumen 0 or scanty; embryo straight.—Shrubs; leaves quite entire, exstipulate; bark tenacious; flowers conspicuous, sweet-scented. (p. 353.)

65. Elæagnaceae. Calyx, in male fl. 3–4-sepalous; in female or 2sexual fl. tubular. Stamens 4–8 at the base of the sepals in the male fl. Ovule erect, anatropous. Albumen 0 or scanty; embryo straight.—Shrubs with silvery scales; leaves quite entire, exstipulate; flowers inconspicuous. (p. 354.)

68. Euphorbiaceae. Flowers 1-sexual. Calyx 0 or sepals 2 or more. Male: Stamens 1 or more; anthers didymous. Female Ovary 2–3-lobed and -celled; ovules 1–2 in each cell, pendulous, anatropous; styles 2–3. Albumen copious, fleshy.—Herbs or shrubs; leaves various; inflorescence often of many stamens and 1 pistil collected in a small calyx-like involucre. (p. 356.)

69. Urticaceae. Flowers 1–2 sexual. Perianth of male 3–8-lobed or -partite; of female tubular, or 3–5-cleft, or a scale. Stamens opposite the perianth-lobes. Ovary 1-celled; styles 1–2 or 0; ovule solitary, pendulous and anatropous, or erect and orthotropous. Albumen fleshy or 0.—Herbs or shrubs; leaves various, stipulate; flowers minute, green. (p. 361.)

73. Ceratophyllaceae. Flowers 1 sexual. Perianth 8–12-partite, segments subulate.—Male, of many anthers. Ovary 1-celled; style subulate, persistent; ovule 1, pendulous, anatropous. Albumen 0.—A submerged herb, with whorled multifid leaves; flowers very inconspicuous. (p. 378.)

** Flowers not in catkins. Perianth single, superior.

adnate to each calyx-lobe. **Ovary** 1-celled; ovule 1, adnate to the ovary. Seed erect, radicle superior; albumen fleshy.—Parasitic shrubs; leaves quite entire, exstipulate; flowers inconspicuous. (p. 354.)

67. **Santalaceae.** Calyx 3–5-lobed, valvate in bud. **Stamens** one adnate to each calyx-lobe. **Ovary** 1-celled; ovules several, pendulous from a free central placenta. **Albumen** fleshy; radicle superior.—Shrubs or herbs, often root-parasites; leaves usually alternate, quite entire, exstipulate; flowers inconspicuous. (p. 355.)

68. **Aristolochiaceae.** Calyx 3-lobed, or 1–2-lipped, valvate in bud. **Stamens** 6–12, epigynous or gynandrous. **Ovary** 4–6-celled; ovules many. **Albumen** fleshy; embryo minute.—Herbs or shrubs; leaves alternate, exstipulate. (p. 351.)

*** Flowers 1-sexual; males in catkins, females in spikes or catkins.
Perianth present or absent.

70. **Myricaceae.** Flowers of both sexes in the axils of imbricating bracts; perianth 0.—Male of 2–16 stamens; anthers basifixed, bursting outwards.
—Female: **Ovary** 1-celled; styles 2, filiform; ovule 1, basal, orthotropous. **Fruit** a drupe. **Albumen** 0.—A glandular shrub; leaves alternate, exstipulate; flowers very inconspicuous. (p. 364.)

71. **Cupuliferae.** Flowers mono-dioecious. **Males** in catkins. **Sepals** 0 or 5 or more. **Stamens** 5–20.—**Females**, sessile in an involucre of free or connate bracts. **Calyx** superior, 5–6-toothed or 0. **Ovary** 2–3-celled; styles 2–3; cells 1–2-ovuled. **Fruit** 1-celled, 1-seeded, dry, indehiscent. **Albumen** 0.—Trees or shrubs; leaves alternate, stipulate; flowers small, green. (p. 364.)

72. **Salicinaceae.** Flowers dioecious, without perianth, both sexes in catkins.—Male: **Stamens** 1 or more.—Female: **Ovary** 1-celled; stigmas 2; ovules many, parietal, anatropous. **Capsule** 2-valved. **Albumen** 0.—Trees, leaves alternate, stipulate. (p. 369.)

**Sub-class II. Gymnospermoius** **Dicotyledons.** Perianth usually 0. **Ovules** not contained in close carpels, fertilized by the direct application of the pollen. **Embryo** with often whorled cotyledons.

74. **Coniferae.** Perianth 0. Male flowers of 2–8-celled anthers, usually forming a deciduous catkin. Female fl. of one or more naked ovules (ovaries of some) on the scales of a cone or head, or of a solitary ovule (**Taxus**). **Albumen** fleshy; embryo straight.—Trees or shrubs; leaves alternate opposite or fascicled; flowers very inconspicuous. (p. 379.)

**Class II. Monocotyledonous** or **Endogenous** plants. Stem with the wood forming longitudinal bundles irregularly disposed in the stem, not in concentric layers, and having no defined central pith. Leaves with usually parallel veins. Flowers with the organs mostly in threes or fours, never in fives. **Embryo** with a single cotyledon; first formed leaves alternate; radicle not branching, but throwing out adventitious roots.
SYNOPSIS OF THE NATURAL ORDERS.

Exceptions. Leaves net-veined in 79 Dioscoreae, 80 Liliaceae (1 Paris), and 84 Aroidae (1 Arum). Flowers 4-merous in 86 Naiadaceae, and 2-3-merous in 89 Gramineae.


75. Hydrocharideae. Flowers regular, 1-sexual. Perianth 6-partite, outer segments herbaceous, inner petaloid (except in Elodea). Stamens 3 or more. Ovary 1- or 3-6-celled. Fruit a berry.—Water plants; leaves erect or floating, flowers usually conspicuous. (p. 381.)

76. Orchideae. Flowers irregular, 2-sexual. Stamens 1 or 2, adnate to the style. Ovary 1-celled. Fruit capsular.—Herbs of various habit. (p. 383.)


77. Irideae. Flowers 2-sexual. Perianth 6-partite, petaloid. Stamens 3, separate; anthers bursting outwards. Ovary 3-celled. Capsule 3-valved.—Herbs; roots tuberous, or rootstock creeping; leaves narrow; flowers usually handsome. (p. 395.)


79. Dioscoreae. Flowers 1-sexual. Perianth small, 6-partite, herbaceous. Stamens 6; anthers bursting inwards. Ovary 3-celled. Berry few-seeded.—Climbing herbs; leaves broad, with netted veins; flowers inconspicuous. (p. 400.)


80. Liliaceae. Flowers usually 2-sexual. Perianth usually 6-cleft or of 6 segments, petaloid. Stamens 6, opposite the perianth-segments. Ovary 3-celled. Fruit various.—Herbs (except Ruscus) of various habit; flowers usually showy. (p. 401.)

81. Junceae. Flowers 2-sexual. Perianth of 6 green or brown segments. Stamens usually 6. Ovary 1-3-celled with 3 basilar, or many parietal or axile ovules. Capsule 3-valved.—Rushy herbs; leaves very narrow; flowers brown, small. (p. 413.)

82. Eriocauloneae. Flowers monoocious, in involucrate heads. Perianth membranous or scarious; outer of 2-3 sepals; inner 3-lobed or of 3 scales. Stamens 2-3 on the inner perianth-segments. Ovary 2-3-celled; ovule 1, pendulous in each cell. Capsule 2-3-valved.—Usually seapigerous, cellular, marsh or water herbs; flowers small, dull-coloured. (p. 420.)
4. Nudifloreæ. Perianth 0, or rudimentary. Ovary superior, syncarpous, or monocarpellary.

83. Typhaceæ. Flowers monoeccious, in catkins or heads. Perianth 0, or of scales or hairs. Stamens many; anthers basifixed. Ovary 1-2-celled; style persistent; ovule 1, pendulous. Fruit a drupe or utricle.—Erect marsh or water plants; leaves linear; flowers small or minute, in conspicuous spiked heads. (p. 421.)

84. Aroideæ. Flowers sessile on a spadix, enclosed in a spathe when young, 1-2-sexual. Perianth 0, or of scale-like sepals. Stamens few or many. Ovary 1- or more-celled. Berry few- or many-seeded. Albumen mealy.—Herbs; leaves various, often broad, net-veined; flowers with often conspicuous spathes or spadixes. (p. 423.)

85. Lemnaceæ. Minute floating cellular green fronds. Flowers imbedded in slits or cavities of the frond, most minute, 1-3 in a spathe. Stamens 1-2. Ovary 1-celled, 1-7-ovuled.—Fronds covering ponds; flowers very rare and inconspicuous. (p. 424.)

5. Apocarpeæ. Perianth coloured and 2-seriate, or green 1-seriate, or imperfect, or 0. Ovary superior, apocarpous or monocarpellary. Seeds exalbuminous, cotyledonal end usually contracted hooked or coiled, rarely straight.

86. Alismaceæ. Flowers usually 2-sexual. Perianth 6-partite, inner segments or all petaloid. Stamens 6 or more. Carpels many. Fruit of many achenes; albumen 0; radicle very large.—Marsh or water herbs; flowers usually conspicuous. (p. 426.)

87. Najadaceæ. Flowers 1-2-sexual. Perianth of 4 valvate sepals, or imperfect, or 0. Stamens as many as the sepals, or fewer. Carpels 1-4, 1-ovuled. Albumen 0; radicle very large.—Marsh or water plants; flowers inconspicuous, green. (p. 428.)


88. Cyperaceæ. Flowers 1-2-sexual. Perianth 0 or of bristles, rarely of scales. Stamens 1-3; anthers basifixed. Ovary 1-celled; style 1, stigmas 2-3 papilllose; ovule 1, erect. Fruit compressed or 3-gonous. Embryo at the base of the albumen.—Stem usually solid, 3-gonous; leaves often grass-like, but with entire sheaths. (p. 439.)

89. Graminæ. Flowers usually 2-sexual. Perianth usually of 2 very minute scales. Stamens usually 3; anthers versatile. Ovary 1-celled, stigmas 1-2, hairy or feathery. Fruit terete, or grooved on one side. Embryo on one side of the base of the albumen.—Stem cylindrical, usually hollow, except at the joints; leaves with sheaths split to the base. (p. 466.)
SYNOPSIS OF THE NATURAL ORDERS.

Sub-Kingdom II. Cryptogams, or Acotyledons, or Flowerless plants. Plants not provided with stamens and ovules as in Phænogams. Seeds represented by minute spores which contain no embryo.

- Class I. Acrogenera. Plants with a distinct stem.

Sub-class Vasculares. Stem with vascular tissue. Spores contained in a spore case (sporangium), and developing a prothallus in germination.

* Spores of one kind.

90. Filices. Sporangia usually very minute, situated on the margin or under surface of the leaf (frond); rarely larger, in separate spikes or panicles. *Fronds* usually circinate in vernation. (p. 507.)

91. Equisetaceae. Sporangia 2-valved, on the under side of peltate scales that are arranged in terminal cones. *Spores* with 4 filiform clubbed appendages rolled round them.—*Stems* erect from a creeping rootstock, cylindric, hollow, grooved, septate, simple or with whorled branches and with toothed sheaths at the joints. (p. 521.)

92. Lycopodiaceae. Sporangia not very minute, situated in the axils of the leaves, or of the scales of a cone.—*Fronds* usually circinate in vernation. (p. 523.)

* Spores of two kinds.

93. Selaginellaceae. Sporangia not very minute, situated in the axils of the scales of a cone or at the bases of subulate leaves. Spores of 2 kinds; the larger developing a prothallus within its coat; the smaller containing antherozoids. Decumbent or prostrate plants with small imbricating leaves of 2 forms; or stemless water plants with subulate leaves. (p. 525.)

94. Marsileaceae. Sporangia (membranous sae) very minute, enclosed in the cells of a globose receptacle near the base of the frond. *Spores* of 2 kinds; the larger developing a prothallus; the smaller containing antherozoids.—Marsh or water plants, rarer on dry soils. (p. 526.)
CLASS I. DICOTYLEDONES.

SUB-CLASS I. ANGIOSPER'MÆ.

ORDER I. RANUNCULA'CEÆ.

Herbs rarely shrubs. *Leaves* radical or alternate, opposite in *Clematis*; stipules 0, or adnate to the petiole. *Flowers* regular or irregular, 1–2-sexual. *Sepals* 5 or more, rarely 2–4, deciduous, often petaloid, usually imbricate in bud. *Petals* 0, or 5 or more, rarely 3, imbricate in bud, often minute or deformed. *Stamens* many, hypogynous; anthers basifixed, dehiscence subdorsal. *Disk* 0. *Carpels* many, rarely 1, usually free, 1-celled; stigma simple; ovules 1 or more on the ventral suture, anatropous, erect with a ventral or pendulous with a dorsal raphe. *Fruit* of 1-seeded achenes, or many-seeded follicles. *Seed* small, albumen copious; embryo minute.—Distrib. Abundant in temp. and cold regions; genera 30; species 503.—Affinities. With Berberideæ and Papaveraceæ; analogies with Alismaceæ and Rosaceæ.—Properties. Usually acrid.—Exceptional Forms (British). Stem woody in *Clematis*; flowers polygamous in *Thalictrum*; sepals persistent, carpels connate in *Helleborus*; stamens few in *Myosurus*; follicle sometimes solitary in *Delphinium*; berry solitary, and stigma dilated in *Actaea*.

TRIBE I. CLEMATI'DEÆ. *Sepals* valvate. Shrubs with opposite leaves.

1. Clematis

TRIBE II. ANEMO'NEÆ. *Sepals* imbricate. *Achenes* with 1 pendulous seed.

Involucre 0. *Sepals* 4–5, petaloid. Petals 0.........................2. Thalictrum.


Involucre 0. *Sepals* 5–8, petaloid. Petals 5–16, conspicuous.....3* Adonis.


TRIBE III. RANUN'CULEÆ. *Sepals* imbricate. *Achenes* with 1 ascending seed.................................................................5. Ranunculus.

TRIBE IV. HELLEBO'REÆ. *Sepals* imbricate. *Follicles* many-seeded, except in *Actaea*.
**Flowers regular. Follicles many-seeded.**

Sepals petaloid. Petals 0. .................................................. 6. Caltha.


Sepals petaloid, deciduous. Petals small, 2-lipped ..................... 8*. Eranthis.


**Flowers irregular. Follicles many-seeded.**

Sepals many, the dorsal spurred ........................................ 9*. Delphinium.

Sepals many, the dorsal arched and hooded .......................... 10. Aconitum.

***Flowers nearly regular. Fruit a berry. ............................. 11. Actaea.


Usually climbing under-shrubs. Leaves opposite, usually compound, exstipulate; petiole often twining. Inflorescence axillary or terminal; flowers protogynous, honeyless. Sepals usually 4, petaloid, imbricate or valvate. Petals 0. Stamens many. Carpels many; ovule 1, pendulous. Fruit a head of sessile or stalked achenes, with long bearded styles. —Distrib. All temp. climates, rarer in the tropics; species 100. —Etym. klēmatis, the Greek name for this or a plant of similar habit.


## 2. Thalic'trum, L. Meadow-rue.

Erect perennial herbs. Leaves compound, stipulate. Flowers panicled or racemed, often polygamous, honeyless, protogynous, anemophilous. Sepals 4–5, petaloid, imbricate in bud. Petals 0. Stamens many. Carpels few or many; ovule 1, pendulous. Fruit a small head of sessile or stalked achenes; style persistent or deciduous. —Distrib. Temp. and colder regions of the N. hemisphere; species 50. —Etym. Probably the Thalictrum of Pliny.

1. T. alpi'num, L.; raceme simple, flowers few drooping, anthers linear apiculate.


2. T. mir'inus, L.; stem more or less striate, panicle lax, flowers drooping, anthers apiculate, fruit erect.
Dry places from Orkney southd.; ascends to 1,800 ft. in the Lake District; Ireland; fl. July-Aug.—Stem ½–4 ft., stout, rigid, often zigzag, striate throughout or towards the nodes only, usually furrowed when dry. Leaves triangular, 3–4-pinnate; leaflets variable, ½–1 in., acutely or obtusely lobed, sometimes stipellate; stipules adnate to the petiole, auricles spreading or reflexed. Sepals 4, yellow-green. Achenes 3–5, sessile, elliptic-oblong, straight or gibbous, 8–10-ribbed.—DISTRIB. Europe (Arctic), N. Africa, N. and W. Asia to the Himalayas, Greenland.

T. MYNUS proper; often glaucous and glandular; stem 6–18 in., usually naked at the base.—VAR. dunense, Dumort. (maritimum, Ed. 2); branches of broad panicle spreading. Sandy coasts, Orkney to Norfolk and S. Wales.—VAR. T. montanum, Wallr. (calcareum, Jord.); branches of deltoid panicle erecto-patent. Dry hills, Argyll to Somerset.—The Cambridge var. saxatile, Bab. of ma'jus seems rather referable here.

Sub-sp. MA'JUS, Sm. (not Jacq.); stem 2–4 ft., more leafy below, leaflets usually much larger. From Perth southd.; most common in the north, in copses, &c.; Ireland. The vars. T. Ko'chii, Fries, with spreading stipules and ovoid achenes, and T. flexu'o'sum, Reichb. (? of Bernhardii), with reflexed stipules and larger gibbous achenes, are with difficulty distinguishable.

3. T. flau'vum, L.; stem furrowed, panicle compound, flowers erect crowded, anthers not apiicate.


VAR. sphaerocarp'um, Lej.; panicle usually contracted, achenes broadly oblong. —VAR. ripo'rium, Jord.; panicle usually lax, achenes oblong.—VAR. T. Moriso'nii, Gmel.; panicle usually interrupted, fascicles of flowers small, achenes narrow oblong.

3. ANEMO'NE, L.

Perennial very acrid herbs. Leaves radical, lobed or divided. Flowers on 1- or more-fld. scapes, rarely yellow; invol. leaves 3-partite. Sepals 4–20, petaloid, imbricate in bud. Petals 0. Stamens many, outer sometimes imperfect or petaloid. Carpels many; ovule 1, pendulous. Fruit a head of sessile achenes, with naked or bearded styles.—DISTRIB. Cold and temp. regions; species 70.—ÉTYM. anemos, the wind, of obscure application.

1. A. Pulsatil'la, L.; sepals 6 erect silky, outer stamens reduced to glands, achenes with long feathery styles. Pasque-flower.

Chalk downs and limestone pastures; York to Norfolk, Essex, and Gloucester; fl. May–June.—Silky, 4–10 in. Rootstock stout, woody. Leaves maturing after flowering, 3-pinnatifid, segments linear; involucral sessile, divided to the base into long linear segments. Flower 1½ in., solitary, proterandrous, inclined in bud, dull purple; peduncle lengthening after flowering. Imperfect stamens honeyed. Styles of silky achenes 1½ in.—DISTRIB. Europe N. Asia to Dahuria.

Woods and copses from Sutherland southd.; ascends to 2,800 ft. in the Highlands; Ireland; fl. April–May.—Nearly glabrous, slender. *Rootstock horizontal, woody. Scape 4–8 in. Leaves few, usually remote from the scape, petioled, 3-foliolate; leaflets narrow, subsessile, cut lobed or pinnatifid; involucral like the radical, petioled. Flower solitary, 1-13 in. diam., homogamous, honeyless. Sepals oblong, white, rarely purple. Achenes downy, as long as the style.—**Distrib.** Europe (Arctic), W. Siberia, N. America.

**3. AD'O'NIS, L.** **PHEASANT'S-EYE.**

Herbs, annual or perennial. Leaves much divided. Sepals 5–8, petaloid, imbricate in bud. Petals 5–16, yellow or red, eglandular. Carpels many; ovule 1, pendulous. Fruit a spike or head of many achenes; style short, persistent.—**Distrib.** Temp. Europe and Asia; species 3–4.—**Etym.** classical.

**A. AUTUMNA'lis, L.** ; annual, flowers globose, petals broad concave.

Naturalized in Suffolk, and S. counties, sporadic elsewhere, and in Scotland and Ireland; (alien or colonist, Wats.); fl. May–Sept.—Stem 8–10 in., erect, branched, very leafy. Leaves decompound; segments small, linear. Sepals greenish. Petals scarlet, with a dark basal spot, suberect, rather longer than the sepals. Head of reticulated achenes sometimes elongate.—**Distrib.** Europe, W. Asia, N. Africa; introd. in America.

**4. MYOSU'RUS, L.** **MOUSE-TAIL.**

Small annual herbs. Leaves narrow, all radical. Scapes 1-fld. Sepals 5, rarely 6–7, with a small basal spur. Petals 5, rarely 6–7, or 0, small, narrow, tubular. Stamens few. Carpels many; ovule 1, pendulous. Fruit a long spike of densely packed achenes; style short, persistent.—**Distrib.** Europe, N. Asia, S. America, Australasia; species 2.—**Etym.** μουσ and obpd, mouse-tail.

**M. min'imus, L.** ; spike slender, style very short.

Cornfields, &c., from Northumberland to Kent and Devon; Channel Islands; fl. April–June.—Glabrous, 2–6 in. Leaves erect, many, linear, rather fleshy. Scapes many, slender. Flowers minute, yellow-green, proterandrous. Sepals 5, narrow-oblong; spur appressed to the scape. Petals 5; limb short, ligulate. Spike of achenes 1–3 in.; receptacle filiform; achenes attached ventrally, minute, keeled, back mucronate.—**Distrib.** Europe, W. Asia, N. Africa; introd. in America, &c.

**5. RANUN'CULUS, L.** **BUTTERCUP, CROWFOOT.**

Annual or perennial usually acrid herbs. Leaves entire lobed or compound; stipules membranous or 0. Flowers usually panicked, white or yellow (the British species). Sepals 3–5, caducous. Petals usually 5, rarely 0, glandular near or above the base. Stamens many. Carpels many; style short; ovule 1, ascending. Fruit a head or spike of apiculate or beaked
Ranunculus.] Ranunculaceæ.

Achenes.—Distrib. All temp. regions; species about 160.—Etym. Rana, a frog.


The following is an attempt to group naturally the British Batrachian Ranunculi, after a protracted study of the large collection at Kew (Herb. Kew, H. C. Watson, Borrer, Bot. Exch. Club, G. Nicholson, &c.). The result accords in a measure with the early views of H. C. Watson (Suppl. to Cybele, 1860; and Companion to ditto, 1868). Opinions vary as to whether the 8 forms or even segregates of them should be ranked as one or more species, sub-species, or varieties; I regard them as approximately equivalent to the species I have retained under Rubus, Rosa, &c. Of the characters attributed to these and their subordinate forms by critical authors, I find some variable, others valueless, and still others deceptive; such especially as concern the tapering, &c., of the peduncle, the comparative length of stamens and petals, number of stamens, and especially the forms of the receptacle, achenes, and stigma.

* Aquatic. Floating leaves usually present; submerged numerous, multifid. Petals 5-9-nerved. Receptacle hispid.

1. R. heterophyllus, Fries; segments of submerged leaves spreading in all directions, peduncles hardly exceeding the leaves, flowers ½-1 in. diam., petals broadly obovate, stamens numerous. R. aquatilis, Sm.

Streams and ponds from Orkney southd., ascending to 1,050 ft. in Scotland; Ireland; Channel Islands; fl. May–June.—Floating leaves (rarely 0), ½-1½ in. diam., from orbicular to reniform, 3–5-lobed or-partite or 3-foliolate; basal sinus broad or narrow, segments broadly cuneate, toothed, lobulate, or laciniate; stipules broad, rounded. Petals much longer than the sepals. Stamens longer than the pistil. Achenes glabrous or hairy or hispid; stigma short, obtuse.—Distrib. Europe (Arctic), N. America, N. Asia.—R. heterophyllus proper; segments of submerged leaves collapsing into a tassel when removed from the water, flowers about ½ in. diam., achenes—usually glabrous.—R. peltatus, Fries (R. floribundus, Bab., R. truncatus, Dumort.), has segments of submerged leaves more rigid, flowers ½-1 in. diam., petals broader, achenes usually hairy or hispid.—R. fissifolius, Schrank, is a form with laciniate leaf-lobes (Loch Maben, &c.).—R. penicillatus, Dumort. (R. pseudo-fluitans, Bab.), is a remarkable form with the habit, long robust stem and long leaves and peduncles, and large flowers of fluitans, but the hirsute receptacle of heterophyllus; it forms the passage between the two. From Derby and Warwick, to Wilts and Surrey; Ireland.—R. triphyllus, Wallr., from Guernsey, an imperfectly known plant, may be a form of heterophyllus.

2. R. mari'nus, Fries; segments of shortly petioled submerged leaves spreading all round, peduncles much longer than the leaves, flowers ½–¾ in. diam., petals narrowly obovate, stamens few or many. R. aquatilis, var. Symei, Hook. and Arn.
Ranunculaceae.

Brackish waters near the sea, from Caithness southd.; Ireland; fl. June-Sept. — Floating leaves reniform or broader than long, basal sinus broad, 3-lobed or -partite, segments sessile or petiolulate, cuneate, crenate or lobed; submerged not collapsing when removed from the water; stipules broad, rounded. Petals not touching, much longer than the sepals. Stamens shorter or longer than the pistil. Achenes very many, small, glabrous or hairy; stigma usually hooked. — Distrib. W. Europe.

The R. maritimus proper (i.e. of Fries) has no floating leaves (like R. salsuginosus, Hiern), and few stamens. — R. confusus, Godr., is characterized by its more slender tapering peduncles, stamens many exceeding the pistil, ovoid-conic receptacles and 1/2-ovate compressed achenes narrowed upwards, and R. Baudotii, Godr., as having stout pedicels, stamens many not exceeding the pistil, long conic receptacles and 1/2-ovate achenes with inflated tops; — characters which I cannot verify as constant in either case.

** Aquatic. Floating leaves rarely present; submerged numerous, multifid. Petals 5-9-nerved. Receptacles glabrous or hairy.

3. R. flu'itans, Lamk. ; stems long robust, submerged leaves with few long narrow rigid tassel-like segments, peduncles much longer than the leaves, flowers 3/4-1 in. diam., petals broadly obovate, receptacle glabrous, achenes few large turgid. R. peucedanifo'lius, Schrank.

Rivers and running streams from the Clyde southd.; Ireland; fl. June-Aug. — Stem several feet long and usually stout. Leaves 3-9-in. long, long petioled, black, forming flaccid or rather rigid tassels; floating leaves very rare, 3-lobed or -partite or -foliolate, segments sometimes petiolulate; stipules broad, rounded. Peduncles very long and robust. Petals often more than 5, and 2-seriate. Stamens many, short or long. Achenes compressed, glabrous; stigma short, thick. — Distrib. Europe. — R. Ba'chii, Wirtg., is a small form, more slender, with subsessile more divided leaves and narrower petals.

4. R. trichophyllus, Chaix; submerged leaves usually subsessile, black and rigid, not collapsing when removed from the water, peduncles stout, shorter than the leaves, flowers 1/2-1/2 in. diam., petals small narrow distant, receptacle glabrous, achenes few. R. pantothrix, Broth. Water-fennel.

Still waters from Orkney southd.; Ireland; fl. May–June.— Floating leaves, if present, 3-lobed, -partite, or sometimes 3-foliolate, submerged; 2-3-chotomously multifid; stipules large, rounded. Peduncles about equalling the leaves, or shorter, not tapering. Stamens few, longer than the pistil. Achenes glabrous or hairy; stigma short, thick. — Distrib. Europe, W. Asia, Himalaya, N. America. — R. Droue'tii, F. Schultz, has paler, more flaccid submerged leaves, the mid segment of the floating ones when present often deflexed. — R. radians, Rev., and R. Godronii, Gren., and R. diver-sifolius, H. Wats., are forms with floating leaves. — Var. confervoides is a depauperated northern form from Rescobie Loch in Forfarshire, which is the original R. aquatilis of Linnæus’s Flora Lapponica. It is probably not rare in the north.

5. R. circina'tus, Sibth. ; floating leaves 0, submerged small sessile orbicular, segments in one plane rigid, peduncles much longer than the
leaves, flowers ⅓ in. diam., petals broadly obovate, receptacle hispid, achenes glabrate or hispid acute. *R. divaricatus*, Schrank.

Still and slowly-flowing water from Forfar southd., not common; Ireland; fl. June–Aug.—Much the most distinct species of this section, very uniform in size, habit, and character. Leaves ⅓–⅔ in. diam.; stipules wholly adnate, like leaf-sheaths. Petal sheaths tapering. Petals twice as long as the sepals, many-veined. Stamens many, longer than the pistil. Achenes compressed; style slender deciduous.—Distr. Europe (local), N. America.

*** Marsh- or mud-plants, creeping, rarely floating. Submerged leaves 0 (very rare in *R. tripartitus*). Petals 3–5-nerved. Receptacle glabrous or nearly so.***

6. *R. tripartitus*, DC.; leaves ⅛-orbicular or reniform 3-lobed or partite, segments cuneate spreading, tips crenate, submerged when present very few and flaccid, peduncles shorter than the leaves, flowers ⅔ in. diam., petals narrow, achenes few glabrous. *R. intermedium*, Hiern. Marshes and ditches in S. and W. England; fl. May–July.—Stem aerial, or floating with emerged tips. Leaves ⅓–⅔ in. diam.; stipules broad, upper rounded free. Petal sheaths equalling the leaves or shorter. Petals 3-nerved, about twice as long as the calyx, pinkish. Stamens few, longer than the pistil. Receptacle slightly hairy. Achenes turgid; style slender, deciduous.—Distr. W. Europe.—With difficulty distinguished from forms of *heterophyllum*.

7. *R. Lenorman'di*, Schultz; leaves all reniform or orbicular, lobes shallow, bases contracted, peduncles equalling the petioles, flowers ⅓–⅓ in. diam., petals remote oblong, receptacles glabrous, achenes many glabrous.

Marshes and ditches from the Clyde southd.; ascends to 1,600 ft. in Yorkshire; S. Ireland; fl. June–Aug.—Stem stout, branched, 2–8 in. long. Leaves ⅓–1 in. diam., often opposite, rounded and more crenate than *R. hederaceus*, never spotted; stipules large, broad. Petals 5-nerved, twice as long as the calyx. Stamens few, about equalling the pistil. Achenes with deciduous subterminal slender styles.—Distr. N.W. Europe.

8. *R. hederaceus*, L.; leaves reniform angularly 5–7-lobed, lobes broadest at base, peduncles usually shorter than the leaves, flowers ⅛–⅓ in. diam., petals very narrow, distant, receptacle glabrous, achenes few obtuse. *Ivy-leaved Crowfoot*.

Shallow ponds and ditches from Shetland southd., ascends to 2,200 ft. in Wales; Ireland; Channel Islands; fl. May–Aug.—Habit of *R. Lenorman'di*. Leaves ⅓–1½ in. diam., usually opposite, with a ⅛-lunar black patch, lobes broader than long; rarely notched; stipules various. Petals 3-nerved, sometimes hardly exceeding the calyx. Stamens few, about equalling the pistil. Achenes small.—Distr. W. Europe.—*R. homoiophyllum*, Tenore (*R. canosus*, Guss.), is a floating form.

Section 2. *Hecato'nia*. Perennial, rarely annual. Leaves mostly radical, stipules obscure or 0. Stems 2- or more-flowered. Sepals 5. Petals 5, yellow. Achenes not tubercled (granulate in *R. ophioglossifolius*).
9. **R. Lin'gua**, L.; perennial, erect, leaves sessile \( \frac{1}{2} \)-amplexicaul lanceolate entire or toothed, achenes pitted, style broad. *Great Spear-wort.*


Wet places; ascends to 2,700 ft. in the Highlands; Ireland; Channel Islands; fl. June–Aug.—Very variable, glabrous or slightly hairy, 4–12 in. Lowest leaves petioled, ovate, upper more lanceolate and sessile. Flowers yellow, rarely \( \frac{1}{2} \)-in. diam., proterandrous. Head of achenes small.—**Distr.** Europe (Arctic), N. Asia, Africa, and America.

R. Flam’Mula proper; prostrate or erect, internodes straight, style of achenes short obtuse.

Sub-sp. R. Rep’tans, L.; creeping, very slender, internodes arching, style of minute achenes subcylindric, style recurved. Sandy shores of Loch Leven. (N.W. Europe, Canada.)

11. **R. ophioglossifo’lius**, Villars; annual, erect, lower leaves long-petioled broadly ovate or cordate, petals scarcely longer than the sepals, achenes small hairy minutely granulate, style minute.

Marshes, S. Hants; Jersey (extinct); fl. June–Aug.—Glabrous or slightly hairy upwards. Root fibrous. Stem 6–10 in. or more, slender, decumbent at the base, branched, hollow, furrowed. Peduncles furrowed. Flowers many, \( \frac{1}{4} \) in. diam.—**Distr.** W. and S. Europe.

**Radical leaves divided, upper cauline entire. Gland of petals without a scale.**


Woods and copse, from Aberdeen southd.; ascends to 1,600 ft. in the Highlands; S. and W. Ireland rare; Jersey; fl. April–May.—Erect, 6–10 in., branched, slender, glabrous or slightly hairy upwards. Root fibrous. Radical leaves long-petioled. Peduncles not furrowed, pubescent. Flowers \( \frac{1}{4} \) in. diam., seldom regular. Petals larger than the downy sepals, bright yellow, often imperfect (var. depaupera’ta). Achenes on tubercles of the receptacle, compressed; style slender, subulate, curved.—**Distr.** Europe (Arctic), N. and W. Asia to the Himalaya.—Not acrid.

13. **R. scelerat’us**, L.; annual, erect, leaves glabrous 3-lobed or -partite, segments of lower lobed obtuse, of upper linear subentire, sepals reflexed hairy, head of small glabrous achenes oblong.

Ditches, &c., from Ross southd.; Ireland; Channel Islands; fl. May–Sept. —Root fibrous. Stem 8–24 in., subcorymbose above, hollow. Leaves variable.
Ranunculus.] **Ranunculaceae.**

in lobing, upper a little hairy. *Flowers ¼ in. diam., proterogynous. Achenes many, small, faces a little wrinkled, dorsal edge furrowed; style minute.—Distr. Europe (Arctic), N. Asia, N. India to Bengal; introd. in America, &c.—Very acrid.

***Perennials. Radical leaves divided, upper cauline entire. Glands of petals with a small scale.***

14. **R. a'cris, L.**; hairy, erect, without runners, leaves 3-7-partite, segments of lower cuneate deeply cut and lobed, peduncles not furrowed, sepals spreading pubescent, receptacle glabrous, achenes compressed margined glabrous, style hooked.

Meadows, &c., N. to Shetland; ascends to nearly 4,000 ft. in the Highlands; Ireland; Channel Islands; fl. April-Sept.—Rootstock straight. *Stem* 8 in.–3 ft. *Leaves* usually all petioled, orbicular or 5-angled in outline, uppermost sessile. *Flowers* 1 in. diam., proterandrous, spreading.—Distr. Europe (Arctic), N. Asia; introd. in America.

Var. **R. vulgatus,** Jord.; rootstock creeping horizontal or slightly inclined.

Var. **R. borea'd'anus,** Jord.; stem glabrous below, leaf-segments very narrow.

Var. **R. to'mophyl'lus,** Jord.; rootstock nearly erect, leaf-segments very narrow.

15. **R. rep'pens, L.**; hairy, stem decumbent below with long runners, leaves 3-foliolate or 3-nately pinnatisect, segments cuneate lobed and toothed, peduncles furrowed, sepals spreading hairy, receptacle slightly hairy, achenes compressed margined glabrous, style hooked.

Waste ground from Sutherland southd.; ascends to 2,700 ft. in the Highlands; Ireland; Channel Islands; fl. May–Aug.—Rootstock stout, short. *Stem* 8 in.–2 ft. *Leaves* petioled, triangular or ovate; segments variable, middle usually longest. *Flowers* 1 in. diam. *Petals* generally suberect.—Distr. Europe (Arctic), N. and W. Asia, N. Africa; introd. in America.

16. **R. bulbo'sus, L.**; erect, hairy, stem swollen at the base without runners, leaves 3-foliolate or ternatisect, segments lobed, peduncles furrowed, sepals reflexed and receptacle hairy, achenes compressed margined glabrous, style short hooked.

Meadows, &c., from Caithness southd.; ascends to 1,500 ft. in the Highlands; Ireland; Channel Islands; fl. May–July.—Stem 6–12 in., base often as big as a walnut, sometimes corymbose above. *Leaves* variable in form and lobing. *Flowers* ½ to 1 in. diam.—Distr. Europe, Asia, N. Africa; introd. in America.

17. **R. cha'ero-phyl'lus, L.**; erect, silkily hairy, stem swollen at the base with tuberous offsets, leaves (of young plant entire) 3-foliolate or ternatisect, peduncles not furrowed, sepals spreading, receptacle glabrous, hairy head of compressed glabrous acute dotted achenes cylindric-oblong.


18. R. hirsutus, Curtis; erect, leaves 3-lobed or -partite, segments obtuse cut, peduncles furrowed, sepals reflexed hairy, petals with a scale over the gland, receptacle hairy, achenes tubercled towards the margin, style straight. R. Philonotis, Ehrhl.

Damp ground from Argyll and Forfar southwd.; rare in Scotland; not in Ireland; Channel Islands; fl. June–Oct.—Hairy. Stems many, 6–18 in. Leaves variable in lobing. Flowers about 1 in. diam., peduncles with spreading or reflexed hairs. Achenes broad, much flattened.—Distr. Europe, W. Asia, N. Africa.—The earlier names of R. parvulus, L., and R. Sardo'us, Crantz, are superseded for being too inappropriate.

19. R. arven'sis, L.; erect, lowest leaves obovate or cuneate toothed, upper 3-partite or -foliolate, segments narrow cut, peduncles not furrowed, sepals spreading, petals gland with a scale, receptacle glabrous, achenes usually covered with hooked spines, style stout hooked.


20. R. parvifo'rus, L.; slender, decumbent, leaves orbicular or reniform 3-lobed, segments toothed, peduncles furrowed, sepals reflexed, petals 3–5 small oblong, gland with an obscure scale, receptacle glabrous, achenes faced with hooked tubercles, style short nearly straight.

Dry banks, &c., from Durham southwd.; Ireland, rare; Channel Islands; fl. May–Aug.—Hairy. Stems and branches spreading, 6–8 in. Leaves divided to the middle or less, lowest often entire, uppermost more deeply cut into linear lobes. Peduncles leaf-opposed or in the forks. Flowers ½–¾ in. diam. Achenes small.—Distr. Europe from Denmark southwd., W. Asia, N. Africa; introd. in America.


Pastures and waste places, N. to Shetland; ascends to 2,400 ft. in Wales; Ireland; Channel Islands; fl. March–May.—Glabrous. Root-fibres, stout, cylindric. Stem short, decumbent, branched at the base. Leaves variable; petiole stout with a base dilated. Peduncles stout, axillary, 1–fld. Flowers about 1 in. diam., bright yellow, sometimes apetalous, proterandrous. Head of achenes globose; Cotyledon solitary (one suppressed).—Distr. Europe (Arctic), W. Asia, and N. Africa.

Var. diver'gens, F. Schultz; lobes of lowest leaves not overlapping at the base, lowest sheaths narrow.—Var. incum'bens, F. Schultz; lobes of lowest leaves overlapping at the base, lowest sheaths amplexicaul.
6. CAL’THA, L. Marsh Marigold.


1. C. palus’tris, L.; stem not rooting at the nodes, leaves orbicular-reniform crenate-toothed.


VAR. C. vulg’dris, Schott; stem ascending, flowers many 1½–2 in. diam., sepals contiguous, follicles spreading, beak short.—VAR. C. Gueran’gërii, Boreau; stem ascending, flowers many smaller, sepals remote when expanded, follicles spreading, beak longer. Probably C. rip’aria, Don, and the origin of the double-flowered Caltho of gardens.—VAR. mi’nor, Syme; stem procumbent, flower solitary ½–1 in. diam., sepals remote, follicles erect, beak short. Mountainous places.

2. C. rad’icans, Forster; rooting at the nodes, radical leaves deltoid obscurely 5-angled acutely toothed, base truncate or reniform.

Forfarshire, very rare; fl. May–June.—This is a very remarkable species, or perhaps form of *C. palus’tris*, differing from all other forms of the latter in the deltoid sharply-toothed leaves and rooting nodes of the branches. It is said by Nyman to have been found by Th. Fries in E. Finland.

7. TROL’LIUS, L. Globe-flowere.


T. europa’eus, L.; flower globose, petals equalling the stamens.

Follicles transversely wrinkled, keeled, beaked. Seeds black, dotted.—Distr. Europe (Arctic) to the Caucasus.

8. HELLEBORUS, L. Hellebore, Bear's-foot.

Coarse perennial herbs. Leaves palmately pedately or digitately lobed, upper bract-like. Flowers corymbose, proterogynous. Sepals 5, large, petaloid or herbaceous, imbricate in bud, persistent. Petals small, tubular, 2-lipped, honeyed. Stamens many. Carpels separate, or cohering below. Follicles dehiscing at the top. Seeds many, oblong, funicle thickened, testa crustaceous shining.—Distr. Europe, N. and W. Asia; species 10.—Etym. ἑλλήβορος, the Greek name.


E. HYEMA'lis, Salisbury; sepals 6–8 oblong.


9. AQUILEGIA, L. Columbine.

Erect perennial herbs. Leaves 2–3-nately divided. Flowers panicled or solitary, handsome, proterandrous. Sepals 5, regular, petaloid. Petals 5,
concave, spurred behind, spur honeyed. Stamens many, inner imperfect. Carpels 5, many-ovuled. Follicles 5. Seeds many, testa crustaceous smooth or granulated.—Distrib. N. temp. zone; species 5-6.—Etym. aquila, an eagle, from the form of the petals.

A. vulgaris, L.; spur hooked, follicles cylindric hairy.
Woods and thickets, England and Ireland, often naturalized, ascending to 1,000 ft. in Yorkshire; fl. May–July.—Rootstock stout, blackish. Stem 1–2 ft., slender. Radical leaves fascicled, petiole long, 2–3-ternately divided, segments stalked, lobed, glaucous, glabrous or hairy beneath. Flowers 1 1/2–2 in. diam., loosely corymbose, drooping, blue or dull purple white (or red in garden varieties). Sepals ovate-lanceolate. Petals oblong; spur curved, involute at the tip. Stamens declinate, rising and dehiscing successively; inner reduced to broad wrinkled white filaments.—Distrib. Europe, N. Africa, N. and W. Asia to the W. Himalaya.

9*. DELPHIN’IUM, L. LARKSPUR.

Erect, annual or perennial herbs. Leaves alternate, lobed or cut. Flowers racemed or panicked, bracteate. Sepals 5, separate, or cohering below, dorsal spurred behind. Petals 2–4, small, 2 dorsal with spurs within the sepaline spur, 2 lateral spurless or 0. Stamens many. Follicles 1–5. Seeds many, testa coriaceous wrinkled or plaited.—Distrib. N. temp. zone; species about 40.—Etym. δελφίνω, a dolphin, from the form of the flower.

D. Ajacis, Reichb. (not L.); racemes long, lower bracts lobed, follicles solitary pubescent. D. Consol’dia, Brit. Fl. (not L.).
Cornfields, naturalized in Cambridgeshire, sporadic elsewhere; (alien or colonist, Wats.); fl. June–July.—Annual, pubescent. Stem 10–18 in., slender, sparingly branched. Leaves cut into many narrow linear lobes, lower petioled, upper sessile. Flower 1 in. diam., blue, white or pink. Sepals spathulate-oblung, spur 1/4 in. Petals 2. Follicles 1/2 in., cylindric; style short. Seeds continuously plaited all round.—Distrib. Central and S. Europe, N. Africa; introd. in U. States.—D. Consol’dia, L., which has been occasionally found in England, has glabrous follicles, short racemes, and seeds with interrupted ridges.

10. ACONI’TUM, L. MONKSHOOD, WOLFBANE.

Erect, perennial herbs. Leaves alternate, palmately-lobed or cut. Flowers panicked or racemed, bracteate, proterandrous. Sepals 5; dorsal large, arched, hooded; anterior narrowest. Petals 2–5, small; 2 dorsal with long claws, hooded at the tip, covered by the sepaline hood; 3 lateral small or 0. Follicles 3–5. Seeds many, testa spongy rugose.—Distrib. Mountains of the N. hemisphere.—Etym. classical.

A. Nape’lius, L.; leaf-lobes pinnatifid, raceme simple dense-fld.
Shady places near streams, in Wales, Hereford, Somerset, Dorset, and Denbigh, naturalized elsewhere; (a denizen? Wats.); fl. July–Sept.—Rootstock fusiform, black. Stem 1–2 ft., erect slightly pubescent. Leaves palmately
5-7-partite, upper often sessile; petiole dilated at the base. Flowers bracteolate, 1-1 1/2 in. diam., dark blue; pedicels erect, pubescent. Upper sepal at first concealing the others, then thrown back. Spurs of upper petals conical, deflexed. Filaments dilated below; anthers greenish-black. Follicles 3-5, sub-cylindric, beaked.—Distrib. Europe, N. and W. Asia to the Himalaya.—A deadly acrid poison.

11. ACTÆ'A, L. BANE-BERRY, Herb Christopher.

Erect perennial herbs. Leaves alternate, 3-nately compound; stipules adnate. Flowers small, in short crowded racemes. Sepals 3-5, rather unequal, petaloid. Petals 4-10, small, spathulate, or 0. Carpels 1, many-ovuled; stigma sessile, dilated. Berry many-seeded. Seeds depressed, testa crustaceous smooth.—Distrib. Colder regions of the N. hemisphere; species 1 or 3.—Etym. ἄκτης, the Elder, from a fancied likeness.

**A. spicata, L.**; raceme simple, fruiting pedicels slender.

Copses on limestone, Yorks. and Westmorel., ascending to 1,000 ft.; fl. May. —Rootstock stout, black. Stem 1-2 ft., perennial, simple or sparingly branched. Radical leaves with long petioles, 2-3-nate-pinnate; leaflets 1-3 in., ovate, acuminate, lobed and serrate, glabrous; auricles short, rounded. Racemes 1-2 in., solitary or few, oblong; peduncle and pedicels pubescent. Flowers 1/4 in. diam., white. Sepals obtuse, caduceus. Petals minute or 0. Filaments dilated above; anther cells dehiscing in front. Berries 1/4 in. long, ovoid, nearly black, on spreading pedicels.—Distrib. Temp. and Arctic Europe, Asia, and N. America (a red-berried var.).—Nauseous, poisonous.

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**Order II. BERBERI'DÆÆ.**

Herbs or shrubs; buds scaly. Leaves alternate, simple or compound, usually exstipulate. Inflorescence various; flowers often globose. Sepals petaloid. Petals hypogynous, numerous, distinct, multiples of 2, 3, or 4, never of 5, imbricate in bud. Stamens one opposite each petal; anthers opening by 2 ascending lids or valves. Carpels 1, 1-celled; stigma usually peltate; ovules 2 or more, basal or on the ventral suture, anatropous, raphe ventral. Fruit a berry or capsule. Seeds albuminous; embryo various.—Distrib. Most cool regions, except Australia and S. Africa; genera 20, species 100.—Affinities with Ranunculaceæ and Menispermaceæ; analogy in anther with Laurinæ and in the 3-nary floral whorls with Monocotyledons.—Properties. Astringent, and yield a yellow dye. Berries of Berberis acid and eatable.

1. BERBERIS, L. Barberry.

Spiny shrubs, wood yellow. Leaves spinous-toothed, jointed on the very short petiole, often reduced to 3-7-fid. spines. Flowers racemose solitary or fascicled, yellow, globose. Sepals 8-9, outer minute, imbricate. Petals 6, in 2 series, with 2 basal honeyed glands. Stamens 6. Ovules
few, basal, erect. *Berry* 1-2-seeded. *Seeds* oblong, testa crustaceous; embryo straight.—**DISTRIB.** N. temp. regions, sub-trop. Asia, temp. S. America; species 50.—**ETYM.** Arabic.

**B. vulgaris**, L.; leaves obovate spinous-serrate, stigma sessile.

Copses and hedges from Caithness southd., naturalized only in Scotland and Ireland; fl. May–June.—An acid shrub, 4-6 ft. *Leaves* on the annual shoots 1-1½ in., alternate, shortly petioled on the woody shoots; reduced to 3-7-forked (rarely simple) spines jointed on to a very short sheath, and bearing fascicles of leaves (reduced branches) in their axils. *Flowers* ¼-½ in. diam., in terminal pendulous racemes, pale yellow, proterandrous; bracts short, triangular. *Stamens* irritable, springing forward when touched at the base. *Berry* ½ in. long, oblong, compressed, slightly curved, orange-red; stigma broad, black.—**DISTRIB.** Europe, temp. Asia, N. Africa; introd. in U. States.

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**ORDER III. NYMPHÆACEÆ.**

Aquatic perennial herbs. *Leaves* usually floating, often peltate, margins involute in vernalion. *Scapes* 1-fld. naked. *Floral whorls* all free and hypogynous, or adnate to a fleshy disk that envelops the carpels. *Sepals* 3-6. *Petals* 3-5, or more. *Stamens* many. *Carpels* 3 or more in one whorl, free, or adnate with the disk into a many-celled ovary; styles as many as carpels, stigma peltate or decurrent; ovules parietal, anatropous or orthotropous. *Fruit* a berry, or carpels separate and indehiscent. *Seeds* naked or arilled, albumen floury or 0; embryo enclosed in the enlarged amniotic sac.—**DISTRIB.** Temp. and trop.; genera 8; species 30-40.—**AFFINITIES.** With *Papaveraceae*, but not close.—**PROPERTIES** unimportant.

1. **NU'PHAR, Smith.** Yellow *Water-lily, Brandy-bottle*.

*Flowers* yellow, globose. *Sepals* 5-6, concave. *Petals* many, small, hypogynous. *Stamens* many, inserted beneath the disk; filaments short, flattened. *Carpels* many, together forming a many-celled ovary; stigma peltate, rayed; ovules many. *Berry* ovoid, of separable carpels, ripening above water. *Seeds* small, not arilled.—**DISTRIB.** N. temp. hemisphere; species 3-4.—**ETYM.** Arabic *na'far*.

1. **N. lut'eatm, Sm.**; leaves orbicular, base deeply 2-lobed, lobes usually contiguous, anthers linear, stigma 10-30 rayed.

Still waters from the Hebrides and Aberdeen southd.; ascends to near 1,000 ft. in Yorkshire; Ireland; fl. June–Aug.—**Rootstock** creeping in mud; bud terminal. *Submerged leaves* membranous, waved; floating coriaceous; petiole obtusely 3-gonous at the top. *Flowers* fragrant, odour alcoholic. *Petals* 18-20, obovate-cuneate, thickly coriaceous, with a sub-terminal glandular pore, honeyed beneath. *Berry* beaked.—**DISTRIB.** Europe, temp. Asia, N. America.—**Rootstock** abounds in tannic acid.

*N. lut'eatm, proper*; flower 2-3 in. diam., stigma generally entire 13-30-rayed.

—**VAR.** *N. intermed'ium, Ledebr.; flower* 1½ in. diam., stigma waved at the margin 10-14-rayed.—**Chartner's Lough**, Northumb., and E. Perth.
2. **N. pu'milum**, Smith; leaves oblong deeply 2-lobed at the base, lobes at length spreading, anthers oblong, stigma lobed at the margin, rays 8–10 reaching the margin.

Small lakes in Scotland, Argyll to Elgin, rare; Salop; fl. June–Aug.—Very similar to **N. lu'teum**, differing in the smaller more orbicular petals, and shorter anthers. **Petiole** 2-edged.—**DISTRIB.** Arctic and Central Europe, N. Asia.

2. **NYMPHÆA**, L. White Water-lily.

Flowers expanded, white blue or red. **Sepals** 4, adnate to the base of the disk. **Petals** in many series, inner successively transformed into stamens, adnate to the sides of the disk. **Carpels** many, their bases and the filaments sunk in the fleshy disk, and with it forming a many-celled ovary, crowned by the connate radiating stigmas; ovules many, anatropous. **Fruit** a spongy berry, ripening under water. **Seeds** buried in pulp, aril fleshy.—**DISTRIB.** Most temp. and trop. regions, except N. Zealand and the Pacific Isles; species 20.—**ETYM.** dedicated by the Greeks to the nymphs.

**N. al'ba**, L.; leaves floating orbicular base cordate quite entire.

Lakes and ponds, from Shetland southd., ascending to 1,000 ft. in the Lake District; Ireland; fl. June–Aug.—**Rootstock** stout, fleshy; buds terminal. **Leaves** 5–10 in. diam., deeply 2-lobed at the base; lobes contiguous; petiole very long. **Flowers** white. **Sepals** linear-oblong, back green. **Petals** oblong, obtuse, with no glandular pore. **Fruit** globose; stigmatic rays 15–20.—**DISTRIB.** Europe (Arctic), N. Africa, N. and W. Asia to Kashmir, N. America.

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Order IV. **PAPAVERÆ.**

Annual or perennial herbs; juice milky or coloured. **Leaves** radical or alternate, exstipulate. **Flowers** regular, usually nodding in bud, envelopes and stamens caducous. **Sepals** 2, concave. **Petals** 4, crumpled. **Stamens** very many, hypogynous, filaments slender; anthers erect, insertion basal, bursting laterally. **Ovary** 1-celled, or 2–4-celled by prolonged placenta; style short or 0, stigmas radiating in connate pairs opposite the placenta, or separate and alternating with these; ovules in many rows, anatropous, parietal. **Capsule** dehiscing by pores or valves. **Seeds** many, small, albumen oily and fleshy; embryo minute.—**DISTRIB.** N. temp. zone chiefly; genera 17; species 65.—**AFFINITIES.** With **Fumariaceae** and **Cruciferae.**—**PROPERTIES.** Narcotic, emetic, purgative, or acridly poisonous.

* **Capsule** dehiscing by pores or very small valves.

Stigmas 4 or more, subsessile, forming a radiating disk.............1. Papaver.

**Capsule** dehiscing to, or nearly to, the base by valves.

Ovary more or less completely 2-celled. Flower yellow.............4. Glaucium.
Papaver.]  

PAPAVERACEÆ.  

1. **PAPA'VER, L.** Poppy.  

Annual erect herbs; juice milky. **Leaves** lobed or cut. **Flowers** long-peduncled honeyless, proterandrous. **Ovary** 1-celled; style short or 0, stigmas opposite the placentas united into a flat or pyramidal sessile or stalked 4–20-rayed disk; placentas prominent. **Capsule** short, opening by very small valves under the lobes of the persistent stigma. **Seeds** small, pitted.—**DISTRIB.** Europe, N. Africa, N. Asia, one S. African and one Australian; species 12.—**ETYM.** obscure.  


Dry fields and waste places from Durham and Carnarvon southd.; rare in Ireland; Channel Islands; (a colonist, *Wats.*); fl. May–July.—**Stem** 10–18 in., sparingly branched. **Leaves** with acute or awned lobes. **Flower** 1–2 in. diam., scarlet with a black disk. **Capsule** ½ in.; stigmatic rays reaching or exceeding the edge of the disk.—**DISTRIB.** Europe, N. Africa, W. Asia to the Himalaya.  

2. **P. Argemo'ne, L.**; leaves 2-pinnatifid, filaments dilated upwards, capsule clavate usually hispid, stigma convex, rays 4–6.  

Waste dry places from Ross, southd.; rare in Ireland; Channel Islands; (a colonist, *Wats.*); fl. May–July.—**Habit** of succeeding species. Hairs of peduncles appressed. Pairs of petals unequal.—**DISTRIB.** Europe, N. Asia, N.W. India; introd. in America.  

3. **P. du'biurn, L.**; leaves 1–2-pinnatifid, filaments filiform, capsule sessile obovoid glabrous, stigma 6–12-rayed.  

Waste places N. to Shetland; Ireland; Channel Islands; (a colonist, *Wats.*); fl. May–July.—**Habit** of succeeding species. Hairs of peduncles appressed. Pairs of petals unequal.—**DISTRIB.** Europe, N. Asia, N.W. India; introd. in America.  

**P. du'biurn** proper; sap white, leaf-lobes shorter, capsule narrowing from just below the stigma to the base, lobes of stigmatic disk spreading. **P. Lamottei**, Bor. Abundant.  

Sub-sp. **P. Lecoq'ii**, Lümoitte; sap yellow on exposure, leaf-lobes longer, capsule broadest at ½ below the stigma, lobes of stigmatic disk deflexed. England, Scotland, Ireland, rare.  

4. **P. Rhoe'as, L.**; leaves 1–2-pinnatifid, filaments filiform, capsule subglobose glabrous, stigma convex with overlapping lobes, rays 8–12.  

Cornfields and waste places; rare N. of the Tay; Ireland; Channel Islands; (a colonist, *Wats.*); fl. June–Aug.—**Stem** branched, hispid. **Leaf** lobes ascending, with a bristle at the tip. **Peduncles** with spreading or appressed (*P. strigo'sum*, Boenn.) hairs. **Flowers** 3–4 in. diam. scarlet; pairs of petals unequal. **Capsule** stipitate.—**DISTRIB.** Europe, N. Africa, W. Asia to India.  

—A form entirely intermediate between *P. dubium* and *P. Rhoeas* has been found in Surrey by Mr. G. Nicholson.
P. somnif'erum, L.; glaucous, glabrous or hispid, leaves amplexicaul sinuate-lobed or toothed, flowers large white or blue-purple, filaments slightly dilated upwards, capsule ovoid or globose stipitate. Opium Poppy.

Corinfields and waste places, sporadic; established in Kent, Syme; fl. July-Aug.—Variable in hispidity, in the shape of the capsule, colour of the flower, and black or white seeds.—Distrib. Europe, W. Africa, all Asia.

2. MECONOPSIS, Viguier. Welsh Poppy.

Perennial herbs; juice yellow. Leaves entire pinnate or pinnatifidly lobed. Flowers solitary or racemed, not honeyed, homogamous. Ovary 1-celled; style distinct, stigmas 4 or more opposite the projecting placentas dilated or club-shaped. Capsule ovoid or elongate, with short valves below the persistent style. Seeds small, testa rugose.—Distrib. Mountain N. temp. regions; species 9.—Etym. μήκος, a poppy, and άψις, resemblance.

M. cam'brica, Vig.; leaves pinnate, lobes pinnatifid.

Moist glens, Cornwall to Somerset, York, Westmoreland(?), Wales (ascending about 2,000 ft.); Ireland; naturalized in Scotland; fl. June.—Nearly glabrous. Rootstock stout, branched, tufted; roots thick. Stem 1-2 ft., woolly at the base. Leaves petaled, pale green; segments distinct or decurrent, ovate-lanceolate, lobed and toothed. Flowers 2-3 in. diam., pale yellow, peduncles long. Sepals hairy. Petals orbicular. Style short, stigma capitulate, 4-6-rayed. Capsule 4-6-valved, ribbed.—Distrib. W. Europe, from Ireland to the Pyrenees.

3. CHLIDO'NIUM, L. Celandine.

Erect, branched, perennial herbs; juice yellow. Leaves much divided. Flowers yellow. Ovary 1-celled; style dilated at the top, with two adnate stigmas opposite the slender placentas. Capsule linear; valves thin, separating upwards from the persistent placentas and style. Seeds with a shining testa and crested raphe.—Distrib. Europe to Japan; species 2. —Etym. doubtful.

C. majus, L.; leaves 1-2 pinnate, flowers small.

Waste places and hedgerows from Inverness southd., probably naturalized, elsewhere an escape; Ireland; Channel Islds.; (a denizen, Wats.); fl. May-Aug.—Stem 1-2 ft., brittle, sparingly hairy, leafy. Leaves membranous, glabrous beneath; segments 1-2 in., ovate, toothed, lobed or laciniate (C. lacinia'tum, DC.); petiole dilated at the base. Flowers 3/4–1 in. diam., in loose few-fl. umbels, yellow; pedicels slender; bracts whorled. Capsule 1½ in., readily dehiscing, valves torulose.—Distrib. Europe (Arctic), W. Asia to Persia; introd. in N. America.


Glaucous herbs; juice yellow. Leaves lobed or cut. Flowers large, yellow or purple. Ovary 2- rarely 3-celled; style short or 0, with 2 deflexed stigmas opposite the placentas which meet in the axis of the ovary; ovules very many. Capsule long, narrow, 2-valved almost to the
base. Seeds many, sunk in the spongy septum, testa pitted.—Distrib. Chiefly Mediterranean; species 5-6. The dissemination (formed by the placetas as in Crucifere) is sometimes incomplete.—Etym. γλαβκιον, from the blue hue of some species.

G. intœum, Scop.; leaves ½-amplexicaul, capsule tuberced.

Sandy sea-shores Shetland; and from the Forth and Clyde southd.; Ireland; Channel Islds.; fl. June-Oct.—Glaucous, sub-hispid, annual, sometimes perennial. Stem 1-2 ft., branched, erect or ascending. Radical leaves 2-pinnatifid, rough with stout hairs; lobes pointing various ways. Flower-2-4 in. diam., golden yellow; peduncles short, glabrous. Petals in opposite dissimilar pairs. Pod curved, a foot long, glabrous; stigmatic lobes spreading.—Distrib. Europe, N. Africa, W. Asia; introd. in U. States.

4*. Rœmë'ria, DC.


R. hyb'rida, DC.; leaves 3-pinnatifid, capsule 3-valved. Glauc'ium viola'ceum, Juss.


Order V. Fumar'ia'ceæ.

Annual or perennial herbs; juice watery. Leaves usually divided. Flowers racemose. Sepals 2, small, scale-like, deciduous. Petals 4, in 2 usually very dissimilar pairs; 2 outer larger lateral, but becoming antero-posterior by a ¼-twist of the pedicel, one or both gibbous or spurred; two inner smaller, erect, often coherent at the tips. Stamens (in the British species) 6, in 2 bundles opposite the 2 outer petals; anther of central stamen in each bundle 2-celled, of lateral 1-celled. Ovary 1-celled; style long or short, stigma obtuse or lobed; ovules 2 or more, amphitropous; placetas parietal. Fruit a 2-valved many-seeded capsule, or an indehiscent 1-seeded nut. Seeds albuminous, raphe sometimes appendaged; embryo minute.—Distrib. Temp. and warm N. hemisphere, and S. Africa; genera 7; species 100.—Affinities. Between Papaveraceæ and Crucifereæ.—Properties. Astringent, acrid, and reputed diaphoretic.

1. Fuma'ria, L. Fumitory.

Annual, rarely perennial herbs, usually branched, often climbing. Leaves much divided; segments very narrow. Flowers small, in terminal c 2
or leaf-opposed racemes honeyed, homogamous. *Petals 4, erect, con- niving; the posterior gibbous or spurred at the base, the anterior flat; 2 inner narrow, cohering by their tips, winged or keeled at the back. Filament of the stamen opposite the gibbous petal usually spurred at the base. Ovary globose; style filiform, stigma entire or shortly lobed; ovules 2, on 2 placetas. Fruit 1-seeded, indehiscent, globose.—Distrib. Europe, Asia, following cultivation; species 6.—Etym. doubtful.

1. **F. capreola'ta**, L.; climbing by the twisting petioles, leaf-segments flat, sepals ovate toothed below at least as broad and ¼-⅔ as long as the corolla-tube, lower petal gradually dilated at the tip, pedicels longer than the bracts, fruit globose contracted into a neck at the base not retuse. Fields and waste places from Orkney southd.; Ireland; Channel Islds.; (a colonist, Wats.); fl. May–Sept.—Stems 1-2 ft. or more, branched. Leaves 2-pinnate; segments broad. *Racemes lax-fld., not much elongated in fruit. Flowers ⅓½ in.—Distrib. Europe, N. Africa, W. Asia.***

**F. capreola'ta proper**; sepals denticulate ¼-⅔ as long as the corolla-tube, petals cream-coloured often coloured after fertilization, fruit longer than broad with 2 deep pits at the top, neck narrower than the dilated top of the recurved pedicel. **F. pallidíifo'ra**, Jord.—From Roxburgh southd.; Co. Down.

**Var. F. Boräti**, Jord.; sepals smaller, petals redder, fruiting pedicels not recurved.—Common.

Sub-sp. **F. confu'sa**, Jord.; sepals ⅓ as long and nearly as broad as the corolla-tube, petals pink tipped with purple, fruit subrugose when dry a little longer than broad with 2 broad shallow pits at the top, neck broader than the dilated top of the erecto-patent pedicel. **F. agrāria**, Mitten.—From Perth southd.

**Sub-sp. F. mura'lis**, Sonder; flowers smaller and laxer, sepals as in confu'sa, petals pink tipped with purple, fruit finely rugose when dry with 2 inconspicuous pits at the top, neck narrower than the dilated top of the erecto-patent pedicel.—England chiefly, rare; Stirling; Belfast.

2. **F. officina'lis**, L.; diffuse, leaf-segments flat, sepals ovate-lanceolate ⅔ as long and ⅔ as broad as the corolla-tube, lower petal abruptly dilated at the tip, pedicel ascending longer than the bracts, fruit depressed-sphérical rugose when dry top with a large shallow pit.

Waste places, N. to Shetland; ascends to 1,000 feet in N. England; Ireland; Channel Islds.; (a colonist, Wats.); fl. May–Sept.—Smaller than *F. capreola'ta*, leaves more divided, flowers smaller and raceme much elongated after flowering. *Flowers dark or pale rose-purple.—Distrib. Europe, N. Africa, W. Asia; introd. in U. States.

3. **F. densíifo'ra**, DC.; diffuse, leaf-segments narrow, sepals broadly ovate toothed ⅓ as long as and broader than the corolla-tube, lower petal abruptly dilated at the tip, pedicels erecto-patent about as long as the bracts, fruit globose rugose when dry top with 2 shallow pits. **F. micran'tha**, Lagasca.

Waste places, from Elgin southd.; (a colonist, Wats.); fl. May–Sept.—Habit of *F. officina'lis*, but weaker, leaf-segments smaller and narrower, flat
or slightly channelled, racemes short, much elongated after flowering, flowers smaller $\frac{4}{10}$ in. pale, bracts coloured.—Distrib. Europe, N. Africa, W. Asia to India.

4. **F. parvifo'ra, Lamk.**; diffuse, leaf-segments narrow, sepals minute toothed $\frac{1}{10}-\frac{1}{8}$ as long and not $\frac{1}{3}$ as broad as the corolla-tube, lower petal abruptly dilated at the tip, pedicels erecto-patent equal to or exceeding the bracts, fruit globose rugose when dry top with 2 pits. *F. tenuise'cta*, Syme.

Waste places, &c., from Mid. Scotland southd.; (a colonist, Wats.) fl. June-Sept.—Best distinguished by habit, by the narrow leaf-segments, small pale flowers and minute sepals.—Distrib. Europe, N. Africa, N. and W. Asia to India.

**F. parviflo'ra proper**; leaf-segments channelled, racemes dense, sepals triangular-ovate $\frac{1}{3}$ as long and $\frac{1}{3}$ as broad as the corolla-tube, pedicels equaling the bracts, fruit pointed.—From Perth southd., rare.

Sub-sp. **F. Vaillan'tii, Loisel.**; leaf-segments flat, racemes lax, sepals lanceolate $\frac{1}{10}$ as long and $\frac{1}{3}$ as broad as the corolla-tube, pedicels exceeding the bracts, fruit rounded at the top.—Yorkshire and S. E. England.

**2. Coryd'alis, DC.**

Erect herbs with a tuberous rootstock, or weak and diffuse, or slender and climbing by tendrils. *Leaves* much divided, alternate or subopposite. *Racemes* terminal or leaf-opposed. *Floral* characters of *Fumaria*, but ovules numerous, and fruit an inflated 2-valved capsule. *Seeds* small, raphe often crested.—Distrib. Chiefly Mediterranean and Himalayan, a few N. American and S. African; species 70.—Etym. Greek for a *Fumaria*.

1. **C. clavicula'ta, DC.**; annual, branched, climbing by branched tendrils terminating the petioles, racemes leaf-opposed.

Copses, banks, and thatched roofs from Ross southd.; ascends to near 1,000 ft.; N.E. Ireland; fl. June-Aug.—Stems 1-3 ft., brittle, slender. *Leaves* glaucous, pinnate, pinna 3- or digitately 5-foliolate; segments small, ovate or oblong. *Pedicels* very short; bracts cuspidate. *Flowers* $\frac{1}{4}$ in., straw-coloured; spur very short. *Pods* $\frac{1}{4}$ in., linear-oblong. *Testa* shining, granulate.—Distrib. W. Europe, from Denmark to Spain.

**C. lu'tea, DC.**; perennial, branched, diffuse, root fibrous, leaves 2-3-ternately pinnate, racemes leaf-opposed, flowers subsecund yellow.

Old walls; an escape from cultivation; fl. May-Aug.—Rootstock branched. *Stem* 6-12 in.; angular. *Leaves* long petioled, leaflets oblong-ovate or oblong, entire or lobed. *Pedicels* long; bracts lanceolate, erose. *Flowers* $\frac{1}{3}-\frac{2}{3}$ in.; spur short, thick, incurved. *Pods* oblong, compressed, acuminate; style deciduous.—Distrib. W. Europe, from Belgium southd.

**C. sol'id a, Hook.**; perennial, rootstock tuberous, stem simple, leaves 2-3-ternately pinnate, raceme terminal, flowers purple. *C. bulbosa, DC.*

Banks and cultivated ground, naturalized in England; fl. April-May.—Very glaucous. *Rootstock* 1 in. diam. and upwards. *Stem* 6-10 in., stout, with
FUMARIACEÆ.

[Corydalis.]

one or two oblong scales below, and a few leaves about the middle. Leaves with stout petioles; leaflets broad. Flowers 1 in.; bracts lobed, leafy; spur longer than the rest of the corolla. Pods narrow, lanceolate; style persistent. Cotyledons connate.—Distr. Europe, from Denmark southd.

ORDER VI. CRUCIFÆRÆ.

Herbs. Leaves radical or alternate, exstipulate. Flowers racem. Sepals 4; 2 lateral (opposite the placentas) often larger and saccate at the base, imbricate in bud. Petals 4, placed crosswise, imbricate in bud. Stamens 6 (rarely 1, 2, or 4), in 2 series, hypogynous; 2 outer opposite the lateral sepals; 4 inner longer, in pairs opposite the other sepals. Disk honeyed, glands 2, 4, or 6, opposite the sepals. Ovary 2-celled by a vertical prolongation of the placentas, or 1-celled, or with superimposed cells; style short or 0, stigma simple or 2-lobed, lobes opposite the placentas; ovules 2-seriate on 2 parietal placentas, rarely solitary and erect, amphitropous or campylotropous, micropyle superior. Fruit a long or short 2-celled and 2-valved capsule (pod); valves deciduous, leaving the seeds on the persistent placentas (replum), rarely indehiscent, or of superposed 1-seeded joints. Seeds small, albumen 0; cotyledons large, plano-convex or longitudinally folded, folicaceous in germination, radicle turned up on the back of one cotyledon (incumbent), or facing their edges (accumbent).—Distr. All temp. and cold regions, but chiefly of the Old World; genera 172; species 1,200.—Affinities. Between Fumariaceae and Capparidæae. —Properties. All are nitrogenous and contain sulphur, are pungent, stimulant, anti-scorbutic, often acrid. Seeds oily. Testa of cress and others mucilaginous when moistened, owing to the swelling and bursting of superficial cells.

A. Pods elongate (much longer than broad), dehiscing throughout their length, flat or turgid, not compressed at right angles to the septum. (Pods sometimes short in Nasturtium, the tip sometimes indehiscent in Brassica. See Draba in B.

TRIBE I. ARABIDÆ. Seeds 1-seriate (or 2-seriate in Arabis and Nasturtium); radicle accumbent. (Flowers white, yellow or lilac.)

* Stigmas erect or decurrent on the style .............. 1. Matthiola. ** Stigma small, simple, terminal.


TRIBE II. SISYMBRIÆ. Seeds usually 1-seriate; radicle incumbent, straight, plano-convex. (Flowers white, yellow or lilac.)

TRIBE III. BRASSICEÆ. Seeds 1–2-seriate; radicle incumbent, longitudinally folded or very concave, (Flowers yellow.)


B. Pods short (not or not much longer than broad), dehiscing through their whole length, broad, flat or turgid, not compressed at right angles to the septum. (Flowers white or yellow.) (Pod sometimes long in Draba; see Nasturtium in A.)

TRIBE IV. ALYSSINEÆ. Seeds 2-seriate; radicle accumbent.


TRIBE V. CAMELINEÆ. Seeds 2-seriate; radicle incumbent.

Tall herb, cauline leaves sessile auricled ..............................13*. Camelina.

C. Pods short, dehiscing throughout their length, much compressed at right angles to the septum, which is hence very narrow. (Pod indehiscent in Seneciera.)

TRIBE VI. LEPIDINEÆ. Cotyledons straight incurved or longitudinally folded, radicle incumbent. (Flowers white.)

Pods dehiscent, many-seeded ..................................................15. Capsella.
Pods dehiscent, 2–4-seeded ..................................................17. Lepidium.

TRIBE VII. THLASPIDÈÆ. Cotyledons straight, radicle accumbent. 

Pods on horizontal pedicels. (Flowers white.)

Pods ovate. Petals very unequal. Filaments without scales ...19. Iberis.

D. Pods indehiscent or with very short valves which cover a few of the seeds only.

TRIBE VIII. ISATIDÈÆ. Pods indehiscent, 1-celled, 1-seeded ...22. Isatis

TRIBE IX. CAKILINEÆ. Pods transversely 2-jointed, lower joint indehiscent seedless or not, or 2-valved and 2- or more-seeded; upper joint indehiscent, 1–2-celled. (Affinity with Brassiceae.)

Lower joint slender, seedless; upper globose, 1-seeded............23. Crambe.

TRIBE X. RAPHANEÆ. Pods elongate, 1-celled, many-seeded, or indehiscent, or jointed, the 1-seeded joints indehiscent ........25. Raphanus.

1. MATTHI'OLA, Br. Stock.

Herbs, sometimes shrubby, downy with stellate hairs. Leaves entire or sinuate. Flowers large. Sepals erect, lateral saccate at the base. Petals with long claws. Pods elongate, terete or compressed; septum thick, often 2–3-nerved; stigmatic lobes erect, conniving, often thickened or horned at
the back. Seeds 1-seriate, compressed, winged, or margined; radicle accumbent.—DISTRIB. Europe, N. Africa, W. Asia, one is S. African; species 30.—ETYM. After Mattioli, an Italian physician.

1. **M. inca'na**, Br.; shrubby, erect, hoary, leaves oblong-lanceolate entire, pod eglandular. *Queen Stock.*

Sea-cliffs eastward of Hastings (now extinct), I. of Wight; (a denizen, *Wats.*)

2. **M. sinua'ta**, Br.; herbaceous, diffuse, woolly or downy, leaves linear-ovate or -oblong, lower sinuate-toothed, pod muricate and glandular.

Shores of Wales, Cornwall (extinct?), Devon; S.E. and S. W. Ireland; Channel Isles; fl. May–Aug.—Stem 1–2 ft., branched above. Root-leaves petioled. Raceme 1–3 in. Flowers 1 in. diam., pale lilac, fragrant at night. Pods 3–4 in., ½ in. broad; seeds winged.—DISTRIB. W. Europe, N. Africa, Levant. —Taste alkaline.

1*. **CHEIRANTHUS, L. WALLFLOWER.**

Herbs or under-shrubs, pubescent with appressed 2-partite hairs. Leaves entire or toothed. Flowers large, racemose, yellow or purple. Sepals erect, lateral saccate at the base. Petals with long claws. Pods elongate, compressed or 4-angled; valves 1-nerved, flat or convex; stigma capitate or with 2 spreading lobes. Seeds 1-seriate, compressed; radicle accumbent.—DISTRIB. N. temp. and cold regions; species 12.—ETYM. doubtful.

C. CHEI'RI, L.; leaves lanceolate acute entire.


2. **NASTUR'TIUM, Br.**

Branched, terrestrial or aquatic glabrous herbs; hairs if present usually simple. Leaves entire lobed or cut. Flowers small, usually yellow, sometimes bracteate. Sepals short, equal, spreading. Petals slightly clawed, or 0. Stamens 1–6. Pods short or long, often curved, terete, pedicels patent and curved; valves not rigid, convex, obscurely 1-nerved; style short or long, stigma simple or 2-lobed. Seeds 2-seriate, small, turgid; radicle accumbent.—DISTRIB. N. temp. and warmer regions; species about 20.—ETYM. *Nasi tortium,* from the bitterness distorting the face.—United with *Cochlearia* by C. Armoracia (Horse-radish) and others.

1. **N. officina'le**, Br.; aquatic, leaves pinnate, leaflets subcordate sinuate-toothed, petals white twice as long as the sepals, pods linear. *Watercress.*

Watercourses, N. to Shetland; ascends above 1,000 feet in N. England; Ireland; Channel Islands; fl. May–Oct.—Perennial, glabrous, green or olive-
Nasturtium. 

Cruciferæ. 

25

brown. Stem 2–4 ft., rooting, often floating, fistular. Leaflets 3–6 pair. Racemes short, flowers \( \frac{1}{2} \) in. diam. Disk-glands 4. Pods \( \frac{1}{2} \) in., deflexed or horizontal, longer than the pedicels; valves beaded; seeds suborbicular, compressed.—Distrib. Europe, W. Asia, N. Africa; introd. in N. America and the colonies, and choking some rivers of N. Zealand. 

N. officinale proper; decumbent, terminal leaflet broadest and largest.—Var. siliquum, Reichb.; erect, tall, leaflets subequal, terminal oblong.—Var. microphyllum is a starved terrestrial state with small leaflets.

2. N. sylvestre, Br.; rootstock creeping, leaves deeply pinnatifid, leaflets many lanceolate more or less cut nearly equal, petals yellow twice as long as the sepals, pod linear. Moist waste places from the Tay southd., rare in the north; S. Ireland, rare; Channel Islands; fl. June–August.—Stem angular, flexuus. Leaves very variable. Racemes short; flowers \( \frac{1}{2} \) in. diam. Disk-glands 6. Pods \( \frac{1}{2} \)–\( \frac{3}{4} \) in., curved, pedicel very slender longer or shorter than the pod; seeds minute, hardly 2-seriate.—Distrib. Europe, N. Africa, temp. and subtrop. Asia; introd. in America.

3. N. palustre, DC.; leaves lyrate-pinnatifid, lobes few broad unequally cut, terminal of the lower leaves very large, petals yellow equalling the sepals or shorter, pods linear-oblong turgid. N. terrestre, Sm. Damp places from the Clyde southd.; Ireland; fl. June–Oct.—Stem 1–2 ft., erect or inclined. Leaves pinnate or pinnatifid, terminal leaflet sometimes 6 in. Flower \( \frac{1}{2} \) in. diam. Disk-glands 4. Pods equalling or exceeding their pedicels; style very short; seeds angular.—Distrib. Europe (Arctic), N. Africa, temp. and cold Asia and America.

4. N. amphibium, Br.; rootstock short stoloniferous, leaves entire toothed or pinnatifid, petals twice as long as the sepals, pods oblong shorter than their pedicels. *Armorac'ia*, Kcch. Wet places, York to Somerset and Kent; Ireland; Channel Islds.; fl. June–Sept.—Stem 2–4 ft., erect. Leaves pinnatifid when submerged, base often \( \frac{1}{2} \)-amplexicaul. Flowers \( \frac{1}{4} \) in. diam. Disk-glands 4. Pods \( \frac{1}{4} \) in., pedicels spreading or deflexed; style slender; stigma large, capitate; seeds small, oblong.—Distrib. Europe, N. Africa, temp. Asia.


Erect, glabrous, biennials. Stem angular. Leaves entire lobed or pinnatifid. Petals clawed. Disk-glands 6. Pods linear, elongate, compressed, 4-angled, acuminate; valves keeled or ribbed; style short, stigma capitate or 2-lobed. Seeds 1-seriate, oblong, not margined; radicle accumbent.—Distrib. Temp. regions; species about 6.—Etym. Dedicated to St. Barbara.—The straight stiff pods, keeled valves, and 1-seriate seeds, separate this from Nasturtium.

1. B. vulg'aris, Br.; leaves toothed or pinnatifid at the base, pods short acuminate, pedicels spreading, style distinct. Hedgebanks, water-sides, from the Clyde and Aberdeen southd.; Ireland; Channel Islds.; fl. May–Aug.—Stem rigid, erect, simple or sparingly branched.
**LOWER LEAVES** pinnate, rarely pinnatifid, terminal leaflet usually largest, cordate; upper subentire or pinnatifid with amplexicaul auricled bases. **Flowers** small, bright yellow. **Pods** \( \frac{3}{2} - 1 \) in., broader than their slender pedicels; style \( \frac{1}{12} - \frac{1}{3} \) in.—**DISTRIBUTION.** Europe (Arctic), temp. Asia, Himalaya to 17,000 ft., S. Africa, Australia, and N. America.

**B. vulgari's** proper; raceme about as long as broad, petals twice as long as the sepals, pods in a dense raceme 3-6 times as long as their pedicels, erect rarely spreading, seeds \( \frac{1}{4} \) times as long as broad.—**Common.** VAR. arcuata, Reichb.; raceme elongate, petals rather more than twice the length of the sepals, pods in a lax raceme arched and spreading when young 5-8 times as long as their pedicels, seeds more than twice as long as broad.—**Rare,** Loughgall, Armagh.

Sub-sp. **B. stricta**, Andr.; upper leaves entire, terminal lobe of lower oblong, flowers smaller, pods in a dense narrow raceme with erect pedicels. **B. parviflora,** Friis.—Chester, York, S. E. counties.

Sub-sp. **B. intermedia**, Boreau; leaf-segments many, petals twice as long as the sepals, pods in a dense raceme erect 4-6 times as long as their pedicels, seeds nearly as long as broad.—**Cultivated fields, rare.**—**Intermediate between B. stricta and praecox.**

**B. praecox, Br.**; leaves pinnatifid, segments narrow, petals 3 times as long as the sepals, pods long and distant scarcely thicker than their very stout short pedicels, style very short. **American Cress.**

Roadsides, &c., a garden escape; (an alien, Wats.) fl. April-Oct.—Very similar to **B. vulgari's**, of which I suspect it is a cultivated form. **Seeds** \( \frac{1}{4} \) longer than broad, twice as large and more ellipsoid than in **B. vulgari's.**—**DISTRIBUTION.** All Europe; introd. in U. States.—An excellent salad.

4. **AR'ABIS**, L. **Rock-cress.**

Annual or perennial herbs, glabrous or with forked or stellate hairs. **Radical leaves** spathulate; cauline sessile. **Flowers** usually white. **Sepals** short, equal, or the lateral saccate at base. **Pedicels** entire, usually clawed. **Pods** linear, compressed; valves flat, keeled, veined or ribbed; stigma simple or 2-lobed. **Seeds** 1-3 rarely sub-2-seriate, compressed, often margined or winged; radicle accumbent.—**DISTRIBUTION.** N. temp. zone; species 60.—**ETYM.** From Arabia, the native country of various species.—Differs from **Cardamìne** in the more keeled less elastic pod-valves.


Alps of Wales and Scotland, ascending above 4,000 ft.; Glenade Mt., Leitrim; fl. June-Aug.—Glabrous or hairy, perennial. **Stem** 3-6 in., branched below. **Leaf-segments** short. **Flowers** corymbose, white or purplish. **Pods** \( \frac{1}{2} - 1 \) in.; valves 3-nerved; seeds hardly winged.—**DISTRIBUTION.** Alpine and Arctic Europe, N. Asia and N. America.

2. **A. stricta**, Huds.; hispid, radical leaves subpetiolate small obtuse sinuate-lobed cauline few \( \frac{1}{2} \)-amplexicaul, petals narrow cuneate suberect, pods suberect.
CRUCIFERÆ.

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Rocks, N. Somersett and W. Gloucester, very rare; fl. March-May.—Perennial. Stems 5-10 in., ascending or erect. Radical leaves ciliate, hairs forked and simple; lobes oblong or triangular, pointing upwards. Flowers rather large, cream-coloured. Pods 1 in., 3-6 times as long as their pedicels; valves 1-nerved; style short; seeds oblong, slightly winged above.—Distrib. Europe, from Spain to Hungary.—Habit of Sisymb. Thalid'nu.

3. **A. hirsuta**, Br.; hispid, stem leafy, radical leaves subpetiolate toothed, cauline sessile or ½-amplexicaul, petals spreading white, pods many slender erect. A. sagitt'la, DC.; Turritis hirsuta, L.

Dry places, ascending to 2,700 ft. in Scotland; local in Ireland; Channel Islds.; fl. June-Aug.—Biennial or perennial. Stems 1-2 ft., many, slender. Leaves 1½-3 in., obtuse or acute. Flowers small. Pods 1½-2 in., very many, much narrower than in A. ciliata; style short; seeds distant, very narrowly winged all round.—Distrib. Europe, temp. Asia to the Himalaya, N. America.—Var. glab'ra, Syme; stem and leaves glabrous or ciliated.—Great Aran Is., W. Ireland, and Eastbourne, Sussex.

Sub-sp. **A. cilia'ta**, Br.; glabrous or ciliate, cauline leaves sessile, base rounded, pods fewer broader, seeds closer.—Rocky shores, S. Wales, W. Ireland.

4. **A. perfoli'a'ta**, Lamk.; nearly glabrous, glaucous, radical leaves obovate sinuate or lobed, cauline amplexicaul entire auricled, petals erect pale yellow, pods many crowded slender erect, seeds sub-2-seriate. Turritis glabra, L.

Dry rocky places, local, from Perth southd.; Ireland, Antrim only; fl. May-July.—Annual or biennial. Stem 2-3 ft., erect, with few spreading hairs about the early withering root-leaves, &c. Pods 1-2 in.; pedicel slender; style very short; seeds minute, oblong, angled, not winged.—Distrib. Europe (Arctic), temp. Asia to the Himalaya, N. America.

A. Turrit'a, L.; stellately pubescent, leaves remotely toothed, radical petioled entire, cauline narrow oblong amplexicaul, flowers bracteate, petals obovate-lanceolate spreading, pods large long second decurved.


5. **CARDAMI'NE, L.** Bitter-cress.

Annual or perennial herbs, usually glabrous. Leaves usually pinnate. Flowers white cream-coloured or purple. Sepals equal at the base. Petals clawed, rarely 0. Pods elongate, linear, compressed; valves flat, indistinctly nerved, elastic; stigma small. Seeds compressed, not margined, funicle filiform; radicle accumbent.—Distrib. Temp. and cold regions, rarely tropical; species 50.—ΕΤΥΜ. κάρδαμον, a kind of cress.

1. **C. hirsuta**, L.; radical leaves pinnate, leaflets broad petioled auricles 0, cauline narrower, petals small erect oblong-lanceolate, anthers yellow, pods erect.
Moist places, N. to Shetland; ascending to 3,000 ft. in Scotland; Ireland; Channel Islds.; fl. April–Sept.–Very variable, glabrous or hairy, 6 in.–2 ft., erect or diffuse. Leaflets 3–6 pairs, angled or sublobate. Flowers ⅛ in. diam., white. Pods about 1 in., slender, torulose.—Distr. N. temp. and cold zones; in S. temp. the perennial varieties are very numerous and puzzling.

C. hisu'ta proper; annual, radical leaves rosulate, pedicels erect, stamens usually 4, style short stout.—Open ground.

Sub-sp. C. flexu'o'sa, Withering; perennial or biennial, radical leaves few, leaflets lobed, pedicels spreading, stamens usually 6, style slender elongate. C. sylvat'ica, Link.—Shaded places.

2. C. praten'sis, L.; leaves all pinnate, leaflets of radical petioloed suborbicular, of cauline narrow subsessile, petals large spreading obovate, anthers yellow, pods erect on slender pedicels, style short stout. Lady’s Smock, Cuckoo-flower.

Moist meadows, N. to Shetland; ascends to 3,200 ft. in Scotland; Ireland; Channel Islds.; fl. April–June.—Rootstock short, stout, sometimes stoloniferous. Stem 1–2 ft. Leaflets of radical leaves ⅛–⅔ in.; of cauline usually much longer, almost entire. Flower ⅔–⅜ in. diam., lilac or almost white. Pods 1–1½ in.; pedicel ⅓–1 in.—Distr. N. temp. and Arctic regions, Abyssinia, Himalaya, Chili.—A similar plant occurs in Tasmania.—Var. C. denta'ta, Schult.; taller, stronger, radical leaves erect or suberect, leaflets fewer larger angled toothed.—Var. Haynea'na, Welw.; habit of C. hisu'ta, leaflets many small round linear or lanceolate, flowers small white, petals narrower. Thames near Mortlake.

3. C. ama'ra, L.; leaves pinnate, radical leaflets suborbicular, cauline narrow or deeply toothed, petals large obovate spreading, anthers purple, pods erect on slender pedicels, style slender. Bitter cress.

River-sides, &c., scarce; from Aberdeen southd., ascending to 1,000 ft. in Yorkshire; N.E. Ireland; fl. April–June.—Rootstock slender, stoloniferous. Stem 1–2 ft., ascending, glabrous or hairy. Leaves all alternate. Flowers ½ in. diam., creamy white. Pods 1–1½ in.; pedicel ½–⅔ in.; style slender, stigma minute.—Distr. N. Europe and Asia to the Himalaya.

4. C. impa'tiens, L.; leaves pinnate, petiole with stipuliform fringed auricles, leaflets all narrow deeply cut, petals linear-obovate or 0, anthers yellow, pods erect on short slender pedicels, style slender.

Shady copses, &c., local; from Westmoreland and York (ascends to 1,000 ft.) southd.; casual in Ireland; fl. May–Aug.—Rootstock spindle-shaped. Stem 1–2 ft., stout, erect, very leafy, glabrous. Leaflets many, petioloed. Flowers ⅛ in. diam., often panicled, white. Pods ⅙–1 in., very slender; pedicel ¼ in. Distr. Europe, temp. Asia to the Himalaya.—The stipuliform auricles, reflexed on the stem, are anomalous structures.

6. DENT'A'RIA, L. Coral-root.

Herbs with creeping, scaly rootstocks. Radical leaves few or 0; cauline often opposite or 3-nately whorled. Flowers large, purple. Sepals erect, equal at the base. Petals clawed. Pods narrow-lanceolate; valves flat,
nearly nerveless, elastic; septum membranous. Seeds 1-seriate, compressed, not margined, funicle dilated; radical accumbent, stalked.—Distrib. N. temp. regions; species about 20.—Etym. dens, from the scaly rootstock. —Differs from Cardamine chiefly in habit, and the funicles.


Woods and copses, rare; Stafford to Kent and Sussex; a doubtful native of Scotland; fl. April–June.—Rootstock annual or biennial, white. Stem 1–2 ft., simple, leafless below. Leaflets 1–2 in., in few pairs, o'long, entire, or serrate ciliate; uppermost confluent at the base; upper bulbiferous. Flowers ½–¾ in. diam., white or lilac; pedicel slender. Pods erect, rarely ripening.—Distrib. Throughout Europe, rare in W. Asia.

7. Sisymbrium, L. Hedge-Mustard.

Annual or biennial herbs; hairs simple. Radical leaves spreading; caudine alternate, often auricled. Flowers loosely racemed, usually yellow, often bracteate. Sepals short or long. Petals often narrow and long-clawed. Pods narrow-linear, terete or 4–6-angled or compressed; valves flat or convex, often 3-nerved; septum membranous, nerveless or 2-nerved; stigma simple 2-lobed or cup-shaped. Seeds many, 1-serial, not margined; radicle usually incumbent.—Distrib. N. temp. and cold regions; rare in Southern species 80.—Etym. doubtful.—Differs from Brassica only in the flat cotyledons, and united to Arabis by S. Thaliana. Pods of 4 types:—1. S. Thaliana, Irio, and Sophia; 2. S. officinale; 3. S. polyceratum; 4. S. Alliaria.

1. S. Thaliana, Hook.; leaves toothed pubescent, flowers white, pods spreading or ascending obscurely 4-angled. Thale-cress.

Dry soils, from Orkney southd., ascends to 1,500 ft. in Yorks.; Ireland; Channel Islds.; fl. May–Sept.—Annual. Stem 6–10 in., slender, nearly leafless. Radical leaves rosalate, oblong, petioled; caudine narrow, sessile, all entire or toothed. Flowers ½ in. diam.; pedicel slender. Pods ½–¾ in., slender, curved; seeds minute; radicle rarely incumbent.—Distrib. Europe (Arctic) to the Himalaya, N. Africa; introd. in N. America.


Waste places, Berwick, Dublin; Channel Islds.; sporadic elsewhere; (a denizen, Wats.); fl. July–Aug.—Annual or biennial. Stem 1–2 ft., branched. Radical leaves petioled; lobes irregularly toothed, terminal large often hastate. Flowers ½ in. diam. Pods ⅔ in., very many, glabrous, erect, strict; valves beaded, 3-nerved; style 0; seeds oblong.—Distrib. Central and S. Europe, N. Africa, W. Asia to the Himalaya.—Called “London Rocket” because it sprang up after the Fire of 1666.

3. S. Sophia, L.; leaves 2–3-pinnatifid glabrous or downy, segments narrowly linear, flowers yellow, pods slender terete ascending curved, pedicels very slender. Flixweed.

Waste places from Caithness southd., rarer in Scotland and Ireland; a colonist? fl. June–Aug.—Annual. Stem 1–3 ft., branched above; branches

4. S. officinale, Scop.; leaves runcinate-toothed or lobed hairy, flowers yellow, pods in a leafless raceme subulate terete appressed to the stem. Hedge-mustard.

Hedgebanks and waste places from Orkney south.d.; Ireland; Channel Islds.; fl. June–July.—Stem 1–2 ft., terete, erect, with spreading or reflexed hairs; branches horizontal. Leaves variously cut or lobed, with a tendency to a large terminal lobe. Flowers ¼ in. diam., homogamous. Pods ½ in., tapered from the base into the almost pungent style; pedicel short, thick.—Distrib. Europe, W. Asia to the Himalaya, N. Africa; introd. in the U. States.

5. S. Alliaria, Scop.; leaves all petioled deltoid or reniform-cordate coarsely toothed or crenate hairy beneath, pods stout long 4-angled, pedicels short stout. Erysimum, L.; Alliaria officinalis, Andiz. Garlic-mustard, Sauce alone, Jack by the hedge.

Hedgebanks, &c., from Ross south.d.; ascends to near 1,000 ft. in England; rarer in Scotland and Ireland; Channel Islds.; fl. May–June.—Annual or rarely biennial, glabrous or with a few scattered simple hairs, rank scented. Stem 2–3 ft., decumbent at the base, then flexuous, erect, simple or sparingly branched. Radical leaves often 3 in. diam., with long slender petioles, smaller and more reniform than the cauline, which are cuneate at the base. Flowers ¼ in. diam., white; homogamous. Pods 2½ in., linear, slightly curved, rigid, subacute; valves keeled; style very short, stigma truncate; seeds oblong.—Distrib. Europe, N. Africa, temp. and W. Asia to the Himalaya.

S. POLYCERATIUM, L.; prostrate, leaves runcinate-pinnatifid glabrous, flowers yellow, pods 1–3 in the axils of leafy bracts cylindrical curved spreading.

Roadside paths, Bury St. Edmunds, introduced by Dr. Goodenough; ballast-heaps, Fife; fl. July–Aug.—Annual, glabrous, very leafy. Leaves often reduced to the large triangular coarsely toothed terminal lobe. Flowers small, yellow. Pods ½ in., in short leafy racemes, broad at the base, on very short thick pedicels; valves 3-nerved, very convex, beaded, obtuse; style evident, short, thick, stigma obtuse.—Distrib. Mediterranean to the Caucasus.


Annual biennial or perennial hoary herbs; hairs appressed, forked. Leaves narrow, entire. Flowers yellow, often fragrant. Sepals erect, equal or the lateral gibbous at the base. Petals clawed. Pods narrow, compressed, 4-angled or terete; valves linear, often keeled; replum usually prominent; septum membranous or corky; stigma 2-lobed or entire. Seeds many, 1-seriate, oblong, not winged or winged at the tip; radicle incumbent.—Distrib. Temp. and cold N. hemisphere; species about 70.—Etym. ἐρυθρός, to draw blisters.—Near Sisymbrium, but cauline
leaves never auricled, and hairs 2–3-partite; differs from *Cheiranthus* in the cotyledons, and generally in the stigma.

**E. cheiranthoides, L.**; leaves lanceolate, pods short suberect.


**Distrib.** Europe (Arctic), N. Africa, N. Asia, N. America.

**8*. Hesperis, L. Dame's Violet.**


**H. Matronalis, L.**; pubescent, leaves oblong-lanceolate acuminate.

Meadows, plantations, &c., rarely even naturalized; fl. May–July.—Perennial, hairs simple or branched. *Stems* 2–3 ft., erect, stout, leafy. *Leaves* 2–5 in., shortly pitted or sessile, finely irregularly toothed or serrate. *Flowers* ½ in. diam., white or lilac, odorous in the evening, proterandrous; pedicel ½ in., spreading. *Pods* 2–4 in., slender, cylindric, constricted here and there between the remote seeds; pedicel ascending; valves much narrowed at the tip; style stout; seeds linear-oblong.—**Distrib.** Europe, temp. Asia.

**9. Bras'sica, L. Cabbage, &c.**

Herbs of various habit. *Leaves* entire or pinnatifid, often large. *Flowers* in corymbs or racemes, white or yellow, rather large. *Sepals* erect or spreading, equal or the lateral saccate at the base. *Pods* elongate, nearly terete, with sometimes an indehiscent 1-seeded beak; valves convex, often 3-nerved, the lateral nerves flexuous; septum membranous or spongy; stigma truncate or 2-lobed. *Seeds* 1-seriate, oblong or subglobose; radicle incumbent, cotyledons concave or conduplicate.—**Distrib.** Temp. Europe, Asia, and N. Africa; species 100.—*Etym.* The Latin name.

**Section 1. Bras'sica proper.** *Sepals* erect.

1. **B. oleraceae, L.**; rootstock stout branched leafy at the top, leaves obovate lobed or sinuate below glaucous glabrous, upper sessile oblong dilated at the base, flowering racemes elongate, beak of pod seedless, valves keeled and nerved. *Wild Cabbage.*

diam., pale yellow, homogamous. *Pods* 2–3 in., spreading, slightly compressed; beak short, subulate; seeds globose.—**Distr.** W. and S. coasts of Europe. Cultivated forms are *aceph'ala* (scotch kail, cow cabbage, borecole); *bullata* and *geminifera* (brussels sprouts and savoys); *capitata* (red and white cabbage); *Caulora'pa* (cole rabi); *Botry'tis* (cauliflower and broccoli).


Mr. Dyer considers that only two primary forms of this species are to be found in cultivation or as escapes in Britain; excluding *B. Na'pus* and its forms (of which none of the leaves are hispid) as being almost exclusively Continental. He assumes that **Var. oleif'era** is the Linnaean type, described as a troublesome weed in Sweden, which may be a starved state of the turnip escaped from cultivation. Mr. *Watson*, on the other hand, considers *B. Ra'pa*, **campes'tris** and *Na'pus* as all British, and affirms that the latter is wrongly described as glabrous. *B. Na'pus*, L. (?) being the rape; *B. Ruta'ba'ga*, L., the swede; and *B. Ra'pa*, L., the turnip, with 3 varieties *sati'va*, *sylves'tris*, and *Brigg'sii*.


Sub-sp. B. *Ra'pa*, L.; leaves not gaucoous, flowers smaller bright yellow. **Var. rapif'era**, Ko'h; root tuberous (turnip).—**Var. campes'tris**, Ko'h; root spindle-shaped.—**Var. sylves'tris**, Lond. Cat. (navew.) B. *Brigg'sii*, Wats., is an annual form from Cornwall.

3. **B. monen'sis**, Huds.; leaves petioled deeply pinnatifid, segments toothed, upper linear, beak of pod 1–3-seeded, valves 3-nerved.

Sea-shores; on the west from Skye to S. Wales; Channel Islands; fl. May–June.—**Rootstock** usually stort, woody, perenniai. Stem 6–24 in., erect or decumbent. Radica'leves with short broad-toothed segments. *Flowers* ½–1½ in. diam., pale yellow. *Pods* 1½–2½ in., spreading; beak thick; seeds globose, dark, punctate.—**Distr.** Shores, W. and S. Europe, N. Africa. (Subalpine in Pyrenees.)

**B. monen'sis** proper; glabrous, stem nearly simple, leaves chiefly radical. S. Wales to Skye; inland at Merthyr Tydfil, S. Wales.

Sub-sp. B. *Chei'ran'thus*, Villars; hispid, stem branched leafy. Cornwall; Channel Is'lands; introduced elsewhere.

**Section 2. Sina'pis**, L. (Gen.). *Sepals* spreading.

*Pods erect, appressed to the stem; valve 1-nerved; cells few-seeded.*

4. **B. ni'gra**, Koch; stem-leaves petioled linear-lanceolate entire or toothed glabrous, pods subulate 4-angled glabrous, beak short seedless. **Black Mustard**.

Hedges and waste places, from Northumberland southd., common as an escape, wild on sea-cliffs (Syme); not wild in Scotland; S. of Ireland;
Channel Islands; (a native? Wats.); fl. June–Sept.—Annual. Stem 2–3 ft. rigid, branched, more or less hispid. Leaves 4–8 in., lower lyrate, terminal lobe much the longest. Flowers \( \frac{1}{3} \text{–} \frac{1}{2} \text{ in.} \), bright yellow. Pod \( \frac{1}{4} \text{–} \frac{1}{3} \text{ in.} \), subulate, beak slender; valves keeled, torulose; pedicel short, stout, erect; cells 3–5-seeded; seeds oblong.—DISTRIB. Europe, N. Africa, W. Asia to the Himalaya; introd. in U. States.

5. **B. adpress’sa**, Boiss.; uppermost stem-leaves linear or lanceolate quite entire hispid, pods subcylindric, beak clavate ribbed \( \frac{1}{3} \) as long as the valves often 1-seeded. *Sinápis inca’na*, L. *Erucastrum inca’nun*, Koch.

Sandy fields, Jersey and Alderney; casual in Ireland; fl. July–Aug.—Habit of *B. wígra*, but more branched; pod \( \frac{1}{2} \text{ in.} \); valves linear; beak 8-ribbed; seeds fewer, flattened.—DISTRIB. Europe, from Belgium southd.

** Pods spreading; valves 3-nerved; cells few- or many-seeded.**


Cornfields, N. to Shetland; ascending to 1,200 ft.; Ireland; Channel Islands; fl. May–Aug.—Annual. Stems 1–2 ft., usually branched. Flowers \( \frac{1}{3} \text{–} \frac{2}{3} \text{ in.} \), diam., subcorymbose, bright yellow, homogamous. Pods 1\( \frac{1}{2} \text{–} 2 \text{ in.} \); pedicel slender, spreading; beak deciduous, straight, almost rigid, as broad as the hispid torulose valves; seeds subcompressed, dark brown.—DISTRIB. Europe, N. Africa, N. and W. Asia to the Himalaya; introd. in America.


Cultivated ground, &c., from Ross southd.; Mid. Ireland rare; Channel Islands; (a colonist, Wats.); fl. June–July.—Annual. Stem 1–3 ft., erect, furrowed; branches ascending. Leaves all lyrate-pinnatifid or pinnate; segments cut and lobed. Flowers \( \frac{1}{3} \text{ in.} \), diam., yellow. Pods 2 in., hispid; valve strongly ribbed, concave; beak ensiform, persistent, ribbed, often curved; cells 1–3-seeded; seeds subglobose, pale.—DISTRIB. Europe, N. Africa, N. and W. Asia to the Himalaya; introd. in the U. States.—Cult. as a salad.

**10. DIPLOTAX’IS, DC.** Rocket.

Annual or perennial herbs. Leaves pinnatifid. Flowers yellow. Sepals spreading, equal. Pod narrow, elongate, compressed; valves 1-nerved; septum membranous; style stout or slender, stigma simple. Seeds many, sub-2-seriate, compressed; cotyledons as in *Brassica*.—DISTRIB. Temp. Europe, Asia, and N. Africa; species 20.—ETYM. διπλός and τάξις, from the 2-seriate seeds.—Differs from *Brassica* in the flat pods, membranous valves, minute compressed 2-seriate seeds, and the flowers varying to pink or purplish, which is never the case in *Brassica*.

Roadsides and waste places, from Roxburgh southd.; E. Ireland; Channel Islands; (a denizen, Wats.); fl. Aug.–Sept.—A small herb. Leaves usually long-petioled. Scapes 6–8 in., few-leaved. Flowers ½ in. diam., yellow; pedicels as long as the expanded flowers, petals 2–3 times as long as the sepals abruptly obvate, style not narrowed below. Pods 1–2 in., slender, narrowed above and below; valves flat, almost nerveless; style stout, straight, cylindric.—DISTRIB. W. Europe, from Belgium southd., N. Africa.

VAR. Babington'oni, Syme; biennial or perennial, stem-leaves several.—S. of England, common; E. of Ireland, very rare; a denizen, Watson.

2. D. tenuifo'lia, DC.; stem branched leafy, leaves pinnatifid, lobes long narrow, pods suberect linear on very long slender pedicels. Sisym'brium, L.; Sinapis, Sm.; Brasa'sica, Boiss.

Waste places from the Cheviots southd.; Ireland; Channel Islands; (a denizen, Wats.); fl. June–Sept.—Bushy, glabrous or hispid, glaucous, foetid. Root-stock woody; branches 1–3 ft. Leaves 3–5 in.; lobes distant, very unequal. Flowers ½ in. diam., yellow. Pods ⅓–⅔ in., distant, linear, narrowed at both ends; valves flat; style stout, straight, cylindric.—DISTRIB. Europe, N. Africa, W. Asia.

11. DRA'BA, L. Whitlow-grass.

Herbs, usually small, rarely annual, hoary with stellate down. Leaves entire; radical rosulate; cauline sessile or 0. Flowers small, racemose or corymbose, white or yellow. Sepals short, equal at the base. Petals shortly clawed, entire. Pods oblong or linear, compressed; valves flattish, rarely ribbed; septum membranous; stigma simple. Seeds 2-seriate, compressed; funicle filiform; radicle accumbent.—DISTRIB. Temp. Arctic and Alpine regions, chiefly of N. hemisphere, and Andes; a prominent feature in N. Polar regions; species 80, all very variable.—ETYM. ὄβάθις, acrid, in allusion to the taste.


2. D. rupe'stris, Br.; erect, small, leaves oblong-lanceolate hairy, scape-leaf 1 or 0, petals white, pods small straight oblong hairy, pedicels straight erecto-patent.

Alpine rocks, alt. 3–4,000 ft., rare and local; Ben Lawers, Cairngorm, Benhope; Benbulben in Ireland; fl. July–Aug.—Rootstock slender. Leaves ¾–1 in., ciliate, rarely toothed. Scapes one or more, 1–2 in., slender, flexuous; their leaf sessile, stellately pubescent. Flowers ⅔ in. diam., few, white. Pods ¾ in., oblong, obtuse; stigma subsessile.—DISTRIB. Arctic regions.

Alpine rocks, N. England, Wales, Scotland; ascends above 3,000 ft.; mountains and maritime sandhills of W. Ireland; fl. June–July. —**Rootstock** often woody and long. **Stem** 6–14 in. **Radical leaves** short, 3⁄4–1 in., densely rosulate, usually much toothed; cauline many, suberect. **Racemes** much elongated after flowering, many-fld. **Flowers** as in *D. rupestris*. **Pods** 2–3 in., variable in length breadth and twisting, glabrous or hairy, obtuse or subacute; pedicel short; stigma subsessile; seeds many. —**DISTRIB.** Alpine and Arctic Europe, Asia, and N. and S. America.—Very variable; small specimens with few stem-leaves resemble *D. rupestris*.

4. **D. mura'lis**, L.; suberect or prostrate, slender, branched, stellately hispid, stem-leaves broadly ovate or cordate obtuse coarsely toothed, petals minute white, pods linear-oblong horizontal, pedicels spreading. Limestone rocks and walls in W. England; from Yorks. (ascending to 1,200 ft.) to Somerset; introd. in Scotland and N.W. Ireland; fl. April–May. —**Rootstock** annual or biennial, slender. **Stem** 1–2 ft., flexuous. **Radical leaves** small, 1⁄3–1 in., obvate; cauline few, distant, broader. **Flowers** 1⁄3 in. diam. **Racemes** short, fruiting long. **Pods** 1⁄2 in., flat, obtuse, on pedicels longer than themselves; style 0; seeds 10–12, minute. —**DISTRIB.** Europe, temp. Asia to the Himalaya, N. Africa.

12. **EROPH'ILA**, DC. **Vernal Whitlow-grass.**

Small annual or biennial herbs. **Radical leaves** entire, spreading. **Scapes** slender, leafless. **Flowers** few, small, white. **Sepals** spreading, equal at the base. **Petals** obovate, 2-lobed or 2-partite. **Pods** oblong, compressed; valves 1-nerved, membranous, flat or convex; septum membranous. **Seeds** 2-seriate, very many and minute; funicle capillary; radicle accumbent. —**DISTRIB.** Europe, W. Asia, and N. India; species 2–3. —**ETYM.** *tàp* and φιλα, from flowering in spring.

**E. vulga'ris**, DC.; leaves oblong-lanceolate toothed. *Draba ver'na*, L.

Abundant on walls, paths, &c., N. to Orkney; Ireland; Channel Islands; fl. March–June. —**Subglabrous or delicately pubescent. Leaves** 3⁄4–1 in., all radical, rosulate. **Scapes** 1–16 in., flexuous. **Flowers** 1⁄3–1⁄2 in. diam., homogamous. **Pods** 1⁄3–1⁄2 in., on spreading pedicels. —**DISTRIB.** Europe, temp. Asia to the Himalaya, N. Africa; N. America (perhaps introd.). —Seventy forms have been cultivated by M. Jordan as specific, with more or less constancy.

**E. vulga'ris** proper; pods compressed obovate-oblong twice or more as long as broad, cells 20–40-seeded. —Ascends to 1,200 ft. in Yorkshire.


D 2
Herbs or small shrubs, often covered with stellate down. Leaves scattered or crowded, entire. Flowers small, white or yellow. Sepals short, equal. Petals short, entire or 2-fid. Filaments sometimes toothed or appended. Pods short, very various in form; valves flat, concave or convex; septum entire or perforate; stigma simple. Seeds 2-10; radicle accumbent.—DISTRIB. N. and W. Asia and N. Africa; species 80-90.—ETYM. obscure.—A polymorphous genus, almost every organ varying; hence 10 genera have been made out of it.


13. COCHLEA'RIA, L. SCURVY-GRASS.

Perennial herbs. Leaves entire or pinnate. Flowers small, white. Sepals short, equal, spreading. Petals shortly clawed. Pods sessile or shortly stalked, oblong or globose; valves turgid, reticulate; septum often imperfect; stigma simple or capitate. Seeds few or many, 2-seriate, not margined, tubercled; cotyledons accumbent.—DISTRIB. Temp. and Arctic regions, chiefly littoral or Alpine; species 25.—ETYM. cochlear, from the spoon-like leaves.—The native British species form a well defined group of variable littoral plants, confined to N.W. Europe and the Arctic regions; but some exotics have the habit of Nasturtium.

* Valves with a dorsal nerve.

1. C. officinalis, L.; radical leaves cordate, pods subglobose, valves reticulate, style very short. C. polymor'pha, Syme. Sea-shores and high mountains, N. to Shetland; Ireland; Channel Islands; fl. May–Aug.—Stems many, 4–10 in., glabrous, fleshy, ascending from the perennial rarely biennial rootstock. Flowers ¼–½ in. diam. Pods ½–⅓
in. diam., cells 4-6-seeded.—DISTRIB. N.W. Europe, Polar regions.—A valuable antiscorbutic.

C. officinalis proper; radical leaves deeply cordate orbicular or reniform, caudine amplexicaul angled toothed or lobed, pods nearly globose. Var. littoralis, Lond. Cat.—Muddy sea-shore.

Sub-sp. C. Alpina, Wats.; radical and caudine leaves as in officinalis, pods rhomboid-oblong narrowed at both ends. C. grandulicica, Sm.—Mountains, ascending to near 4,000 ft.

Sub-sp. C. Danica, L.; radical leaves deltoid lobed, lower caudine similar petioled, upper amplexicaul also lobed, petals smaller, and pods as in alpina.

—Sandy and muddy shores, rarer in Scotland and Ireland.

2. C. anglica, L.; radical leaves oblong-rhomboid or ovate not cordate entire lobed or angled, caudine ½-amplexicaul, pods oblong or obvoid inflated much constricted at the sutures, valves reticulate, style slender. Muddy shores in England and W. Scotland; rare in Ireland; Channel Islands; fl. May–July.—Much larger than C. officinalis, branches 10–18 in., but connected with it by intermediates. Leaves more fleshy, narrower, and pod very different, sometimes ½ in., style longer, seeds larger.—DISTRIB. Cf. C. officinalis.

C. Anglica proper (Var. gemina, Hort); radical leaves narrowed below, pod obvoid large much constricted at the suture.—Var. Hortii, Syme; radical leaves rounded at the base, pod smaller ellipsoid.

** Valves with no dorsal nerve. Armora'cia, Rupp.

C. Armora'cia, L.; leaves linear-oblong obtuse deeply regularly crenate, radical long-petioled, caudine narrower sessile, racemes panicked, pods (immature) obvoid on long slender pedicels. Horse-radish.

Ditches, corners of fields, &c.; (an alien or denizen (?) Wats.); fl. May–June.

—Rootstock stout, long, cylindric. Leaves 8–12 in., radical 3–5 in. broad, on petioles 1 ft., waved with many spreading reticulate nerves, cordate cuneate or unequal at the base; caudine many, 4–8 in., ½–1 in. broad, more serrate than toothed. Flowers ½ in. diam. Pods never ripening in this country; style slender; stigma large, capitate; seeds described as 8–12 in a cell, smooth.—DISTRIB. Origin unknown; possibly a cultivated form of C. macrocarpa, W. and K., a native of Hungary.


Annual, erect herbs. Leaves almost entire, caudine auricled. Flowers small, yellow. Sepals short, equal at the base. Petals spatulate. Pods obvoid; valves turgid, keeled at the back, produced upwards along the base of the style; margin flat; septum membranous; stigma simple. Seeds 2-seriate, not margined; funicle slender, adnate at the base to the septum; radicle incumbent.—DISTRIB. Europe and temp. Asia; species 5–10 (all vars. of one?).—Etym. Χαμήλα and λίνον, dwarf flax.

slender spreading pedicels, obovoid, margins thin; seeds few, oblong, punctate.—Distrib. Central and S. Europe, and temp. Asia.—Seeds used for soap-makers' oil, oil-cake, and for feeding poultry.

14. SUBULA'RIA, L. AWL-WORT.

A small submerged perennial scapigerous herb. Leaves all radical and subulate. Flowers small, white. Sepals spreading, equal. Petals small. Pods shortly stalked, oblong or nearly globose; valves convex, ribbed; septum membranous; stigma sessile, entire. Seeds few, 2-seriate; radicle incurred, narrowed into the incumbent radicle, and owing to their lengthened bases being turned up a transverse section of the embryo shows a radicle with apparently 3 cotyledons.—Distrib. Arctic, N. Europe, N. Asia, N. E. U. States.—Etym. subula, from the awl-like leaves.

S. aquat'ica, L.; leaves cellular, scape naked few-flowered.

Gravely bottoms of subalpine lakes in N. Wales, Cumberland, and N. to Sutherland; ascends to 2,200 ft.; Ireland; fl. June—Aug.—Roots of densely tufted matted white fibres from a small stock. Leaves 1–3 in., fascicled, terete, gradually tapering upwards. Scapes 1–3 in. Flowers 1/6 in. diam., submerged. Pods small, 1/8 in.; pedicel short, ascending; seeds pale brown punctulate.

15. CAPSEL'LA, Mënch. SHEPHERD'S PURSE.

Annual herbs. Radical leaves entire or lobed. Flowers small, white, pedicels slender. Sepals spreading, equal. Pods much laterally compressed, oblong or obcuneate or obcordate; valves boat-shaped, keeled; septum membranous; stigma sessile. Seeds many, minute; radicle incumbent.—Distrib. N. temp. regions; species 6.—Etym. Diminutive Capsula.—Petals tend to be transformed into stamens.

C. Bur'sa-Pasto'ris, Mënch; pod triangular or obcordate.

A weed in all situations, ascending to 1,200 ft.; fl. March—Nov.—Glabrous or hairy, hairs branched. Root long, tapering. Stems 6–16 in., branched. Leaves rosulate, pinnatifid, rarely entire, end lobe triangular, cauline; auricled. Flowers 1/10 in. diam., homogamous. Pods 1/4–1/3 in.; pedicel slender; style short; valves smooth; seeds many, oblong, punctate.—Distrib. Temp. and Arctic Europe, N. Africa and Asia to the Himalaya; introd. in all temp. climates.

16. SENEBIE'RA, DC. WART-CRESS.

Annual or biennial, branched, prostrate herbs. Leaves entire or cut. Flowers in short leaf-opposed racemes, minute, white, sometimes apetalous. Sepals short, spreading. Stamens 2 or 6, or 4 when the shorter are absent. Pods small, didymous, indehiscent, laterally compressed; lobes subglobose, rugose or crested; style short or 0. Seeds 1 in each cell; cotyledons induplicate, gradually narrowed into the incumbent radicle.—Distrib. Temp. and warm regions; species 6.—Etym. J. Senebier, a Genevese physiologist.—Rapidly spreading weeds in the colonies, &c. Embryo in some species cyclical.
1. *S. did'yma*, Persoon; lobes of fruit separating wrinkled, style minute. *Coronopus*, Sm.

Waste ground from Fife southd., and spreading; S. and W. Ireland; Channel Islands; a colonist; fl. July–Sept.—Annual or biennial, slightly hairy, diffuse, creeping, branched and leafy. *Leaves* finely cut, 1–2-pinnatifid; lobes small, ovate, spreading. *Flowers* very minute, in leaf-opposed racemes, with a solitary one on the internode below, usually apetalous and diandrous. *Pods* 3/4 in. broad, pedicels spreading, separating into 2 indehiscent hard lobes; seeds reniform, punctate-striate.—*Distrib*. Temp. S. America; a colonist elsewhere.

2. *S. Coronopus*, Poiret; lobes of fruit not separating deeply wrinkled, the wrinkles forming a crest, style subulate. *Coronopus Ruellii*, Allioni.

Waste ground from Caithness southd.; rare in Scotland; local in Ireland; Channel Islands; fl. June–Sept.—Habit, &c., of *S. did'yma*, but glabrous, less branched; foliage larger, less divided; petals and stamens usually perfect; pods twice the size, abruptly narrowed into the subulate style, lobes connate; pedicels very short, thick, and seeds twice as large. Surface of pod variable as to sculpturing.—*Distrib*. Europe, N. Africa, W. Asia; introd. in the U. States.

17. **LEPID' IUM, L.** Cress.

Herbs, sometimes shrubby at the base, various in habit. *Leaves* entire or much divided. *Flowers* small, white, often apetalous. *Sepals* short, equal. *Petals* short or 0. *Stamens* 2, 4, or 6. *Pods* oblong ovate obovate or obcordate, much laterally compressed; valves usually keeled, winged or not; septum narrow; stigma notched. *Seeds* 1 in each cell, rarely 2, pendulous from the septum; radicle incumbent, rarely accumbent.—*Distrib*. Temp. and warmer regions; species 60–80.—*Etym.* λεπίδος, from the scale-like form of the pods.—*Stamens* sometimes deformed. Cotyledons 3-partite in the common Cress (*L. sativum*, L.)

**Section 1. Nasturtias'trum**, Gren. and Godr. *Pods* much compressed, entire or notched; valves keeled, not winged; style minute.


2. *L. rudera'le*, L.; annual, erect or prostrate, lower leaves 2-pinna-tifid, pod orbicular-oblong notched.

Waste places chiefly near the sea, rare and doubtfully native in Scotland; Ireland; Channel Islands; fl. May–June.—Glabrous or slightly pubescent. *Radical leaves* much divided, segments narrow; upper caulline linear, entire.
Flowers minute, usually apetalous and diandrous, in terminal and lateral corymbs. Pods \( \frac{1}{4} - \frac{1}{2} \) in., flat; pedicel slender; diverging; valves keeled, almost winged at the top; seeds compressed.—Distrib. Europe, N.W. Asia to the Himalaya; introd. in U. States.

Section 2. Le'pia, DC. Pod ovoid or oblong, much compressed, notched; valves broadly winged; style short.


Fields and roadsides, from Lanark and Elgin southd.; rare in Scotland and Ireland; Channel Islands; fl. May–Aug.—Glabrous or pubescent, annual or biennial. Stem 6–18 in., erect, simple or branched. Radical leaves pinnatifid or entire, cauline oblong-lanceolate. Flowers \( \frac{1}{10} \) in. diam. Pods \( \frac{1}{4} \) in., in spreading racemes, broadly ovate, shorter than the spreading pedicels; papillae scale-like when dry; seeds oblong, curved.—Distrib. Europe, N. Africa, N. and W. Asia to India; introd. in U. States.

L. campes'tre proper; stem simple below branched above, anthers yellow, pod papillose, style not longer than the notch.—Common in dry places.

Sub-sp. L. Smithii, Hook.; branched from the base, anthers violet, pod nearly smooth, style longer than the notch, seeds smaller. L. hirtum, Sm., in part. Fields and banks; ascends to 1,000 ft. in Ireland; Channel Islands (W. Europe only). Var. alatostyla, pod not notched, produced into the style. Hants.

Section 3. Carda'ria, DC. Pod deltoid-cordate, constricted between the valves; valves hardly keeled, not winged; style distinct.

L. Dra'ba, L.; stem flexuous leafy, leaves oblong amplexicaul toothed.

Fields, banks, and railway cuttings in Mid. and S. England; Channel Islands; rare and sporadic; (an alien, Wats.); fl. May–June.—Perennial, hoary or downy. Stem 1–3 ft., branched above. Leaves 1–3 in., auricles converging, lower petioled. Racemes short, panicled. Flowers \( \frac{1}{2} \) in. diam., white. Pods \( \frac{1}{2} \) in. broad, deltoid with rounded angles, on slender spreading pedicels; valves slightly papillose, one often smaller or imperfect, enclosing the seed when dehiscing.—Distrib. S.E. Europe, W. Asia; introd. in U. States.

18. THLAS'PI, L. Penny Cress.

Annual or perennial, glabrous, often glaucous herbs. Leaves quite entire or toothed, radical rosulate, cauline auricled. Flowers white or rose-coloured. Sepals erect, equal at the base. Petals obovate. Pods short, laterally compressed, broader upwards, notched; valves keeled or winged. Seeds few or many, not margined; radicle accumbent.—Distrib. Temp., Alpine, and Arctic N. hemisphere, rare in South; species 30.—Etym. The old Greek name of the genus.

Fields, &c., rather common; rarer in Scotland; E. Ireland; Channel Islands; (a colonist, Wats.); fl. May–July.—Stem 1–2 ft., usually simple, slender, erect. Radical leaves petioloed, cauleine with prominent auricules. Flowers $\frac{1}{4}$ in. diam., white, homogamous. Pods in long racemes $\frac{1}{2}$–$\frac{3}{2}$ in. diam., flat, pedicels slender spreading, marginal nerve delicate, lobes sometimes overlapping at the tip; style very short; seeds dark, oblong, ridged and punctate.—Distrib. Europe to N. Africa, N. and W. Asia to N.W. India; introd. in U. States.

2. **T. perfoliata**, L.; annual, cauleine leaves cordate with converging auricules, pods small obcordate, valves winged above, cells 4–6-seeded.

On limestone; Oxford (extinct), E. Glosler; fl. April–May.—Paniculately branched; branches 4–6 in., ascending, flexuous. Leaves $\frac{3}{4}$–1 in. broad; radical spathulate, petioloed. Flowers $\frac{3}{4}$ in. diam., white. Pods $\frac{1}{2}$ in., and pedicels horizontal; valves turgid, wings short, marginal nerve stout, style very short; seeds pale.—Distrib. Mid. and S. Europe, N. Africa, N. and W. Asia.

3. **T. alpestre**, L.; perennial or biennial, cauleine leaves sagittate, pods obcordate retuse, valves winged above, cells 4–8-seeded.

Mountain districts, England, Wales and Scotland, ascending to 2,500 ft. in Forfarshire; fl. June–Aug.—Stem 6–10 in. Radical leaves long-petioloed, obovate, entire; cauleine $\frac{3}{4}$ in. Flowers $\frac{3}{4}$ in. diam. Racemes of pods variable. Pod $\frac{1}{2}$ in., curved upwards, on spreading pedicels, longer than in the preceding species, and more narrowed at the base; marginal nerve obscure; seeds red-brown.—Distrib. Europe, Himalaya.—I do not find that authentically named specimens of the following varieties altogether tally with the characters assigned to them.—Var. **T. sylvestre**, Jord.; notch of pod shallow, style as long as its lobes.—Teesdale; Allen river, Northumbd.; Glen Isla and Glen Shee, Scotland.—Var. **T. occidentale**, Jord.; notch of pod shallow, style slender longer than its lobes, radicle at times incumbent (Syme).—Limestone rocks, Settle, Yorkshire; Llanrwst, N. Wales.—Var. **T. vivens**, Jord.; notch of pod minute, style slender much exceeding it. **T. alpestre**, Sm.—Limestone rocks, Matlock.


Low, glabrous, branched, leafy herbs, often shrubby below. Leaves entire or pinnatifid, often fleshy. Flowers corymbose, all or the outer only with the 2 outer petals radiating. Sepals equal at the base. Petals white or lilac, the two outer much the longest. Filaments without appendages. Pods broad, much compressed, orbicular or ovate, tip entire or notched; valves keeled or winged; septum very narrow, of two lamellae; stigma notched. Seeds 1 in each cell, not margined; radicle accumbent, horizontal, or ascending.—Distrib. Mid. and S. Europe, Asia Minor; species about 20.—Etym. Iberia (Spain), where many species grow.

**I. ama'ra**, L.; leaves oblong-lanceolate, pods suborbicular.

Cornfields and cultivated ground, on a dry soil, chiefly in the centre and E. of England, rare in Scotland; (a colonist, Wats.); fl. July–Aug.—Annual. Stem 6–9 in., erect, corymbose branched, ribbed, the ribs minutely downy.
Leaves 1-3 in., sessile, scattered, sparingly toothed or pinnatifid, often minutely ciliate. Flowers $\frac{1}{2}-\frac{3}{4}$ in. diam., white or purplish. Pods in short racemes, $\frac{1}{4}$ in. broad, flat; pedicels horizontal; notch triangular; valves narrowly winged, wings acute above; style exceeding the wings.—Distrib. W. Europe, from Belgium southd.—Very bitter.

20. Teesdalia, Br.

Small, annual, glabrous, scapigerous herbs. Leaves rosulate, pinnatifid. Flowers minute, white. Sepals spreading, equal at the base. Petals equal, or 2 outer larger, with a basal pouch. Stamens 4 or 6, with a scale at the base of each filament. Pods broadly obovate or orbicular, notched or 2-lobed; valves boat-shaped, slightly winged; cells 2-seeded; stigma simple. Seeds 2 in each cell; radicle accumbent.—Distrib. S. and W. Europe and W. Asia; species 2.—Etym. Robert Teesdale, a Yorkshire botanist.

T. nudicaulis, Br.; two outer petals twice as long as the others. T. Iberis, DC.

Sandy and gravelly places; ascends to near 1,000 ft. in Yorks.; local in Scotland; Channel Islands; fl. April–June.—Stems 4-18 in., usually many, slender, ascending. Radical leaves 1-2 in., numerous, lobes broad, spreading. Flowers $\frac{1}{2}$ in. diam., homogamous, corymbose then racemose. Pods $\frac{1}{4}$ in., in racemes 2-9 in.; pedicels short, slender, spreading; style very short. —Distrib. Europe, N. Africa, W. Asia.


1. H. petrae'a, Br.; sepals about equalling the petals.

Limestone rocks W. of England and Wales, from Dumfries and Yorkshire (ascending to 1,500 ft.) to Somerset; naturalized in Eltham churchyard, where planted by Dillenius? and in Mathew cemetery, Cork; fl. March–May.—Glabrous or sparingly hairy, slender, much branched from the base, 2-5 in. Radical leaves $\frac{1}{2}$-1 in., lobes spreading, obovate, almost petioled; cauline shorter, pinnatifid. Pods $\frac{1}{16}$-$\frac{1}{12}$ in., on horizontal pedicels, in a short raceme; style distinct; seeds pale.

22. Isatis, L. Woad.

Tall, erect, annual or biennial branched herbs. Cauline leaves sagittate. Flowers yellow, pedicels slender, deflexed in fruit. Sepals equal at the base. Petals equal. Pods indehiscent, 1-celled, oblong obovate or orbicular, thickened in the middle; wing or margin very broad; stigma sessile. Seed pendulous from the top of the cell; radicle incumbent.—Distrib.

I. tinctoria, L.; pods obovate-oblong, tip rounded, wing thick.

Wild on cliffs by the Severn, Tewkesbury; naturalized near Guildford; sporadic elsewhere; (an alien, Wats.); fl. July-Aug.—Glaucous, glabrous or nearly so. Stem 1-3 ft., stout, erect, branched above. Radical leaves oblong-obovate or lanceolate; petiole long; cauline 3-5 in., sessile. Flowers ½ in. diam., in crowded panicked coryms. Pods ½ in. in short racemes, pendulous, glabrous, brown when ripe; stigma sessile in a minute notch; seed linear-oblong.—Distrib. Europe, N. Asia.—The ancient Britons stained themselves with it; later, the Saxons imported it; it is still cultivated in Lincolnshire.


Perennial herbs with stout branching stems. Leaves usually broad. Flowers white, in long corymbose racemes. Sepals spreading, equal. Longer filaments often with a tooth on the outside. Pods indehiscent, 2-jointed; lower joint slender, seedless, forming a pedicel to the upper, which is globose 1-celled and 1-seeded; stigma sessile. Seed globose, pendulous from a basal funicle; radicle incumbent, conduplicate.—Distrib. Europe, W. Asia; species 16.—Etym. The Greek name of the plant.

C. maritima, L.; leaves broad waved toothed or pinnatifid.

Sandy and shingly sea-coasts, rare, from Fife and Isla southd.; N. and W. Ireland; Channel Islands; fl. June–Aug.—Rootstock as thick as the thumb, fleshy, burrowing; branches 1-2 ft., spreading. Leaves 6-10 in., fleshy, petioled, broadly ovate-cordate oblong or orbicular, glabrous and glaucous; upper few and small. Corymbs much branched. Flowers ½ in. diam., white; longer filaments toothed near the tip externally. Pods ½ in., on slender ascending pedicels 1 in.—Distrib. Coasts from Finland to the Bay of Biscay and the Black Sea.—Formerly eaten wild, cultivated for about 200 years in England, whence it was introduced to the Continent.


Annual, large, fleshy, branched herbs. Leaves entire or pinnatifid. Flowers white or purplish. Lateral sepals gibbous at the base. Pods indehiscent 2-jointed; joints angled, 1-celled, upper deciduous compressed, seed basal; lower cuneate, 2-edged, seed pendulous; stigma sessile. Radicle accumbent, sometimes oblique.—Distrib. Sea-shores of Europe and N. America; species 2.—Etym. An Arabic word.

C. maritima, Scop.; suberect or decumbent, leaves entire or lobed.

Sandy and shingly shores, N. to Shetland, abundant; Ireland; Channel Islands; fl. June–July.—Annual; rather succulent; branches 1-2 ft., zigzag, ascending. Leaves 2-3 in., fleshy. Flowers ½ in. diam., corymbose; pedicel stout. Pods on short thick pedicels loosely racemed, ribbed when dry; lower joint ½ in., broader upwards; upper ¼ in., base truncate.—Distrib. Europe, N. Africa, Iceland.—C. americana, which is perhaps identical, extends from the Canadian Lakes to the W. Indies.
25. RAPHA'NUS, L. RADISH.

Annual or biennial herbs. Radical leaves lyrate. Flowers in long racemes, white or yellow, purple-veined. Sepals erect, lateral saccate at the base. Pods elongate, indehiscent, or separating into several superimposed 1-seeded joints, terete or moniliform, coriaceous or corky; style or beak of the pod slender; stigma notched. Seeds pendulous, globose; cotyledons conduplicate or much folded.—Distr. Europe and temp. Asia; species 6.—Etym. Rapa, the Latin name.

1. R. Raphanis'trum, L.; leaf-segments usually few and remote, pod subulate not much constricted at the 4–8 faintly-ribbed joints, beak as long as the 2 or 3 last joints. Wild Radish or White Charlock.

Cornfields, N. to Shetland; Ireland; Channel Islands; ascends to 1,000 feet; (a colonist, Wats.); fl. May–Sept.—Annual, stout, 1–2 ft., erect or spreading, hairy or hispid. Leaves 4–10 in., coarsely toothed or serrate, terminal lobe largest. Flowers $\frac{3}{4}$ in. diam., white or straw-coloured, homogamous. Pods 1–3 in., dehiscing at the base above the first segment, which is seedless and very small; beak $\frac{1}{2}$–$\frac{3}{4}$ in., subulate, flattened.—Distr. Europe (Arctic), N. Africa, N. and W. Asia to India; introd. in America.

2. R. marit'imus, Sm.; leaf-segments many approximate horizontal or reversed, alternate often smaller, pod deeply constricted at the 2–4 strongly ribbed joints, beak slender subulate.

Sandy and rocky shores from the Clyde southd.; Ireland; Channel Islands; fl. July–Aug.—Very near R. Raphanis'trum, and perhaps the wild form of that plant, but biennial, more hispid, leaves with more numerous and closer set lobes; flowers smaller, darker yellow, rarely white; pod with fewer joints, deeper intervals between these, stronger ribs, and a beak as long as the upper joint.—Distr. W. Europe, from Holland to Spain.

Order VII. RESEDA'CEAE.

Annual or perennial herbs, rarely shrubs. Leaves alternate, simple or pinnatisect; stipules 0, or minute and glandular. Flowers racemed or spiked, bracteate. Calyx persistent, 4–7-partite, often irregular, imbricate in bud. Petals 4–7, hypogynous, entire or lobed, equal or the posticus larger, open in bud. Disk hypogynous, conspicuous. Stamens usually many, inserted on the disk, equal or unequal, free or connate. Ovary of 2–6 connate carpels, lobed at the top, open between the stigmatiferous lobes; ovules usually many, on 2–6 parietal placentas, amphitropous or campylotropous. Fruit usually a coriaceous capsule, open at the top. Seeds many, reniform, exalbuminous; embryo curved or folded, radicle incumbent.—Distr. Europe, W. Asia, N. and S. Africa; genera 6; species 20.—Affinities. Closely allied to Cappari'deæ.—Properties, unimportant.
Reseda.] RESEDACEÆ.

1. Rese'da, L. Mignonette.

Herbs. Leaves entire lobed or pinnatifid; stipules glandular. Flowers racemose. Calyx irregular. Petals unequal, 2-multifid, the posticus with a membranous appendage on its face. Disk broad, honeyed, dilated behind. Stamens 10–40.—Distrib. Europe, W. Asia, N. Africa; species 26.—Etym. reseda, being a supposed sedative.


2. R. Lu'teal, L.; leaves 2–3-fid or pinnate or bipinnatifid, lobes few distant linear obtuse, sepals and petals 6 very unequal, stigmas usually 3.


R. Al'ba, L.; leaves pinnate undulate glaucous, sepals 5–6, petals 5–6 all 3-fid, stigmas usually 4. R. Suffruticulo'sa, L., and R. Fruticulo'sa, L. R. Hook'er, Guss.

Waste places, chiefly near the sea, an outcast; fl. June–Aug.—I follow Bentham in taking the name of al'ba for this, which most authors agree in considering the same with fruticulo'sa and suffruticulo'sa. Flowers white. Stamens 12–14. Seeds reniform, rough.—Distrib. S. Europe and N. Africa. —The true R. alba is more often 6-merous than is fruticulo'sa.

Order VIII. Cisti'neæ.

Herbs or shrubs. Leaves mostly opposite, entire; stipules foliaceous, small, or 0. Flowers terminal and solitary, or in scorpioid cymes, not honeyed. Sepals 3–5, imbricate, 2 outer (bracts of some) small or 0; 3 inner often convolute in bud. Petals 5, rarely 3 or 0, fugacious, convolute in bud. Stamens many, rarely few, hypogynous, free. Ovary 1-celled, or divided by parietal septa; style simple, stigmas 3; ovules 2 or more, on parietal placentas, orthotropous, funicle slender. Capsule 3–5 valved; valves placentiferous. Seeds with mealy or firm albumen, testa crustaceous often mucilaginous; embryo usually curved and excentric.—Distrib. Europe, N. Africa, and W. Asia; rare in N. America;
genera 4; species 60.—Affinities. With Bixineae and Capparideae.—Properties. A resinous balsam (Ladanum) is yielded by Cisti.

1. HELIAN'THEMUM, Tourn. Rock-rose.

Herbs or under-shrubs. Petals 5. Stamens many, rarely few, diverging when irritated. Ovary many-ovuled; style jointed at the base, stigma capitate or 3-lobed. Embryo hooked, folded or circumflex.—Distrib. Europe, W. Asia, and N. America; species about 30.—Etym. ἡλιος and ἀνθον, sun-flower.—Various species are dimorphic, some flowers having no petals and few stamens.

Section 1. Helianthemum proper. Style elongate, bent upwards. Funicle thickened. Embryo with the radicle bent upwards parallel to the cotyledons.

1. H. vulga're, Gærtn. ; shrubby, leaves opposite stipulate hairy above downy beneath, margins flat, pedicels bracteate. H. surreid'num, Mill. (a garden variety); Čistus tomento'sus, Sm.


2. H. polifo'lium, Pers.; shrubby, leaves opposite hoary and downy on both surfaces stipulate, margins recurved, pedicels bracteate.

Stony places, very rare, Brean Down Somerset, Babicombe near Torquay; fl. May–July.—Habit of H. vulga're, but more shrubby, leaves with recurved and even revolute margins, and flowers white. Sepals tomentose, inner obtuse.—Distrib. Mid. and S. Europe, N. Africa.

Section 2. Tubera'ria. Style straight or 0. Funicle thickened. Embryo annular.

3. H. gutta'tum, Miller; annual, erect, hoary and hairy, lower leaves opposite exstipulate, upper alternate stipulate.


H. gutta'tum proper; pedicels ebracteate.—Cork, Jersey, Alderney.

Sub-sp. H. BREWE'RI, Planch.; pedicels bracteate.—Holyhead and Anglesea.


4. H. ca'num, Dunal; shrubby, hoary, leaves opposite exstipulate, pedicels usually bracteate. Čistus marifo'lius, Sm., and C. angli'cus, L.

Dry banks, rocks, &c., in W. England, from Westmoreland to Glamorgan, and in Teesdale, ascending to 1,800 ft.; fl. May–July.—Woody, procumbent,

_H. ca'nun_ proper; leaves hoary on both surfaces hairy above, sepals pubescent and patently hairy.—Var. _H. vine'al_, Pers.; leaves hoary beneath nearly glabrous above, sepals hoary and shortly hairy on the ribs and margins.—W. Ireland, Aran Is.

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**ORDER IX. VIOLA'CEÆ.**

Herbs or shrubs. Leaves radical or alternate, entire or pinnatisect, margins involute in vernation, stipulate. Flowers axillary, regular or irregular, solitary or cymose, 2-bracteolate. Sepals 5, persistent, equal or unequal, imbricate in bud. Petals 5, equal or unequal, hypogynous, imbricate or contorted in bud. Disk 0. Stamens 5, filaments short, broad, lower with hooded spurs; connectives broad, often connate, produced beyond the cells. Ovary sessile, 1-celled; style simple, stigma entire cup-shaped or lobed; ovules many, on 3 parietal placentas, anatropous. Fruit a 3-valved capsule, rarely a berry. Seeds many, small, funicle short, albumen fleshy; embryo straight, cotyledons flat.—Distrib. Temp. and trop. regions; genera 21, species 240.—Affinities with Bixineæ, Passiflorææ, and Franken'iaææ.—Properties. Emetic and laxative.

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1. **VI'OLA, L.** Violet, Pansy, Heartsease.

Low herbs, rarely shrubs. Leaves radical or alternate. Flowers on 1- rare 2-fld. peduncles. Sepals subequal, produced at the base. Petals erect or spreading; lower largest, spurred or saccate at the base. Anthers connate, connectives of the 2 lower often spurred at the base. Style swollen above, tip straight or oblique, stigma obtuse or cup-shaped. Capsule 3-valved; valves elastic. Seeds ovoid or globose.—Distrib. All temp. regions; species 100.—Etym. The old Latin name.—Flowers often cleistogamous (except in sect. Melan'ium), the large-petalled appear early and often yield no seed; the small-petalled or apetalous appear late, and are prolific.

**Section 1. Nomin'ium.** Stipules not leafy. Upper petals directed forwards. Stigma oblique.—Apetalous autumnal flowers chiefly fertile.

* Stem very short. Leaves enlarging after flowering. Sepals obtuse.

1. **V. palus'tris, L.;** nearly glabrous, rootstock subterranean creeping, leaves reniform-cordate, style straight, stigma obliquely truncate, fruiting peduncle erect.

Swamps and bogs, N. to the Shetlands, ascends to 4,000 ft., rarer in S. England; Ireland; fl. April-July.—Rootstock white, scaly; runners short, leafless. Leaves slightly crenate; stipules glandular. Flowers ½ in. diam., white or lilac, scentless; spur short, obtuse. Lateral petals almost glabrous. Anther-spurs short.—Distrib. Temp. and Arctic Europe, Asia, and America.
2. **V. odora'ta**, L.; slightly hairy or downy, runners very long, leaves broadly cordate, spur nearly straight, style hooked, stigma oblique, fruiting peduncle decurved. *Sweet Violet.*

Banks and copses, wild in E. and S. England; and perhaps E. Ireland; naturalized as far N. as Forfar; Channel Islands; fl. March–May.—**Rootstock** short, scarred. *Leaves* deeply cordate at the base, sinus closed; stipules glandular; petiole with deflexed hairs. *Bracts* at or about the middle of the peduncle. *Flowers* fragrant, blue, white, or red-purple; lateral petals with or without a tuft of hairs; spur short, obtuse. *Anther-spurs* linear-oblong. *Capsule* pubescent; peduncle recurved.—**Distrib.** Europe, N. Africa, N. and W. Asia to the Himalaya. The following are probably hybrids with *V. hirta.*

**V. permix'ta**, Jord.; runners not rooting, flowers pale scentless.—*V. sepin'cola*, Jord.; more hairy, runners rooting, flowers dark scentless.

3. **V. hirta**, L.; pubescent, rootstock very short, runners short or 0, leaves subtriangular-cordate, spur hooked, style hooked, stigma oblique.

Dry soils, local, from Forfar southd.; ascends to 1,000 ft. in Yorks.; Ireland; fl. April–June.—Very near *V. odora'ta*, but more tufted and hairy, leaves narrower and more triangular, with deeper crenatures and shallower sinus; hairs of petiole more spreading; bracts lower on the peduncle; spur long and hooked; flowers inodorous or faintly scented; anther spurs lanceolate.—**Distrib.** Europe, N. and W. Asia to N.W. India.

**V. calca'rea**, Bab.; is a dwarf starved form with petals narrower. Gogmagog Hills and Portland.

**Stem evident.** *Leaves* not enlarging after flowering. *Sepals* acute or acuminate.

4. **V. can'ina**, L.; glabrous, main stem elongate and flowering, leaves ovate-cordate or oblong-lanceolate, stipules small narrow toothed and ciliate, fruiting peduncle erect. *Dog-violet.*

Pastures and banks from Caithness southd.; Ireland; Channel Islands; fl. April–Aug.—Very variable in size, habit, and colour of flower, glabrous or nearly so. *Leaves* long-petioled, crenate-serrate, from $\frac{2}{3}$ in., broadly ovate deeply cordate, to oblong-lanceolate and 3 in. *Bracts* at or above the middle of the peduncle, subulate or lanceolate, toothed or serrate. *Flower* $\frac{1}{2}$–1 $\frac{1}{8}$ in. diam., blue, lilac, grey or white. *Sepals* narrow, acuminate. **Style** clavate, hooked; stigma oblique. **Capsule** oblong; 3-gonous.—**Distrib.** Europe (Arctic), N. and W. Asia to the Himalaya, N. Africa, N. America. **V. can'ina** proper; rootstock short, runners 0, leaves narrow ovate-cordate, spur obtuse, anther-spurs 5 times as long as broad. *V. flavicor'nis*, Sm. **V. pu'mila**, Hook and Arn.

Sub-sp. **V. LAC'TEA, Sm.**; very slender, rootstock short, runners 0, leaves ovate-lanceolate, base rounded or cuneate, petals narrow grey, spur very short, capsule subglobose.—Heaths, York to Cornwall, W. Europe.

Sub-sp. **V. PERSICLEFO'LIA, Roth**; rootstock long with runners, leaves oblong-lanceolate base truncate, upper narrower, petals pale lilac or white, spur very short, capsule 3-gonous. *V. stagnina*, Kit.—Bogs, E. of England, Galway; extends to Siberia.

5. **V. sylvat'ica**, Fries; glabrous, flowers on axillary branches from a radical rosette, leaves broadly ovate-cordate, stipules lanceolate acute
fimbriate or toothed, fruiting peduncle erect, capsule glabrous. *V. canina*, Sm. *Wood Violet.*

Cepses and woods, from the Shetlands southd.; ascends to 3,000 ft.; Ireland; Channel Islands; fl. March–July.—*Rootstock* very short. *Leaves* in a rosette, which however is often deficient, when it is with difficulty distinguished from *V. canina*, from which I doubt its permanent distinctness.—*Distr*. Europe, N. and W. Asia, N. America.

*V. sylvatica* proper; rootstock short, spur short broad compressed furrowed, usually pale, base of sepals much produced in fruit. *V. Riviniid*na, Reichb.

Sub-sp. V. *Reichenbachiana*, Bor.; flowers smaller paler, spur longer, fruiting sepals hardly produced. (Flowers earlier.)

6. *V. arenaria*, DC.; small, tufted, pubescent, leaves orbicular-ovate obtuse, flowers on short axillary branches from a compact rosette, stipules small fimbriate, spur short, capsule oblong pubescent.

Upper Teesdale, alt. 2,000 ft., and Westmoreland, very rare; fl. May–June.—Whole plant about 2–6 in. diam., compact, hoary-pubescent. *Leaves* much rounder than in *V. sylvatica* and *canina*. *Sepals* lanceolate, acute, bases produced square in fruit. *Petals* broad, pale blue; spur short.—*Europe* (excl. Greece), Siberia, Labrador.


7. *V. tri'color*, L.; leaves long-petioled ovate-oblong or lanceolate crenate, stipules pinnatifid, sepals with large auricles, style short straight, stigma capitate excavated. *Heartsease, Pansy.*

Pastures, banks and waste places, N. to Shetland; Ireland; Channel Islands; fl. May–Sept.—Very variable. *Stem* 4–18 in., branched, erect or ascending. angular, flexuous. *Leaves* 1–1 1/2 in., lyrate, coarsely and remotely crenat-serrate; stipules 1/4–1/2 in. broad, very large; lobes spreading like a fan, linear or oblong, obtuse, lateral smaller, middle sometimes leafy.—*Bracts* minute, high up on the peduncle. *Flowers* 1/4–1 1/4 in. diam.; petals purple whitish or golden yellow, sometimes parti-coloured, very variable in size, sometimes 0.—*Distr*. Europe (Arctic), N. Africa, N. and W. Asia to Siberia and N.W. India.—Sub-sp. *lu'tea* and *Curtisii* are confined to W. and Central Europe. *V. tri'color* proper and *arvensis* are naturalized in America.

*V. tri'color* proper; rootstock 0, stem elongate branched, petals spreading usually longer than the sepals pale yellow or lilac, lip of stigma developed, capsule ovoid. —Cultivated ground; ascends to near 2,000 ft. in the Highlands.

Sub-sp. V. *Arven'sis*, Murr.; rootstock 0, stem elongate branched, petals erect usually shorter than the sepals or 0 white or yellowish, capsule globose. —Cultivated ground; ascends to near 1,000 ft. in Scotland and Yorkshire.

Sub-sp. V. *Curtisii*, Forst.; rootstock branched stoloniferous tufted, petals spreading rather longer than the sepals blue purple or yellow, capsule 3-gonous. *V. sabulo'sa*, Boreau. *V.* *Mackai'i*, Syme'i and Forst'er'i are
hardly distinguishable forms.—Sandy shores from the Clyde to Cornwall; Ireland.

Sub-sp. V. LUTEA, Huds.; rootstock branched, branches slender with short stems and underground runners, mid lobe of stipules entire, petals spreading much longer than the sepals blue purple (var. amena) or yellow, capsule oblong 3-gonous. V. grandiflora, Huds. ed. 2.—Hilly districts from Mid. England and Wales to Ross; ascends to 2,800 ft.

Order X. POLYGALÆ.

Herbs or shrubs, erect or climbing. Leaves alternate or subopposite, simple, exstipulate. Flowers irregular. Sepals imbricate in bud; 2 inner larger, petaloid, winglike. Petals 3–5, hypogynous, 2 outer (lateral) separate or united with the hooded lower one into a tube split at the base behind; 2 inner equal to the outer, or smaller or 0. Stamens 8, filaments connate in a split sheath which is usually adnate to the petals; anthers 1–rarely 2-celled, opening by pores, rarely by valves. Disk small. Ovary free, 2-celled; style simple, curved, stigma various; ovules 1 in each cell, pendulous, anatropous, raphe ventral. Seeds pendulous, testa often hairy, arillate, albumen fleshy or 0; embryo straight.—Distrib. Temp. and trop. regions; genera 15; species 400.—Affinities, distant with Sapindaceæ, Violaceæ, and Pittosporaceæ.—Properties. Bitter, emetic, purgative, and diuretic.

1. POLYG'ALA, L. Milkwort.

Herbs or shrubs. Leaves alternate, rarely subopposite or whorled. Flowers in terminal or lateral racemes or spikes; pedicels bracteate and 2-bracteolate. Petals combined below with the staminal sheath, which has reversed hairs within, and a viscid gland at the mouth. Stamens 8; anthers 1–2-celled, opening by transverse pores. Stigma spathulate. Capsule compressed, loculicidal at the margins. Seeds usually downy; aril very variable, 2-aricled. Distrib. Trop. and temp. regions; species 200.—Etym. πίλως and γάλα, being supposed to increase the milk in cows. Flowers in some cleistogamous.

1. P. vulg'aris, L.; stems many leafy, leaves scattered lower oblong upper lanceolate, lateral nerves of inner sepals anastomosing copiously, central nearly simple.


P. vulg'aris proper, stems ascending, branches straight, leaves all linear or lanceolate, racemes many-fid., bract as long as the flowering pedicel, pedicels
sepal petals and capsules not ciliate, large sepals oblong-ovate broader than the capsule. Common; ascends to near 3,000 ft. in the Highlands.—

Var. grandiflora, Bab.; upper leaves large, inner sepals oblong acute, flowers large dark blue. Benbulben, Sligo.

Sub-sp. P. oxyptera, Reichb.; branches flexuous, leaves linear, inner sepals cuneate below shorter and narrower than the capsule, pedicels &c. glabrous. —Sandy shores, limestones and chalky soils, from Perth southd.; local.

Sub-sp. P. depres'sa, Wend.; stems flexuous, leaves somewhat opposite and distichous, lower oblong spathulate, racemes fewer-flowered, bract shorter than the flowering pedicel. P. serpylla'cea, Weihe.—Common on heaths.—

Var. P. cili'da'ta, Lebel; branches prostrate tortuous, inner sepals broader than the capsule, pedicels bracts sepals and capsule ciliate. Gogmagog Hills.

2. P. calca'rea, F. Schultz; branches many rooting and proliferous umbellately spreading from the root, radical leaves rosulate, cauline oblong, inner sepals longer and broader than the obcordate capsule, central nerve branching above the middle. P. ama'ra, Don, not L.

Dry soil and rocks, S. and S.E. of England; Wiltshire to Kent, and Gloucester to Berks; Channel Islands; fl. June–July.—Perhaps only a sub-species of P. vulg'aris, approaching sub-sp. depres'sa, but the habit is entirely different, and the nerves of the sepals scarcely anastomose.—DISTRIB. Central and S. Europe.

3. P. ama'ra, L.; leaves rosulate spathulate, flowering branches axillary, inner sepals narrower than the capsule, nerves simple or slightly branched free, capsule orbicular notched.

Rare, margins of rills, in Teesdale, alt. 1,800 ft.; Wye Down, Kent; fl. June–July.—Much smaller in all its parts than P. vulg'aris or calca'rea, and readily distinguished by this character and the narrow inner sepals. The Teesdale form (P. uligino'sa, Fries) is rather more fleshy and has rosy flowers; the Kent form (P. austri'aca, Crantz) is blue flowered. I find no difference between their capsules. It is certainly the P. ama'ra of Linn. Herb.—DISTRIB. Europe (Arctic) from Sweden southd.

Order XI. FRANKENIA'CEAE.

Perennial rarely annual herbs or small shrubs, with jointed branches. Leaves small, opposite, exstipulate. Flowers small, regular, solitary, in the forks of the branches. Calyx tubular, persistent; lobes 4–6, induplicate in bud. Petals 4–6, hypogynous, imbricate in bud, claw with an adnate scale. Stamens 4 or more, separate or connate at the base; anthers versatile. Disk 0. Ovary free, sessile, 1-celled; style slender, stigma 2–5-lobed; ovules many, in 2 series, on 2–5 parietal placentas, amphitropous with the micropyle below; funicle slender. Capsule enclosed in the persistent calyx, 3–5-valved. Seeds oblong, raphe linear, testa crustaceous, albumen mealy; embryo axile, straight.—DISTRIB. Temp. and warm regions, chiefly littoral; species about 12.—Affinities with Caryophyll'laceæ and Tamariscine'æ.—Properties none.
FRANKENIACEÆ

1 FRANKENIA, L. Sea-Heath.

Characters of the Order.—Etym. J. Franken, a Swedish botanist.

**FRANKENIA.**

1 FRANCE'NIA, L. *Sea-Heath.*

**Characters of the Order.**—Etym. J. Franken, a Swedish botanist. **F. le⁄vis, L.**; stem pubescent, leaves with revolute margins.

Salt marshes on S.E. coasts of England, Yarmouth to Kent; Channel Islands; fl. July–Aug.—Perennial, procumbent; branches wiry. *Leaves* ¾–1 in., fascicled or whorled, oblong but linear from the reflexed margins, glabrous, ciliate at the base. *Flowers* small, rose-coloured, dichogamous. *Capsule* 3-gonous.—**Distrib.** W. Europe and Africa to the Cape, W. Asia to India, in salt plains.

**Order XII. CARYOPHYL'LEÆ.**

Herbs, sometimes woody below, nodes thickened. *Leaves* opposite, bases usually connate, entire; stipules 0, or small and scarious. In-florescence definite, centrifugal. *Sepals* 4–5, free or connate, imbricate in bud. *Petals* 4–5 (rarely 0), hypogynous, rarely perigynous, imbricate or contorted in bud. *Stamens* 8–10, rarely fewer, inserted with the petals. *Disk* annular or elongated, or of inter-staminal glands. *Ovary* free, 1-celled, or 3–5-celled at the base; *styles* 2–5, free or connate, stigmatose on the inner surface; ovules 2 or more, funicles slender basal often connate, amphitropous, micropyle inferior or transverse. *Fruit* capsular. *Seeds* many, small, albumen floury, rarely fleshy; embryo cylindric, usually curved or annular, radicle incumbent.—**Distrib.** Cosmopolitan, but chiefly Arctic, Alpine Europe, and W. Asiatic; genera 35, species 800.—**Affinities** with Illecebra'ceæ, Portula'ceæ, and Chenopodia'ceæ.—**Properties** unimportant.

**TRIBE I. SILE'NEÆ.** *Stipules* 0. *Calyx* 4–5-lobed or toothed. *Disk* elongated, bearing the petals and stamens. *Styles* free.

* Hilum on the face of the peltate seed. *Embryo* straight. 1. **Dianthus.**

**Hilum lateral. *Embryo* annular.**

* Styles 2. *Capsule* 4-valved. 1*. **Saponaria.**

* Styles 3. *Capsule* 6- rarely 3-valved. 2. **Silene.**

* Styles 4–5. *Petals* appendiculate. 3. **Lychnis.**

* Petals exappendiculate. 4. **Githago.**

**TRIBE II. ALSINEÆ.** *Sepals* separate. *Disk* small. *Styles* free.

* **Stipules** 0.

* Capsule cylindric, 6-valved. *Petals* jagged. *Styles* 3. 5. **Holosteum.**

* Capsule cylindric, 8–10-valved. *Petals* notched (rarely entire). 6. **Cerastium.**

* Capsule globose, 6–10-valved; *styles* 3–5. *Petals* 2-fid. 7. **Stellaria.**


* Capsule 4–5-valved. *Styles* 4–5. *Petals* entire or 0. 9. **Sagina.**

**Stipules scarious.**

* Styles and valves of capsule 5. 10. **Spergula.**

* Styles and valves of capsule 3. 11. **Spergularia.**

1. DIANTHUS, L.  Pink and Carnation.

Tufted herbs, often shrubby at the base. Leaves narrow, grass-like. Flowers solitary, panicked or fascicled, dichogamous, protandrous. Calyx tubular, 5-toothed, striate, with imbricating bracts at the base. Petals 5, entire or cut, claw long. Stamens 10, emerging and dehiscing 5 at a time. Disk elongated. Ovary 1-celled; styles 2. Capsule 4-valved at the top. Seeds discoid, imbricate upon the columnar placenta, hilum ventral; embryo straight.—Distr. Europe, temp. Asia, N.W. America, N. and S. Africa; species about 70.—Etym. supposed to be Διός and ἄνθος, flower of Jupiter.

* Flowers fascicled.


2. D. prolifer, L.; fascicles of flowers capitate, bracts ovate membranous as long as the calyx-tube, inner obtuse. Tunica prolifer, Hall.


** Flowers solitary or loosely cymose.

3. D. deltoides, L.; leaves narrow-lanceolate downy and subscabrous, lower obtuse, flowers solitary, bracts ovate acuminate half as long as the calyx-tube, petals toothed. Maiden Pink.


4. D. cæsius, Sm.; leaves scabrous at the margin, flowers usually solitary, bracts orbicular mucronate 4 times shorter than the calyx-tube, petals jagged and bearded. Cheddar Pink.


D. Caryophyllus, L.; leaves grooved above, margins smooth, cymes loosely panicled, bracts obovate mucronate 3–4 times shorter than the calyx-tube, petals toothed and crenate. Wild Carnation, Clove Pink.


D. Pluma'rius, L.; leaves all acute 1-nerved, margins scabrous, cymes loosely panicled, bracts 4 rhomboid cuspidate equalling 1/4 of the calyx-tube, petals fimbriate. Wild Pink.

Naturalized on old walls in England and Wales; fl. June–Aug.—Perennial, tufted, branched, 1 ft. Flowers as in D. Caryophyllus, but smaller, rose-purple, segments of petals 2–3 as long as the blade.—Distrib. Mid. Europe from Austria to Lombardy, and Mid. Russia.—The origin of the garden pinks.

1*. Saponaria, L. Soapwort, Fuller's Herb.

Annual or perennial herbs. Radical leaves spathulate, caudine narrower. Flowers in panicked or fascicled cymes, white, lilac, red or yellow, honeyed, proterandrous. Calyx tubular, 5-toothed, obscurely nerved, ebracteate. Petals 5, clawed, entire or notched. Stamens 10. Disk small. Styles 2. Capsule oblong, 2-celled at the base, 4-valved at the top. Seeds reniform, tubercled, hilum marginal; embryo annular.—Distrib. Europe and temp. Asia; species 30.—Etym. Sapo, the plant having been used as a soap.

S. officinalis, L.; glabrous, glaucous, leaves oblong-lanceolate.

Hedges, roadsides, and fields, naturalized before Gerard's time; (a denizen, Wats.); fl. Aug.–Sept.—Rootstock white, creeping, fleshy, stoloniferous. Stem 1–3 ft., straight, ascending. Leaves 2–4 in., 3-ribbed. Cymes in panicked corymbs. Flowers 1 in. diam. Petals obcordate, lilac or white. Capsule ovoid, on a stout pedicle, enclosed in the fusiform calyx-tube.—Distrib. Europe, W. Asia; introd. in U. States.—A decoction is very saponaceous. Flowers often double.—S. hybr'ida, L., is a var. with connate upper leaves and monopetalous corolla.—Var. puberula, Syme, is another with the upper part of the stem and calyx pubescent. Near Hightown, Lancashire.

2. Sile'ne, L. Catchfly.

Habit of Saponaria. Calyx inflated, 5-toothed, 10-nerved. Petals 5; claw narrow; blade entire or divided, with usually 2 scales at its base.
Silene.] CARYOPHYLLEAE. 55

Stamens 10, the 5 petaline sometimes adnate to the claw. Disk columnar. Ovary 1–3-celled below the middle; styles 3, rarely 2–5, opposite the sepals; ovules many. Capsule 6–rarely 3-valved at the top. Seeds with a marginal hilum; embryo annular or ½-anular.—DISTRIB. N. temp. hemisphere; species 800.—ETYM. σαλώς, salicus, from the viscosity of some species.

* Calyx bladdery, nerves reticulate. Capsule incompletely septate.

1. S. Cucubal, Wibel. ; erect, panicle many-fld., bracts scarious, petals deeply cloven, scales obscure. S. inflata, Sm. Cucubal Behen, L. Bladder Campion, White bottle.

Roadsides and waste places, N. to Caithness; ascends to nearly 1,000 ft. in Yorkshire; Ireland; fl. June–Aug.—Perennial, branched, 2–3 ft., glabrous, glabrous or downy (VAR. puberula). Leaves 1–3 in., variable, ovate, obovate or oblong. Flowers ¼ in. diam., drooping, white, proterandrous, trimorphous (male, fem., and hermaphr.). Capsule globose, top conical.—DISTRIB. Europe (Arctic), N. Africa, Siberia, W. Asia to N.W. India; introd. in the U. States.

2. S. maritima, With. ; diffuse, flowers 1–4, bracts herbaceous, petals shortly cleft, segments broad with two scales at the base.

Sea-shores, N. to Shetland; rare by Alpine streams; ascends to 3,000 ft. in the Highlands; Ireland; Channel Islands; fl. June–Aug.—Very nearly allied to S. Cucubal.—DISTRIB. Shores of Europe (Arctic), from Italy to the Canaries, Norway and Finland.

** Calyx cylindric, strongly many-ribbed, closing tightly over the capsule at the top. Capsule incompletely septate.


Pastures and sandy heaths, local; Kent, Norfolk, Suffolk, Haddington and Forfar; Channel Islands; fl. May–July.—Annual, 6–12 in. Leaves linear, upper acute and ribbed. Calyx ½ in., ampulliform, 30-ribbed, intruded at the base; teeth subulate. Petals small, rosy or purple, cleft, with 2 scales at the base of the blade; gynophore very short.—DISTRIB. Europe, N. Africa, Siberia, W. Asia to India.

*** Calyx with broad nerves. Capsule incompletely septate.

4. S. gallica, L. ; hairy and viscid, lower leaves spatulate, flowers in leafy racemose cymes, calyx-teeth setaceous, petals and scales small entire or slightly 2-fid.

Gravelly places from Moray southd., not rare, probably often an escape; Ireland; Channel Islands; fl. June–Oct.—Annual, 1–2 ft., erect or diffusely branched. Leaves variable. Calyx ½ in., membranous with green pubescent ribs. Capsule ovoid on a usually deflexed pedicel.—DISTRIB. Europe, N. Africa, Siberia, N. and W. Asia to India.

S. gallica proper; flowers white or pink, petals large 2-fid.—VAR. S. quinquevul’nera, L.; petals entire white with a red spot.—VAR. S. anglica, L.; branches spreading, petals small white often jagged.

Alpine rocks; ascends to 4,300 ft.; Donegal only in Ireland; fl. June–Aug.—Perennial, glabrous, forming bright green, moss-like cushions. *Leaves* \(\frac{1}{2}\) in., channelled above, keeled below, ciliate. *Flowers* pink, rarely white, \(\frac{1}{2}\) in. diam., peduncles lengthening after flowering. *Calyx* faintly nerved; teeth with scarious margins. *Capsule* exserted, sub-cylindric, 6-toothed.—*Distr.* Alps of Europe, N. Asia, N. America; all Arctic regions.

6. *S. oti'tes, L.*; flowering stems erect simple few-leaved viscid, radical leaves narrow-spathulate, cymes peduncled, flowers small sub-dioecious erect whorled, calyx teeth obtuse, petals linear without scales.


7. *S. nu'tans, L.*; pubescent, stem above and calyx viscid, radical leaves oblong-lanceolate, cauline linear, flowers in peduncled or subcaulescent cymes drooping, calyx teeth acute, petals 2-partite, scales lanceolate. *S. paradoxxa,* Sm., not L. *Nottingham Catchfly.*

Dry places and walls, from Forfar southd., local; Channel Islands; fl. May–July.—*Rootstock* woody, branched. *Stems* 2–3 ft. *Radical leaves* 2–5 in., tufted, petioled; cauline small, narrow, sessile. *Flowers* dimorphic, honey-less, proterandrous, opening and fragrant for 3 nights, 5 stamens ripening on each of the two first nights, the styles protruding on the third. *Calyx* \(\frac{1}{2}\) in., tubular, swollen in the middle, membranous, nerves purple. *Petals* white or pink; segments diverging, narrow, incurved. *Capsule* erect, exceeding and rupturing the calyx.—*Distr.* Europe (Arctic), Siberia, Dahuria, Canaries.

**** *Calyx* cylindric or ovoid, 10-nerved. *Capsule* without septa.

8. *S. noctifo'ra, L.*; softly pubescent, viscid above, leaves all oblong-lanceolate acute the lower petioled, flowers few, calyx-tube long, teeth slender, petals 2-fid, scales truncate.

Sandy fields, on the E. chiefly; Forfar to Cornwall; Ireland; Channel Islands; a colonist; fl. July–Aug.—*Annual*; 1–2 ft., erect, simple or dichotomous. *Leaves* 3–4 in., \(\frac{1}{2}\)–1\(\frac{1}{2}\) in. broad. *Flowers* erect, open at night, fragrant. *Calyx* 1 in., narrow in flower; nerves green. *Petals* rosy within, yellow outside, segments incurved by day. *Capsule* as long as, and often rupturing, the calyx.—*Distr.* Europe, Siberia, W. Asia; introd. in U. States.—Regarded by A. de Candolle as a Siberian and Caucasian plant of very ancient naturalization in W. Europe.

3. **LYCH’NIS, L.** Campion.

Characters of *Silene*, but styles 5. *Sepals* not foliaceous. *Petals* with a simple or 2-fid scale at the base of the blade. *Styles* and *carpels* opposite
the sepals.—Distrib. N. temp. hemisphere; species 30.—Etym. λέχνος, from the flame-like flowers of some species.—Styles rarely 3-4, when the species may be referred with equal justice to Silene.

* Petals 4-cleft. Capsule 5-toothed, without septa.


Moist meadows, copses, &c., N. to Shetlands; ascends to near 2,000 ft. in the Highlands; Ireland; Channel Islands; fl. May–June.—Glabrous. Rootstock slender. Stem 1-2 ft., roughish above. Radical leaves petioled, oblong-lanceolate, acuminate, cauline narrow. Flowers drooping, pedicels slender, honeyed, proterandrous. Calyx ½ in., veins purple; teeth acuminate. Petals rosy, rarely white, segments linear; scales long, 2-fid. Capsule broadly ovoid, very shortly pedicelled.—Distrib. Europe (Arctic), Siberia.

** Petals notched or 2-fid. Capsule 5-toothed, with incomplete septa.

2. L. Visca'ria, L.; stem viscid at the nodes, petals notched.

Trap rocks local; N. Wales; Mid. and S. Scotland; fl. June–Aug.—Glabrous, stout, 6-10 in. Rootstock perennial, woody. Radical leaves 3-5 in., very narrow-lanceolate; petiole downy at the margins. Cymes very contracted, panicled, few-flowered. Flowers almost sessile. Calyx ½ in., membranous, purple, dilated upwards; teeth short, acute. Petals obovate, red-purple; scales short. Capsule broadly ovoid; pedicel slender, ½ as long as the capsule.—Distrib. Europe (excl. Spain and Greece) to the Caucasus, Siberia.

3. L. alpi'na, L.; tufted, not viscid, cymes compact, petals 2-lobed.


*** Petals 2-partite. Capsule 10-toothed, septa 0. Flowers subdiseaseous.

4. L. diur'na, Sibth.; calyx reddish teeth triangular acute, petals red, capsule subglobose, teeth recurved. L. dio'ca a, L. Red Campion.

Damp copses and hedgebanks, N. to Shetlands; Ireland; Channel Islands; fl. June–July.—Softly hairy, rarely quite glabrous, viscid above. Rootstock slender; branched. Radical leaves 3-6 in., obovate, petioled; cauline narrower. Flowering stem 1-3 ft., erect. Flowers in loose dichotomous cymes. Calyx ½ in., subcylindric, reddish, rarely green. Petals red, rarely white, lobes oblong; scales lanceolate. Capsule mouth wide; pedicel very short.—Distrib. Europe (Arctic) to the Caucasus, Siberia to Baikal, Greenland.

Fields, hedgerows, &c., to Orkneys; Ireland; Channel Islands; fl. June–Sept.
—Very similar to *L. diurna*. *Flowers* rarely reddish, open and fragrant in
the evening.—**Distrib.** Europe, N. Africa, Siberia, W. Asia; introd. in
U. States.

4. **GITHA’GO,** Desfontaines. **Corn-cockle.**

Characters of *Lychnis*, but calyx coriaceous with foliaceous teeth, and
entire petals without scales at the base of the blade. *Flowers* honeyed,
proterandrous. *Styles* and *carpels* opposite the petals.—**Distrib.** Europe,
Siberia, W. Asia to Persia; introd. in U. States, species 1.—**Etym.**
obscure.

**G. seg’etum,** Desf.; flowers solitary, calyx woolly segments much
longer than the petals. *Agrostem’na Githa’go,* L.  
Cornfields N. to the Orkneys; Ireland; Channel Islands; (a colonist, *Wats.*);  
*Leaves* 2–5 in., linear-lanceolate. *Flowers* 1 1/2–2 in. diam.; pedicels long.  
*Calyx* 1–1 1/2 in., cylindric-ovoid, ribs strong. *Petals* pale purple, limb obo-
vate. *Capsule* ovoid.—Cosson regards this as a quasi-cultivated form, of
which the type is the Anatolian *A. gra’cilis*, Boiss.

5. **HOLOS’TEUM,** L.

Annual herbs, viscid and glandular. *Leaves* narrow. *Flowers* in ter-
mental umbel-like cymes. *Sepals* 5. *Petals* 5, toothed or notched. *Sta-
mens* 3–5, rarely 10. *Ovary* 1-celled; *styles* 3, rarely 4 or 5; *ovules*
many. *Capsule* subcylindric, with twice as many short terminal valves
as there are styles. *Seeds* peltate, concavo-convex, rough; embryo-
horseshoe-shaped.—**Distrib.** Europe, W, Asia; species 3.—**Etym.**
doubtful.

**H. umbella’cum,** L.; lower leaves petioled elliptic-oblong.

Old walls and thatched roofs, very rare, Norwich, Eye, and Bury; (a denizen
or native? *Wats.)*; fl. April–May.—**Annual**; with very slender, branched at
the base. *Radical leaves* 3/2–1 in.; cauline very few, sessile, ovate or linear.
*Flowers* few, erect; pedicels ½ in., deflexed after flowering, erect after fruit-
ing; bracts small, membranous. *Sepals* white, edges scarious, obtuse. *Petals*
½ in., a little longer than the sepals, white or pale pink. *Stamens* and styles
often 3 each. *Capsule* twice as long as the sepals. *Seeds* black.—**Distrib.**
Europe, N. Africa, W. Asia to N.W. India.

6. **CERAS’TIUM,** L. **Mouse-ear Chickweed.**

Pubescent rarely glabrous herbs, the hairs articulate, some glandular,
others not. *Leaves* small. *Flowers* white, in terminal dichotomous cymes,
proterandrous. *Sepals* 5, rarely 4. *Petals* as many, rarely 0, notched
or 2-fid, rarely quite entire or deeply cut. *Disk* of 5 honeyed glands.  
*Stamens* 10, 5, or fewer. *Ovary* 1-celled; *styles* usually 3, when 5,
opposite the sepals; *ovules* many. *Capsules* cylindric, often incurved,
with twice as many short terminal valves as styles. *Seeds* compressed,
often tubercled; embryo annular.—Distrib. All temp. and cold regions; species 40.—Etym. képas, from the horn-like capsule.

Section 1. Möench’ia, Ehrh. (gen.). Sepals acuminate, longer than the entire petals.

1. C. quarternel’ium, Fenzl; glabrous, glaucous, stamens 4. Möench’ia erecta, Ehrh.

Gravelly pastures, &c., from the Cheviots southd.; ascends to 1,200 ft. in Wales; Ireland; Channel Islands; fl. May–June.—Annual. Stems 2–6 in., dichotomously branched from the base; branches slender, stiff. Leaves 1 in., radical sublanceolate; cauline few, shorter, broader. Flowers few; pedicels long, erect, stiff. Sepals 4, ¼ in.; margins broad, membranous, white. Petals 4, shorter than the sepals, oblong. Styles 4, short. Capsule subcylindrical, as long as the sepals, 8-toothed.—Distrib. W. Europe from Holland to Hungary, N. Africa; introd. in the U. States.

Section 2. Cerastium proper. Petals notched 2-fid, or erose.

* Annual rarely perennial, hairy and viscid except C. triviale. Sepals 4–5, about as long as the petals. (Perhaps all sub-species of one.)

2. C. tetran’drum, Curtis; sepals viscid, pedicels usually erect when fruiting 2–3 times as long as the capsule, bracts herbaceous, sepals 4 rarely 5 lanceolate, glandular margins narrowly membranous, capsule straight. C. atrovirens, Bab.

Sandy and waste places usually near the sea, N. to the Shetlands; Ireland; Channel Islands; fl. April–Oct.—Stem 4–12 in. dichotomously branched from the base. Radical leaves obovate-lanceolate, cauline usually broader upwards. Cymes leafy. Flowers ⅓ in. diam. Petals notched, veins branched. Capsule scarcely longer than the sepals.—Distrib. W. Europe from Sweden to Spain and eastwards to Hungary.

Var. C. pu’milum, Curtis; branching from above the middle, upper bracts with narrow membranous margins, petal notched, veins branched, fruiting pedicel short curved, capsule curved. C. glutinosum, Fries.—Dry banks, rare, Worcester to Devon, Surrey.

3. C. semidecan’drum, L.; pedicels a little exceeding the sepals deflexed between flowering and fruiting, bracts half-membranous, sepals usually 5 glandular margins broadly membranous, capsule slightly curved.

Walls and banks, N. to Shetland; ascends to 1,000 ft. in Yorkshire; Ireland; Channel Islands; fl. March–May.—Stem 1–10 in., erect or decumbent, sometimes nearly glabrous, branched from the base. Leaves as in C. tetran’drum. Cymes few- or many-fid. Petals erose, with simple veins, shorter than the sepals. Stamens 4–5, or 10. Capsule exserted.—Distrib. Europe, N. Africa.—The earliest to flower.

4. C. glomera’tum, Thuillier; fruiting pedicels suberect shorter than the sepals, bracts all herbaceous, sepals acute with few glands and narrow membranous margins, petals as long as the sepals 2-fid rarely 0, capsule twice as long as the sepals curved. C. vulga’tum, L., and visco’sum, L., in part.
Dry places, N. to Shetland; ascends to 1,000 ft.; Ireland; Channel Islands; fl. April–Sept.—Habit of the preceding but usually larger, less glandular and cymes more fascicled, at first subcapitate.—DISTRIB. Europe (Arctic), N. Africa, W. Asia to the Himalaya, Greenland; introd. in U. States.

5. **C. triviale**, Link; pedicels longer than the sepals reflexed between flowering and fruiting, primary bracts wholly herbaceous, margins of secondary sometimes membranous, sepals obtuse margins broad membranous, petals 2-fl., capsule twice as long as the sepals curved. *C. viscosum*, L., of Sm. and Hook, and Arn. *C. vulgatum*, Fries.

Waste places, N. to Shetland; ascends to 3,600 ft. in Scotland; Ireland; Channel Islands; fl. April–Aug.—Similar to *C. glomera'tum*, but usually perennial, often with leafy barren shoots and lax cymes. Flowers proterandrous.—DISTRIB. Europe from the Arctic circle southd., N. and W. Asia, the Himalaya, N. Africa; introd. in U. States.

*C. triviale* proper; perennial, decandrous, hairs not glandular, sepals pubescent.—**VAR.** *C. holosteo'ides*, Fries; stem sparingly pubescent, leaves dark smooth shining, flowers large. Tidal rivers, Newcastle, Wigtown, Perth.—**VAR.** *pentandrum*; annual, pentandrous, capsule shorter, sepals as in *triviale*. Sea-shores.—**VAR.** *alpe'stre*, Lond. Cat. (alpinum, Koch); dwarf, flowers much larger. Scotch Mts.

**Perennial, downy or woolly. Petals 5, twice as long as the sepals, 2-flid.**

6. **C. arve'nse**, L.; stems hairy all round, leaves linear-lanceolate, bracts and sepals subacut, margins and tip membranous, seeds acutely tubercled.


**VAR. pubesc'cens**, Syme; leaves soft and pubescent, cymes 3–10-flowered.—**VAR.** *Andrew'sii*, Syme; leaves rigid glabrescent, midrib strong beneath, flowers sub solitary.

7. **C. alpi'nun**, L.; stems hairy all round, leaves ovate or oblong-ovate obtuse pubescent, bracts herbaceous obtuse, sepals obtuse with a membranous margin, seeds tubercled.

Alpine and subalpine rocks, Westmoreland, Wales, and Scotland; ascends to near 4,000 ft.; fl. June–Aug.—Habit of *C. arvense*, but leaves much broader, flowers fewer and much larger, 3/4–1 in. diam., and capsule almost twice as long as the sepals on a spreading pedicel.—DISTRIB. Mountains of Europe, N. America, and all Arctic regions.

*C. alpinum* proper; villous, cymes 1–several-fl., sepals faintly margined, seeds small subacutely tubercled.—**VAR.** *Smithii*; loosely tufted, less hairy and glandular, leaves broader, flowers sub solitary, seeds larger obtusely tubercled. *C. latifo'lium*, Sm. not L. *C. lan'datum*, Lamk.—**VAR.** *Edmonstone'i*, Wats. (*nigres'cens*, Syme); deep green, leaves broader. Unst, in Shetland.—The true *C. latifo'lium*, L., of the Alps, with globose capsules and inflated testa, is not British.


Slender, usually glabrous herbs. *Leaves* narrow or broad. *Flowers* in dichotomous cymes, white, small, honeyed, proterandrous. *Sepals* 5, rarely 4. *Petals* 5, rarely 4, 2-fld or 2-partite. *Stamens* 10 (rarely 8 5 or 3) more or less perigynous, rising and dehiscing in 2 sets. *Disk* annular elongating, or of 5 interstaminal glands. *Ovary* 1-celled; *styles* 3, or 5 and opposite the petals, ovules many. *Capsule* short, splitting below the middle into as many simple or 2-fld valves as there are styles. *Seeds* compressed, granulate; embryo annular.—*Distrib.* All temp. and cold regions; species 70.—*Etym.* Stella, from the star-like flowers.


2. *S. nem'orum*, L.; stem ascending glabrous or hairy all round, leaves ovate acuminate, lower subcordinate long-petioled, upper cauline sessile, cymes lax, petals longer than the sepals.

3. **S. media**, Vill.; stem procumbent with a line of hairs, leaves ovate acuminate, lower petioled, upper sessile, cymes many-flowered, petals shorter than the glandular sepals sometimes 0. Chickweed. Cultivated and waste ground, N. to Shetland; ascends to 2,700 ft.; Ireland; Channel Islands; fl. March–Oct.—One of the commonest and most variable of plants, 6–18 in., easily recognized by the line of hairs on the stem and branches. **Stamens 3, 5, or 10.** —**Distrib.** All Arctic and N. temp. regions; naturalized elsewhere.

S. me'dia proper; pedicels pubescent, sepals hairy, petals 5, variable or 0, stamens 5 (3 in *S. Boreana*, Jord., and *Als. Pal'ilda*, Dum.) (10 in *S. neglecta*, Weihe), seeds obtusely tubercled

Sub-sp. S. umbro'sa, Opitz.; more erect, leaves more acuminate, pedicels glabrous, sepals lanceolate glabrous with raised points, seeds acutely tubercled. *S. Elizabeth*, Schultz.—From Perth south.

4. **S. Holo'stea**, L.; stem suberect 4-angled, angles rough, leaves sessile connate lanceolate acuminate ciliate, petals twice as long as the almost nerveless sepals.

Copes, hedgerows, &c., from Caithness south.; ascends to 1,900 ft. in the Highlands; Ireland; Channel Islands; fl. April–June.—Perennial. **Stem 1–2 ft., decumbent at the base, brittle at the nodes, hairy above. Leaves 1–4 in.**, rigid. **Flowers ½–¼ in. diam., white, pedicels slender. Capsule globose.—**Distrib. Europe, W. Asia.—Flowers sometimes double; petals occasionally laciniate.

**Section 3. Lar'brean, St. Hilaire (gen.).** Sepals united at the base into a conical tube. **Stamens** very perigynous. **Styles 3.** **Capsule** 6-valved.

5. **S. palus'tris**, Ehrh.; glaucous, glabrous, stem suberect 4-angled, leaves very narrow sessile margins even, peduncles very long axillary, petals longer than the 3-nerved sepals. *S. glau'ca*, With.

Marshy places, not uncommon from the Clyde and Forth to Surrey and Dorset; rare in Ireland; Channel Islands; fl. May–July.—Perennial. **Stems 1–2 ft., very slender. Leaves 1–2 in.**, oblong-lanceolate, or linear-oblong. **Flowers ½–⅓ in. diam., few, distant. Bracts membranous. Sepals lanceolate, acute, margins broadly scarious. Capsule ovoid, as long as the sepals; pedicel spreading.—**Distrib. Europe, Siberia, W. Asia to the Himalaya, Greenland.

6. **S. gra'minea**, L.; glabrous, stem suberect 4-angled, leaves very narrow sessile ciliate, cymes branched, petals equalling the 3-nerved sepals.

Dry pastures, hedgebanks, &c., N. to Shetland; ascends to 1,000 ft. in Yorks.; Ireland; Channel Islands; fl. May–Aug.—Perennial, not glaucous **Stem 1–3 ft. Leaves as in S. glau'ca, but ciliate. Flowers ½–⅓ in. diam., many. Bracts scarious, ciliate. Pedicels reflexed after flowering, then spreading. Sepals acute. Capsule ovoid, nodding, a little longer than the sepals.—**Distrib. Europe (Arctic), Siberia, W. Asia to the Himalaya.—*S. scapig'era*, Willd., said to be found by Don in Perth and Inverness-shire, is a cultivated abnormal form, with short stems, imbricate leaves, long erect solitary peduncles, and small flowers.
7. **S. uliginosa**, Murr.; glaucous, nearly glabrous, stem 4-angled, leaves oblong or ovate-lanceolate, cymes few-fl., petals shorter than the acuminate sepals.

Wet places, N. to Shetland; ascends to 3,300 ft. in the Highlands; Ireland; Channel Islands; fl. May–July.—Perennial, 3–18 in., erect or diffuse, variable in size, habit, and breadth of leaves, 1- or more-fl., glabrous, or with a few hairs at the bases of the leaves, which are narrowed at both ends, and callous at the tip. **Bracts** scarious. **Flowers** ⅓ in. diam. **Tube** of calyx funnel-shaped. **Capsule** ovoid. **Seeds** minute.—**Distr.** Europe (Arctic), N. Africa, N. and W. Asia to the Himalaya, N. America.

8. **ARENA'RIA, L.** **Sandwort.**

Annual or perennial herbs, often tufted. **Leaves** broad or narrow. **Flowers** white or pink, in dichotomous cymes. **Sepals** 5. **Petals** 5, entire or slightly notched, rarely 0. **Stamens** 10, rarely 5, inserted on the disk. **Disk** annular, or of inter-staminal honeyed glands. **Ovary** 1-celled; **styles** 3–4; ovules many, rarely few. **Capsule** short, with as many entire or 2-fl. valves as there are styles. **Seeds** pressed, smooth or tubercled; embryo annular.—**Distr.** all temp. and cold regions; species 130.—**Etym.** Arena, from many growing in sand.

**SECTION 1. ALSINE, Wahl. (gen.).** **Flowers** hermaphrodite. **Disk** annular. **Capsule** with 3–4 entire valves. **Seeds** many, funicle not swollen or appended.—Leaves linear-setaceous in all the British species.

1. **A. verna**, L.; densely tufted, leaves crowded subulate, flowering branches slender, few-fl., oblong petals and capsule rather longer than the lanceolate sepals.

Dry rocks, pastures and banks, N. to Shetland, local; ascends to 2,500 ft. in the Highlands; Ireland; fl. May–July.—Perennial, bright green, sparingly hairy and glandular. **Rootstock** woody; branches 2–4 in., densely tufted, forming a green cushion. **Leaves** ⅓–⅔ in., 3-nerved. **Bracts** acute, margins scarious. **Flowering** branches strict. **Flowers** ⅓ in. diam., white, proterandrous; pedicels slender, glandular. **Petals** oblong, hardly longer than the sepals.—**Distr.** Mid. and S. Europe, N. Africa, N. America. **A. verna**, proper; leaves apiculate, lower not appressed.—**Var.** Gerar'di, Wahlb.; leaves not apiculate, lower appressed.—Cornwall.

2. **A. hir'ta**, Wormsk.; densely tufted, leaves crowded subulate obtuse, peduncles pubescent 1-flowered, petals lanceolate and capsule shorter than the acute 3-nerved sepals. **A. rub'ella**, Hook.

Rocky tops of Breadalbane Mts. and Ben Hope, alt. 2,500 to 4,000 ft., very rare; fl. July–Aug.—General character of **A. verna**, of which it may be an Arctic sub-species, but of laxer habit, smaller in all its parts, yellow-green and purplish; leaves more falcoid and obtuse; flowers usually solitary; petals shorter; styles commonly 4; seeds smaller and more orbicular.—**Distr.** Arctic regions.

3. **A. uliginosa**, Schleich.; stems loosely tufted ascending, peduncles filiform 1-3-flowered, leaves subulate semieterete obtuse nerveless, petals
 oblong as long as the ovate acute 3-nerved sepals. *Sper'gula stric'ta*, Swartz; *Als'ine stric'ta*, Wahl.

Banks of a rill, Widdy-bank Fell, Teesdale, alt. 1,800 ft.; fl. June–July.—Perennial, glabrous, 2–3 in., very slender, habit of *Sagina*. Leaves $\frac{1}{4}$–$\frac{1}{3}$ in., curved, upper pairs few and distant. *Peduncles* 1–2 in. *Flowers* $\frac{1}{3}$ in. diam., white. *Capsule* ovoid. *Seeds* reniform, rugose on the disk.—*DISTRIB.* W. Europe (Arctic), Lapland to Italy, Greenland.

4. *A. tenuifo'lia*, L.; erect, very slender, leaves subulate acute 3–5-nerved, cymes many-fl., petals oblong half as long as the lanceolate 3-nerved sepals, capsule 3-valved equalling the sepals or longer.

Sandy fields and waste places from York southd., chiefly in the E. counties; Channel Islands; fl. June–Aug.—Annual, 2–3 in., simple or branched. Leaves crowded below, upper pairs remote. *Flowers* $\frac{1}{3}$ in. diam., white.—*DISTRIB.* Europe, N. Africa, Siberia, W. Asia to India.

*A: tenuifo'lia* proper; glabrous, stamens 10, capsule equalling the sepals.—


Moist copses, hedgebanks, &c., N. to Ross; Ireland; Channel Islands; fl. May–July.—Annual, branched, flaccid; branches 4–18 in. *Leaves* $\frac{1}{2}$–1 in. *Flowers* $\frac{1}{4}$ in. diam., rarely 5-androus, proterogynous; pedicels long, slender. *Sepals* lanceolate, longer than the obovate-lanceolate petals, middle nerve hairy. *Capsule* subglobose, shorter than the sepals.—*DISTRIB.* Europe (Arctic), Canaries, Siberia, W. Asia; Greenland.

6. *A. serpyllifo'lia*, L.; decumbent or suberect, pubescent, leaves subsessile ovate acuminate 1–3-nerved ciliate, cymes many-flowered, bracts foliaceous, sepals with 3–5 hairy ribs.

Wall-tops, &c., N. to Orkneys, ascends to 2,000 ft.; Ireland; Channel Islands; fl. June–Aug.—Annual, very variable in habit, grey-green, branched, hairs recurved on the stem and peduncles. *Leaves* $\frac{1}{4}$–$\frac{1}{3}$ in., shortly petioled, rather rigid. *Flowers* $\frac{4}{8}$ in. diam. *Sepals* with narrow margins, longer than the petals. *Seeds* rough, shining, not arilled.—*DISTRIB.* Europe (Arctic), N. Africa, N. and W. Asia to the Himalaya; introd. in the U. States.

*A. serpyllifo'lia* proper (*A. sphaerocar'pa*, Tenore); rigid, sepals ovate-lanceolate, capsule ovoid, its pedicel ascending.—*VAR. glutino'sa*, Koch; shorter, stouter, more glandular, capsule more swollen below. Isle of Wight.—*VAR. A. leptoclo'a'dos*, Guss.; weak, sepals lanceolate, capsule narrower, its pedicel spreading.
7. **A. cilia'ta, L.**; procumbent or ascending, leaves oblong-spathulate obtuse 1-nerved, flowers subsolitary, bracts foliaceous, sepals oblong-lanceolate with 3 hairy ribs much shorter than the petals.

Ireland, Orkney and Shetlands; fl. June–July.—Perennial, dark green, hairs reflexed. **Stems** 3–6 in., numerous, matted, tips ascending. **Leaves** 1/4–1 in., petioled. **Flowers** nearly 1/4 in. diam. **Sepals** subacute, margins membranous. **Petals** spathulate. **Capsule** ovoid, as long as the sepals. **Seeds** not arillate.

—**Distrib.** Arctic and Alpine Europe, E. to Crete.

**A. cilia'ta** proper; pubescent, leaves ciliate, ribs of sepals hairy.—Sligo Mountains, alt. 1,000–1,700 ft.

Sub-sp. **A. norve'gica**, Gunn.; almost glabrous, leaves denser shorter broader more fleshy, peduncles shorter, ribs of sepals glabrous.—Shetlands and Orkney.

**SECTION 3. Ammode'nia, Gmel.** (gen.). **Flowers** polygamous. **Disk** glandular, 10-lobed. **Capsule** fleshy, usually 3-valved. **Seeds** 1–2, large. **Honcke'nya**, Ehrh.

8. **A. peploi'des**, L.; creeping, fleshy, leaves ovate acute recurved, flowers 1–3 together axillary subsessile, sepals obtuse. **Sea Purslane**.

Sandy and pebbly shores, N. to Shetland; Ireland; Channel Islands; fl. May–Aug.—Perennial, dark green, glabrous. **Rootstock** creeping; branches 4–8 in., ascending. **Leaves** 1/4–1/2 in., decussate, margins cartilaginous. **Flowers** 1/4 in. in diam., pedicels compressed. **Sepals** with membranous margins. **Petals** of male fl. as long as the sepals, of female shorter, **Sepals** 10, the alternate shorter. **Styles** 3–5. **Capsule** globose. **Seeds** obvoid, concavo-convex.—**Distrib.** W. Europe from the Arctic regions to Spain, Arctic America.—Used as a pickle in Yorkshire.

**SECTION 4. Cherle'ria, L.** (gen.). **Flowers** polygamous. **Sepals** united at the base. **Petals** 0 or minute. **Disk** with 5 large glands. **Seeds** few, minute, smooth.

9. **A. Cherle'ri, Benth.**; densely tufted, leaves closely imbricate linear-subulate 3-nerved, flowers solitary, sepals obtuse. **Alsine Cherleri**, Fenzl. **Cherleria sedoides**, L. **Cyphel**.

Lofty Scotch mountains, alt. 2,500–3,000 ft.; fl. June–Aug.—Perennial, forming mossy, yellow-green cushions 6–12 in. diam., with a very long tap root. **Leaves** 1/4–1/2 in., obtuse, ciliate, grooved above. **Flowers** sessile, proterandrous. **Sepals** 3-nerved, margins membranous. **Petals** 0, or in the male fl. subulate. **Capsule** ovoid, shorter than the sepals.—**Distrib.** Alps of Central and S. Europe, Pyrenees.

**9. SAGI'NA, L.** **PEARL-WORT.**

Very small, tufted, annual or perennial herbs. **Leaves** subulate, connate at the base. **Flowers** small, solitary, pedicelled, proterandrous. **Sepals** 4–5. **Petals** 4–5, entire, sometimes minute or 0. **Sepals** 4, 5, 8, or 10. **Ovary** 1-celled; styles 4–5, opposite the sepals; ovules many. **Capsule** 4–5-valved to the base.—**Distrib.** Temp. and cold N. and S. hemispheres; species 8.—**Etym.** doubtful.
* Flowers 4- rarely 5-merous. Petals minute.

1. **S. apet'ala**, L. ; annual, primary and lateral shoots all flowering, radical leaves sub-rosulate, petals minute or 0.

Dry banks, wall tops, &c.; fl. May–Aug.—A slender, wiry herb, 4–10 in. **Leaves** 1/5–1/3 in. **Flowers** 1/2 in. diam., green, pedicels capillary.—DISTRIB. Europe, N. Africa, W. Asia; doubtfully indigenous in the U. States.

**S. apet’ala** proper; branches ascending, leaves ciliate at the base mucronate, pedicels erect, sepals at length spreading obtuse exceeding the capsule.—From Perth and Forfar southd.; rare in Scotland; Ireland; Channel Islands.

Sub-sp. **S. cilia’ta**, Fries; decumbent, glandular-pubescent, leaves more or less ciliate mucronate, sepals always appressed to the capsule 2 outer mucronate. **S. ambigu’a**, Lloyd.—From Aberdeen southd., Ireland and Channel Islands; rather rare.

Sub-sp. **S. marit’ima**, Don; decumbent or ascending, glabrous, leaves obtuse or apiculate, sepals suberect in fruit broad obtuse.—**S. marit’ima** proper; ascending, slender, internodes long, capsule about equal to the sepals. Sandy sea-shores, N. to Shetland, Ireland and Channel Islands.—VAR. **S. deb’ilis**, Jord.; decumbent, slender, internodes long, capsule a little shorter than the sepals.—VAR. **S. den’sa**, Jord.; tufted, slender, internodes short, capsule as in deb’ilis. Christchurch, Hants, and Wisbeach.—VAR. **alpi’na**, Syme; ascending, stoutish, internodes short, capsule shorter than the sepals. Top of Ben Nevis, Don.

2. **S. procum’bens**, L. ; perennial, stems many, primary shoot flowerless, lateral slender with fascicled branchlets usually procumbent and rooting, petals very small.

Waste places, paths, banks, &c.; ascends to 3,800 ft. in the Highlands; Ireland; Channel Islands; fl. May–Sept.—Branches 1–8 in. **Leaves** glabrous or ciliate (var. spino’sa, Bab.), obtuse, mucronate, longer than in **S. apet’ala**. **Flowers** usually solitary, sometimes 5-merous. **Sepals** spreading in fruit. **Styles** recurved during flowering. **Capsule** a little longer than the sepals, pedicels erect or curved at the tip.—DISTRIB. Europe (Arctic), N. Africa, N. and W. Asia to the Himalaya, Greenland, N. America, Fuegia.

**Flowers** 5- rarely 4-merous. Petals as long as the sepals or longer. (Perennial, with a leafy flowerless central stem, many lateral flowering branches, minute subulate leaves, and slender erect 1-flowered pedicels. **Spergella**, Reich.)

3. **S. linne’i**, Presl; glabrous, leaves mucronate, petals longer than the glabrous obtuse sepals, capsule 5-valved almost twice as long as the usually appressed sepals.

Alps of Perth and Forfar to Sutherland; ascends to 2,700 ft.; fl. June–Aug.—Distinguishable from the 5-merous forms of **S. procum’bens** only by the longer white petals, erect styles, and usually longer capsules with appressed sepals.—DISTRIB. Arctic and Alpine Europe, Siberia, N. America.

**S. linne’i** proper; branches many prostrate rooting, pedicels curved erect in fruit. **S. saxat’iles**, Wimm. ; **Sper’gula sagino’des**, Sm.

Sub-sp. **S. niva’lis**, Fries; densely tufted, leaves broader, pedicels always erect, petals shorter.—Ben Lawers, Skye, and Clova Mountains.
4. **S. subulata**, Prest; tufted, more or less glandular and hairy, leaves narrowed to the awned tip, petals as long as the lanceolate obtuse subglandular sepals, pedicels long curved after flowering then erect, capsule rather longer than the appressed sepals. *Spergula*, Swartz.

Heaths, dry pastures, &c.; ascending to 2,700 ft. in the Highlands; N. and W. Ireland; Channel Islands; fl. June–Aug.—**Distrib.** Mid. and W. Europe, N. America (doubtfully indigenous, Gray).

5. **S. nodosa**, E. Mey.; glabrous or glandular, leaf-buds many in the axils of the subulate acute leaves, pedicels short always erect 1–2-flowered, petals and capsules much longer than the oblong obtuse sepals. *Spergula*, L. *Knotted Spurrey*.

Moist heaths and sandy places, N. to Shetland; ascends to 1,800 ft. in Yorks.; Ireland; Channel Islands; fl. July–Aug.—Much the largest and largest-flowered species of the genus. Branches 4–10 in., decumbent, curved, wiry, rooting at the nodes. **Radical leaves** \(\frac{1}{2}\) in., cauline, usually \(\frac{1}{2}–\frac{3}{4}\) in. **Flowers** \(\frac{1}{2}\) in. diam., proterandrous.—**Distrib.** Europe (Arctic), N. Africa, Siberia, W. Asia to the Himalaya, N. America.

**10. Spergula**, L. *Spurrey*.

Annual herbs, with forked or fascicled branches. **Leaves** opposite, with abbreviated leaf-buds in their axils, whence the foliage appears whorled; stipules small, scarious. **Flowers** white, in peduncled cymes. **Sepals** 5. **Petals** 5, entire. **Stamens** 5 or 10. **Ovary** 1-celled; styles 5, opposite the petals; ovules many. **Capsule** with 5 entire valves. **Seeds** compressed, margined or winged; embryo annular.—**Distrib.** Weeds of cultivation in temp. regions; species 2–3.—**Etym.** *spargo*, from scattering its seeds.

**S. arvensis**, L.; leaves linear-subulate semiterete rather fleshy.

Cornfields, &c., N. to Shetland; Ireland; Channel Islands; ascends to 1,000 ft.; fl. June–Aug.—More or less pubescent and glandular. **Stems** 5–18 in., branched from the root, geniculate. **Leaves** \(\frac{1}{2}–\frac{3}{4}\) in., in distant pairs grooved beneath. **Flowers** \(\frac{1}{2}–\frac{3}{4}\) in. diam., in terminal subumbellate cymes; pedicels slender, spreading or reflexed. **Sepals** ovate, obtuse, rather shorter than the white petals. **Capsule** sub-globose.—**Distrib.** Europe (Arctic), N. Africa, W. Asia to N.W. India; introd. in N. America.

**S. arvensis** proper (*S. vulg'aris*, Bonn.); seeds papillose, wing narrow or 0.—**Var.** *S. sat’iva*, Bøenn.; more viscid, seeds smooth or punctulate, winged.


Diffuse herbs, with the foliage and inflorescence of *Spergula*. **Stipules** membranous connate and surrounding the leaf-bases. **Sepals** 5. **Petals** 5, rarely 0, entire, white or red. **Stamens** 2–10. **Ovary** 1-celled; styles 3. **Capsule** 3-valved. **Seeds** compressed, often winged; embryo annular or hooked.—**Distrib.** Temp. and warm regions; often littoral; species 3–4.—**Etym.** a derivative from *Spergula*.

The species are very variable, and may be regarded as sub-species of one.
1. **S. ru'bra**, Pers.; annual or biennial, leaves linear flat acute, stipules cleft, capsule equalling the calyx, seeds plano-convex tubercled, margins thickened not winged. *Arenaria ru'bra*, L. *Lepig'onum ru'brum*, Fr. Gravelly and sandy soils, from Ross southd.; rare in Ireland; Channel Islands; fl. June–Sept.—Pubescent and glandular above. Stem much branched from the base; branches 4–12 in., spreading, prostrate. Leaves \(\frac{1}{2}\) in. *Stipules connate, silvery, torn. Flowers \(\frac{1}{4}\) in. diam., solitary or in subracemose cymes; pedicels short, spreading or reflexed, erect in fruit. *Petals* rosy, shorter than the obtuse lanceolate sepals. *Stamens* 5 or 10.—**Distrib.** Europe, N. and S. Africa, N. and W. Asia to India, America, Australia.

2. **S. sali'na**, Presl.; annual or biennial, leaves \(\frac{1}{2}\)-cylindric acuminate, stipules entire short, capsule longer than the calyx, seeds orbicular plano-concave smooth or papillar, margin thickened winged or not. *Lepig'onum sali'num*, Kindb. Muddy and rocky places by the sea, N. to Shetland; Ireland; Channel Islands; fl. June–Aug.—More or less pubescent and glandular. Branches stout from a small rootstock, compressed. *Stipules* dark, deltoid. Pedicels equalling or longer than the capsule. *Petals* shorter than the calyx, rose. Capsule \(\frac{1}{2}\) in. *Seeds* pale brown.—**Distrib.** Europe, N. and W. Asia, N. and S. Africa, N. America. *S. sali'na* proper; seeds smooth, pedicels equalling the bracts.—**Var.** *L. me'diun*, Fries; pedicels shorter than the leaf-like bracts, seeds nearly smooth.—**Var.** *L. neglectum*, Kindb.; glandular above, upper pedicels longer than the scarious bracts, seeds papillose.

3. **S. me'dia**, Pers.; perennial, usually glabrous, leaves \(\frac{1}{2}\)-cylindric subacute, stipules usually entire, pedicels long, capsule twice as long as the calyx or less, seeds orbicular, smooth, margins thickened and broadly-winged. *S. mari'na*, Leb. *Arenaria marginata*, DC. *Lepig'onum sali'num*, Wahl. Muddy salt marshes, from Orkney southd.; fl. June–Aug.—*Rootstock* woody; branches stout, compressed. *Leaves* fleshy, stipules broad. *Flowers* \(\frac{1}{2}\) in. diam. *Petals* pale, as long as the sepals. *Capsule* \(\frac{3}{4}\) in. (the largest of the genus).—**Distrib.** Europe, N. and W. Asia, N. and S. America, Australia.

4. **S. rupe'stris**, Lebel; perennial, glandular-pubescent, leaves \(\frac{1}{2}\)-cylindric fleshy acute, stipules subentire, capsule equalling the calyx, seeds pyriform compressed, margin thickened not winged. *Lepig'onum rupe'stre*, Kindb. Suppl. *L. rupeis'tola*, Kindb. (Bab.). Rocky places near the sea, from Ross southd., not common; fl. June–Aug.—Habit and size of *S. me'dia*, but glandular, with very different seeds.—**Distrib.** France, Spain, Italy, and probably elsewhere in N. and S. temp. regions.

12. **POLYCAR'PON, L.**

Polycarpon.} \textit{Caryophyllææ.}


\textit{P. tetraphyllium}, \textit{L.} ; lower leaves in whorls of 4, flowers 3-androus. Channel Islands, Cornwall, Devon and Dorset, in sandy and waste places; fl. June–July.—Stems 3–6 in., prostrate. \textit{Leaves} \(\frac{1}{2}\) in., obovate, upper opposite. \textit{Flowers} \(\frac{1}{2}\) in. diam.—Distrib. Europe, Asia, Africa, &c.

Order XIII. \textit{Portula'ceæ.}

Herbs, rarely small shrubs. \textit{Leaves} opposite or alternate, quite entire; stipules scarios. \textit{Inflorescence} various. \textit{Sepals} 2, imbricate in bud. \textit{Petals} 4 or more, distinct or united at the base, imbricate in bud. \textit{Stamens} 4 or more, free or adnate to the petals, filaments filiform. \textit{Disk} small or 0. \textit{Ovary} usually free, 1-celled; style simple or 3-fid, branches stigmatose all over; ovules 2 or more, on long often connate basal funicles, amphi-tropal, ascending, micropyle inferior or transverse. \textit{Capsule} dehiscing transversely or 2–3-valved.† \textit{Seeds} 1 or more, compressed, hilum marginal; embryo terete, hooked or annular and coiled round the mealy albumen.—Distrib. Cosmopolitan, but chiefly American; genera 15; species 125.—Affinities. Close to Caryophyllum, Ficoideæ, and Molluginæ.—Properties. Purslane is a good salad and a potherb.

Petals united at the base. \textit{Stamens} 3.................................1. \textit{Montia}.
Petals distinct. \textit{Stamens} 5........................................1*. \textit{Claytonia}.

1. \textit{Mon'tia}, \textit{L.} Blinks.


\textit{M. fonta'na}, \textit{L.} ; leaves spathulate, flowers drooping then erect. Brooks and marshes, N. to Shetland; ascends to 3,200 ft. in the Highlands; Ireland; Channel Islands; fl. May–Aug.—Pale-green, 1–5 in., usually flaccid, branched, tufted. \textit{Leaves} \(\frac{1}{2}–\frac{3}{4}\) in., sub-opposite. \textit{Flowers} \(\frac{1}{16}\) in. diam. \textit{Bracts} scarios. \textit{Petals} a little longer than the obtuse sepals. \textit{Capsule} obovoid. \textit{Seeds} shining.


1*. \textit{Clayton'ia}, \textit{L.}

Glabrous succulent herbs. \textit{Radical leaves} petioled, cauline alternate and opposite, exstipulate. \textit{Flowers} in terminal cymes. \textit{Petals} 5. \textit{Stamens} 5,
opposite and adnate to the bases of the petals. Ovary free; style entire or 3-fid at the tip; ovules few. Capsule membranous, 3-valved.—Distrib. America, N.W. Asia, Australia; species 20.—Etym. Dr. J. J. Clayton, an American botanist.


Order XIII*. TAMARISCINÆ.

Shrubs or small trees. Leaves very small, often scale-like, imbricate, amplexicaul, exstipulate. Inflorescence of solitary or panicked axillary spikes. Sepals 5, rarely 4, imbricate in bud. Petals 5, rarely 4, distinct or connate below, imbricate in bud. Stamens 4, 5, 8, or 10 inserted on the disk, distinct or connate below; anthers versatile. Disk hypogynous or slightly perigynous, 10-glandular. Ovary free, 1- or imperfectly 2-5-celled; styles 2–5, distinct or connate, or 2–5 sessile stigmas; ovules 2 or more, basal, erect, anatropous, raphe ventral, micropyle inferior. Capsule 2 5-valved. Seeds erect, usually more or less comose or winged,albumen fleshy farinaceous or 0; embryo straight, cotyledons flat.—Distrib. Cold, temp. and hot regions, often in sandy or saline places; genera 5; species 40.—Affinities. With Caryophyllææ, Portulaceæ, and Frankeniaceæ.—Properties. Tamarix yields manna and galls, and its ashes soda.

TAM'ARIX, L. Tamarisk.

Sepals 4–5, distinct. Petals 4–5, distinct or connate at the base. Stamens 4, 5, 8, or 10. Ovary narrowed upwards; styles 3–4, short, thick; ovules many. Capsule 3-valved. Seeds many, with a lateral and terminal pencil of hairs, albumen 0; embryo ovoid.—Distrib. Of the Order; species 20.—Etym. The Tamaris, a river of Spain, where Tamarisk abounds.

Elatine.]  ELATINEÆ. 71

Order XIV. ELATINEÆ.

Herbs, often minute, or under-shrubs. Leaves opposite or whorled, entire or serrate, stipulate. Flowers small, axillary, solitary or cymose. Sepals and petals each 2–5, distinct, imbricate in bud. Stamens 2–5, or twice as many, hypogynous, distinct; anthers versatile. Ovary free, cells and styles 2–5; stigmas capitate; ovules many, on the inner angles of the cells, anatropous, raphe lateral or ventral. Capsule septicidal; valves flat concave or inflexed, separating from the axis and septa. Seeds straight or curved, raphe on the concave side, testa often rugose, albumen scanty or 0; embryo cylindrical, straight or curved, cotyledons small.—Distrib. Scattered over the globe; genera 2; species 20.—Affinities. With Caryophylleæ and Hypericinæ.—Properties. Supposed to be acrid.

1. ELATINE, L. WATERWORT.


1. E. hexan'dra, DC.; flowers pedicelled 3-merous, capsule turbinate, seeds 8–12 in each cell straight ascending. E. tripeta'la, Sm.

Margins of ponds and lakes, rare, from Perth to Surrey and Cornwall (not in E. counties), ascends to 1,617 ft. in the Highlands; N. and W. Ireland; fl. July–Sept. Stems 1–3 in., matted, flaccid, rooting at the nodes. Leaves 1/8–1 in., spatulate. Flowers 1/16 in. diam., alternate, axillary. Sepals unequal. Petals pink, longer than the sepals.—Distrib. Europe, from Norway, southd. to Spain, Lombardy, and Hungary, Azores.

2. E. Hydropi'per, L.; flowers sessile 4-merous, capsules subglobose, seeds 4 in each cell hooked pendulous.

Muddy ponds, very rare; Surrey, Worcester, and Anglesea; Lough Neagh, and Lagan Canal, Ireland; fl. July–Aug.—Very similar to E. hexan’dra.—Distrib. Europe to S. Russia (excl. Spain, Greece, Turkey, and Denmark).

Order XV. HYPERICI'NEÆ.

Herbs, shrubs, or trees. Leaves opposite, often covered with pellucid glands, entire or glandular-toothed, exstipulate. Flowers terminal, cymose, rarely axillary. Sepals 5, rarely 4, imbricate in bud. Petals as many, hypogynous, usually twisted in bud. Stamens many, rarely few, more or less connate in bundles; anthers versatile. Disk obscure or of interstaminal glands. Ovary of 3–5 carpels, 1- or 3-5-celled; styles as many, filiform, stigmas terminal; ovules few or many, on parietal or axile placentas, anatropous, raphe lateral or superior. Fruit a septicidal capsule,
rarely a berry. Seeds exalbuminous; embryo straight or curved.—Distrib. Temp. and mountains of warm regions; genera 8; species 210.—Affini-
ties. Close with Guttiferae and Ternstroemiaceae, less close with Elatineae.
Properties. Drastic purgatives, astringents, and tonics.

1. HYPER'ICUM, L.  St. John’s Wort.

Herbs, shrubs, or small trees. Leaves sessile, often gland-dotted. Flowers cymose, yellow, not honeyed, homogamous. Sepals 5. Petals 5, generally very oblique. Ovary 1-celled with 3 or 5 parietal, or 3–5-celled with axile placentas; styles distinct or connate; ovules many in the cells, rarely few. Capsule (rarely a berry) septicidal, placentas adhering to the edges of the valves or to the axis. Seeds oblong; embryo straight or incurved.—Distrib. All temp. regions; species 160.—Etym. obscure.

Section 1. Sepals 5, unequal. Petals deciduous. Stamens connate in 5 bundles at the very base only, without intervening glands. Ovary incompletely 3- or 5-celled.


H. calyc'num, L.; shrubby, leaves sessile oblong obtuse, flowers sub-
solitary shortly pedicelled, styles 5 straight.


*Margins of sepals entire or toothed, eglandular.

2. H. perfora'tum, L.; stem erect 2-ridged, leaves linear or oblong obtuse, glands and veins pellucid, reticulations opaque, sepals glandular, styles as long as the capsule.
Copse and hedgebanks, N. to Sutherland; ascends to 1,000 ft. in Yorks.; Ireland; Channel Islands; fl. July–Sept.—Glabrous. Stems 1–3 ft., branched above, slender, strict, light brown. Leaves ½–1 in. Cymes corymbose, many-flowered. Flowers 1 in. diam. Sepals acute, entire, or slightly serrate in a narrow-leaved var. (angustifolium, Bab.). Petals much
longer. Capsule transversely wrinkled; carpels 2-vittate.—Distrib. Europe (Arctic), N. Africa, N. and W. Asia to the Himalaya; introd. in U. States.

3. H. quadrangulum, L. (in part), Fries; stem erect 4-ridged, leaves ovate oblong or orbicular glands few or 0, upper 1-3-amplexicaul, veins and reticulations pellucid, sepals glandular, styles as long as the capsules.


H. quadrangulum proper (H. dubium, Leers); leaves broad, sepals oblong obtuse entire.—Var. H. macula’tum, Bab.; leaves and denticulate sepals narrower.

4. H. undulatum, Schousb.; stem erect narrowly 4-winged, leaves oblong glands copious and reticulations pellucid, sepals lanceolate glandular, styles half as long as the capsule. H. boeticum, Boiss.


5. H. tetrap’terum, Fries; stem erect narrowly 4-winged, leaves broadly ovate or oblong glands and reticulations pellucid, sepals lanceolate acuminate eglandular, styles shorter than the capsule. H. quadrangulum, L. in part and Sm.


6. H. humifu’sum, L.; stems many procumbent with 2 raised lines, leaves oblong with pellucid glands, margins often revolute with black glands, cymes forked, sepals unequal.

Roadsides, commons, &c.; ascends to 1,000 ft. in Yorks.; Ireland; Channel Islands; fl. July–Aug.—Perennial, glabrous. Branches 4–10 in., very many, compressed, curving upwards, leafy. Leaves 1/4–3/4 in. Flowers 1/2 in. diam., homogamous.—Distrib. Europe, from Denmark southd. (excl. Turkey), Canaries, Azores.

** Margins of sepals with glandular teeth.

7. H. linarifo’lium, Vahl; stems ascending subterete, leaves linear obtuse, margins revolute, sepals lanceolate acute.

Rocky banks, Cornwall and Devon; Channel Islands; fl. June–July.—Stems 6–15 in., many from the roots, leafy. Leaves 3/4–1 in. Cymes few-flowered. Flowers 1/2 in. diam. Petals twice as long as the sepals, with black marginal glands. Stamens few. Styles short.—Distrib. S.W. Europe, Canaries.—A hybrid growing with this, and intermediate between it and H. humifu’sum (H. decumbens, Peterm.), occurs in Jersey.
8. *H. pul'chrum, L.*; glabrous, stems erect slender terete branched above, leaves with pellucid glands cordate very obtuse, upper shorter, sepals small oblong.

Dry copses, heaths, and commons, N. to Shetland; ascending to 2,200 ft. in the Highlands; Ireland; Channel Islands; fl. June–July.—Very elegant. *Stems* 1–2 ft., flexuous. *Cymes* panicled, many-fld. *Leaves* \( \frac{1}{2} \) in. *Flowers* \( \frac{3}{4} \) in. diam. *Petals* twice as long as the sepals, yellow tinged with red, margins with black glands. *Anthers* red. *Styles* short.—DISTRIB. W. Europe from Norway southd. and E. to Russia.

9. *H. hirsu'tum, L.*; finely pubescent, stem erect terete subsimple, leaves with pellucid glands very shortly petioled ovate or oblong obtuse, sepals linear-oblong subacute.

Copses, &c., from Ross southd.; ascends to 1,300 ft. in Yorks.; very rare in Ireland; fl. July–Aug.—Rather stout, 1–3 ft., leafy; pubescence curly. *Leaves* 1–2 in., without marginal glands. *Cymes* panicled. *Flowers* \( \frac{3}{4} \) in. diam., pale yellow, homogamous. *Petals* twice as long as the sepals.—DISTRIB. Europe, Siberia, W. Asia.

10. *H. monta'num, L.*; almost glabrous, stems ascending terete, leaves with marginal black glands sessile oblong obtuse, upper cordate-ovate or linear oblong puberulous beneath, sepals lanceolate acute.

Copses in gravelly or chalky soil, England, Ayrshire, and N.E. Ireland; Channel Islands; ascends to 700 ft. in Surrey; fl. July–Aug.—*Stem* 1–2 ft., rigid, very slender, often leafless above. *Leaves* 1–2 in., membranous. *Cymes* few and dense-fld.; bracts glandular, toothed. *Flowers* \( \frac{1}{2} \)–\( \frac{3}{4} \) in. diam., pale yellow, fragrant. *Petals* eglandular or nearly so, twice as long as the sepals.—DISTRIB. Europe to the Caucasus, N. Africa.

Section 3. *Sepals* nearly equal. *Petals* not oblique, persistent. *Stamens* 15, connate \( \frac{1}{2} \) way up in 3 stalked bundles which alternate with 2-fld hypogynous scales. *Ovary* incompletely 3-celled.

11. *H. elo'des, Huds.*; villous, leaves orbicular or oblong-cordate.

Bogs, ditches, and wet moors, S. of England, W. of Scotland, from Argyll southd.; all Ireland; Channel Islands; fl. July–Aug.—*Stems* 3–18 in., many, creeping, terete. *Leaves* \( \frac{1}{2} \)–1 in., \( \frac{1}{2} \)-amplexicaul, pellucid glands small. *Cymes* irregular, often spuriously axillary, 3-chotomus; bracts small, deltoid, gland-serrrated. *Flowers* \( \frac{1}{2} \) in. diam., pale-yellow, homogamous. *Sepals* glabrous, oblong, obtuse, with red glandular serratures.—DISTRIB. W. Europe, from Holland to Spain and Italy; Azores.

Order XVI. **MALVA'CEAE.**

Herbs, shrubs, or trees, hairs often stellate. *Leaves* alternate, 3- or more-nerved at the base; stipules deciduous. *Inflorescence* various; bracteoles when present often connate and with their stipules forming an epicalyx. *Calyx* 5-lobed, valvate in bud. *Petals* 5, adnate at the base to the staminal
column, twisted in bud, often oblique. Stamens many, filaments combined into a tube; anthers reniform annular or twisted, 1-celled, bursting outwards. Disk small. Carpels many, whorled, distinct or connate; styles distinct or connate, stigmatose on the inner face or top; ovules 1 or more on the inner angles of the carpels, usually horizontal or ascending. Fruit usually of many dry indehiscent or 2-valved loculicidal crustaceous or coriaceous 1- or more-seeded carpels. Seeds often woolly, albumen little or 0; embryo curved, cotyledons usually thin folded or plaited.—Distrib. All regions but very cold ones; genera 60; species 700.—Affinities. With Sterculiaeæ, Tiliaeæ, and Euphorbiaeæ.—Properties. Mucilaginous; the bark yields textiles, and cotton is the covering of the seeds of Gossypium.

Bracteoles 6-9, connate at the base..........................1. Althæa.
Bracteoles 3, connate at the base..........................3. Lavatera.

1. ALTHÆ'A, L. MARSH-MALLOW.

Herbs, hairy or tomentose. Leaves lobed or divided. Flowers axillary or racemose. Calyx 5-fid; epicalyx 6-9-fid. Staminal column long, filaments distinct at its top only. Ovary many-celled; styles filiform, inner surface stigmatose; ovules 1 in each cell. Fruit a whorl of indehiscent 1-seeded carpels. Seed ascending.—Distrib. Temp. and warm regions; species 12.—Etym. ἁλθα, from its healing properties.


2. A. hirsuta, L.; hispid, peduncles 1-fld. longer than the leaves.


2. MAL'VA, L. MALLOW.

Hirsute or glabrous herbs. Leaves angled, lobed or cut. Flowers axillary, honeyed. Calyx 5-fid, 3-bracteolate. Staminal column long, filaments distinct at its top only. Ovary many-celled; styles stigmatose on the inner surface. Fruit a whorl of indehiscent 1-seeded carpels separating from a short conical axis. Seed ascending, albumen scantily mucilaginous.—Distrib. Europe, temp. Asia and N. Africa, and as weeds of cultivation in other regions; species 16.—Etym. μαλαχη, in allusion to its emollient properties.


3. **Lavatera**, L. Tree-mallow.

Tall, hirsute or tomentose herbs or shrubs. *Leaves* angled or lobed. *Flowers* axillary. *Calyx* 5-fid.; epicalyx 3-fid. *Staminal column* long, filaments distinct at its top only. *Ovary* many-celled; styles filiform, as many as the cells, inner surface stigmatose; ovules 1 in each cell. *Fruit* a depressed whorl of indehiscent 1-seeded carpels, separating from the axis, *Seed* ascending.—*Distrib.* Europe, W. Asia, N. Africa, and 1 Australian; species 18.—*Etym.* The brothers Lavater, Swiss physicians.


**Order XVII. Tilia'ceæ.**

Trees or shrubs, rarely herbs. *Leaves* alternate, entire or toothed, stipulate. *Flowers* cymose, honeyed, proterandrous; cymes usually corymbosæ or panicled. *Sepals* 5, distinct or connate below, valvate in bud. *Petal.*
5 or fewer or 0, aestivation various. Stamens many, inserted on the disk, filaments filiform distinct or connate in bundles; anthers 2-celled, opening by pores or valves. Disk tumid. Ovary free, 2-10-celled; styles entire or divided, or stigma sessile; ovules 1 or more, in the inner angle of the cells, anatropous, usually pendulous, raphe ventral. Fruit 1-12-celled, dry or baccate, indehiscent or loculicidal. Seeds various, albumen fleshy; embryo straight, cotyledons foliaceous.—Distrib. Chiefly tropical; genera 40; species 330.—Affinities with Sterculiaceae and Malvaceae.—Properties. Usually mucilaginous, liber of many species yields fibre.

1. Tilia, L. Lime-tree or Linden.

Trees with simple or stellate hairs. Leaves oblique, cordate, serrate. Cymes axillary or terminal; peduncle with a leafy decurrent bract. Sepals 5. Petals 5, with often a scale at the base. Stamens many, filaments distinct or connate in bundles at the base. Ovary 5-celled; style simple, stigma 5-toothed. Fruit globose, indehiscent, 1-2-seeded. Seeds ascending; cotyledons broad, crumpled with involute margins.—Distrib. Europe, N. Asia, N. America; species 8.—Etym. The old Latin name.

1. T. parvifo'lia, Ehrh.; glabrous, leaves glaucous and pubescent in the axils of the nerves beneath, fruit crustaceous pubescent.


T. vulga'ris, Hayne; glabrous, leaves pubescent in the axils of the nerves beneath, fruit woody pubescent not ribbed when ripe. T. interme'dia, DC. Common Lime.


Order XVIII. Lin'eeæ.

Herbs, shrubs, or trees. Leaves alternate, rarely opposite, simple, entire, sometimes stipulate. Inflorescence cymose. Sepals 4–5, distinct or connate, imbricate in bud. Petals 4–5, hypogynous, imbricate or twisted in bud. Stamens 4–5 with alternating staminodes, or 10 with the filaments inserted on a hypogynous ring; anthers versatile. Disk 0–or of 5 honeyed glands. Ovary free, 3–5-celled; styles 3–5, stigmas terminal; ovules
1–2 in each cell, pendulous, raphe ventral. *Capsule* septicidally splitting into 2-valved coci. *Seeds* compressed, albumen fleshy; embryo long, cotyledons plano-convex.—**Distrib.** All regions; genera 14; species 135.—**Affinities,** slight with *Malvaceae* and *Geraniaceae*; more close with *Malpighiaceae* and *Fernstroemiaceae.*—**Properties.** mucilaginous, oily, diuretic; seeds occasionally purgative; bark fibrous (as in flax).

Sepals 5, quite entire.................................1. *Linum.*
Sepals 4, 2–4-toothed................................2. *Radiola.*

### 1. *Linum, L. Flax.*

Herbs or small shrubs. *Leaves* alternate, rarely opposite, narrow, quite entire; stipules 0 or glandular. *Flowers* in dichotomous panicled racemose or fascicled cymes. *Sepals* 5, entire. *Petals* 5, distinct or connate below, fugacious. * Stamens* 5, hypogynous, connate at the base, alternating with 5 minute staminodes. *Disk* of 5 glands opposite the petals. *Ovary* 5-celled, cells sometimes divided into 2; styles 5; ovules 2 in each principal cell. *Cocci* 5, 1-or partially 2-celled, 2-seeded. *Albumen* scanty; embryo straight.—**Distrib.** Temp. and warm regions; species 80.—**Etym.** The classical name.


Heaths and pastures, N. to Shetland; ascends to 2,400 ft. in the Highlands; Ireland; Channel Islands; fl. June–Sept.—Glabrous, glaucous, 2–10 in., very slender. *Leaves* linear-oblong. *Flowers* \(\frac{3}{4}\) in. diam., white, homogamous. *Petals* oblong, acute or obtuse.—**Distrib.** Europe (Arctic), Canaries, W. Asia to Persia.

2. *L. perenne,* L.; perennial, leaves alternate narrow linear-lanceolate acute, sepal obovate obtuse glabrous 3–5-nerved, petals distinct.


3. *Linum angustifolium,* Huds.; annual or perennial, leaves alternate narrow linear-lanceolate, outer sepal ovate acuminate, inner ciliate 3-nerved.

From Lancashire southd.; Ireland rare; Channel Islands; fl. May–Sept.—Glabrous, glaucous. *Stems* 1–2 ft.; branches few, divaricate. *Leaves* as in *L. perenne,* but fewer and smaller. *Cymes* few-flowered. *Flowers* \(\frac{1}{2}\)–\(\frac{3}{4}\) in., pale lilac-blue.—**Distrib.** W. and S. Europe, to W. Asia, N. Africa.

*L. usitatis'simum,* L.; annual, leaves alternate linear-lanceolate, sepal ovate acuminate ciliate 3-nerved, petals crenulate. *Common Flax.*

An escape of flax-fields; fl. June–July.—Larger than any of the preceding. *Stem* corymboseyly branched above. *Cymes* broad, many-flowered.—**Distrib.** Wherever flax is cultivated for oil or fibre.
2. Radiola, Gmelin. All-seed. Flax-seed.

A minute annual, with filiform repeatedly-forked branches. Leaves opposite, exstipulate. Flowers in corymbose cymes. Sepals 4, 2-4-toothed. Petals 4, fugacious. Stamens 4, scarcely connate; staminodes minute or 0. Disk glands inconspicuous. Ovary 4-celled; cells divided into 2; styles 4; ovules 2 in each cell. Capsule of 4 nearly 2-celled 2-seeded divisible cocci. Seeds exalbuminous.—Distrib. Europe (excl. Central), N. Africa.—Etym. radius, from the rayed ramification.

R. lino'ides, Gmel.; leaves ovate acute 3-5-nerved. R. Millegra'na, Sm.

Gravelly and sandy damp places, uncommon, from the Orkneys to Cornwall; Ireland; Channel Islands; fl. July-Aug.—Stem 1-4 in. Leaves 1/5-1/2 in., sessile, rather succulent. Flowers axillary and in the forks, most minute; peduncles short, erect. Sepals connate below, as long as the oblong petals.

Order XIX. Geraniacœæ.

Herbs, rarely shrubby. Leaves opposite or alternate, usually stipulate. Inflorescence various; flowers regular or irregular. Sepals 5 or fewer, imbricate or valvate in bud. Petals 3-5, imbricate in bud. Stamens usually 5 in irregular flowers, and 10 in the regular, some often deformed. Disk inconspicuous or glandular. Ovary 3-5-lobed, 3-5-celled, produced upwards into a styliferous beak, or with one or more terminal styles; ovules 1-2 or many in each cell, anatropous, pendulous, raphe ventral. Fruit septicidal or loculicidal, or separating into cocci. Seeds small, albumen scanty or 0; embryo various.—Distrib. Temp. and Trop. rarely Arctic regions; genera 10; species 750.—Affinities. With Rutaceæ and Lineæ.

—Properties. Tribe Geraniæ are often astringent, aromatic, and abound in volatile oil. Oxalidæ are abound in oxalic acid, and some have eatable tubers.


Stamens 10, all antheriferous
Stamens 5, staminodes 5

1. Geranium.

Tribe II. Oxalidæ. Flowers regular. Sepals imbricate. Glands 0. Capsule loculicidal; cells 2- or more-seeded

2. Erodium.

Tribe III. Balsami'neæ. Flowers irregular. Sepals coloured, posticus spurred. Stamens 5. Glands 0. Capsule loculicidal; cells 2- or more-seeded

3. Oxalis.

4. Impatiens.

1. Geranium, L. Crane’s-bill.

Herbs, rarely shrubs, nodes swollen. Leaves opposite or alternate, usually cut or lobed, stipulate. Flowers regular, on 1-2-fld. axillary peduncles. Sepals and petals 5, imbricate in bud. Stamens 10, ripening
in 2 sets, rarely 5, hypogynous, honeyed. Disk of 5 glands opposite the sepals. Ovary 5-lobed, 5-celled, with a long beak terminated by 5 stigmas; ovules 2 in each cell, superposed. Fruit of 5 dehiscent 1-seeded carpels, which terminate upwards in slender tails, and usually separate elastically from the styliferous and placentaliferous axis. Seeds oblong, albumen scanty or 0; cotyledons plicate or convolute; radicle incumbent.

**Distrib.** All temp. regions; species 100. — **Etym.** γέφαρος, a crane, from the form of the fruit. — The garden Geraniums are Pelargonia, having irregular flowers, a spurred sepals, perigynous petals, no glands, and few decline stamens.


Dry rocks and sandy shores, from Ross southd.; ascends above 1,000 ft. in the Highlands; local in Ireland; fl. July–August. — **Rootstock** stout, truncate. **Stems** 1–2 ft., geniculate; hairs spreading. **Leaves** 1–2 in. diam., segments linear-oblong or lanceolate, obtuse or subacute; stipules ovate, acute. **Flowers** 1–1 1/4 in. diam., crimson or pink, proterandrous; peduncles very long, 2-bracteate in the middle. **Sepals** oblong, obtuse, awned. **Claw of petals** bearded. — **Distrib.** Europe, W. Asia. G. sanguineum proper; suberect, hairs scattered. — **Var.** G. prostratum, Cav.; stems shorter decumbent, hairs more copious, flowers pinkish. G. lancastriense, With. Sands, Walney Island, Lancashire.

**Perennial. Stem erect. Peduncles 2-flowered. Sepals spreading.**

2. **G. sylvaticum**, L.; erect, pilose and glandular above, leaves orbicular deeply 7-lobed, lobes cut and serrate, sepals awned, petals notched, carpels smooth hairy, pedicels erect, seeds minutely reticulate.

Copse and moist meadows from Stafford and Carnarvon to Caithness; ascends to 2,700 ft. in the Highlands; very rare in Ireland; fl. June–July. — **Rootstock** truncate, creeping. **Stem** 1–3 ft., branched above. **Leaves** 3–5 in. diam., radical long-petioled, cauline sessile; stipules ovate. **Flowers** 1–2 in. diam., blue-purple or rose-coloured, cymose at the ends of the branches, gynodioecious, proterandrous. **Claw of petals** bearded. **Filaments** filiform, ciliate. — **Distrib.** Europe (Arctic), Siberia, W. Asia.

3. **G. praten'se**, L.; erect, pubescent, hairs reflexed, leaves orbicular 7–9 partite, lobes laciniate coarsely serrate, sepals awned, petals notched, carpels smooth glandular-hairy, pedicels deflexed, seeds minutely reticulate.

Moist meadows, &c., from Aberdeen and Isla southd.; ascends to 1,800 ft. in the Highlands; N.E. Ireland, very rare; fl. June–Sept. — **Rootstock** truncate. **Stem** 3–4 ft., branched above. **Leaves** 3–6 in. diam., all petioled, radical very long-petioled; stipules subulate-lanceolate. **Flowers** many, 1 1/2 in. diam., proterandrous. **Sepals** with very long awns. **Claw of petals** bearded. **Filaments** glabrous, cuneate at the base. — **Distrib.** Europe (Arctic), Siberia.

4. **G. perenne**, Huds.; erect or ascending, hairy, leaves reniform 7–9-lobed, lobes cuneate 3-fid crenate, sepals mucronate, petals 2-lobed, carpels keeled pubescent, pedicels deflexed, seeds smooth. G. pyren'icu'm, L.
G. Phæum, L.; erect, laxly hairy and glandular above, leaves orbicular or reniform 5-7-lobed. Lobes cut and serrate, sepals mucronate, petals waved, carpels hairy wrinkled above, pedicels deflexed, seeds smooth.


*** Annual or biennial. Stems ascending or decumbent. Peduncles 2-flowered. Sepals spreading.

5. G. molle, L.; softly hairy, leaves orbicular 7-9-lobed, lobes contiguous, sepals mucronate generally shorter than the notched petals, claw of petals bearded, carpels persistent wrinkled keeled glabrous, seeds smooth.

Pastures and waste places, N. to the Shetlands; ascends to 1,500 ft. in Yorkshire; Ireland; Channel Islands; fl. May-Sept.—Branches 8-12 in. Leaves 1-2 in. diam., lobes broadly irregularly lobed or crenate at the tip, radical long-petioled; stipules ovate. Peduncles axillary. Flowers ½-1 in. diam., rose-purple or pink, homogamous.—Distrib. Europe, N. Africa, W. Asia.

6. G. rotundifolium, L.; laxly hairy, leaves as in G. molle, sepals mucronate generally shorter than the entire petals, claw of petals naked, carpels keeled not wrinkled hairy, seeds pitted.

Hedges and waste places, rare, from S. Wales and Norfolk southd.; local in Ireland; Channel Islands; fl. June to July.—Branches 6-12 in., slender, geniculate. Leaves ½-1 in. broad; stipules ovate-lanceolate. Flowers ¼-½ in. diam., pale pink. Petals narrow.—Distrib. Europe, N. Africa, Siberia, W. Asia to India.

7. G. pusillum, L.; softly pubescent, leaves as in G. molle but deeper lobed, sepals acute equalling the notched petals, claw of petals subciliate, carpels persistent keeled not wrinkled pubescent, seeds smooth.

Hedgebanks and waste places, from Aberdeen and Isla southd.; rare in Scotland; Ireland; Channel Islands; fl. June-Sept.—Branches 6-18 in.; stipules ovate-lanceolate. Peduncles axillary. Flowers ¼-½ in. diam., many, pale rose-colour, homogamous. Perfect stamens often only 5.—Distrib. Europe, N. Africa, W. Asia; introd. in America.

8. G. columbinum, L.; nearly glabrous, leaves 5-7-partite, lobes distant pinnatifid, segments narrow, sepals large acuminate long-awned equalling the entire petals, claw of petals ciliate, carpels not wrinkled keeled glabrous, seeds pitted.
Dry copses and pastures, from Forfar and Ayr southd.; rare in Scotland and Ireland; Channel Islands; fl. June–July.—Branches 8–24 in., slender, hairs reflexed. Leaves 3/4–1 1/2 in. broad, long-petioled; stipules ovate-lanceolate. Flowers 1 1/4 in. diam., few, rose-purple, homogamous; peduncles and pedicels very long and slender. Calyx angular.—Distrib. Europe, N. Africa, Siberia.


Hedges and waste places, from the Orkneys southd.; ascends to near 1,000 ft. in Yorks.; Ireland; Channel Islands; fl. May–Aug.—Similar to G. columbinum, but petioles and peduncles very much shorter, and calyx and capsules quite different. Stipules ovate, long-acuminate. Flowers 1 1/4 in. diam., axillary, bright red.—Distrib. Europe, N. Africa, W. Asia, N. America.

**** Annual or biennial. Stems ascending or decumbent. Peduncles 2-flowered. Sepals erect in flower, conviving in fruit.


Waste places and hedgebanks, from Orkney southd.; ascends to near 2,000 ft. in Yorks.; Ireland; Channel Islands; fl. May–Sept.—Plant foetid, reddish. Branches 6–18 in., brittle, leafy. Leaves 1–3 in. broad; petiole 1/2–1 ft.; stipules ovate. Flowers 1/2 in. diam., streaked with dark and light red, sometimes white, homogamous. Calyx angular. Claw of petals glabrous. Carpels attached by silky hairs to the axis.—Distrib. Europe (Arctic), N. Africa, Siberia, W. Asia to N.W. India.

G. Robertianum proper; glandular, hairy, blade of petal about as long as the claw, carpels with deciduous hairs.—Var. G. purpur'reum, Vill. (G. Lebel'ii, Bor., G. modestum, Jord.), is a small flowered maritime state with more fleshy leaves more divided. S. of England.

11. G. lucidum, L.; glabrous, shining, bright red, branches above with 2 lines of hairs, leaves orbicular 5-lobed, sepals long-awned shorter than the petals, carpels wrinkled keeled glabrous or nearly so, seeds smooth.


Var. G. Ravi'ii, Lindl., is a maritime form with shaggy stem and calyx, more succulent leaves and wrinkled fruit.

2. Erodium, L’Héritier. Stork’s-Bill.

Herbs with swollen nodes. Leaves alternate, or, if opposite unequal, stipulate. Flowers regular, solitary or umbellate (contracted cymes) on
axillary peduncles, proterandrous. Sepals 5, imbricate. Petals 5, hypogynous, imbricate, 2 upper sometimes deficient. Stamens 5, alternating with scale-like staminodes. Disk of 5 glands opposite the sepals. Ovary, fruit and seed as in Geranium, but tails of carpels spirally twisted and usually silky on the inner surface.—Distrib. Europe, N. Africa, temp. Asia; rare in S. Africa and Australia; species 50.—Etym. ἐρόδιος, a heron, from the form of the fruit.

1. **E. cicuta'rium**, L'Hérît.; leaves 1–2-pinnate, leaflets pinnatifid, segments narrow cut, peduncles few- or many-flld., filaments entire.

Waste places, most frequent by the sea; ascends to 1,200 ft. in N. Wales; Ireland; Channel Islands; fl. June–Sept.—Annual or biennial; laxly hairy and glandular. Stems at first short, then elongating to 6–24 in., prostrate or decumbent. Leaves 6–18 in., oblong; stipules lanceolate. Peduncles longer than the leaves, strict. Flowers ¾–½ in. diam., umbelled, rosy or white. Sepals hairy. Petals rather unequal, two often with a red spot, entire. Carpels hairy with an eglandular subapical pit and usually a shallow curved furrow below the pit; pedicle reflexed.—Distrib. Europe, N. Africa, Siberia, W. Asia to N.W. India.

*E. cicuta'rium* proper (var. vulgata, Syme, *E. pimpinellæfolium*, Cav., *E. commix'tum*, Jord.); pinnules short, lobes obtuse or subacute, petals hardly longer than the sepals which have spreading often glandular hairs.—Var. *E. cherophyl'luum*, Cav., pinnules with longer more acute lobes, petals twice as long as the eglandular sepals which have appressed hairs.

2. **E. moscha'tum**, L'Hérît.; leaves pinnate, leaflets deeply sharply irregularly serrate, antheriferous filaments toothed at the base.


3. **E. marit'imum**, L'Hérît.; leaves simple oblong or ovate-cordate, margin lobulate, lobes crenate, peduncles 1–2-flld., filaments entire.

Sandy and gravelly places chiefly near the sea, from Wigton southd.; all round Ireland; Channel Islands; fl. May–Sept.—Small, hairy, annual or biennial. Stems 6–16 in., decumbent. Leaves ¼–½ in., petiole longer; stipules ovate, Flowers ½ in. diam., pale pink. Petals sometimes 0. Carpels hairy with a deep subapical eglandular pit subtended by a straight deep furrow.—Distrib. W. Europe, from France to Italy.

3. **Ox'alis, L.** Wood-sorrel.

Acid herbs. Leaves radical or alternate, stipulate or estipulate, compound, usually 3-foliolate. Flowers on axillary 1- or more-flowered peduncles, regular. Sepals 5, imbricate in bud. Petals 5, twisted in bud. Stamens 10, distinct or connate at the base. Disk 0. Ovary 5-lobed, 5-celled; styles 5, stigmas terminal; ovules 1 or more in each cell.
Capsule loculicidal, valves adhering by the septa to the axis. Seeds with an elastic dehiscent fleshy coat, testa crustaceous, albumen fleshy; embryo straight.—Distrib. 3 or 4 species widely dispersed, the rest S. African and S. American; species 220.—Etym. ὠξυς, acid.—Leaflets pendulous at night, sensitive to light.

O. Acetosella, L.; stemless, leaves all radical 3-foliolate, stipules broad membranous, scape 1-flowered. Wood-sorrel.

Moist shady places, N. to Orkneys; ascends to near 4,000 ft. in the Highlands; Ireland; Channel Islands; fl. April-Aug.—Glabrous or hairy. Root-stock creeping, scaly. Petioles 3-6 in.; leaflets obcordate, \( \frac{1}{3} - \frac{2}{3} \) in., often purple beneath. Scape axillary, slender, 2-bracteate about the middle. Flower \( \frac{1}{2} - \frac{3}{4} \) in. diam., dimorphic, larger \( \frac{1}{2} - \frac{3}{4} \) in. diam.; smaller cleistogamous. Sepals oblong. Petals obovate, white veined with purple, rarely rose-purple, erose, cohering above the claw. Capsule erect, 5-gonal; cells 2-3-seeded. Seeds ribbed.—Distrib. Europe (Arctic), N. Africa, N. and W. Asia to the Himalaya, N. America.

O. corniculata, L.; pubescent, stems branched procumbent without runners, leaves all cauline 3-foliolate, stipules adnate, peduncles axillary 2-3-flowered, fruiting pedicels deflexed, capsules downy.

Waste shady places, local, possibly indigenous in S.W. England, not north of it; Channel Islands; fl. June-Sept.—Very variable in size and habit; annual or biennial. Stems 6-16 in. Leaves as in O. Acetosella. Flowers \( \frac{3}{4} \) in. diam., subumbellate, very long-pediculed, yellow. Seeds transversely ribbed.—Distrib. Ubiquitous, except in very cold regions.

O. stricta, L.; subglabrous, stem erect with copious runners at the base, leaves as in O. corniculata but often whorled and stipules minute, peduncles 2-8-flowered, capsules glabrous, fruiting pedicels spreading.

A weed in Cheshire and south of it, local, not indigenous; casual in Ireland; fl. June-Sept.—Similar to and distribution of O. corniculata, of which it is perhaps a sub-species.

4. Impatiens, L. Balsam.

Herbs, rarely shrubby. Leaves opposite or alternate, stipules 0 or glandular. Flowers irregular, resupinate, on 1- or more-flowered axillary peduncles. Sepals 3, rarely 5, petaloid, imbricate; 2 anterior (if present) minute; 2 lateral small, flat; posterior large, produced into a hollow spur. Petals 3; anterior external in bud, large; lateral 2-lobed, each formed by a connate lateral and posterior petal. Stamens 5, filaments short broad; anthers cohering. Disk 0. Ovary oblong, 5-celled; stigma sessile, 5-toothed; ovules many in each cell, 1-seriate. Capsule loculicidal, valves 5 elastic separating from the placentas and then twisting. Seeds smooth or villous, albumen 0; embryo straight.—Distrib. Mountains of trop. Asia and Africa; rare in temp. Europe, N. America, N. Asia, and S. Africa; species 135.—Etym. The Latin name, from the ripe capsules bursting when touched.—The anterior lateral sepals occur in a few Indian species. Cleistogamous flowers occur in I. noli-me-tangere and I. fulva.
I. noli-me-tangere, L.; glabrous, leaves oblong obtuse crenate-serrate; peduncles 1-3-flowered, posterior sepal funnel-shaped gradually contracted into a slender spur with an entire tip. Yellow Balsam.

Moist mountainous situations, probably wild in N. Wales and Westmoreland; an escape elsewhere; and in Ireland; fl. July–Sept.—Annual, succulent, 1–2 ft., nodes thickened. Leaves 2–4 in., alternate, membranous; petiole half as long, slender. Flowers 1½ in., drooping, pale-yellow dotted with red, proterandrous.

—DISTRIB. Europe, Siberia, W. Asia.

I. fulva, Nuttall; habit and characters of I. noli-me-tangere, but leaves acute, serratures more shallow, flowers orange, posterior sepal saccate suddenly contracted into an upcurved spur with a notched tip.

Naturalized on river-banks in Surrey, the Clyde, and other places; fl. June–Aug.—A North American plant, naturalized within the last 50 years, and spreading rapidly.

I. parviflora, DC.; leaves elliptic-ovate acuminate serrate, peduncles erect 3–10-flowered, posterior sepal contracted into a short straight spur.

A garden escape, naturalized in several places; fl. July–Nov.—An annual weed, with very small yellow flowers (none cleistogamic).—DISTRIB. Siberia.

Order XX. Ilicineæ or Aquifoliiaceæ.

Shrubs or trees. Leaves alternate, simple, often evergreen; stipules minute or 0. Flowers small, in axillary cymes, often polygamous. Calyx 3–6 parted, imbricate in bud, persistent. Petals 4–5, distinct or connate at the base, deciduous, imbricate in bud. Stamens 4 or 5, hypogynous, free or adnate to the petals, filaments subulate; anthers oblong. Disk 0. Ovary free, 3- or more-celled; style 0 or short, stigmas terminal; ovules 1, or 2 and collateral in each cell, pendulous, raphe dorsal; funicle often cupular. Drupe with 3 or more 1-seeded distinct or connate stones. Seed with a membranous testa, fleshy albumen, and minute straight embryo.—DISTRIB. Temp. and trop. regions, absent from N.W. America; genera 3; species 150.—AFFINITIES. Differing from Olacineæ only in the several-celled ovary.—PROPERTIES. Antiseptic and astringent. Holly berries are purgative and emetic; bark yields bird-lime. "Maté" or "Paraguay tea" is the leaf of Ilex paraguayensis.

1. Ilex, L. Holly.

Calyx 4–5-parted, persistent. Corolla rotate; petals connate at the base or distinct. Stamens 4, adhering to the base of the corolla. Ovary 4–6-celled; stigmas free or confluent. Drupe globose, with 4 stones or a 4–5-celled stone.—DISTRIB. Trop. and temp. regions, abundant in S. America, rare in Africa and Australia; species 145.—ETYM. doubtful.

I. Aquifoilium, L.; glabrous, shining, leaves ovate spinescent.
Copses and woods, from Caithness southd., often planted; ascends to 1,000 ft. in the Highlands; Ireland; Channel Islands; fl. May–Aug.—A shrub or small tree, 10–40 ft., young shoots puberulous; bark ashy, smooth. Leaves glossy, 2–3 in., acute or acuminate, with waved spinous cartilaginous margins, those on the upper branches often entire. Cymes umbellate, shortly peduncled, many-fld. Flowers ¾ in. diam., white, often subdicelous. Sepals ovate, puberulous. Petals obovate, concave. Stigmas 4, sessile, Drupe scarlet, rarely yellow; stones 4, bony, furrowed.—DISTRIB. Europe from S. Norway to Turkey and the Caucasus; W. Asia.

Order XXI. Empetra'ceae.

Heath-like shrubs. Leaves alternate, exstipulate. Flowers small, solitary or clustered, axillary or terminal, regular, polygamous, bracteolate or not. Sepals (or bracts) 2–3, distinct, coriaceous, or thin, imbricate in bud. Petals (or sepals) 2–3, hypogynous, distinct, persistent. Stamens 3–4, alternate with the petals, hypogynous; filaments long, filiform, persistent; anthers deciduous, 2-celled; pollen compound. Ovary globose, 3–9-celled; styles short, stigmas subulate or dilated; ovule 1, ascending from the inner angle of each cell, anatropous. Drupe depressed-globose, with 2–9 bony 1-seeded connate or distinct stones. Seed erect, 3-gonous, testa very thin, albumen fleshy; embryo straight, slender, axis, cotyledons short, radicle inferior.—DISTRIB. N. temp. and Arctic zones, Chili and Fuegia; genera 3; species 4.—Affinities. Very close to Ilicineæ (Decaisne); reduced Ericaceæ (A. Gray); with Euphorbiaceæ (A. DC., &c.).—Properties unimportant.

1. Empétrum, L. Crowberry.

Flowers bracteolate. Sepals and petals 3 each, quite entire. Ovary 6–9-celled; stigmas 6–9, dilated. Drupe fleshy; stones free.—DISTRIB. of the Order; species 1.—ETYM. év πέτρον, from growing in stony places.

E. ni'grum, L.; leaves linear-oblong margins so recurved as to meet over the midrib.

Moors, &c., Shetland to Devon and Somerset (Sussex, extinct); ascends to 4,000 ft.; Ireland; fl. April–June.—Glabrous, tufted; branches 6–18 in., slender, wiry, spreading and trailing. Leaves ½–¾ in., crowded, obtuse, reddish in age, sides minutely scabrid, the recurved portion concealing the pubescent under-surface, and forming a tube closed at both ends. Flowers minute, sessile. Sepals rounded, concave. Petals scarious, subspathulate, pink, reflexed. Filaments very long; anthers red. Drupe ¼–⅓ in., black (often purple in N. America, red in S. America), eatable.—The structure of the leaf is very curious.
Order XXII. **CELASTRI'NEÆ**.

Trees or shrubs, sometimes spinous or climbing. *Leaves* opposite and alternate, simple, stipulate or not. *Flowers* small, cymose. *Calyx* small, 4-5-lobed, imbricate in bud, persistent. *Petals* 4-6, short, imbricate in bud. *Stamens* 4-6, inserted on the flat tumid or lobed disk, filaments subulate honeyed. *Ovary* sessile, 3-5-celled; style entire or 3-5-fid, stigmas terminal; ovules 2 in each cell, basal, erect, anatropous, raphe ventral. *Fruit* various, dehiscent or not. *Seeds* erect, usually arillate (the aril produced from the exostome, an *arillode*), albumen fleshy or 0; cotyledons large, foliaceous.—*Distrib.* Temp. and trop.; genera 40; species 400.—*Affinites.* With Ampelidææ, Sapindaceæ, Ilicinææ, and *Rhamnææ.*—*Properties.* Purgative and emetic.

1. **EUONYMUS, L.** Spindle-tree.

Shrubs or trees. *Leaves* opposite, persistent; stipules caducous. *Flowers* small, in axillary cymes, proterandrous. *Calyx* 4-6-fid. *Petals* and *stamens* 4-6, inserted on a broad, fleshy, 4-6-lobed disk. *Ovary* confluent with the disk, 3-5-celled; style short, stigma 3-5-lobed. *Capsule* 3-5-lobed and celled, angled or winged, loculicidal, cells 1-2-seeded. *Seeds* with a complete arillode, albumen fleshy; embryo straight. *Distrib.* Temp. Europe, Asia, and N. America; species 40.—*Etym.* Euonyme, mother of the Furies, the fruit being reputed poisonous.

*E. europæus*, L.; leaves ovate- or oblong-lanceolate serrulate.


—Wood hard and tough, used for fine gunpowder, spindles, &c.

Order XXIII. **RHAM'NEÆ**.

Trees or shrubs, often spiny, erect or climbing. *Leaves* simple, alternate or opposite, often 3-5-nerved; stipules small. *Flowers* small, sometimes unisexual, green or yellow. *Calyx-tube* coriaceous; lobes 4-5, triangular, valvate in bud. *Petals* 4, 5, or 0, inserted on the throat of the calyx, minute, usually clawed, hooded. *Stamens* 4-5, inserted with and opposite the petals which often enclose them, filaments subulate; anthers small, versatile. *Disk* large, annular, cupular or coating the calyx-tube. *Ovary* 3-celled, sessile or sunk in the disk, free or adnate to the calyx-tube; styles short, simple or 3-lobed, stigmas terminal; ovules 1 in each cell, basal, erect, anatropous, raphe usually ventral. *Fruit* various, free or girt with the calyx-tube. *Seeds* compressed, sometimes arillate, albumen fleshy or 0; embryo large, often green, cotyledons plano-convex.—*Distrib.* Chiefly in warm and temp. regions; genera 37; species
430.—Affinities. With Celastrineæ, and certain Euphorbiaceæ.—Prop-
erties. Rhamnus yields a green dye.

1. Rham'nus, L. Buckthorn.

Leaves alternate, deciduous. Flowers in small axillary cymes, often uni-
sexual. Calyx-tube urceolate. Petals 4–5 or 0. Stamens 4 or 5, very 
short. Disk coating the calyx-tube, honeyed. Ovary adnate below with 
the calyx-tube, 3–4-celled; style 3–4-fid, stigmas obtuse. Drupe girt with 
the calyx-tube; stones 2–4. Seeds obvoid, albumen fleshy; cotyledons 
flat or with recurved margins; radicle short.—Temp. and trop. regions, 
none Australian; species 60.—Etym. The Greek name, from the branched 
habit. (Position of raphe variable, dorsal lateral or ventral.)

1. R. catharticus, L.; branchlets spinous, leaves ovate acutely serrate, 
nerves divergent, flowers 4-merous dioecious.

Woods and thickets from Westmoreland southd., chiefly on chalk, perhaps 
not wild N. of Durham; rare in Ireland; fl. May–July.—A rigid shrub, 5–10 
ft., much branched; bark blackish. Leaves 1–2 in., fascicled at the ends of 
the shoots, subopposite lower down, shortly petioled, young downy beneath; 
stipules subulate, deciduous. Flowers ½ in. diam., solitary or fascicled in 
the axils of the fascicles of leaves on the previous year's wood, yellow-green, 
proterandrous; pedicle's very short. Calyx of the male campanulate, female 
cupular, lobes acute. Style 4– rarely 2– or 5-cleft. Drupe ¼ in. diam., globose, 
black; stones 4, obvoid, grooved at the back. Seed curved like a horse-
shoe; embryo obcordate, similarly curved.—Distrib. Europe, N. Africa, 
Siberia; cult. for hedges in the U. States.

2. R. Fran'gula, L.; unarmed, leaves obovate quite entire, nerves 
parallel, flowers 5-merous bisexual. Berry-bearing Alder.

Woods and thickets, common in England; Ayr and Moray in Scotland; very 
rare in Ireland; fl. May–June.—Shrub 5–10 ft.; branches slender. Leaves 
alternate, stipules subulate. Flowers ¼ in. diam., few, axillary, greenish-
white, pedicels ½ in. Calyx campanulate. Style entire. Drupe ¼ in. diam., 
globose, black when ripe; stones compressed, broadly obvoid. Seed of the 
same form.—Distrib. Europe, N. Africa, Siberia.—Drupes cathartic, when 
unripe used to dye green. The Black Dogwood of gunpowder-makers.

Order XXIV. Sapinda'ceæ.

Tribe Aceri'neæ.

Trees; juice often sugary, sometimes milky. Leaves opposite, simple 
or pinnate, deciduous. Flowers racemed or corymbose, often polygamous, 
regular; the lower or earlier in the raceme generally male, the terminal 
Petals as many or 0, imbricate in bud. Stamens 8, rarely indefinite, 
inserted on the annular, thick, lobed disk. Ovary laterally compressed,
2- rarely 3-4-lobed and -celled; styles 2, filiform, stigmatic on the inner surface; ovules 2 in each cell, attached by a broad base, superposed or collateral. Fruit of 2, rarely 3 or 4 spreading samaras. Seed ascending, compressed, testa membranous, inner coat fleshy; cotyledons plaited, radicle long.—Distrib. Europe, N. Asia, N. America, Java, the Himalaya, and Japan; genera 3; species 50.—Affinities. Allied to Celtis-trinerv.—The Tribe Aceri'nece differs from the others of this great tropical Order chiefly in the opposite leaves, and stamens inserted on (not within) the disk.—Properties. Several American maples yield sugar.

1. A'cer, L. Maple.

Leaves simple, entire or lobed. Disk annular.—Distrib. of the Tribe.
—Etym. The Latin name.

A. campes'tre, L.; leaves reniform obtusely 5-lobed entire lobulate or crenate, corymbs erect, wings of fruit horizontal. Common or Small-leaved Maple.

Thickets and hedgerows, from Durham southd.; naturalized in Scotland; Ireland; Channel Islands; fl. May–June.—Small tree 10–20 ft., with spreading branches; bark rough, fissured; wood beautiful, fine-grained. Leaves 2–4 in. diam., pubescent when young; petiole 1–1 1/2 in., slender. Corymbs 1–2 in. Flowers 1/2 in. diam., green, shortly pedicelled. Sepals linear-oblong. Petals similar, but narrower; wings of fruit linear-oblong, slightly curved, each 1/2 in. long.—Distrib. Europe, from Denmark southd., N. and W. Asia.


Order XXV. Legumino'sæ.

Sub-order Papilion'a'ceæ.

Herbs, rarely shrubs. Leaves alternate, 3- or more-foliolate, rarely simple; stipules usually present; leaflets often stipellate. Inflorescence various. Flowers irregular, proterandrous. Calyx of 5 connate sepals, often 2-lipped, Petals 5, very unequal, distinct or 2 or more adherent by their claws to the staminal tube, imbricate in bud; upper (standard) broad, often reflexed, exterior in bud; 2 lateral (wings) parallel, enclosing and sometimes adhering to the 2 lower (keel), which are interior in bud, and distinct, or connate by their lower edges. Stamens 10, perigynous, filaments united into a sheath,
or the upper one distinct, equal or the alternate longer; anthers usually versatile. Disk lining the base of the calyx-tube. Ovary of one 1-celled carpel, included in the staminal sheath; style incurved, stigma simple, oblique or terminal; ovules 2 or more, 1–2-seriate on the ventral suture, campylotropous or anatropous. Fruit a dry pod (legume) dehiscent along one or both sutures or not at all, continuous or septate internally. Seeds with a coriaceous testa, and simple or dilated funicle, albumen 0; cotyledons plano-convex, radicle incurved, incumbent.—DISTRIBUT. Chiefly N. temp., but found all over the globe; few in New Zealand; genera 295; species 4,700.—AFFINITIES. Principally with Rosaceae.—PROPERTIES too numerous to mention here.

The Tribal characters here given apply to British Genera to the exclusion of many exotic ones.

**Series 1.** Leaves 1- or 3-foliolate, without tendrils.

**Tribe I. Genisteæ.** Shrubs. Leaves 0 or 1-foliolate or digitately 3-foliolate; leaflets quite entire. Filaments all united. Pod 2-valved.
Calyx shortly 2-lipped, lips deeply toothed 1. Genista.
Calyx deeply 2-lipped, coloured 2. Ulex.
Calyx shortly 2-lipped, lips minutely toothed 3. Cytisus.

**Tribe II. Trifoliiæ.** Herbs, rarely shrubs. Leaves pinnately rarely digitately 3-foliolate; veins generally ending in teeth. Upper filament usually separate.
Filaments all united 4. Ononis.
Upper filament separate.
Racemes short. Pod longer than calyx, curved, dehiscent 5. Trigonella.
Flowers capitate. Pod short, 1–4-seeded. Keel petals adnate 8. Trifolium.

**Series 2.** Leaves 5- or multi-foliolate, with a terminal leaflet.

**Tribe III. Lotææ.** Herbs or shrubs. Upper filament separate or not; alternate filaments often dilated. Pod 2-valved, without a longitudinal septum.
Calyx inflated, including the pod 9. Anthyllis.
Calyx not inflated, pod exserted dehiscent 10. Lotus.

**Tribe IV. Galegeæ (sub-tribe Astragaleæ).** Herbs or shrubs. Upper filament separate. Pod 2-valved, turgid or flat, with a longitudinal septum.
Keel obtuse 11. Astragalus.
Keel beaked or with an incurved tip 12. Oxytropis.

**Tribe V. Hedysarææ.** Herbs or shrubs. Upper filament separate. Pod indehiscent, of 1 or many 1-seeded joints.
Pod flat, of many curved 1-seeded joints 14. Hippocrepis.
Pod flat, hard, 1-seeded 15. Onobrychis.
Series 3. Leaves abruptly pinnate (or leaflets 0); petiole ending in a tendril or point.


1. Genista, L.

Shrubs, sometimes spinous. Leaves 1-foliolate in British species; stipules minute or 0. Flowers racemed, yellow, rarely white, bracteate. Calyx shortly 2-lipped; upper lip deeply 2-fid, lower shorter 3-toothed. Wings oblong, gibbous at the base, adnate to the staminal tube, deflexed after flowering. Keel petals separating and not resilient after deflection. Filaments all united, tube entire; anthers alternately short and versatile, and long and basifixed. Style incurved, stigma oblique; ovules 2 or more. Pod 2-valved or indehiscent, 1-celled.—Distrib. Europe, W. Asia, N. Africa; species 70.—Etym. obscure.

1. G. tinctoria, L.; unarmed, leaflet oblong or lanceolate nearly glabrous, racemes slender, keel and pod glabrous. Dyers' Greenweed.

Meadows and fields, from Wigton and Berwick southd.; Ireland; fl. July–Sept.—Stem 1–2 ft., branched, rigid, striate. Leaflets $\frac{1}{3}$–1 in., appressed, ciliate; stipules minute, subulate. Flowers $\frac{1}{2}$ in., yellow, not honeyed. Stamens, 4 outer ripen first, then 5th, followed by 5 inner. Calyx deciduous above the base, teeth acuminate. Pod 1–1$\frac{1}{4}$ in., compressed, 5–10-seeded,—Distrib. From Gothland southd., N. and W. Asia; introd. in N. America.—Yields a yellow dye.

G. tinctoria proper (Var. glabra, Syme); glabrous, branches erect or ascending.—Var. humifusa, Syme; branches decumbent hairy, as are the pedicels calyx and pod. Kynance Cove, Lizard district.


Gravelly heaths, rare and local, Suffolk and S. Wales to Cornwall and Kent; fl. May–Sept.—Stem much branched, curved, prostrate, tortuous, woody. Leaflets $\frac{1}{4}$ in., very shortly petioled; stipules ovate, obtuse. Flowers $\frac{1}{2}$ in., yellow. Calyx with 2 upper lobes lanceolate, and 3 lower subulate. Pod $\frac{3}{2}$ in., deciduous, flat, valves bulging over the seeds.—Distrib. From Gothland southd. to Greece and Tauria.


Heaths and moist moors, from Ross southd.; ascends to 2,200 ft. in the Highlands; fl. May–June.—Branches 1–2 ft., slender, spreading, curved; spines $\frac{1}{2}$–1 in., slender, recurved, simple, rarely branched. Leaflets $\frac{1}{10}$–$\frac{3}{10}$ in.; stipules obsolete. Flowers $\frac{1}{3}$ in., yellow, shortly pedicelled. Calyx persistent; teeth short, triangular. Pod $\frac{3}{4}$ in., deciduous, inflated, acuminate at both ends.—Distrib. W. Europe, from Denmark to France, Germany, and Italy.
2. **U'LEX**, *L.* Furze, Whin, Gorse.


1. **U. europæus**, *L.*; bracts large ovate lax, calyx hairs spreading, teeth minute, wings longer than the keel.

Heaths, &c., N. to Shetland; rarer in the North; ascends to 2,100 ft. in Wales; Channel Islands; fl. Feb.–March, and Aug.–Sept.—Bush 2–5 ft., rounded; spines 1–2 in., straight. *Leaves* small; leaflets hairy; spines sometimes furnished with minute 1-foliolate leaves. *Flowers* \(\frac{3}{4}\) in., borne on the spines, bright yellow, odorous. *Calyx* yellow, hairs black. *Pod* \(\frac{3}{4}\) in., black, covered with brown hairs, dotted.—*Distrib.* Denmark to Italy, Canaries and Azores.

*U. europæus* proper; branches spreading, spines furrowed rigid.—*Var.* *U. strict'us*, Mackay; branches erect compact, spines soft 4-gonous. Lord Londonderry's park, Down. *Irish Furze.*

2. **U. na'num**, Forster; bracts minute, calyx with appressed pubesence, teeth lanceolate, wings longer or shorter than the keel.

Heaths and commons, from Ayr and Northumbd. southd.; Ireland; fl. July–Nov.—Much smaller than *U. europæus*. *Stems* 1–3 ft. *Spines* \(\frac{1}{2}-1\frac{1}{2}\) in. *Flowers* \(\frac{1}{2}\) in., more racemose. *Pods* persist till next season.—*Distrib.* Belgium and France.

*U. na'num* proper; branches procumbent drooping, primary spines weak short.—Chiefly in S. England; not in Ireland; Channel Islands. (S.E. France).

Sub-sp. *U. Gal'lii*, Planch.; branches ascending, primary spines rigid.—Heaths and downs in the West, common; ascends to 2,000 ft. in Ireland. (S.W. France).

3. **CYT'ISUS**, *L.* Broom.


Heaths, commons, &c., from Caithness southd.; ascends to 2,000 ft. in the Highlands; Ireland; Channel Islands; fl. May–June.—Shrubby, 2–6 ft., hairy; branches green, angular, furrowed. *Leaves* shortly petiolate; leaflets
1-3, $\frac{1}{4}$ in. Flowers 1 in., bright yellow, rarely white, pedicels short. *Style* spiral. *Pod* 1-2 in., black; valves twisted after dehiscence.—A prostrate variety is found at Kynance Cove.—**Distrib.** From Gothland S., excl. Greece and Turkey, N. Asia, Canaries, Azores.—Twigs diuretic, and used for tanning. Seeds a substitute for coffee.

### 4. *ONO'NIS, L.* Rest-harrow.

Herbs or small shrubs, with often viscid hairs. *Leaves* pinnately-foliolate, nerves ending in teeth; stipules adnate to the petiole. Flowers pink, white or yellow, not honeyed; bracts minute or 0, upper leaves bracteiform; peduncles sometimes spinescent. *Standard* broad; wings oblong; keel incurved, pointed, not adnate to the staminal tube, returning to position after deflection. *Filaments* all connate, 5 or all dilated above; anthers uniform, or the alternate smaller. *Style* incurved, smooth, stigma terminal; ovules 2 or many. *Pod* turgid or terete, 1-celled, 2-valved.—**Distrib.** Europe, W. Asia, N. Africa; species 60.—**Etym.** The Greek name for the genus.

1. *O. spino'sa, L.*; suffruticose, hirsute, usually spiny, pod obliquely ovate or oblong 1-4-seeded.

Dry pastures, fields, and sandy shores, N. to Sutherland; Ireland; Channel Islands; fl. June-Aug.—A very variable undershrub, 1-2 ft., much branched, villous or thinly hairy and glandular, hairs on the branches in 2 lines or all round. *Leaves* often 1-foliolate, leaflets $\frac{1}{4}$-in. *Flowers* sessile or shortly pedicelled, solitary or in leafy racemes, $\frac{3}{4}$ in. long, or less, pink, proterandrous. *Standard* streaked with red. *Pod* $\frac{1}{2}$ in. long. *Seeds* granulate.—**Distrib.** Europe, W. Asia, N. Africa.—The two sub-species present no constant characters, and authors are greatly at variance with respect to the names they should bear. Wilkomm and Lange appear to have devoted most time and study to them. They adopt the Linnean names for the two principal forms (as does Boissier for the erect form), and they describe a third intermediate one for *O. arven'sis, L.*, to which they refer *O. spino'sa a, L.*. *O. iner'mis B*, Huds., and *O. procur'rens, Wallr.*, as synonyms. It differs from *repens* in the shorter standard and pods, and is fotid and viscidly hirsute.

*O. spinosa* proper; erect, spinous, not fotid, without stolons, hairs on branches usually bifarious, leaflets linear-oblong, pod usually equalling the calyx. *O. spinosa a, L.*, *O. campestris*, Koch and Ziz.—From Forfar and Dumbarton southd.; not in Ireland.

Sub-sp. *O. re'pens, L.*; viscidly villous, prostrate or ascending, stoloniferous, rarely spinous, leaflets ovate or obovate, flowers larger, pod usually shorter than the calyx. *O. iner'mis B*, Huds. *O. procum'bens B, marit'ima, Gren.* and Godr.—Dry pastures and sandy shores, common.—VAR. horrida, Lange, is a maritime spinous form.

2. *O. reclina'ta, L.*; annual, spreading, viscid and hairy, pod cylindric oblong reflexed.

Sea-cliffs, Devon, Wigton; Alderney; fl. June-July.—**Stem** 2-3 in. *Leaflets* $\frac{1}{4}$-in., acutely toothed; stipules large, $\frac{3}{4}$-ovate. *Pedicels* slender, jointed beneath the flower. *Flower* $\frac{3}{4}$ in., rosy. *Pod* $\frac{1}{2}$ in., glandular and hairy as long as the calyx or longer.—**Distrib.** W. France, Spain, Italy, Greece.
5. TRIGONEL'LA, L. FENUGREEK.

Herbs, often strongly scented. Leaves pinnately 3-foliolate; nerves terminating in teeth; stipules adnate to the petiole. Flowers solitary, capitate, or in dense racemes, white, yellow, or blue. Calyx tubular, teeth subequal. Petals very persistent; wings longer than the keel, the claws of both free from the staminal tube. Filaments not dilated, upper distinct or nearly so; anthers uniform. Style glabrous, stigma terminal; ovules many. Pod various in form, dehiscent in the British species, longer than the calyx.—Distrib. Europe, temp. Asia, N. and S. Africa, Australia; species 50.—Etym. The old Greek name.

T. ornithopodiol'des, DC.; glabrous, prostrate, very slender, leaflets obcordate, keel nearly as long as the wings. Trifolium, L. Falcatula, Brot. Aporan'thus Trifoliatrum, Bromfield.

Sandy heaths and gravelly places, local, from Fife and Renfrew southd.; E. Ireland, very rare; Channel Islands; fl. June–Aug.—Annual or biennial, branching from the base; branches 2–8 in., slender. Leaflets ⅔–⅓ in., toothed, strongly nerved; petiole ½–1 in.; stipules large, ovate, long-acuminate. Peduncles solitary, shorter than the petioles, axillary, 1–3-flowered. Flowers ½ in., very shortly pedicelled, white and pink. Pod ¼–⅓ in., linear-oblong, slightly curved, obtuse, partially dehiscent, 6–8-seeded.—Distrib. W. Europe from Denmark to Portugal and Italy.—An anomalous species, on account of the length of the keel; habit of Trifolium subterraneum.

6. MEDICA'GO, L. MEDICK.

Herbs. Leaves pinnately 3-foliolate, nerves ending in teeth; stipules adnate to the petiole. Flowers small, yellow or violet, honeyed; bracts small or 0. Calyx-teeth 5, nearly equal. Keel obtuse, shorter than the oblong wings, not adnate to the stamens, spreading and exposing the anthers. Filaments not dilated, upper distinct; anthers uniform. Style subulate, glabrous, stigma subcapitate; ovules few or many. Pod spirally curved or coiled, very rarely falcate, often spiny, rarely dehiscent, 1–more-seeded.—Distrib. Europe, W. Asia, N. Africa; species 40.—Etym. The Greek name.

* Perennial. Pod dehiscent, falcate, annular, or coiled into an open helix, smooth, many-seeded; marginal nerve 0.

1. M. falca'ta, L.; erect or decumbent, pod linear compressed falcate or annular downy.

Gravel banks and waste sandy places in the E. counties; fl. June–July.—Stems 6–24 in., diffuse. Leaflets ¼–⅓ in., narrowly linear, or obovate oblong, toothed, notched and mucronate at the tip; stipules large, subulate. Flowers ⅓ in., shortly pedicelled, in contracted racemes. Pod ⅓ in.—Distrib. Europe, N. Asia, India. M. sylvestr'is, Fries; with flowers yellow then dark green, and pod semicircular or annular, is probably a hybrid, Nyman.—E. counties.
LEGUMINOSÆ.


Hedges and fields, not indigenous; fl. May–July.—Stems 1-2 ft., fistular, branched. Leaflets narrowly obovate-oblong, toothed, tip notched and apiculate. Flowers ½-1½ in., in a short dense raceme, yellow blue or purple; peduncles longer than the leaves, pedicels very short. Pod ½ in. diam.—Distrib. E. Mediterranean region; naturalized elsewhere.

**Annual or biennial. Pod indehiscent, reniform, tip coiled, smooth, 1-seeded; marginal nerve 0.


Waste places and fields, N. to Shetlands; ascends in Derby to 1,200 ft.; Ireland; Channel Islands; fl. May–Aug.—Pubescent or glabrous. Stems 6-24 in., much branched. Leaflets ¼-½ in., obovate, toothed, apiculate; petiole very short; stipules ¼-cordate. Flowers ½ in., peduncles longer than the pediotes; pedicels very short. Pods ¼-½ in., black.—Distrib. Europe, N. Africa, temp. Asia, India; naturalized elsewhere.

***Annual. Pod indehiscent, coiled into a closed helix, many-seeded, bordered with spines or tubercles, marginal nerve strong. (Stems prostrate. Leaflets toothed. Peduncles few-flowered. Flowers yellow; calyx-teeth subulate, incurved.)

3. M. denticulata, Willd.; nearly glabrous, stipules laciniate, pod flat deeply reticulate with 2 or 3 coils and a double row of spines.

E. and S. counties from York and Norfolk to Cornwall, casual elsewhere; (a denizen? Watts?); Ireland; Channel Islands; fl. May–Aug.—Stem 6-24 in., furrowed. Leaflets ¼-1 in. Flowers ½ in., umbellate, yellow; pedicels very short. Pod ½ in. diam.—Distrib. Mid. and S. Europe, N. Africa, N. Asia, India; introd. in N. America.

M. denticulata proper; spines subulate half the diameter of the pod.—Var. M. apiiculata, Willd.; spines of pod very short.—Var. M. lappa'cea, Lamk.; spines longer than the semi-diameter of the subglobose pod. Bedford.

4. M. maculata, Sibth.; nearly glabrous, stipules ¼-cordate toothed, pod subglobose faintly reticulate with 3-5 coils and a double row of long curved spines.

Pastures and hedgebanks, from Northumberland southd.; S. Ireland; Channel Islands; fl. May–Aug.—Stems 1-2 ft., numerous. Leaflets ¼-1 in., obovate obcordate or cuneate, with often a black central spot; stipules herbaceous; petiole hairy. Flowers ½ in., yellow. Pod ¾ in. broad; margin with 4 ridges. —Distrib. Europe, N. Africa, W. Asia; introd. in N. America.

5. M. minima, Desr.; downy, stipules ¼-cordate faintly toothed, pod subglobose faintly reticulate with 4 or 5 coils and a double-row of close-set hooked spines.

Sandy fields, rare; E. counties, Norfolk to Kent; Channel Islands; fl. May–July.—Stems 6-10 in., very many, rigid, prostrate. Leaflets ¼-¾ in., from narrowly to very broadly obovate. Flowers ½ in. Pod ¾ in. diam., margin keeled.—Distrib. From Denmark southd., N. Africa, W. Asia, Kashmir.
7. MELILOTUS, Tournefort. MELIOT.

Annual or biennial, fragrant herbs. Leaves pinnately 3-foliolate, nerves ending in teeth; stipules adnate to the petiole. Flowers in axillary racemes, small, drooping, yellow or white, honeyed; bracts minute or 0. Calyx-teeth 5, nearly equal. Petals very deciduous; standard oblong; keel shorter than the wings, obtuse, not adnate to the stamens, resilient after depression. Filaments not dilated upwards, the upper distinct, or only so above the middle; anthers uniform. Style filiform, stigma terminal; ovules few. Pod short, straight, thick, hardly dehiscent. Seeds 1 or few.

—Warm and temp. regions of the Old World; species 10.—Etym. mel and lotus, from the honeyed smell.


Fields, &c., from Perth southd.; Ireland very rare; (a denizen, Wats.); fl. June-Aug.—Annual or perennial. Stem 2–3 ft., much branched. Leaflets ½–1½ in., obovate- or linear-oblong, toothed; stipules subulate, very slender. Racemes 3–4 in. Flowers ¼ in., secund, deep yellow, pedicels short. Corolla more than twice as long as the calyx. Pod black when ripe, 1–2-seeded.—Distrib. Europe, E. and W. Asia, Tibet; introd. in N. America.


Waste places, not rare, from Elgin southd.; Ireland; (an alien or colonist? Wats.); fl. July–Aug.—Very similar to M. altissima, but more slender; flowers smaller, white, in long racemes; pod more ovoid and glabrous, also black when ripe.—Distrib. Europe, E. and W. Asia, India; introd. in N. America.

M. officinalis, Desr.; standard longer than the keel as long as the wings, pod ovoid obtuse mucronate transversely ribbed rugose glabrous. M. arvensis, Wallr.

Waste places, not indigenous, chiefly in the E. counties; Ireland; fl June–Aug.—Habit, &c., of the preceding. Flowers pale-yellow or white. Pod olive-brown when ripe.—Distrib. Europe, N. Africa, N. and W. Asia, India.

8. TRIFO'LIUM, L. TREFOIL, CLOVER.

Herbs, usually low. Leaves digitately, rarely pinnately 3-foliolate; stipules adnate to the petiole. Flowers capitate or spiked, rarely solitary, red, purple, or white, rarely yellow, honeyed; bracts small or 0, sometimes forming a toothed involucre. Calyx-teeth 5, subequal. Petals persistent; wing longer than the keel, the claws of both adnate to the staminal tube; keel petals resilient after depression, but exposing the stamens. Upper stamens distinct; filaments all or 5 with dilated tips; anthers uniform. Style filiform, stigma oblique or dorsal; ovules few. Pod small, indehiscent, or with the top falling off, rarely 2-valved, 1–4-seeded, nearly enclosed
in the calyx.—Distrib. N. temp. regions, rare in S.; species 150.—Etym. in allusion to the 3 leaflets.

Section 1. Heads axillary. Fertile flowers few. Calyx enclosing the 1-seeded pod, which at length splits; its throat naked. Petals caducous. Pods burrowing in the earth when ripening, then covered by the reflexed deformed calyces of the other flowers.

1. T. subterra'neum, L.; very hairy, stipules broadly ovate acute, calyx-teeth setaceous as long as the tube, deformed calyces slender with 5 rigid palmate lobes.


Section 2. Heads many-fl., rarely axillary, globose or oblong; pedicels ebracteate. Calyx not inflated; throat with a ring of hairs or callous constriction (obscure in T. Bocco'ni); teeth ciliate, equal or the lower longest. Petals usually persistent. Pod sessile, 1-seeded.

* Heads cylindric or oblong during or after flowering.

2. T. arven'se, L.; softly hairy, leaflets narrow obovate-oblong longer than the petiole, stipules with very long setaceous points, heads terminal peduncled cylindric soft, calyx-teeth persistent longer than the corolla plumose. Hare's-foot Trefoil.

Dry pastures and fields, from Isla and Ross southd.; local in Ireland; Channel Islands; fl. July–Sept.—Annual. Stems many, ascending or suberect. Leaflets ½–3 in. Heads ½–1 in., dense. Flowers minute, white or pale pink.—Distrib. Europe, N. Africa, N. and W. Asia; introd. in America.

3. T. Bocco'ni, Sav.; pubescent, leaflets obovate, stipules ovate with setaceous points, heads axillary and terminal cylindric sessile, calyx glabrous teeth straight erect spinescent rather shorter than the petals.


T. Incarna'tum, L.; pubescent or villous, leaflets broadly obovate or obcordate, stipules obtuse, heads peduncled terminal ovoid or cylindric, calyx hairy teeth shorter than the corolla spreading in fruit. Crimson Clover.

T. incarnatum proper; stem villous with spreading hairs, flowers scarlet. Naturalized only.—Var. T. Molinerii, Balbis; hairs of stem appressed, heads shorter, calyx-teeth glabrous at the tips, flowers pale white or rose.—Lizard Point and Kynance Cove, amongst short grass. Probably the original form, of which incarnatum is the cultivated state.

** Heads ovoid or globose.**

4. T. ochroleucum, L.; softly pubescent, leaflets obovate or oblong, heads terminal globose at length ovoid, peduncles short subtended by opposite leaves, calyx-teeth spinescent spreading and recurved in fruit, lowest much longest.

Dry pastures, local; E. counties, Norfolk and Bedford to Essex; Channel Islands; fl. June—Aug.—Perennial. Stems ascending, 6-18 in. Leaflets ½—1 in., tip entire or notched; stipules lanceolate, adnate to the middle. Heads ⅓—1 in. broad. Flowers pale yellow, brown when old. Calyx ribbed, half as long as the corolla. Pod striate, opening by the conical top falling away.—Distr. From Belgium southd., W. Asia.

5. T. pratense, L.; more or less pubescent, leaflets oblong, stipules membranous free portion appressed to the petiole, heads terminal sessile globose at length ovoid subtended by opposite leaves with much-dilated stipules, calyx-teeth slender setaceous erect or spreading in fruit, the lowest longest. Red or Purple Clover.

Pastures, roadsides, &c., N. to Shetland; ascends to 1,900 ft. in the Highlands; Ireland; Channel Islands; fl. May—Sept.—Annual or perennial. Stems 6-24 in., solid or fistular, robust or slender. Leaflets ½—2 in., often with a white spot or lunate band, finely toothed; stipules often 1—1½ in., with long setaceous points. Heads ½—1½ in. diam., pink purple or dirty white. Flowers proterandrous. Calyx strongly nerv'd, throat with a 2-lipped contraction; teeth not exceeding the corolla, very slender, unequal. Pod opening by the top falling off.—Distr. Europe (Arctic), N. Africa, N. and W. Asia, India; introd. in N. America.—Cultivated for fodder; also wild in a small form with a shorter corolla (var. parviflora, Balb.).

6. T. med'ium, Huds.; slightly hairy, leaflets oblong obtuse or acute, stipules herbaceous free portion spreading, heads terminal subglobose shortly peduncled subtended by opposite leaves, calyx-teeth setaceous spreading in fruit, lowest a little longest. Meadow Clover.

Pastures, meadows, &c., from Ross southd.; ascending to 1,300 ft. in the Highlands; Ireland; fl. June—Sept.—Perennial. Stems straggling, flexuous. Leaflets 1—2 in., rather rigid almost quite entire, ciliate. Heads 1—1½ in. diam. Flowers ⅓ in., rose-purple, proterandrous. Calyx-throat with a ring of hairs, tube 10-nerved, glabrous; teeth reaching half-way up the corolla. Pod dehiscing longitudinally.—Distr. Europe (Arctic), N. and W. Asia; introd. in N. America.

7. T. marit'imum, Huds.; pubescent, leaflets narrowly obovate-oblong obtuse or acute, stipules herbaceous free portion linear-subulate spreading, heads terminal ovoid very shortly peduncled subtended by opposite leaves, calyx-teeth short triangular-subulate spreading and herbaceous in fruit, 4 upper shorter than the tube.

8. **T. striatum**, *L.*; softly hairy, leaflets obovate, stipules membranous free portion broadly triangular tip recurved, heads terminal and axillary ovoid sessile, calyx ventricose, teeth short spinescent triangular-subulate 1-nerved spreading in fruit.


Section 3. *Heads* many-fld., usually axillary, rarely both axillary and terminal; pedicels distinct, short or long, bracteate. Calyx not inflated; throat naked; teeth equal or the upper longest. *Pod* 2–4-seeded (or 1-seeded through imperfection).


11. **T. suffoca'tum**, *L.*; glabrous, petioles very long, leaflets obcordate, stipules ovate acuminate, heads sessile ovoid, calyx campanulate, teeth not spinescent recurved in fruit exceeding the corolla.

Sandy and gravelly pastures, especially near the sea, rare; Anglesea and Norfolk to Cornwall and Kent; Channel Islands; fl. June–July.—Annual. *Stems* 2–6 in., prostrate, spreading, slender. *Leaflets* ½–¾ in., toothed, nerves
faint petiole 1-3 in. Heads $\frac{1}{4}$ in. diam., often confluent, axillary and terminal. Flowers minute, whitish. Standard persistent, scariosus. Calyx membranous; teeth herbaceous, lanceolate, as long as the tube.—DISTRIB. Mid. Europe and Mediterranean region.

12. T. strictum, L.; glabrous, petioles very short, leaflets linear-lanceolate, stipules broadly ovate acute toothed, heads peduncled globose, calyx-tube campanulate, teeth subulate spinescent sub-equal spreading in fruit.

Lizard Rocks, very rare; Jersey; fl. June–July.—Annual. Stems 2-6 in., few, ascending. Leaflets $\frac{1}{2}$-1 in., toothed; nerves slender. Heads $\frac{4}{5}$-1 in. broad, terminal and axillary; peduncle $\frac{1}{2}$-1 in., strict. Flowers $\frac{1}{5}$ in., rose-purple. Corolla longer than the calyx. Pod obliquely orbicular, compressed, beaked, dorsal suture much thickened, 1-2-seeded.—DISTRIB. W. France and Spain to Greece, N. Africa.

T. hybridum, L.; almost glabrous, leaflets obovate or oblong, stipules oblong tips triangular, heads axillary peduncled globose, pedicels elongate at length reflexed, flowers drooping, calyx-tube campanulate gibbous, teeth subulate nearly equal unaltered in fruit. Alsike Clover.

Fields, &c., introduced with clover (the var. elegans only); fl. June–Aug.—Perennial. Stems 2-10 in., flexuous. Petioles long; leaflets $\frac{1}{2}$-1$\frac{1}{2}$ in., toothed. Stipules herbaceous, nerves green. Heads $\frac{3}{4}$-1 in. diam., depressed (from the dropping flowers); peduncles 2-4 in. Flowers $\frac{1}{3}$ in., white or rosy. Calyx white, teeth green. Standard twice as long as the calyx, striate, folded over the 2-seeded pod.—DISTRIB. Europe, N. Africa, W. Asia. T. hybridum proper; stem stout fistular, stipules few-nerved.—VAR. T. elegans, Savi; stem weak decumbent solid, leaves more sharply toothed, stipules with several nerves, heads small.

13. T. repens, L.; glabrous, leaflets obovate or obcordate, stipules lanceolate acuminate, heads all axillary very long-peduncled globose, pedicels at length reflexed, calyx-tube campanulate gibbous, teeth triangular unaltered in fruit. White or Dutch Clover.

Meadows and pastures, N. to Shetlands; ascends to 2,700 ft. in the Highlands; Ireland; Channel Islands; fl. May–October.—Perennial. Stems 1-18 in., creeping. Leaflets $\frac{1}{2}$-1 in., toothed, with often a white semilunar band towards the base; nerves slender; petiole 2-4 in. Heads $\frac{3}{4}$-1$\frac{1}{2}$ in. diam.; peduncle 3-6 in. Flowers nearly $\frac{1}{3}$ in., white or rosy. Standard persistent, brown, covering the pod, much longer than the calyx. Pod elongate, 4-6-seeded.—A Scilly Is. variety (Townsendii) has dark rose-purple flowers.—DISTRIB. Europe (Arctic), N. Africa, N. and W. Asia, India, N. America.

SECTION 4. Heads many-fl., axillary; pedicels short, bracteate. Calyx 2-lipped, becoming inflated above, membranous, reticulated; throat naked; teeth equal, the upper pair lengthening. Corolla withering, standard deciduous. Pod sessile, 1-2-seeded.

14. T. fragiferum, L.; glabrous, leaflets obovate or obcordate, stipules oblong-triangular with a long point, heads dense-flowered long-peduncled
globose, outer bracts lanceolate as long as the calyx, calyx-tube downy above striate vesicular, 2 upper teeth enlarged and deflexed in fruit.

Meadows and ditches, from Fife southd.; local in Scotland and Ireland; Channel Islands; fl. July–Aug.—Perennial. **Heads** 1/3-2 in. diam. **Flowers** 1⁄4 in., creeping. **Pod** ovoid, compressed, reticulate, 1-2-seeded.—**Distrib.** Europe, N. Africa, W. Asia, N.W. India.

—Habit when flowering of *T. repens*, but the large bracts and fruit are widely different.

**Section 5. Heads** many-fld., axillary, globose, long-peduncled; pedicels short or 0, bracteate. **Flowers** at length pendulous. **Calyx** not inflated; throat naked; teeth equal or upper shorter. **Corolla** yellow; standard persistent, enlarged and bent down over the fruit. **Pod** stalked, 1- rarely 2-seeded.—**Leaves** pinnately or palmately 3- rarely 5-foliolate.

15. **T. procumbens**, L.; stems pubescent, leaves more or less pinnately 3-foliolate, leaflets obovate or obcordate, heads many and dense-fld., standard broad slightly convex arching but not folded over the pods. *T. agra'rium*, Huds. *Hop Trefoil*.

Pastures, roadsides, &c., from Ross southd.; ascends to 1,200 ft. in Derby; Ireland; Channel Islands; fl. June–Aug.—Annual. **Stems** 6-18 in., central erect, lateral decumbent. **Leaflets** 1/4-3 in., toothed; petiole 1/4-3 in., slender; stipules 1/2-ovate, tip triangular, acute. **Heads** 1/3-2 in. diam. **Flowers** pale yellow, upper pedicelled. **Calyx** campanulate, upper teeth triangular, very short; lower longer, lanceolate. **Standard** 1⁄4 in., brown, shining. **Pod** obovoid; style hooked.—**Distrib.** Europe, N. Africa, N. and W. Asia; introd. in N. America.—This is the *T. procumbens* of Linn. Herb. (Syme).


Pastures, roadsides, &c., from Caithness southd.; ascends to 1,350 ft. in Derby; Ireland; Channel Islands; fl. June–Aug.—Annual. **Stems** 10-20 in., straggling, slender. **Leaflets** truncate or notched, finely toothed; petiole very short, slender; upper part of stipules ovate, acuminate. **Heads** 4-20-fld., much smaller than in *T. procumbens*; peduncle long, very slender. **Flowers** yellow, small, turning dark brown. **Calyx** and **pod** much as in *T. procumbens*.—**Distrib.** Europe, N. Africa; introd. in N. America.—This is the *T. filiforme* of various authors.

17. **T. fili'form'e**, L.; sparsely hairy, leaflets obcordate or obovate, heads axillary, peduncles slender, flowers few subracemose, pedicels as long as the calyx-tube spreading or reflexed, standard keeled folded over the pod.

Dry pastures often near the sea, rare, from Roxburgh southd.; doubtfully N. of it; Ireland; Channel Islands; fl. June–July.—Annual. **Stems** 4-8 in., very slender, prostrate. **Leaves** pinnately or digitately 3-foliolate; upper part of stipules ovate, acute. **Leaflets** 1/4-1 in., toothed at the tip. **Heads** very small, 2-6-fld.; peduncle capillary. **Flowers** yellow. **Calyx** and **pod** much as in the two last species.—**Distrib.** Europe to the Caucasus.
9. ANTHYLLIS, L. Kidney-Vetch.

Herbs or shrubs. Leaves pinnate, with a terminal leaflet; stipules small or 0. Flowers in capitate cymes, sometimes involucrate, yellow white or red-purple; bracts various or 0. Calyx inflated, mouth oblique 5-toothed. Petals with long claws, those of the 4 lower adnate to the staminal tube; standard auricled at the base; keel incurved, gibbous on each side, resilient after deflection with the anthers retracted. Filaments all united, or the upper distinct; anthers uniform. Style smooth, stigma terminal; ovules 2 or more. Pod enclosed in the calyx, obliquely ovoid, dehiscent or not, 1–3-seeded.—DISTRIB. Europe, Asia, N. Africa; species 20.—ETYM. The old Greek name.

A. Vulneraria, L.; silky, stems herbaceous, leaflets 2–6 pairs.

Dry rocky banks, N. to Shetlands, rather local; ascends to 2,400 ft. in the Highlands; Ireland; Channel Islands; fl. June–Aug.—Rootstock woody, short, branched. Stems 6–16 in., many, leafy, herbaceous, suberect. Radical leaves 2–4 in., pinnate, unequal; leaflets ½–1½ in., narrow-oblong. Heads ½–1⅓ in. diam., in pairs, rarely solitary, or with small accessory ones, the pairs peduncled, but each sessile; involucre of sub sessile linear appressed or spreading leaflets. Flowers ½–⅔ in., usually yellow, but variable in colour, proterandrous. Calyx membranous, longer than the petals; teeth minute, ovate, acute, mouth contracted. Pod very small, acute, glabrous, reticulated, partially dehiscent, 1-seeded.—DISTRIB. Europe (Arctic), N. Africa, W. Asia.
A. Vulneraria proper; involucral leaves short, flowers yellow.—VAR. A. Dillé'nii, Schult.; involucral leaves nearly as long as the cream coloured flowers with red tips. Sussex to Cornwall and Wales.

10. LO'TUS, L. Bird’s-foot Trefoil.

Herbs or under-shrubs. Leaves pinnately or palmately 4–5-foliolate; stipules minute or 0. Flowers in capitate or umbellate axillary peduncled cymes, yellow red or white, proterandrous; bracts 3-foliolate. Calyx 2-lipped, or with 5-subequal teeth. Petals free from the staminal tube; keel incurved or flexed, beaked, gibbous on each side, resilient after deflection. Alternate filaments dilated upwards, upper distinct; anthers uniform. Ovary sessile; style flexed, glabrous, stigma terminal or lateral; ovules many. Pod elongate, cylindric, 2-valved, sepaee between the seeds.—DISTRIB. Europe, N. and S. Africa, temp. Asia, America, Australia; species 50.—ETYM. unknown.


Pastures and waste places, N. to Shetlands; ascends to 2,800 ft. in the Highlands; Ireland; Channel Islands; fl. June–Sept.—Variable in habit and stature. Rootstock short, woody, branched, not or scarcely stoloniferous. Stems 4–16 in., tufted at the base. Leaves very shortly petioled; leaflets ½ in.; stipules ovate or lanceolate. Heads ½–1½ in. diam., depressed.
Flowers $\frac{1}{2}-\frac{3}{4}$ in., very shortly pedicelled. Petals twice as long as the calyx, bright yellow, often streaked with crimson, often greenish or purple-brown when dry. Pod $\frac{3}{4}-1\frac{1}{4}$ in.—Distrib. Europe (Arctic), N. Africa, N. and W. Asia, India.

L. CORNICAL'TUS proper; almost glabrous, stem short, leaflets membranous obovate obtuse or subacute.—Var. L. crassifol'ius, Pers.; almost glabrous, leaflets fleshy. Chiefly maritime.—Var. villosa; covered with spreading hairs. Kent, Devon, Sandgate.

Sub-sp. L. ten'vis, Waldst. and Kit.; stem filiform, leaflets generally linear-lanceolate acuminate, stipules narrower, flowers fewer and smaller. L. tenuifol'ius, Reichb., L. decum'bens, Forst.—Damp soils, not common, from Forfar southd.; very rare in Ireland.

2. L. uligino'sus, Schk.; perennial, erect or ascending, heads 5-12-fld., peduncles very long, calyx-teeth spreading in bud, 2 upper triangular or subulate diverging with an acute sinus. L. ma'jor, Sm., not of Scop.

Moist meadows, &c., from Isla and Banff southd.; ascends to 1,200 ft. in Yorkshire; Ireland; Channel Islands; fl. July-Aug.—Glabrous or hairy. Rootstock elongate, stoloniferous, branched at intervals. Stems 6-24 in. Leaflets $\frac{1}{2}$-1 in., obliquely obovate. Flowers proterandrous, and pods much as in L. cornicula'tus.—Distrib. Europe, W. Asia, N. Africa.—The L. ma'jor of Scopoli, with lanceolate leaflets and bracts, and which grows in dry places, is probably a var. of L. cornicula'tus.

3. L. his'pidus, Desf.; annual, procumbent, laxly villous, peduncles longer than the leaves 3-4-fld., pods $\frac{1}{2}-\frac{3}{4}$ by $\frac{1}{10}$ in. more than twice as long as the calyx subtorulose.

Dry banks by the sea, from Hants to Cornwall, rare; Channel Islands; fl. July-Aug.—Stems slender, 6-36 in. Leaflets $\frac{1}{2}-\frac{3}{4}$ in., elliptic or obovate acute; stipules $\frac{1}{2}$-cordate. Flowers $\frac{1}{2}$ in. Calyx-teeth subulate, straight in bud. Standard obovate. Seeds subreniform.—Distrib. S.W. France, Spain, Portugal, Italy.

4. L. augustinis'simus, L.; annual, procumbent, laxly villous, peduncles shorter than the leaves 1-2-fld., pods $\frac{2}{3}-1$ by $\frac{1}{12}$ in. four times as long as the calyx, torulose. L. deflex'us, Sol.; L. diffusus, Sm.

Dry banks by the sea, from Kent to Cornwall, very rare; Channel Islands; fl. July-Aug.—Stems very slender, 6-12 in. Leaflets $\frac{3}{4}-1$ in., elliptic, obovate or obovate acute or obtuse; stipules ovate-lanceolate. Flowers $\frac{1}{2}$ in. Calyx-teeth subulate, straight in bud. Standard elliptic. Seeds globose.—Distrib. of hispidus, and E. to Hungary and W. Asia.

11. ASTRAG'ALUS, L. MILK-VETCH.

Herbs or shrubs. Leaves pinnate with a terminal leaflet, rarely 3-folio-late; leaflets entire; stipules distinct or connate, free or adnate to the petiole. Flowers in axillary racemes or spikes; bracts small. Calyx tubular; teeth 5, subequal. Petals usually narrow with long claws; keel obtuse. Upper filament distinct; anthers uniform. Ovary sessile or
stalked; style filiform, beardless, stigma terminal; ovules many. Pod 2-valved, often longitudinally 2-celled by the inflexion of the suture next to the keel.—DISTRIB. Temp. and cold regions; most abundant in Asia; absent from S. Africa and Australia; species 500.—ETYM. doubtful.

1. A. glycyphyll'ios, L.; glabrous, stipules free, flowers racemed, peduncles much shorter than the leaves, pods suberect exserted elongate many-seeded.

Fields and copses, from Ross southd.; fl. June–Sept.—Rootstock short, stout. Stems 2–3 ft., prostrate, stout, zigzag. Leaves 4–6 in.; leaflets $\frac{3}{4}$–1$\frac{1}{4}$ in., broadly oblong, obtuse, glabrous above, slightly hairy beneath; stipules 1 in., ovate-lanceolate, acute, lower auricled. Racemes 1–2 in., compact, ovoid; bracts subulate, longer than the short pedicels. Flowers $\frac{1}{2}$ in., creamy white. Calyx campanulate, half as long as the corolla. Pod 1–1$\frac{1}{2}$ in., linear, terete, curved, acuminate, 2-celled, pale. Seeds many, pale, compressed.—DISTRIB. Europe, N. Asia.

2. A. hypoglot'tis, L.; hairy, stipules connate, flowers spiked, peduncles usually much longer than the leaves, pods very short ovoid suberect included 2-seeded. A. danicaus, Retz.

Gravelly and chalky soil, from Sutherland to Essex and Wilts; Isle of Aran, Ireland; fl. June–July.—Clothed with soft white hairs mixed with black above. Rootstock very slender, straggling, branching. Stems 2–6 in., slender, ascending. Leaves 2–4 in., leaflets $\frac{1}{2}$–$\frac{3}{4}$ in., many, oblong or linear-oblong, obtuse. Spikes 1 in., ovoid; peduncle stout. Flowers $\frac{1}{2}$–$\frac{1}{4}$ in., blue-purple. Calyx with black hairs, longer than the bracts. Pod shortly stipitate.—DISTRIB. Arctic and Alpine Europe, N. Asia, N. America.

3. A. alpi'num, L.; decumbent, hairy, stipules free, flowers shortly racemose or subcapitate, peduncles rather shorter than the leaves, pods oblong pendulous exserted few-seeded. Phaca astragali'na, DC.

Aberdeen and Forfar, very rare; alt. 2,400–2,600 ft.; fl. July.—Perennial, more slender than A. hypoglot'tis; leaves very similar; peduncles shorter; flowers horizontal or drooping, pale blue tipped with purple; calyx shorter. Pod $\frac{1}{2}$ in., 1-celled, stalk longer than the calyx, hence wholly exserted, covered with black hairs.—DISTRIB. Arctic and Alpine Europe, N. Asia, W. Tibet, N. America.

12. OXY'TROPIS, DC.

Herbs or shrubs. Leaves pinnate with a terminal leaflet; leaflets quite entire; stipules free or adnate to the petiole. Flowers in axillary spikes or racemes, purple white or pale yellow; bracts membranous. Calyx tubular, teeth subequal. Petals with long claws; keel erect, with a straight or recurved tooth at the tip. Upper filament free; anthers uniform. Ovary sessile or stalked; style beardless, stigma minute; ovules many. Pod longitudinally more or less 2-celled by the inflexion of the suture next the standard.—DISTRIB. Europe, temp. and cold Asia, and N. America; species 100.—ETYM. δένσις and τρόφις, from the sharp kcel.
Habit, &c., of Astragalus; distinguished by the mucronate keel, and septum of the pod never produced from the dorsal suture.


Dry and rocky pastures, from Wigton and Fife to Caithness; ascends to 2,000 ft.; fl. June–July.—Rootstock stout, woody; branches very short. **Leaves** 2–4 in.; leaflets ¼–½ in., many, membranous, close-set; stipules lanceolate. **Heads** 6–10-fld.; peduncle stout, erect; bracts leafy, shorter than the calyx. **Flowers** ¾ in., pale; keel tipped with dark purple. **Calyx-tube** oblong, hairy and slightly glandular, cylindric; teeth short, subulate. **Pod** about 1 in., sessile, erect, ovoid, tumid, bursting the calyx, hairy, many-seeded, beak curved.—**Distrib.** Arctic and sub-Alpine Europe, N. Asia, N. America.

—I cannot distinguish the Uralian plant from the Scotch, and that found all round the N. temp. and Arctic zones, except by its rather larger size. Boissier has but the one name for the Russian and Alpine plants.

2. **O. campesi'stris**, DC.; softly hairy, leaflets linear-oblong or oblong-lanceolate, flowering peduncles shorter than the leaves, flowers pale yellow. Alpine rocks, Clova Mts.; alt. 2,000 ft.; fl. June–July.—Habit of *O. uralensis*, but larger; leaves 4–6 in.; leaflets usually longer, sometimes 1 in., narrower, more obtuse; peduncles lengthening after flowering to 8 in. **Flowers** ¾ in., yellow tinged with purple. **Pod** ½–¾ in., sessile, ovoid-lanceolate, hairy, half 2-celled, beak curved.—**Distrib.** Arctic and Alpine Europe, Siberia, N. America.

13. **ORNITH'OPUS, L. BIRD'S-FOOT.**

Slender, hairy herbs. **Leaves** pinnate with a terminal leaflet; leaflets small; stipules membranous. **Flowers** minute, in long peduncled heads or umbels, pink white or yellow. **Calyx-lobes** equal or 2 upper connate. **Keel** obtuse, sometimes very short. **Alternate filaments** dilated upwards, the upper free; anthers uniform. **Style** inflexed, stigma capitate; ovules many. **Pod** curved, slender, indehiscent, breaking up into many short 1-seeded joints.—**Distrib.** Europe, N. Africa, W. Asia.—**Etym.** ὤνος and πους, from the fruits resembling *birds' claws*.

1. **O. perpusil'lus, L.;** bracts pinnate, flowers white, pod much constricted between the seeds.

Sandy and gravelly places from Moray and Dumbarton southd.; E. Ireland, very rare; Channel Islands; fl. May–July.—Annual, grey-green, hairy above. **Stems** 6–18 in., many, prostrate, filiform, leafy, sparingly branched. **Leaves** 1–2 in., upper sessile; leaflets ¼–½ in., 6–14 pair, close-set, oblong or linear-oblong, the lowest pair recurved when at the base of the petiole; stipules minute. **Peduncles** axillary, slender, strict, longer or shorter than the leaves. **Heads** 3–6-fld. **Flowers** ½ in., veined with red; pedicels very short. **Calyx-tube** subcampanulate; teeth short. **Pod** ½–1 in., 7–9-jointed, beaked, glabrous or pubescent, reticulated.—**Distrib.** Europe, N. Africa.

2. **O. ebractea'tus, Broth.**; bracts 0, flowers yellow, pod slightly constricted between the seeds. *Arthrolo'bium ebracteatum*, DC.

**14. HIPPOCRE'PIS, L. HORSESHOE VETCH.**

Diffuse, glabrous herbs. Leaves pinnate with a terminal leaflet; leaflets many, quite entire; stipules small or absent. Calyx with 2 upper teeth connate. Petals long-clawed; keel incurved, beaked, resilient after deflection. Style inflexed, subulate, stigma minute; ovules many. Alternate filaments slightly dilated, upper free; anthers uniform. Pod flat, curved, upper margin deeply notched opposite each seed, breaking up into 3-6 horseshoe-like joints. Seeds curved.—Distrib. Europe, N. Africa, W. Asia; species 12.—Etym. πτερός and κρητίς, from the shape of the joints of the pod.

**H. comos'as, L.;** leaflets 4-8 pair oblong-ovate.


**15. ONOBRYCHIS, Tournefort. SAIN-POIN.**

Herbs or shrubs. Leaves pinnate with a terminal leaflet; leaflets quite entire; stipules scarios. Flowers purple red or white, in axillary spikes or racemes, honeyed. Calyx-lobes subulate. Wings short; keel obliquely truncate, as long as or longer than the standard, resilient after deflection. Upper filament distinct at the base; anthers uniform. Style inflexed, stigma minute. Pod compressed, indehiscent, not jointed, often spiny winged or crested, 1-2-seeded.—Distrib. Europe, temp. Asia and Africa; species 50.—Etym. obscure.

**O. sativa, Lamk.;** pod tubercled on the lower margin.

16. VIC'IA, L. VETCH, TARE.

Climbing or diffuse herbs. Stems terete, angled, or ridged. Leaves abruptly pinnate; petiole usually ending in a simple or branched tendril; leaflets many, entire or toothed at the tip; stipules $\frac{1}{2}$-sagittate. Flowers blue purple or yellow, axillary, racemured, honeyed. Calyx-teeth equal or the lower longer. Wings adnate to the keel, which is resilient after deflection. Staminal tube abruptly truncate; filaments filiform, upper more or less free; anthers uniform. Style inflexed, cylindric or flattened, glabrous or downy all round, or bearded below the terminal stigma; ovules usually many. Pod compressed, 2-valved. Seeds globose, with a small aril.—Distrib. Temp. N. hemisphere, and S. America; species 100.—Etym. The old Latin name.


1. V. tetrasper'ma, Mænch; leaflets 3–6 pair, pedicules 1–2-fld., pod shortly stipitate glabrous 3–8-seeded.

Hedges, cornfields, &c., from Lanark and Forfar southd. ; hardly indigenous in Scotland; Ireland, very rare; Channel Islands; fl. May–Aug.—Almost glabrous. Stems 1–2 ft., filiform. Leaflets variable, $\frac{1}{2}$–1 in., usually truncate, narrow; tendrils once or twice forked; lower stipules 2-fld, upper entire toothed on the base at one side. Pedicules $\frac{3}{4}$–1 in., produced beyond the flowers; pedicels slender, curved. Flowers $\frac{1}{2}$ in., pale blue. Calyx-tube short, upper teeth shortest. Pod $\frac{3}{4}$–$\frac{5}{4}$ in., linear oblong.—Distrib. Europe, N. Africa, W. Asia; introd. in N. America.

V. tetrasper'ma proper; leaflets 4–6 obtuse mucronate, peduncles as long as the leaves 1–2-flowered, pod 3–4-seeded.

Sub-sp. V. grac'cilis, Loisel.; leaflets 3–4 pair acuminate, peduncles longer than the leaves 1–4-flowered, pod longer 5–8-seeded.—From Warwick and Cambridge to Kent and Devon; (a native or colonist, Wats.).

2. V. hirsu'ta, Koch; leaflets 6–8 pair obtuse mucronate, peduncles 1–6-fld. pod sessile hairy 2-seeded. Common Tare.

Hedges and waste places, from Caithness southd.; Ireland; Channel Islands; fl. May–Aug.—Habit of V. tetrasper'ma, but hairy; leaflets smaller, more numerous; stipules often 4-lobed; pedicels straighter; flowers smaller, and pods much shorter, sessile, hairy and 2-seeded.—Distrib. Europe (Arctic), N. Africa, N. and W. Asia, N.W. India; introd. in N. America.


3. V. Grac'ca, L.; tendrils branched, stipules nearly entire, flowers bright blue.

Hedges, fields, and waste places, N. to Shetlands; ascends to 2,400 ft. in the Highlands; Ireland; Channel Islands; fl. June–Aug.—Pubescent or slightly silky. Rootstock creeping. Stems 2–6 ft., angled, scandent or diffuse. Leaves 1–4 in., sessile; leaflets $\frac{3}{4}$–1 in., linear-oblong, acute or
mucronate. **Racemes** dense, 10-30-flowered, unilateral; peduncle longer than the leaves, pedicels short. **Flowers** $\frac{1}{2}$ in., drooping, proterandrous. **Calyx-tube** short. **Pod** $\frac{3}{4}$-1 in., obliquely truncate, beaked, many-seeded.—**DISTRIB.** Europe (Arctic), N. Africa, N. and W. Asia, India, Greenland, N. America.

4. **V. Or'obus, DC.**; tendrils 0, stipules slightly toothed, flowers white tinged with purple. **Or'obus sylvaticus, L.** *Bitter Vetch.*

Western wooded and rocky districts, from Skye and Forfar to Hants and Cornwall; Ireland, very rare; fl. June–Sept.—Sparingly pubescent. **Stem** 1-2 ft., erect, stout, leafless or with reduced leaves below. **Leaves** 2-3 in., sessile; leaflets $\frac{8}{10}$-1 in., linear-oblong or oblong-lanceolate, acute, or obtuse and mucronate; petiole produced beyond the leaflets. **Racemes** loose, 6-20-flowered, unilateral; peduncle as long as or longer than the leaves; pedicels much shorter than the calyx-tube. **Flowers** $\frac{1}{2}$ in. **Pods** oblong-lanceolate, 1 in., acute at both ends, glabrous, 3-5-seeded.—**DISTRIB.** Norway, Denmark, S. France, Bavaria.


Rocky woods, local, from Caithness southd.; ascends to near 1,700 ft. in the Highlands; Ireland; fl. June–July.—Glabrous. **Rootstock** creeping. **Stems** 2-4 ft., usually trailing. **Leaves** 2-4 in., sessile; leaflets $\frac{8}{10}$-1 in., oblong, obtuse, mucronate, membranous; stipules with spreading teeth. **Racemes** laxly 6-18-flowered, unilateral; peduncle as long as or longer than the leaves; pedicels nearly as long as the calyx-tube. **Flowers** $\frac{1}{2}$ in. **Pods** oblong-lanceolate, acuminate at both ends, slightly curved, 3-4-seeded.—**DISTRIB.** Europe (Arctic), N. Asia.

**SECTION 3.** **Vic'ia** proper. Annual, rarely perennial. **Leaflets** many. **Flowers** few, sessile, or on very short pedicels. **Style** villous below the stigma on the outer side.

* Leaflets many. **Calyx** gibbous at the base.

6. **V. se'pium, L.**; perennial, flowers racemose, calyx-teeth unequal shorter than the tube, pod stalked linear glabrous.

Hedges, copses, &c., N. to Orkney; ascends to 2,000 ft. in Yorkshire; Ireland; Channel Islands; fl. May–July.—Slightly hairy. **Rootstock** creeping, stoloniferous. **Stem** 2-3 ft., climbing or trailing. **Leaves** 2-5 in.; leaflets in 6-8 pairs, smaller upwards, lowest $\frac{8}{10}$-1 in., ovate, acute obtuse or truncate, mucronate, membranous; stipules $\frac{1}{2}$-sagittate. **Racemes** $\frac{1}{2}$-1 in., 2-6 fld., subsessile; pedicels shorter than the calyx-tube. **Flowers** $\frac{1}{2}$-$\frac{3}{4}$ in., dull pale purple. **Pod** linear, 1 in., beaked, black, 6-10-seeded. **Seed** with a linear hilum.—**DISTRIB.** Europe (Arctic), N. and W. Asia, Kashmir.

7. **V. lu'tea, L.**; annual, flowers solitary sessile, upper calyx-teeth shorter lower than the tube, pod shortly stalked hairy.

Rocky and pebbly places, rare and local, from Ayr and Forfar southd.; Channel Islands; fl. June–Aug.—Sparingly hairy. **Rootstock** short. **Stems** 6-18 in., tufted, prostrate. **Leaves** 1-2 in.; leaflets $\frac{1}{2}$-$\frac{1}{2}$ in., 5-7 pairs, linear-oblong, obtuse, mucronate; stipules small, ovate, acute, lower $\frac{1}{2}$-hastate. **Flowers**
rarely in pairs, suberect, pedicels shorter than the calyx-tube. Flowers 3-1 in., narrow, pale yellow. Pod 1-1⁵/₄ in., hairy, narrow, oblong, acuminate at both ends, beaked 4-8-seeded. Seeds with a short hilum.—Distrib. From Holland southd., N. Africa, W. Asia.

V. HYBRIDNA, L., formerly found on Glastonbury Tor, which differs in the larger truncate and retuse leaflets and hairy standard, has long been extinct. It is a native of W. France, Spain, and the Mediterranean.—V. LÉVIGATA, Sm., is another extinct closely allied plant, formerly found on the Weymouth Beach, and differs in being glabrous and having pale blue or whitish flowers. A solitary specimen in Smith’s Herbarium is all that is known of it.

V. SATI'VA, L.; annual, leaflets obovate or oblong truncate or retuse, flowers 1-2 axillary subsessile, calyx-teeth nearly equal as long as the tube, pod 2-3 in. sessile. Common Vetch.

Hedges and roadsides, a casual; ascends to upwards of 1,600 ft. in Derby; Ireland; Channel Islands; fL. April–June.—Annual, sparsely hairy. Stems many, trailing or climbing, stout or slender. Leaflets variable, in 5-6 pairs, 3-3/₄ in., 1-1½ in. broad. Stipules 1/₂-hastate, toothed or entire, often with a dark blotch. Flowers 3/₄ in., pale purple. Pods linear, 4-10-seeded, slightly hairy. Seeds subglobose, ½ in. diam., variable in colour, smooth; hilum linear.—Distrib. Mediterranean region; cultivated in Europe, Asia, and America.

8. V. ANGUSTIFOLIA, Roth; annual, leaflets of upper leaves linear or oblong acute or obtuse, calyx-teeth nearly equal as long as the tube, pods 1-2 in.

Dry places, from Aberdeen and the Clyde southd.; Ireland; Channel Islands; fl. May–July.—An excessively variable plant, of which V. SATI’VA is probably the cultivated form, differing in the much smaller flowers, pods, and seeds; stem robust or slender, 6-18 in. long; leaflets 4-1½ in.; seeds only ½ in. diam.—Distrib. Europe, N. Africa, N. and W. Asia.—The following varieties run into one another and into V. SATI’VA.

V. ANGUSTIFOLIA PROPER (V. ANGUSTIFOLIA, Forst., V. SEGETALIS, Thuill.); stout, upper leaves with oblong leaflets, flowers usually 2-nate, pods 1½-2 in. bursting the calyx.—Var. V. BOBARTII, Forst. (V. ANGUSTIFOLIA, Sm.); slender, upper leaves with linear leaflets, flowers subsolitary, pod 1-1½ in., not bursting the calyx.

** Leaflets few. Calyx not gibbous at the base.

9. V. LATHYROIDES, L.; annual, flowers solitary sessile, calyx-teeth equal nearly as long as the tube, pod sessile glabrous.

Dry pastures and roadsides, local from Ross southd.; Ireland, very rare; Channel Islands; fl. May–June.—Hairy. Stem 6-8 in., spreading, slender. Leaves 1-1½ in.; leaflets 4-5 in., 2-3 pair, linear-oblong or obovate, acute obtuse or notched; tendrils simple or 0. Flowers 4-5 in., lilac. Calyx funnel-shaped; teeth subulate. Pods ½-1 in., linear, tapering at both ends, beaked, 8-12 seeded. Seeds obtusely angled, granulate; hilum very short.—Distrib. Europe, N. Africa, W. Asia.

10. V. BITHYNICA, L.; perennial, peduncles 1- rarely 2-3-fld., pedicels as long as the calyx, calyx-teeth unequal subulate, pod shortly stalked reticulate hairy.
Bushy places, local, from Flint and York to Kent and Devon; fl. May–June.

Stems 1–2 ft., many from the root, glabrous, except at the tips, trailing or climbing, flexuous. Leaves 1½–2 in., exclusive of the tendril; leaflets variable, 3/3-2½ in., 1/4-1 in. broad, obtuse and mucronate or acute or acuminate; stipules large; tendrils elongate, branched. Peduncles 1½-3 in., and pedicels hairy. Flowers ½ in., pale purple, wings paler. Calyx hairy, teeth longer than the tube, very slender. Pod the largest of the British species, 1½ in. by ½ in. broad, abruptly beaked, 4–6-seeded. Seeds large, globose, speckled, ½ in. diam., dark-brown.—Distrib. W. and S. Europe, Asia Minor, N. Africa.

Syme distinguishes 2 vars.; latifolia, with leaflets ovate or oblong, stipules all toothed; and angustifolia, with leaflets linear acuminate, and upper stipules sparingly toothed.

**17. LATH'YRUS, L. EVERLASTING PEA.**

Herbs with the habit of Vicia, but fewer leaflets, petals broader, staminal tube obliquely truncate, and the style flattened and longitudinally bearded on its inner face.—Distrib. of Vicia; species 100.—Etym. An old Greek name.

Section 1. Aph'aca. Annual. Stipules leaf-like. Leaves reduced to tendrils. Calyx-tube equal at the base, shorter than the teeth.

1. L. Aph'aca, L.; stipules ovate-hastate acute or obtuse, peduncles elongate 1-flld., flowers erect.

Cornfields, &c., from Warwick and Norfolk to Kent and Devon southd.; (a colonist, Wats.); fl. June–July.—Glabrous. Stems 1–3 ft. trailing. Leaflets chiefly seen on seedlings, then oblong, when developed on older plants linear ½-3 in.; stipules ½-1 in. broad, quite entire, striated with nerves. Peduncles slender, stout and 2–3 in. in fruit; pedicels ¼ in., with a minute bract at the base. Flowers ½ in., pale yellow. Calyx-lobes green, linear, nearly as long as the corolla. Pod 1–1½ in., ¼ in. broad, ascending, slightly falcate, beaked, reticulate, 6–8-seeded.—Distrib. From Denmark southd., N. Africa, W. Asia, India.


Section 3. Lath'yrus proper. Petioles all with leaflets and tendrils. Calyx gibbous at the base.


4. *L. pratensis*, L.; stem acutely angled, leaflets lanceolate, stipules very large lanceolate sagittate, peduncles 3-12-fl., calyx-teeth subulate as long as the tube, pod glabrous or hairy, seeds smooth.

Hedges, copses, and meadows, N. to Shetland; ascends to near 1,600 ft. in the Highlands; Ireland; Channel Islands; fl. June–Sept.—Glabrous or slightly hairy. *Rootstock* creeping. *Stems* 1½-2 ft.; trailing or climbing. *Leaflets* ½-1 in., nerves indistinct; stipules with spreading subulate auricles; petiole ½-3 in.; tendrils short. *Peduncles* longer than the leaves; pedicels as long as the calyx-tube, hairy; bracts setaceous. *Flowers* ½-3 in., racemose, bright yellow. *Pod* 1½-2 in., sessile, linear, acuminate, many-seeded.—*Distr.* Europe (Arctic), N. and W. Asia to the Himalaya; introd. in N. America.

*L. tuberosus*, L.; stem angled, leaflets obovate, stipules large ½-sagittate, peduncles 2-5-fl., calyx-teeth triangular as long as the tube, pod glabrous.


5. *L. sylvestris*, L.; stem winged, leaflets large ensiform, stipules falcate ½-sagittate, peduncles 3-10-fl., calyx-teeth triangular, upper shorter than the tube, pod glabrous, seeds faintly remotely tubercled.

Rocky thickets, local, often an escape, from Mull and Forfar southd.; fl. June–Aug.—Glaucous, glabrous. *Rootstock* creeping. *Stem* 3-6 ft., wings herbaceous. *Leaflets* 4-6 in., ½ in. broad; nerves parallel; stipules large, falcate, with long lanceolate auricles; petiole winged or not; tendrils slender, branched. *Peduncles* 4-6 in.; pedicels longer than the calyx; bracts filiform. *Flowers* ½ in.; racemose, standard rosy; wings purplish. *Calyx-tube* broad, short. *Pod* 2-3 in., sessile, narrowly winged above, 10-14-seeded.—*Distr.* Europe (Arctic), Caucasus, N. Africa.—Very near the Everlasting Pea, which occurs here and there as an escape.
**Leaflets 2 or more pairs. Flowering peduncles longer or shorter than the leaves.**

6. *L. palus'tris*, *L.*; stem winged, leaflets 2–3 pair sword-shaped, stipules lanceolate ½-sagittate, peduncles usually longer than the leaves 2–6-fld., pod compressed glabrous.


7. *L. marit'imus*, Bigelow; stem angled, leaflets 3–5 pair oblong, stipules ovate ½-hastate, peduncles usually shorter than the leaves 5–10-fld., pod turgid glabrous. *Pisum marit'imum*, *L.*


*L. marit'imus* proper; leaflets broadly oblong obtuse.—*Var.* acutifo'lia, Bab.; slender, straggling, leaves elliptic-lanceolate acute. Shetlands and Orkneys.


*L. macrorrhiz'us* proper; leaflets elliptic-oblong acute or obtuse. *Or'obus* tubero'sus, *L.*—*Var.* O. tenuifo'l'us, Roth; leaflets sword-shaped or narrow-linear.


Subalpine Scotch valleys; Den of Airly, Killiecrankie, Moy House; ascends to 1,200 ft.; (native? Wats.); fl. June–Aug.—Glaucous, black when dry.
LATHYRUS.

LEGUMINOSÆ.

Rootstock short. Stems 1–2 ft., erect, branched, stout or slender. Leaflets ½–1½ in., nerves diverging; petiole 1–2 in.; stipules ¼–½ in. Peduncles shorter or longer than the leaves, 2–8-fld.; pedicels about as long as the calyx; bracts filiform or 0. Flowers ½ in., livid-purple fading to blue. Calyx-teeth very short, triangular. Pods 2 in., narrow, turgid, rugose, acuminate at both ends, 6–8-seeded, subseptate. Seeds compressed, obtusely angled.

—Distrib. Europe, Caucasus.

Order XXVI. ROSA'CEÆ.

Herbs, shrubs, or trees. Leaves alternate, rarely opposite, simple or compound, stipulate. Inflorescence various. Flowers regular. Calyx superior or inferior; lobes 5, the 5th next the axis, imbricate in bud. Petals 5, rarely 0, perigynous, often orbicular and concave, claws very short or 0, deciduous, imbricate in bud. Stamens many, rarely 1 or few, inserted with the petals or on the disk, 1–many-seriate, incurved in bud; anthers small, usually didymous. Disk lining the calyx-tube. Carpels 1 or more, distinct or connate, free or adnate to the calyx-tube; styles as many, distinct or connate, terminal ventral or basal, stigma simple rarely feathery or decurrent; ovules 1, or 2 collateral in each carpel, rarely more, anatropous. Fruit various, a pome, or of one or many drupes achenes or follicles, rarely a berry or capsule. Seeds ascending or pendulous, albumen scanty or 0; cotyledons plano-convex, radicle short.—Distrib. Ubiquitous; genera 71; species 1,000.—Affinities with Leguminosæ and Saxifragæ.—Properties astringent in Potentillæ and Roseæ. Prunææ and Pomeæ yield hydrocyanic and malic acids.

Series I. Ripe carpels not enclosed within the calyx-tube.

Tribe I. PRU'NEÆ. Calyx deciduous. Carpel 1; ovules 2, pendulous. Fruit a drupe..........................1. Prunus.

Tribe II. SPIRÆ'Æ. Calyx persistent, ebracteolate. Carpels 5 or more; ovules 2 or more in each carpel, pendulous. Fruit a follicle...2. Spirææ.

Tribe III. RU'BÆÆ. Calyx persistent, ebracteolate. Carpels many; ovules 2 in each carpel, pendulous. Fruit of many small drupes ......3. Rubus.

Tribe IV. POTENTIL'LEÆ. Calyx persistent, bracteolate. Carpels 4 or more; ovule 1 in each carpel, ascending. Fruit of 4 or more achenes.

* Style elongating after flowering.


** Style not elongating after flowering.

Series 2. Ripe carpels enclosed within the calyx-tube.

Tribe V. Poterieae. Petals 4, 5, or 0. Carpels 1–3; ovules 1 in each carpel, erect or pendulous. Fruit of 1–3 achenes enclosed in the small dry calyx-tube.


Tribe VII. Pomeae. Petals 5. Carpels 1–5; ovules 2 collateral in each carpel, erect or ascending. Fruit fleshy, 1-2- or 5-celled.

Fruit a drupe with 1–5 included stones ................................13. Crataegus.

1. Prunus, L. Plum and Cherry.

Shrubs or trees. Leaves alternate, simple, glandular-serrulate; petiole 2-glandular. Flowers white or red, solitary corymbose or racemced, honeyed. Calyx inferior, deciduous in fruit; lobes 5, imbricate. Petals 5. Stamens 15–20, perigynous, filaments free. Carpels 1; style terminal; ovules 2, collateral, pendulous. Drupe with an indehiscent or 2-valved, 1-seeded, smooth, or rugged stone. Seed pendulous, testa membranous, albumen scanty or 0.—Distr. N. temp. regions, rare in the tropics; species 80. —Etym. The old Latin name.

Section 1. Prunus proper. Leaves convolute in bud. Flowers solitary or fascicled, appearing with the leaves or before them. Drupe glaucous.

1. P. communis, Huds.; leaves ovate or oblong-lanceolate pubescent beneath when young, petals obovate-oblong, flesh of drupe adhering to the stone.

Copses, hedges, &c., ascending to 1,300 ft. in Yorkshire; Ireland; Channel Islands; fl. March–April.—A small, rigid, much-branched shrub, 3–8 ft.; branches usually spinescent; wood very hard and tough. Leaves petioléd, ¾–2 in., variable in breadth, acuteness, and length of petiole. Flowers white, shortly pedicelled, proterogynous. Petals variable in breadth. Drupe globose. —Distr. The Sloe is confined to Europe, the Bullace extends to N. Africa and the Himalaya.

P. communis proper; bark black, branches divaricate all spinescent, leaves finely serrulate at length glabrous beneath, flowers ½–¾ in. diam. preceding the leaves, pedicels solitary or in pairs glabrous, petals obovate, drupe ½ in. diam. black erect very austere. P. spinosa, L.—From Sutherland southd. Sloe, Blackthorn.

Sub-sp. P. insititia, L.; bark brown, branches straight a few spinescent, leaves larger broader more obtusely serrate pubescent beneath, peduncles downy, petals broader, drupe ¾–1 in. diam. globose drooping black or yellow.—From Lanark southd., but doubtfully indigenous in many habitats Bullace.

**SECTION 2. Cer’asus.** Leaves conduplicate in bud. Flowers solitary or fascicled, appearing with the leaves or after them.

2. *P. Cer’asus,* L.; leaves spreading oblong-ovate or elliptic crenate-serrate glabrous, petiole short, corolla cup-shaped, petals firm suberect obovate, fruit acid. *Wild Cherry; Dwarf Cherry.*

Copses, &c., from York southd., wild or well established; rare in Ireland; Channel Islands; fl. May.—A bush or small tree with copious suckers; bark red; branches slender, pendulous. Leaves dark blue-green. Flowers homogamous; buds with scarious outer scales and leafy inner ones. Calyx-tube not constricted, lobes crenate. Petals notched. Fruit red, juice not staining.—Origin of the Morello, Duke, and Kentish cherries.—Distr. Europe to W. Himalaya, Azores, Canaries.

3. *P. Avi’um,* L.; leaves drooping oblong-ovate acutely serrate pubescent beneath, petiole long, corolla open, petals flaccid almost obcordate, fruit sweet or bitter. *Gean.*

Copses and woods from Caithness southd., probably wild only in the S.; Ireland; fl. May.—A tree without suckers, branches short, stout, rigid ascending. Leaves large, pendulous, pale green. Flowers homogamous; buds with none of the scales leafy. Calyx-tube constricted at the top, lobes quite entire. Fruit with staining juice.—Origin of the Geans, Hearts, and Bigaroon cherries.—Distr. Europe to W. Himalaya.

**SECTION 3. Laurocer’asus.** Leaves conduplicate in bud. Flowers in axillary or terminal racemes, appearing after the leaves.


**2. SPIRÆ’A,* L.

Perennial herbs or shrubs. Leaves alternate, simple or compound; stipules free or adnate to the petiole, rarely 0. Flowers in axillary or terminal cymes, white or red. Calyx inferior, persistent; lobes 4–5, imbricate or valvate in bud. Petals 4–5. Stamens 20–60, filaments free or connate below. Disk fleshy, often hairy. Carpels 5 or more, free or connate below; styles subterminal; ovules 2 or more, pendulous. Follicles
5 or more, few-seeded.—Distrib. Temp. and cold regions of the N. hemisphere; species 50.—Etym. doubtful.

1. S. Ulmaria, L. ; herbaceous, leafy, leaves interruptedly pinnate serrate white and downy beneath, terminal segments large acutely lobed, cymes corymbose very compound, carpels glabrous twisted 2-ovuled. Meadow-sweet, Queen of the Meadows.


2. S. Filipendula, L. ; herbaceous, leaves interruptedly pinnate glabrous, leaflets sessile deeply cut serrate, cymes panicked, carpels pubescent straight 2-ovuled. Dropwort.

Dry pastures, from Caithness southd.; ascends to 1,200 ft. in Yorkshire; W. Ireland; fl. June-July—Rootstock short; root-fibres interruptedly tuberous. Stem 2-3 ft., erect, grooved, with few small leaves. Leaves 4-10 in. chiefly radical; leaflets ½-⅓ in., very many, almost pinnatifid, sessile by a broad base, alternate very small, terminal 3-lobed; stipules of cauline leaves toothed. Cymes loose; peduncles slender. Flowers ⅓-⅓ in. diam., white or rosy outside, homogamous, not honeyed. Calyx-lobes obtuse. Carpels 6-12, erect.—Distrib. Europe, N. Africa, N. Asia.

S. Salicifolia, L. ; shrubby, leaves oblong-lanceolate serrate glabrous, stipules 0, cymes terminal racemose, carpels glabrous many-ovuled.


3. Rubus, L. Bramble, Raspberry, &c.

Creeping herbs or sarmentose shrubs, almost always prickly. Leaves alternate, simple or compound; stipules adnate to the petiole. Flowers in terminal and axillary corymbose panicles, rarely solitary, white or red. Calyx inferior, tube broad; lobes 5, persistent. Petals 5. Stamens many. Disk coating the calyx-tube. Carpels many, distinct, on a convex receptacle; style subterminal; ovules 2, collateral, pendulous. Drupes many, 1-seeded, crowded upon a dry or spongy conical receptacle. Seed pendulous.—Distrib. Abundant in the N. hemisphere, few in the Southern; species 100.—Etym. The old Latin name.

* Stem herbaceous or nearly so.

1. R. Chamæmo'rus, L. ; stem erect unarmed 1-flowered, leaves few subcorbicular-cardate obtusely 5-7-lobed, flowers dicocious. Cloudberry.


** Stem shrubby, with many suckers. *Leaves* pinnately 3–5-foliolate.

3. *R. Idæus*, L.; prickles of the stem straight slender, of the flowering shoots curved, leaflets ovate or elliptic acuminate white and hoary beneath, flowers drooping, petals short, drupes deciduous. *Raspberry.*


*** Stem shrubby, without suckers. *Leaves* 3–7-foliolate, rarely pinnate.

4. *R. fruticosus*, L.; stem prickly, flowers in paniced or racemed corymbs or fascicles. *Blackberry, Bramble.*

Copses, hedges, &c.; ascends to near 1,000 ft. in Yorkshire; Ireland; Channel Islands; fl. July–Sept.—*Stem* glabrous or with prickles bristles and gland-tipped hairs in various proportions, best marked on the flowerless shoots, which are suberect, or arched and rooting from a callus at the tip, thus giving rise to new individuals. *Leaves* usually pinnately 3–5-foliolate, subpersistent, glabrous or pubescent; leaflets petioled, overlapping or not, obovate or rhomboid-ovate, coarsely irregularly serrate or toothed, convex, dark green above, paler, often glaucous beneath. *Flowers* white or pink, homogamous, in terminal racemes, the lateral branches corymbose or elongate. *Drupes* black or red-purple.—*Distrib.* Europe (Arctic), N. Africa, N. and W. Asia, Himalaya.
For the following arrangement of the British forms of *R. fruticosus* I am indebted to Mr. J. G. Baker.

a Stems with scattered uniform prickles, quite glabrous, i.e. without bristles or gland-tipped hairs.


Sub-sp. *R. rhamnifolius*, W. and N.; barren stem arched angular tips rooting not glaucous, leaflets often large cordate and reflexed more finely toothed than in the two following, sometimes white and tomentose beneath, sepals not distinctly white edged, fruit large black juicy.—From Mid. Scotland, southd.; Ireland.—*R. cordifolius*, W. and N., has leaflets larger, rounder, more coarsely toothed, terminal more cordate.—*R. incurvatus*, Bab., differs in the broad basal prickles, leaflets more sharply toothed with incurved waved margins, more hairy beneath, and more densely hairy white calyx.—*R. imbricatus*, Hort, is intermediate between *corylifolius* and *cordifolius*; *R. Grabowskii*, Weihe, and *R. Colemanii*, Bloxam, are intermediate between this sub-sp. and *Kekleri*. *R. macrophyllus* var. *glabra*, Bab., belongs here. *R. ramosus*, Blox., has fewer prickles, broadly ovate convex shining leaflets that do not overlap, a larger laxer panicle and pink petals.

Sub-sp. *R. Lindleaenus*, Lees; barren stems arching glabrous, leaflets not imbricate terminal obovate or oblong cuspidate, panicle very open compound with patent hairy corystose branches and many deflexed unequal prickles. *R. nitidus*, Bell Salter, not W. and N.—Common in Britain, unknown on the Continent.

Sub-sp. *R. corylifolius*, Sm.; barren stem between arched and prostrate not glaucous tip rooting, leaflets 5 membranous hazel-like imbricate, sepals densely tomentose all over the back, drupes few large. *R. subulistris*, Lees, *R. purpureus*, Bab.—From the Clyde southd.—The type has terete stems and many small slender prickles.—*R. Balchioridus*, Blox., and *althelifolius*, Bab., not Host, have sepals appressed to the fruit; the former approaches *caesius* by its corystose inflorescence. *R. latifolius*, Bab., is a rare form intermediate between this sub-sp. and the last. *R. Wahlerii*, Arrh. (*conjungens*, Bab.), is a form with more angular barren stems and larger prickles.

Sub-sp. *R. caesius*, L.; stem prostrate glaucous, prickles more unequal setaceous, leaflets usually 3 green on both surfaces, sepals appressed, densely tomentose all over the back, drupes few large glaucous.—Hedges and thickets from Perth southd.; ascends to near 1,000 ft. in Yorkshire; Ireland. —Deuxberry.—Often a well-marked form from its glaucous character. *R. tenuis*, Bell Salter, *ulumifolius*, *intermedius*, and *hispidus* are indistinguishable forms; *R. pseudo-ideus*, Lej., is probably a hybrid with *R. Ideus*. 
β Stems with scattered uniform prickles, pubescent or hairy, but with few or no gland-tipped hairs or bristles, barren ones arching and rooting at the tip.

Sub-sp. R. dis'color, W. and N.; stem with appressed stellate hairs, prickles strong, leaflets small most persistent of any, bright green above, densely tomentose and white beneath, flowers pink, sepals always reflexed, drupes small with little flesh. *R. abruptus*, Lindl.—The most common form except in Scotland (chiefly S. and Mid. Europe.)—*R. thyrso'deus*, Wimm., has stem stronger and more arching, flowers white, leaflets larger less white beneath, pubescence of stem and leaves looser.—*Var. pubiger'a*, Bab., connects this with *leucosta'chys*.

Sub-sp. R. leucosta'chys, Sm.; stem angular between arching and prostrate with copious spreading hairs and sometimes a few glandular hairs rachis of panicle densely villous, leaflets finely toothed densely pubescent often white beneath, terminal one roundish with a point, panicle thyrsoid compound, sepals reflexed, petals often deep red. *R. vesti'tus*, Weihe; *R. Leightoni'a'rus*, Bab.—Common from Berwick southd.; Ireland.

Sub-sp. R. villicau'lis, Weihe; stem angular with copious spreading hairs but no glandular ones, rachis of panicle densely villous, leaflets finely toothed densely pubescent often white beneath, terminal roundish with a point, panicle thyrsoid compound, sepals reflexed, petals pale. *R. carpins'i-fol'ius*, Bab. not Blox.; *R. pampins'o'sus*, Lees. *R. vulg'dris*, W. and N., connects villicau'lis with *Radula* by *R. adsci'tus*, Genev., and *R. dera'sus*, Müll.—Common, N. to Sutherland; Ireland.

Sub-sp. R. Salt'er'i, Bab.; stem angular arching with no glandular hairs, spreading hairs few and deciduous, leaflets coarsely and irregularly toothed shortly grey-pubescent or finally subglabrous beneath, terminal roundish pointed often cordate, panicle thyrsoid compound, rachis finely pubescent with copious strong red prickles, sepals reflexed, petals pale. *R. calva'tus*, Blox.—From York southd.; Ireland.—Connects this group with *rhamnifo'lius*.

Sub-sp. R. umbro'sus, Arrh.; stem angular, hairs few and deciduous none glandular, leaflets sometimes 7 finely toothed finely grey-pubescent beneath, terminal roundish or obovate pointed, panicle thyrsoid compound, rachis finely pubescent, sepals reflexed, petals pale. *R. macrophy'lus*, var. *umbro'sa*, Bab.; *R. carpins'i-fol'ius*, of many English writers, not Weihe.—*R. hirtifo'lius*, Müll., is an allied form unknown to me.—Common, from the Clyde southd.

Sub-sp. R. macrophy'lus, Weihe; stem angular with a few spreading hairs and no glandular ones, leaflets coarsely and irregularly toothed finely grey-pubescent beneath, terminal obovate or obovate-oblong pointed, panicle thyrsoid compound, rachis finely pubescent, sepals reflexed, petals pale. *R. Schlechtendahl'i'i*, Weihe; *R. amplifica'tus*, Lees.—From Aberdeen southd.; Ireland.

Sub-sp. R. mucronula'tus, Boreau; stems between arching and prostrate with a few spreading and often a few glandular hairs, leaflets shortly grey-pubescent beneath, terminal roundish abruptly pointed, panicle sparse often subsimple, rachis densely villous, its prickles few and weak, sepals reflexed, petals pale. *R. mucrona'tus*, Blox. not Seringe.—Local, from the Clyde southd.; Ireland.

Sub-sp. R. sprengel'i'i, Weihe; stem weak wide-trailing terete with a few spreading and often a few glandular hairs, leaflets coarsely toothed finely and shortly grey-pubescent or finally subglabrous beneath, often only three
on the fully developed leaves, terminal obovate pointed, panicle broad sparse often subsimple, rachis finely pubescent with few prickles, sepals ascending often leaf-pointed, petals pink. *R. Borré'ri*, Bell Salter; *R. rubicolor*, Blox.—A well-marked but local form from York to Hants.

γ Stems with copious bristles and glandular hairs, prickles unequal, often very numerous.

† Leaves of the barren shoot 5-foliolate.

Sub-sp. R. * dumeto'rum*, Weihe; stem between arching and trailing sub-cylindrical sometimes pruinose, bristles few or many, hairs 0 or few on the barren shoots, generally fewer on the rachis of the panicle than in all the following, leaflets broad finely grey-pubescent or subglabrous beneath, lateral pairs much imbricated, toothing open but not long, terminal suborbicular, sepals reflexed or ascending not leaf-pointed, petals broad, drupes few large. *R. nemor'osus* of many, scarcely of Hayne.—The glandular representative of *corylifo'lius* in fruit, leaves, and prolonged flowering. *R. tubercula'tus*, Bab., is a variety with subequal prickles, appressed sepals, few bristles and glandular hairs. *R. diversifo'lius*, Lindl., has more copious and irregular prickles and sepals mostly reflexed. *R. emersisty'lus*, Müll. (R. *Briggs'ii*, Blox.), is near *diversifo'lius*, but stems more hairy, leaflets round, and calyx appressed to the fruit. *R. concin'nus*, Baker, has subequal prickles, smaller and less coarsely toothed leaflets and reflexed sepals.—Common in hedges, England and Ireland; very variable.

Sub-sp. R. * Rad'ula*, Weihe; stem arching angular, prickles strong subequal, bristles hairs and glands of barren stem copious, leaflets not imbricated grey or often white-pubescent beneath, toothing moderately fine in the typical form, terminal leaflet obovate, sepals reflexed not leaf-pointed, petals broad.—*R. ra'dis*, Weihe, is a variety with stronger prickles and leaflets deeply and very irregularly toothed. *R. Leight'o'mi*, Lees, *denticulo' tus*, Bab., *muta'bilis*, Genev., and *obli'quus*, Wirtg., are closely allied.—Common in hedges, from Fife southd.; Ireland.

Sub-sp. R. * Bloxa'mi*, Lees; stem arching angular, prickles smaller than in the preceding, subequal, hairs bristles and glands moderately numerous, leaflets not imbricated moderately coarsely toothed green finely-pubescent beneath, terminal suborbicular often cordate, sepals reflexed not leaf-pointed, petals broad.—*R. sca'ber*, Weihe (*Babin'to'ni*, Bell Salter), is an allied form with stronger prickles and the panicle often very large and lax with patent branches. *R. fusco'a'ter*, Weihe, is a rare form connecting this with *villicaud'is*.—Local, from Durham southd.

Sub-sp. R. * Kehr'eri*, Weihe; stem trailing nearly terete, prickles very numerous irregular strongly hooked, bristles numerous, glandular and simple hairs few, leaflets not imbricate pubescence thin grey, toothing moderately coarse, terminal orbicular, sepals reflexed not leaf-pointed, petals broad.—*R. cavati'foli us*, Müll., is a subglabrous form with few hairs and bristles, leaflets not tomentose hairy on the veins beneath terminal cordate, panicle abrupt with short thick terminal peduncles. *R. infest'us*, Weihe, is a variety with an arching stem, prickles and bristles much less dense.—From the Clyde southd.; Ireland.
Sub-sp. R. Hys'trix, Weihe; stem arching angular, prickles weak subequal, bristles glandular and simple hairs moderately numerous, leaflets not imbricate green thinly pubescent or finely glabrous beneath, terminal obovate, tooting fine, sepals ascending remarkably leaf-pointed, petals broad.—R. Laje'dni, Weihe, is a variety with a large lax panicle with patent branches. 

R. ros'ae'seus, Weihe, is a trailing variety with more irregular prickles and narrow petals.—Local, from Northumberland southd.; Ireland.

Sub-sp. R. pal'lidus, Weihe; stem angular wide-trailing, prickles small copious very unequal, bristles simple and glandular hairs copious, leaflets not imbricate finely toothed densely grey or sometimes white-pubescent beneath, terminal obovate, sepals reflexed not leaf-pointed, petals narrow.—R. humi'fusus, Weihe, and R. folio'ssus, Weihe, are varieties with the leaves prolonged into the panicle. R. hirtus, Weihe (fuscus, Lees), and Reuteri, Merc., are closely allied forms. R. pre'ruptorum, Boul. (R. pygmae'us, Bab., not Weihe, and var. Men'kii, Bab.), is a form between pal'lidus and Blox'amii.

—Common in woods, from Perth and the Clyde southd., local; Ireland.

†† Leaves of barren shoot 3-foliolate.

Sub-sp. R. glandulo'ssus, Bell.; stem subterete trailing, prickles small straight weak, bristles simple and glandular hairs copious, leaves green thinly pubescent beneath, panicle thyrsoid compound, bristles of rachis very fine and copious, sepals ascending leaf-pointed densely bristly on the back, petals narrow.—R. Bellar'di, Weihe (R. denta'us, Blox.), is a variety with less prickly rachis and sepals and membranous leaves green and nearly glabrous beneath. R. rotundifo'lius, Blox., has prickles stronger, leaves more hairy beneath, sepals less distinctly leaf-pointed. R. Purchasii, Blox., is an obscure plant of this affinity.—Local, from Aberdeen southd.; Ireland.

Sub-sp. R. saltu'um, Focke; stem trailing terete, prickles small very unequal, bristles glandular and simple hairs much fewer than in the last, leaves densely shortly pubescent often white beneath, panicle compound, rachis very wavy, sepals reflexed not leaf-pointed, petals narrow. R. Gunthe'vi, Weihe.—Local.

Sub-sp. R. pyramida'lis, Bab.; stem trailing clothed as in the last, leaves green thinly hairy beneath, panicle subracemose, rachis straight, sepals ascending leaf-pointed, petals narrow.—Wales, Worcester, and Devonshire.

4. DRY'AS, L.

Prostrate, tufted, scapigerous shrubs. Leaves simple, white beneath; stipules adnate to the petiole. Flowers solitary, large white, or yellow, andro-dioecious, proterandrous or subproterogynous. Calyx inferior, persistent; lobes 8–9, valvate in bud. Petals 8–9. Stamens many, crowded. Disk concave, hairy. Carpels many, sunk in the calyx-tube; style terminal; ovule 1, ascending. Achenes many; styles slender, feathery.—Distrib. Arctic and Alpine regions of N. temp. zone; species 2 or 3.—Etym. ὅψας, from the oak-like foliage.

D. octopet'ala, L.; leaves oblong-ovate coarsely crenate-serrate. D. depressa, Bab.
Stony, chiefly limestone and mountain districts, local, from Carnarvon and Stafford to Orkney, ascends to 2,700 ft.; descending to sea-level in N. and W. Ireland; fl. June–July. — Stem tortuous, much branched. Leaves \( \tfrac{1}{2} \)-1 in., crowded, obtuse, hoary beneath, shining above, margins reflexed, midrib hairy and scurfy; scape 1-3 in., glandular and hairy, longer in fruit. Flowers 1-1\( \frac{1}{2} \) in. diam., white. Sepals about 8, woolly and with black glandular hairs, obtuse or subacute. Petals oblong. Achenes hispid; awn 1-2 in.—Distrib. of the genus.


Erect perennial herbs. Radical leaves crowded, pinnate; terminal leaflet very large; stipules adnate to the petiole. Flowers solitary or corymbose, white yellow or red, honeyed. Calyx inferior, persistent, with 5 bracteoles above its base; lobes 5, imbricate or valvate in bud. Petals 5. Stamens crowded. Disk smooth or grooved. Carpels many, receptacle short or long; styles filiform, straight or bent; ovule 1, ascending. Achenes many, on a dry receptacle, ending in filiform straight or bent styles which are often hooked at the tip.—Distrib. N. and S. temp. and cold regions; species 30.—Etym. γέβω, from the aromatic roots.

1. *G. urba'num, L.*; flowers erect, head of achenes sessile, awn with a short glabrous hook at the tip, calyx-lobes reflexed in fruit.

Borders of copses, hedgebanks, &c., from Caithness southd., ascends to near 1,700 ft. in the Lake district; Ireland; Channel Islands; fl. June–Aug.—Softly hairy. Stem 1-3 ft. Radical leaves long-petioled, interruptedly pinnate; terminal leaflet 2-3 in. broad, suborbicular, obscurely lobed, crenate; lateral \( \tfrac{1}{2} \)-\( \frac{1}{2} \) in., oblong, sessile; cauline leaves variable; stipules foliaceous, lobed and toothed. Flowers \( \tfrac{1}{2} \)-\( \tfrac{3}{4} \) in. diam., yellow, proterogynous; peduncle slender. Petals obovate, spreading, as long as the acute calyx-lobes. Achenes hispid, spreading; awn \( \frac{1}{2} \) in.; receptacle hispid.—Distrib. Europe (Arctic), N. Africa, N. and W. Asia, Himalaya, N. America.

2. *G. riva'le, L.*; flowers drooping, head of achenes stalked, awn jointed and hairy beyond the middle, calyx-lobes appressed in fruit.

By streams, in copses, &c., from Devon and Sussex to Orkney; ascends to 2,800 ft. in the Highlands; Ireland; fl. May–July. — Stem 1-1\( \frac{1}{2} \) ft., lower part with soft reflexed hairs, very pubescent above. Leaves very variable, much as in *G. urba'num*, but the segments are often numerous, the lateral larger, and all more toothed; stipules small. Flowers 1-1\( \frac{1}{2} \) in. diam., proterogynous, sometimes submonoeious. Calyx-segments red-brown, acuminate, pubescent. Petals yellow, obcordate. Achenes more or less hispid.—Distrib. Europe (Arctic), N. and W. Asia, N. and S. America, Australasia.

*G. intermé'dium, Ehrh.* is a hybrid; flowers sometimes erect, petals of *G. urba'num* but deeper coloured, calyx intermediate, not reflexed in fruit, fruit usually sessile.—Damp woods, not uncommon (often with *riva'le*, seldom with *urba'num*, Syme). Bell Salter produced this hybrid artificially, and it proved fertile.
6. FRAGARIA, L. Strawberry.

Perennial scapigerous herbs, with runners. Leaves 3-foliolate (in Britain), pinnate or 1-foliolate; stipules adnate to the petiole. Flowers white or yellow, honeyed, proterogynous, often polygamous. Calyx inferior, persistent, 5-bracteolate; lobes 5, valvate in bud. Petals 5. Stamens many, persistent. Carpels many, distinct, receptacle convex; styles ventral, persistent; ovule 1, ascending. Achenes many, minute, on the surface of the enlarged fleshy receptacle.—Distrib. N. temp. regions, Andes, Sandwich Islands, Bourbon; species 3 or 4.—Etym. The Latin name for the fragrant fruit.

F. ves'ca, L.; leaflets usually sessile, pedicels with silky appressed hairs, flowers hermaphrodite. Wild Strawberry. Shady places, N. to Shetland; ascends to near 2,000 ft. in the Highlands; Ireland; Channel Islands; fl. April-May.—Silky and hairy. Rootstock short or long, woody, with a terminal tuft of leaves. Radical leaves petiolate; leaflets 1–2 in., obliquely ovate or oblong, coarsely toothed or serrate, plaited, lateral sometimes cleft; stipules scarious. Scapes 1–6 in., axillary. Flowers ½–¾ in. diam., in irregular cymes, inclined, white; bract at the base of the cyme leafy, at the pedicel smaller stipuliform; bracteoles ovate, smaller than the acute calyx-lobes. Petals obovate. Receptacle of fruit obovoid or globose, red or white, covered to the base with achenes, calyx-lobes spreading.—Distrib. Europe (Arctic), N. and W. Asia, Himalaya, N. America.

F. ELA'TIOR, Ehrh.; much larger than F. vesca, leaflets often shortly stalked, pedicels with spreading hairs, flowers sub-1-sexual. A garden escape; fl. April–May.—The Haut-bois strawberry, whose origin is probably F. ves'ca; the base of receptacle is without achenes.

7. POTENTIL'LA, L. Cinquefoil.

Perennial herbs, rarely shrubs. Leaves compound; stipules adnate to the petiole. Flowers white or yellow, rarely red, solitary or in corymbose cymes, honeyed. Calyx inferior, persistent, 5–7- rarely 4-bracteolate; lobes as many, valvate in bud. Petals as many. Stamens many, rarely few and definite. Disk annular or coiling the calyx-tube. Carpels many, rarely 1 or few, on a dry convex or concave receptacle; style persistent or deciduous, ventral or basal; ovule 1, pendulous. Achenes many, receptive dry.—Distrib. N. temp. and Arctic regions, 2 are southern; species 120.—Etym. Potens, from the powerful medicinal effects attributed to some.

Section 1. Trichothal'amus, Lehm. (gen.). Shrubby. Petals 5, orbicular, yellow. Achenes many, hairy, on a very hispid receptacle.

bark flaking. Leaves oblong or lanceolate; leaflets 3-5, ¾-⅞ in.; margins entire, revolute; stipules entire. Flowers 1-1¾ in., few, in terminal subcorymbose cymes, golden yellow, sub-1-sexual, homogamous; bracteoles lanceolate, longer than the ovate calyx-segments.—Distr. N. and Mid. Europe, Alps (Arctic), N. and W. Asia, Himalaya, N. America.—In Teesdale the flowers appear to be functionally 1-sexual; the sexes differ in appearance.

Section 2. Co'marum, L. (gen.). Petals 5, small, purple-brown. Stamens many. Achenes many, glabrous, on a conical dry spongy downy receptacle.

2. P. Co'marum, Nestl.; leaves pinnately 5-7-foliolate. Co'marum palustre, L.


Section 3. Sibbald'ia, L. (gen.). Petals 5-7. Stamens 4-10. Achenes 4-10, glabrous, on a concave pubescent receptacle.

3. P. Sib'baldi, Hall. f.; leaves 3-foliolate, leaflets obovate truncate tip 3-6-toothed. P. procumb'bens, Clairv.; Sibbald'ia procumb’bens, L.

Stony places on the Scotch alps, from Peebles north to Shetland; alt. 1,500-4,000 ft.; fl. July.—More or less hairy and glaucous. Rootstock woody, depressed, branches leafy at the tip. Leaves 1-3 in.; leaflets ½-1 in. Flowering stems 3-5 in., axillary, ascending, leafy. Flowers ¼ in. diam., few, in terminal close cymes. Petals small, narrow, orange-yellow, or 0. Calyx-segments lanceolate, acute; bracteoles linear.—Distr. Alpine and Arctic Europe, N. Asia, Himalaya, N. America.

Section 4. Potentil'la proper. Petals 5, rarely 4, orbicular or obcordate, usually yellow or white. Stamens many. Achenes many, on a concave glabrous or hairy receptacle.

* Flowering stems annual, from below the crown of the perennial rootstock.

4. P. Tormentil'la, Scop.; stem slender rarely rooting, leaves 3-rarely 5-foliolate, flowers usually cymose, petals usually 4 yellow, achenes reticulate.

Heaths, copses, dry pastures, N. to Shetland; ascends to 3,300 ft. in the Highlands; Ireland; Channel Islands; fl. June-Sept.—Slightly hairy. Rootstock stout, almost tuberous. Stems 6-10 in., slender, leafy, clothed with curly hairs. Leaves subsessile; radical petiolated, leaflets ¼-½ in., obovate-cuneate, tip 3-4-toothed or -lobed; cauline subsessile, leaflets much narrower; stipules foliaceous, cut. Flowers ¼-⅞ in. diam., yellow, homogamous. Calyx-
lobes ovate; bracteoles linear, as long.—Distrib. Europe (Arctic), W. Siberia, Azores.—Rootstock strongly astringent, used for tanning.

5. **P. rep'tans**, L.; stem slender creeping and rooting, leaves digitately 5- to 7-foliolate, leaflets ovate or cuneate truncate deeply crenate or lobulate towards the tip, flowers several yellow, achenes smooth glabrous.

Meadows, waysides, and pastures, from Banff and Cantire southd.; Ireland; Channel Islands; fl. June-Aug.—Very variable in size and pubescence; usually larger than *P. Tormentilla*, and having besides the above characters bracteoles as broad as the sepals. *Flowers* ½–1 in. diam., homogamous.—Distrib. Europe, from Gothland southd., N. and W. Asia, Himalaya, Canaries, Azores. *P. mixta*, Nolte, is a supposed hybrid with *P. Tormentilla*.

6. **P. ver'na**, L.; stem prostrate, leaves digitately 5- to 7-foliolate, leaflets obovate or cuneate truncate deeply crenate or lobulate towards the tip, flowers several yellow, achenes smooth glabrous.

Hilly rocky places, local; from Forfar to Cambridge and Somerset; fl. April–June.—More or less hairy. Rootstock woody, branched, tufted. Radical leaves 2–3 in.; stipules with narrow subulate tips; leaflets ½–¾ in., green on both surfaces; terminal tooth short; cauline 1–3-foliolate, their stipules ovate-lanceolate. *Flowers* few, ½ in. diam., homogamous.—Distrib. Europe (Arctic), Siberia, W. Asia, Himalaya.

7. **P. salisburgen'sis**, Haenke; stem ascending, leaves digitately 5- to 7-foliolate, leaflets obovate or cuneate deeply crenate or serrate usually above the middle, flowers several yellow, achenes smooth glabrous. *P. alpe'stris*, Hall. f.; *P. au'rea*, Sm. not L.; *P. macula'ta*, Pourr.

Rocky alpine ledges, local, from Aberdeen and Argyll to York and Wales; ascends to 2,700 ft. in the Highlands; fl. June–July.—Probably a large form of *P. ver'na*, with ascending stems, 4–10 in., larger less truncate leaflets (but not constantly so), and flowers 1 in. diam.—Distrib. Europe (Arctic), N. and W. Asia, Greenland, Labrador.—The name *P. macula'ta* is coeval with *salisburgen'sis*. I have taken the latter because the spotted-petalled form (which occurs on Ben Lawers) is a scarce one.

8. **P. anser'i'na**, L.; stoloniferous, silky, leaves interruptedly pinnate, leaflets many deeply serrate or pinnatifid, the alternate minute, flowers solitary yellow, achenes glabrous smooth. *Silver Weed*.

Roadsides and damp pastures, N. to Shetland; ascends to 1,200 ft. in Derby; Ireland; Channel Islands; fl. July–Aug.—Rootstock slender, branched. Stems 0. Leaves 2–5 in., silvery beneath, stoloniferous from their axils; leaflets ¼–2 in., alternate, close-set, sessile, obovate oblong, obtuse, serratures tipped with silky hairs; stipules calyptriform, enclosing the buds. *Flowers* ½–¾ in. diam., on solitary axillary slender peduncles, homogamous; bracteoles
often serrate.—Distrib. Arctic and N. and S. temp. regions, Himalaya.—
Rootstock eaten in times of scarcity in the Hebrides.

9. P. Fragarias'trum, Ehrh.; leaves 3-foliolate, leaflets obovate, flowers white, achenes hairy below reticulate. Fragaria ster'illus, L.

Waysides, woods, and banks, N. to Caithness; ascends to 2,100 ft. in Wales; Ireland; Channel Islands; fl. March—May.—Similar to Fragaria ves'ca, but has no runners, nerves of leaflets not sunk above, and fruit very different.—More or less hairy or silky. Rootstock stout, woody, branched, depressed. Leaves 2–6 in., tufted; petiole with spreading hairs; leaflets ½–1 in., coarsely crenate towards the tip, very hairy beneath. Flowering stems 1–6 in., axillary, slender, naked or 1–2-leaved, 1–3-fl. Flowers ½ in. diam. Receptacle with very long hairs.—Distrib. Europe, N. Africa.

** Flowering stems annual, terminating the branches of the perennial rootstock. Receptacle hairy.

10. P. rupe'stris, L.; leaves pinnate, radical 5- cauline 3-foliolate, flowers white.

Rocks, Craig Breiddden, Montgomery; fl. May–June.—Hairy, especially below. Rootstock woody, branched. Stems 1–2 ft., erect, branched above. Radical leaves 3–6 in., petiole very slender; leaflets ½–1 in., unequal at the base, oblong or obliquely obovate, irregularly crenate; cauline few, sub sessile. Flowers few, ½–1 in. diam. Achenes smooth, glabrous.—Distrib. From Gothland southd., N. and W. Asia, Kashmir.

11. P. argen'tea; L.; leaves digitately 5-foliolate, leaflets cuneate much cut white beneath, flowers yellow.

Dry pastures and roadsides; from Elgin and E. Scotland southd., local; Channel Islands; fl. June–July.—More or less covered, especially the leaves beneath, with white appressed wool. Rootstock short, woody. Stems 6–18 in., slender, sub erect or decumbent, branched, leafy; branches divaricating. Leaves petioled, upper most sessile; leaflets ½–1½ in., narrowly cuneate, ½-pinnatifid upwards, margins recurved. Flowers ¾–1½ in. diam., sub cor ymbose. Achenes smooth, glabrous.—Distrib. Europe (Arctic), N. and W. Asia, Himalaya, N. America.

*** Root annual.

P. norve'gica, L.; hirsute, leaves palmately 3-foliolate, leaflets ob lanceolate coarsely-toothed, flowers yellow.

Middlesex, Hertford, York; naturalized and apparently rapidly spreading; fl. July.—Stem stout, simple below, erect; 8–10 in.; rarely branched above, rarely at the base and decumbent. Leaves 1–2 in. diam., petiole slender, leaflets 1–2 in., serrate nearly to the base. Flowers in crowded terminal cymes, ¾ in. diam. Petals stouter than the calyx, obovate. Achenes rugose. —Distrib. Europe, temp, and Arctic Asia and America.—Though usually annual, specimens from the Kolyma river in Siberia have a perennial rootstock.

8. ALCHEMIL'LA, L. Lady’s Mantle.

Annual or perennial herbs. Leaves orbicular, lobed or deeply divided; stipules sheathing and adnate to the petiole. Flowers minute, in scorpioid
cymes, honeyed. Calyx urceolate, persistent, 4–5-bracteolate; lobes 4–5, valvate in bud. Petals 0. Stamens 1–4, inserted on the mouth of the calyx. Disk coating the calyx-tube, its thickened margin all but closing the mouth. Carpels 1–5, basal in the calyx-tube; styles basal or ventral; ovule 1, basal. Achenes 1–4, enclosed in the membranous calyx-tube.—Distrib. Europe, India, and America, but chiefly Andean; species 30.—Etym. Arabic.


1. A. arvensis, Lamk.; leaves cuneate or fan-shaped 3-lobed, lobes cut. Aphanes, L.

Fields and waste places in dry soil, N. to Shetland; ascends to 1,600 ft. in the Highlands; Ireland, Channel Islands; fl. May–Aug.—Hairy, much branched from the base; branches 2–8 in., erect or prostrate. Leaves 4–5 in., narrowed into the short petiole, lobes cuneate; stipules palmately cut. Flowers hidden by the stipules. Calyx usually 4-cleft. Achenes 1–3.—Distrib. Europe, N. Africa, W. Asia; introd. in N. America.


2. A. vulgaris, L.; leaves reniform plaited 6–9-lobed green beneath. Moist pastures and streams, N. to Shetland (absent in Kent); ascends to 3,600 ft. in the Highlands; Ireland, Channel Islands; fl. June–Aug.—More or less hairy. Rootstock black, stout, short. Stem 6–18 in., ascending. Radical leaves 2–6 in. diam., lobes serrate, petiole 6–18 in., cauline smaller; stipules connate, toothed. Cymes irregularly racemose or panicled. Flowers ½ in. diam., yellow-green, proterandrous, rarely perfect; pedicel short. Achenes 1 or 2, glandular.—Distrib. Europe (Arctic), N. and W. Asia, Kashmir, Greenland, Labrador.—Rootstock astringent and edible.—A. montana, Willd. (A. hybrida, Pers.), is a dwarf mountain form with leaves and petioles very pubescent or silky.

3. A. alpina, L.; leaves 5–7-partite or -foliolate silvery beneath.


A. conjuncta, Bab. (A. argentea, Don), is a sport with subpeltate leaves, the leaflets connate below the middle, found in Forfar and Arran, Faroe Isles, France and Switzerland.

9. **AGRIMO’NIA, L.** Agrimony.

Slender perennial herbs. Leaves pinnate; leaflets serrate; stipules partially adnate to the petiole. Flowers small, yellow, in terminal spike-
like racemes, not honeyed; pedicels bracteate at the base, 2-bracteolate. 
Calyx inferior, persistent; tube turbinate, spinous, mouth contracted; 
lobes 5, imbricate. Petals 5. Stamens 5-10 or more, inserted at the 
mouth of the calyx. Disk lining the calyx-tube, its margin thickened. 
Carpels 2, included in the calyx-tube; styles exserted, stigma 2-lobed; 
ovule pendulous. Fruit pendulous, of 1 or 2 achenes enclosed in the 
hardened spinous calyx.—Distrib. N. temp. regions, and S. America; 
species 8.—Etym. obscure.

A. Eupator’ia, L.; leaves interruptedly pinnate, spines of calyx 
hooked.
Hedgebanks, copses, and borders of fields; ascends to 1,200 ft. in Yorkshire; 
Ireland; fl. June–Aug.—Hairy or villous, erect, leafy, 1½–3 ft., rarely 
branched. Rootstock woody, short. Leaves 3–7 in.; leaflets 3–10 pairs, 
larger upwards, largest 1–3 in., sessile, oblong or lanceolate, deeply coarsely 
serrate; smaller 1½–2 in., obovate or cuneate, 3–5-lobed; stipules foliaceous, 
½-lunate. Racemes lengthening and pedicels recurved in fruit; bracts 3-fid; 
bracteoles close to the calyx. Flowers ½ in. diam., homogamous. Calyx-tube 
½ in., woody in fruit, spines many around the thickened mouth; lobes 
connivent, triangular, acute.—Distrib. N. temp. regions, Himalaya, N. and 
S. Africa, N. America.—Rootstock astringent, and yields a yellow dye.
A. Eupatoria proper; calyx-tube obconic deeply furrowed fruiting, lower 
spines spreading.—From Sutherland south.
Sub-sp. A. Odonata, Mill.; more branched, resinous-scented, racemes denser, 
flowers larger, calyx-tube campanulate scarcely furrowed, lower spines 
spreading or reflexed.—From the Clyde and Perth southd., local; very rare 
in Ireland.

10. Pote’rium, L.

Erect perennial herbs. Leaves pinnate; leaflets petioled; stipules 
adnate to the sheathing petiole. Flowers small, in dense long-peduncled 
centrifugal heads or spikes, bracteate, 2-bracteolate, often polygamous, 
anemophilous. Calyx tube turbinate, mouth contracted; lobes 4, petioled, 
deciduous, imbricate in bud. Petals 0. Stamens 4 or more, inserted at the 
mouth of the calyx, filaments slender; anthers pendulous. Disk lining 
the calyx-tube and closing its mouth. Carpels 1–3, enclosed in the calyx-
tube; styles filiform, stigmas penicillate; ovule 1, pendulous. Achenes 
 solitary, enclosed in the hardened 4-angled often winged or muricate 
calyx-tube.—Distrib. N. temp. regions; species 20.—Etym. obscure.

1. P. Sanguisor’ba, L.; upper flowers female, lower male or 2-sexual, 
stamens 20–30 much exserted, fruiting calyx 4-winged reticulate but not 
pitted between the wings, edges of reticulation smooth. Salad Burnet.
Dry pastures; ascending to 1,600 ft. in Yorkshire; E. Scotland only from 
Perth to Berwick, local; rare in Ireland; Channel Islands; fl. June–Aug. 
—Glabrous or nearly so. Rootstock stout. Stem 6–18 in., ascending, 
slender, much branched. Radical leaves 4–10 in.; leaflets 5–10 pair, ½–¾ in., 
broadly oblong, coarsely serrate; stipules leafy. Flower-heads ½–¾ in., on 
long peduncles, shortly oblong, purplish. Calyx-lobes ½ in., oblong; wings

P. muricatum, Spach; flower-heads and flowers as in P. Sanguisorba, but fruiting calyx with thick entire or toothed wings pitted and reticulated between the wings, ridges muricate and toothed.

Cultivated ground in Mid. and S. England; (an alien or colonist, Wats.); fl. July.—Chiefly distinguished from P. Sanguisorba by the larger fruit and calyx.—Distrib. Mid. Europe and Mediterranean region.

2. P. officinale, Hook. f.; flowers 2-sexual, stamens 4 not longer than the calyx-lobes, fruiting calyx 4-winged smooth between the wings. Sanguisorba officinalis, L. Great Burnet.

Damp meadows, from Ayr and Selkirk southd.; ascends to 1,500 ft. in Yorkshire; W. and N. Ireland; Channel Islands; fl. June-Aug.—Very similar to P. Sanguisorba, but rootstock horizontal, stem erect, leaflets fewer, longer, less deeply serrate, usually cordate at the base, and flower-heads often cylindric and 1-1 ½ in. long. Flowers, honeyed, homogamous.—Distrib. Europe (Arctic), N. and W. Asia.

11. RO'SA, L. Rose.

Erect, sermentose or climbing prickly shrubs. Leaves pinnate; leaflets serrate; stipules adnate to the petiole. Flowers terminal, solitary or corymbose, white yellow or red, rarely bracteate, not honeyed, homogamous. Calyx-tube persistent, globose ovoid or pitcher-shaped, mouth contracted; lobes imbricate in bud. Petals 5. Stamens many, inserted on the disk. Disk coating the calyx-tube, its thickened margin all but closing the mouth, silky. Carpels many, rarely few, sunk in the calyx-tube; styles subterminal, distinct or connate above, stigma thickened; ovule 1, pendulous. Achenes coriaceous or bony, enclosed in the fleshy or coriaceous calyx-tube.—Distrib. N. temp. regions, rare in America; Abyssinia, India, Mexico; species about 30.—Etym. The old Latin name.

The following account of the British roses is condensed from Mr. Baker's monograph (Linn. Journ. xi. 197), and revised by himself, most of the species being regarded as sub-species. As with the fruticose Rubi, all the so-called species are connected by intermediates; but whereas, in the Rubi, the 4 or 5 most distinct British forms are connected by so many links that various botanists regard them as forms of one species; in Rosa, the five most distinct British forms are connected by so few (comparatively) intermediates, that no botanical authority has reduced them to one species.

1. R. spinosisima, L.; small, erect, bushy, prickles crowded very unequal nearly straight passing into stiff bristles and glandular hairs, leaves not or slightly glandular, sepals more or less persistent, fruit short, disk small or 0. Scotch Rose, Burnet Rose.

Open places especially sandy sea shores, from Caithness southd.; Ireland; Channel Islands; ascends to 1,700 ft. in Scotland; fl. May–June.—Shrub 1-4 ft., much branched. Leaves small, eglandular; leaflets 7-9, singly or

2. **R. villo'sa**, L. ; bush large, branches erect or elongate and arching, prickles uniform scattered slender nearly straight, leaflets very hairy eglandular or nearly so beneath, sepal more or less persistent densely glandular, fruit globose or turbinate densely prickly rarely naked.

Hedges and thickets, N. to Shetland; Ireland; ascends to 1,500 ft. in Yorkshire; fl. June–July.—Chiefly distinguished from *R. spinosissima* by its larger size, equal prickles, fewer very downy leaflets which are more constantly doubly serrate, and the more glandular fruit; and from *R. canina* by the straight prickles, and globose glandular fruit.—*Distrib*. Europe (Arctic), W. Asia.

**R. villo'sa proper**; branches arching, sepal copiously pinnate quite persistent, corolla often ciliate and glandular, fruit ripening early, disk obscure. *R. pomif'er*a, Herrm.—Stafford and Gloster; not indigenous, common in gardens.

Sub-sp. **R. mol'lis**, Sm.; branches erect, leaflets softly pubescent, sepal sparingly pinnate quite persistent, fruit ripening early, disk obscure. *R. mollis'sima*, Willd. *R. heterophyl'la*, Woods.—From Orkney southd.; Ireland; extends into Arctic Europe.—**Var. ceru'lea**, Baker, has glands and bristles few on the petiole, calyx-tube glandular, fruit broad glabrous, peduncle naked or with few bristles.—*R. pseud'ro-rubigino'sa*, Lej., has leaflets nearly glabrous above, glandular beneath, petiole and calyx-tube densely Cristly.

Sub-sp. **R. tomento'sa**, Sm.; branches long (6–10) ft., arching, prickles sometimes curved, leaflets pubescent, sepal copiously pinnate not quite persistent, fruit not ripening early, disk distinct.—Common, N. to Shetland; Ireland.—*R. subglobo'sa*, Sm. (*R. Sherrav'di*, Davies); *R. farino'sa*, Raü.; *R. scabrius'cula*, Sm.; *R. sylvestris*, Woods (*R. Jundzilli'a*, Baker; *R. britan'nica*, Deseg.); and *R. obou'ata*, Baker, are forms differing in pubescence and amount of glands on the leaves petioles peduncles calyx-tube and sepal, amount of double serration of the leaflets, number of flowers in a cluster, and of prickles, their length, strength, and curvature.—**Var. Woodsiana*, H. and J. Groves, is a form allied to *scabriuscula*, but smaller, more compact, with erect persistent sepal.—Wimbledon Common.

3. **R. involu'ta**, Sm.; small, erect, branches short, prickles crowded gradually passing into bristles, leaflets doubly serrate glabrous or pubescent and glandular beneath, flowers 1–3, peduncle bristly, sepals persistent densely glandular on the back, fruit erect subglobose red, disk inconspicuous.

R. involuta proper (var. Smith'ii, Baker); dwarf, mature leaflets glabrous above hairy and eglandular beneath, serratures close sharp; flowers solitary, calyx-tube densely acicular, sepals simple.—**VAR. R. Sabi'ni**, Woods; prickles $\frac{1}{2}$ in. straight, leaflets with copious compound serratures thinly pubescent above, petioles and peduncles densely hairy glandular and bristly, calyx-tube subglobose more or less setose, sepals pinnate, fruit subglobose. **R. gracilis**, Woods; **R. nivealis**, Don; **R. coronata**, Crep. The most common form.—**VAR. R. Donia'na**, Woods; small, leaflets more densely hairy, flowers solitary, sepals hardly pinnate, calyx-tube and fruit densely prickly. Dry places. Approaches **R. mollis'sima**.—**VAR. graciles'cens**, Baker; robust, leaflets thinly hairy on both surfaces eglandular beneath much toothed, terminal 1-1$\frac{1}{2}$ in., flowers 3-6, calyx-tube glabrous ellipsoid. Antrim.—**VAR. Roberts'o'ni**, Baker; sepals of Sabi'ni, but teeth of leaflets sharper and less compound, upper surface glabrous when mature, calyx-tube sometimes naked. Newcastle, Yorkshire, Antrim.—**VAR. Nichols'o'ni**, Crep.; densely setose, leaflets broadly ovate glabrous above, glandular beneath with hairy nerves, teeth very compound glandular.—**VAR. lexiaga'ta**, Baker; leaflets of Sabi'ni, petiole villous and glandular rarely bristly, peduncle and calyx-tube glabrous, sepals simple eglandular, fruit depressed globose. Yorkshire, Antrim, and Derry.—**VAR. Moor'e'i**, Baker; prickles very stout $\frac{1}{2}$ in., leaflets densely glandular beneath, petiole peduncle and calyx-tube densely setose and glandular, the larger prickles curved, sepals slightly pinnate. Derry. Approaches **R. rubigin'o'sa**.—**VAR. occidenta'lis**, Baker; near Wilso'ni, but leaflets smaller and petioles and peduncles glandular and bristly, calyx-tube globose. Ireland, locality unknown.—**VAR. R. Wilso'ni**, Borrer; tinged with purple, prickles as in Sabi'ni, leaflets often cordate terminal large glabrous above, ribs thinly hairy and subglandular beneath, serratures simple, calyx-tube almost glabrous, sepals nearly simple, fruit subovoid. Menai Straits, Derry. Approaches **R. rubel'lta**.

4. **R. rubigin'o'sa**, L.; bush small, branches erect or arching, prickles stout at the base scattered hooked with often glandular hairs and bristles intermixed, leaflets densely glandular aromatic glabrous or thinly hairy, flowers 1-3, sepals subpersistent, fruit globose ovoid or oblong.

Best distinguished by its suberect habit and copious glandular pubescence, which gives out the strong sweetbriar odour; this, however, becomes fainter in the forms that pass into **R. canina** and **R. villosa**.—Europe, N. and W. Asia to N.W. India; introd. in N. America.

**R. rubigino'sa** proper; very sweet-scented, erect, branches compact, prickles with a few bristles and glandular hairs intermixed, peduncles densely bristly, leaflets glabrous above, pubescent beneath, sepals densely glandular pinnate, fruit globose. **R. Eglant'eria**, Woods. Chalk hills, S. of England, native?; probably not indigenous in Scotland and Ireland; Channel Islands. **Sweetbriar**.—**VAR. R. permix'ta**, Deseg.; leaves and styles glabrous, sepals deciduous, fruit ovoid. Box-hill. Approaches **micran'tha**.—**R. sylvi'cola**, Deseg. and Rip., is less scented, prickles more slender, leaflets hairy and less glandular beneath, styles hairy, fruit ovoid. N. Yorkshire.

Sub-sp. **R. micran'tha**, Sm.; branches long arched, prickles equal, scent faint, leaflets small more pointed glabrous above densely glandular beneath, flower 1 in. diam., sepals deciduous densely glandular with a leafy point and 1-2 leaflets, styles glabrous, fruit urceolate scarlet, disk evident.
Midway between *rubiginosa* and *canina*. From Roxburgh southd.; Ireland; Channel Islands.—**Var. Briggsii**, Baker; large and luxuriant, leaflets larger less glandular beneath, peduncles and fruit naked, sepals more pinnate eglandular on the back. Plymouth.—*R. Hys'trix*, Leman, is small, leaflets narrow glabrous, calyx-tube glabrous, peduncle densely aciculate. Box-hill, Oxfordshire, Bristol.

Sub-sp. *R. agrastesis*, Savi; laxer in habit than *rubiginosa*, prickles with a few bristles and glandular hairs intermixed, leaflets small narrowed to both ends glabrous but densely glandular beneath, peduncle and ovoid fruit naked, sepals subpersistent, disk moderate, styles pubescent. *R. se'pium*, Thuill. Surrey, Sussex; Ireland.—**Var. R. Billietii**, Puget (*R. se'pium*, Borrer); differs only by its leaves rather hairy beneath, and rounded at the base. Warwickshire.—*R. inodo'ra*, Fries. (*R. pulverulent'a*, Lindl. not M. Bieb.), is much taller, flowers $1\frac{1}{2}$ in. diam., leaflets larger rounded at the base, sepals more copiously pinnate, fruit ovoid. England, local.—**Var. crypto-po'da**, Baker; differs from the last principally by its very short peduncles and round fruit. West Yorkshire.

5. *R. hiber'nica*, Sm.; small, erect, branches short, prickles rather crowded gradually passing into bristles, leaflets simply-serrate glabrous or pubescent beneath wholly eglandular, peduncles naked, sepals persistent naked on the back, fruit erect globose naked, disk moderate.

From Sutherland southd.; Ireland; ascends to 1,000 ft.; fl. June–July.—Intermediate between *spinosis'sima* and *canina*, most like the latter; (a hybrid, Christ.). Branches sometimes arching; prickles stout, curved. Leaflets with rarely cut serratures, glaucous green above, nerves beneath thinly hairy; petiole pubescent; stipules nearly naked on the back, auricles gland-ciliated. Flowers sometimes 12. Peduncles and broad calyx-tube always naked. Sepals leafy. Petals pale pink. Fruits in October.—**Distr.** France; very rare on the Continent.

*R. hibernica* proper (*glabra*, Baker); leaflets glabrous, serratures sharper, peduncle naked. Resembles *R. canina*.—**Var. cordif'olia**, Baker; prickles more slender and denser, leaflets almost glabrous beneath, terminal $1\frac{1}{2}$ in., serratures more open and obtuse, peduncle bristly and glandular. Northumberland.

6. *R. cani'na*, L.; bush large, branches long arching, prickles scattered uniform stout broad hooked base thickened, leaflets eglandular (except rarely the midrib and veins beneath) glabrous or thinly hairy acute very sharply toothed, peduncle usually naked, sepals usually naked reflexed pinnate, styles free or nearly so hirsute, fruit ovoid urceolate or subglobose, mouth of disk conspicuous. *Dog Rose*.

Thickets, hedges, &c., N. to Orkney; ascends to 1,350 ft. in Yorkshire; Ireland; Channel Islands; fl. June–Aug.—Of the above characters, most disappear in one or other of the following 29 varieties, which Mr. Baker has systematized with great care. In its common form, this is the largest and freest growing of British roses, and may be distinguished from *spinosis'sima* by the hooked prickles and habit, from *villosa* by being more glabrous, from *rubiginosa* by being eglandular, and from *arvensis* by the free styles.—**Distr.** Europe, N. Africa, Siberia.
**SERIES 1. ECRISTA'TÆ.** Leaves eglandular beneath. Sepals reflexed after the peta's fall, deciduous before the fruit (which ripens late) colours.

* Leaves glabrous on both surfaces. Peduncles not bristly.

**R. lutetia'na, Leman; 10–12 ft., leaflets about 7 green or glaucous, terminal obovate, serratures simple, flowers 1–4 pink 2 in. diam., sepals naked. Abundant.—**VAR. R. surcul'osa, Woods; robust, flowers 10–30, leaflets flat rounded at the base, teeth open.—VAR. R. sphæ'rica, Gren.; like lutetia'na, but leaflets broader, petioles pubescent, fruit globose $\frac{3}{2}$ in. diam., styles villous.—VAR. R. sentico'sa, Ach.; slender, flexuous, leaflets 1 in., teeth acute, fruit small globose.—VAR. R. duma'lis, Bechst. (R. sarmenta'cea, Sm.; glaucophyll'la, Winch); petioles glandular, stipules and sepals more densely gland-ciliated, leaflets doubly-serrate. Very common.—VAR. R. biserra'ta, Merat; quite like duma'lis, but serratures more open and very compound, petioles very glandular.—**R. vindæ'cea, Baker, has leaflets and bracts narrow acute, and fruit oblong.

**Leaves glabrous above, hairy on the nerves beneath. Peduncles not bristly.**

**R. urb'ica, Leman (R. colli'na, Woods; Forsteri, Sm.; platyphyll'la, Rau.); like lutetia'na, but leaves hairy beneath and petioles pubescent, scarcely glandular.—**VAR. R. frondo'sa, Stev. (R. dumeto'rum, Woods); leaflets smaller flatter ovate-oblong more rounded at the base, fruit smaller globose.—VAR. arrati'ca, Baker; like urb'ica, but leaves doubly-serrate, fruit ovoid. Common in the N. of England.

***Leaves more or less hairy on both surfaces. Peduncles not bristly.***

**R. dumeto'rum, Thuill. (R. uncinell'la, Bess.); leaflets green terminal often large simply-serrate thinly hairy above, softly beneath, fruit large ovoid, styles villous.—**VAR. pruin'osa, Baker (R. ces'tia, Forr.); leaflets glaucous doubly-serrate, petioles glandular. **VAR. R. inca'na, Woods (R. canes'cens, Baker); leaflets very glaucous above densely pubescent beneath with few inconspicuous glands doubly-serrate, fruit large oblong.—VAR. R. tomentell'la, Leman; flexuous, leaflets short green above very hairy beneath doubly serrate, petioles prickly, peduncles very short, flowers small white, fruit small short.—**R. inodo'ra, Hook. Fl. Lond. (R. obtusi'folia, Desv.), is like tomentell'la, but the leaflets are simply serrate.

****Peduncles move or less bristly and glandular.***

**R. ande'vegans'is, Bast., is lutetia'na with bristly peduncles. S. of England, rarer in the N. and Scotland.—**VAR. verticillalca'ntha, Merat, is dumalis with ditto. Not uncommon.—VAR. R. colli'na, Jacq. (R. Kosincia'na, Bess., R. asperna'ata, Deseg.), is urb'ica with ditto. Surrey and Devonshire.—VAR. R. ces'tia, Sm., is near colli'na, but leaflets grey-green, stipules and bracts pubescent on the back. Argyll, Northumberland, Leicester.—VAR. concin'na, Baker; prickles much hooked, leaflets very small simply serrate, petioles not setose pubescent, ovary small, styles short thinly hairy. Devonshire.—VAR. decipl'iens, Dumort.; like tomentell'la, but for the bristly peduncles, more glandular midrib, pubescent and glandular petiole, and sepals densely glandular not fully reflexed. Northumberland, Chester, Leicester.
Series 2. **Subcristatæ.** Leaves eglandular beneath. Sepals ascending after the petals fall, not deciduous till after the fruit (which ripens early) colours.—**Var.** *R. sclerophylla*, Scheutz, and *R. monticola*, Rap., include various forms of this.


Series 3. **Subrubbiginosæ.** Leaflets glandular beneath on the midrib and principal nerves only (not on the surface, as in *R. rubiginos'a*).

*R. Borre'ri*, Woods (*R. dumeto'rum*, Engl. Bot.); prickles stout much hooked, leaflets flat doubly-serrate glabrous above, glands obscure, stipules and bracts densely gland-ciliate, backs of these and sepals naked, flowers many, peduncles bristly, calyx-tube ovoid naked, sepal at length spreading or reflexed deciduous on the fruit changing colour. Yorkshire to Sussex.—**Var.** *R. Bake'ri*, Deseg.; prickles less hooked, leaflets obovate doubly-serrate, flowers 3–4, peduncles very short, back of sepals bracts and stipules thinly glandular, sepals at length ascending not deciduous till the naked oblong fruit has changed colour. N. Yorkshire.—**Var.** *R. marga'nta*, Wallr. (*R. Blondae'na*, Ripart); branches purple, prickles more slender less hooked, leaflets altogether glabrous, glaucous above, pale beneath, veins prominent glandular, flowers 3–4, sepals and fruit much as in *R. Bake'ri*. Arran on the Clyde, N. Yorkshire, N. Wales, Derry.

7. **R. arven'sis**, Huds.; bush large, branches long arching or trailing, prickles uniform stout strongly hooked, leaflets eglandular glabrous or slightly pubescent, flowers 1–6, sepals deciduous, styles glabrous connate into an exserted column, fruit ripening late, disk much thickened.

Hedges and thickets; England and Ireland; fl. June–July.—A low trailing plant in its usual form, with the foliage and hooked prickles of *R. cani'na*. Leaflets glabrous and shining above, rarely downy. *Flowers* rarely solitary, generally white, scent faint or 0. *Fruit* naked; achenes sessile or stalked. —**Distrib.** W. and Mid. Europe, from Belgium southd.

*R. arven'sis* proper; bush 2–3 ft., branches trailing purple glaucous, prickles often very large, leaflets quite glabrous glaucous beneath, flowers white throat yellow, calyx purple, sepals naked on the back short broad reflexed after flowering deciduous not much pinnate, fruit subglobose small, styles glabrous as long as the stamens. *R. repens*, Scop.—Common in S. of
England, rare to the N. and in Scotland.—**Var.** R. bibracteota, Bast., shoots stronger more arching, leaflets large more acute, fruit obovoid, peduncles thinly glandular. (Easily mistaken for *stylo'sa*.)

Sub-sp. *R. stylo'sa*, Bast.; bush tall, rarely low, leaflets pubescent beneath, peduncles elongate more or less bristly and glandular, sepals reflexed much pinnate, styles as long as or shorter than the stamens.—Connects arvens' sis with cani'na.—**R. stylo'sa** proper; leaflets oblong acute rounded at the base hairy all over beneath, petioles and peduncles with a few glands and bristles, flowers 3–6 white, styles protruded, disk very prominent. Sussex.—**Var.** R. sy's'tyla, Bast. (*R. collina*, Engl. Bot., not Jacq. *R. leucochroa*, Desv.), like *stylo'sa* but flowers usually pink, leaflets hairy only on the nerves beneath, and petioles less hairy. Mid. and S. England.—**Var.** op'd'ca, Baker; leaflets still more hairy beneath rounded at the base, peduncle shorter naked, flower white 1 in. diam., styles scarcely protruded. Kent.—**Var.** gallicoi'ddes, Baker; habit and leaflets of sy's'tyla, but prickles of stem mixed with copious glands and bristles, leaflets almost doubly-serrate, flowers white, fruit narrow, styles as long as stamens. Warwick.—**Var.** Monso'nia, Lindl.; low, erect, flowers red very large, styles scarcely protruded, fruit subglobose orange-red. Hereford.—**Var.** R. fastigi'a'ta, Bast.; flowers pink, styles not protruded.

**12. PY'RUS, L.** PEAR, APPLE, SERVICE, &c.

Trees or shrubs. Leaves deciduous, simple or pinnate; stipules deciduous. Flowers white or pink, in terminal cymes or corymbs, honeyed; bracts subulate. Calyx-tube urceolate; lobes 5, superior, reflexed, persistent or deciduous. Petals 5. Stamens many, filaments sometimes connate at the base. Petals 5. Stamens many, filaments sometimes connate at the base. Disk annular, or coating the calyx-tube. Carpels 2–5, connate and adnate to the calyx-tube; styles distinct or connate below, stigmas truncate; ovules 2 in each cell, ascending. Fruit (a pome) fleshy, 2–5-celled; endocarp cartilaginous or bony often 2-valved, cells 1–2-seeded.—Distrib. N. temp. and cold regions; species 40.—Etym. The old Latin name.

**Section 1. Pyrus** proper. Fruit large 5-celled; cells 1–2-seeded; endocarp cartilaginous. Flowers umbellate or in simple cymes. Styles 5.

1. *P. commu'nis, L.*; cymes simple, styles distinct to the base, fruit pyriform. **Wild Pear.**

Woods and thickets, from Yorkshire southd., a relict of gardens?; (a denizen? Wats.); fl. April–May. A shrub or small tree, 20–40 ft.; branchlets more or less spinescent and pendulous. Leaves 1–1½ in., fascicled on the last year's wood, alternate on the shoots, oblong-ovate, acute, obtusely serrate, more or less pubescent or flocculent below when young, those of the young tree often lobed; petiole slender. Flowers 1–1½ in. diam., white, proterogynous. Fruit 1–2 in. long.—Distrib. E. Europe to W. Asia, Himalaya.

*P. commu'nis* proper (*P. Pyras'ter, L.*); leaves shortly acuminate pubescent below when young, base of fruit obconic.—**Var.** P. Ach'ras, Gärtn.; leaves broader acute or cuspidate flocculent on both surfaces when young, fruit rounded at the base. Rarer.—**Var.** P. corda'ta, Desv. (*Brigg'sii, Syme*); leaves ovate base rounded, fruit very small globose or pyriform. Cornwall.
2. **P. Malus, L.**; peduncles umbellate, style connate below, fruit subglobose indented at the base. *Wild or Crab-apple.*

Copses and hedges, from Perth and the Clyde southd.; often a relict of gardens; wild in Ireland; Channel Islands; fl. May.—A shrub or small tree; branches spreading. *Leaves* 1–2 in., oblong rounded acuminate or cuspidate at the tip, glabrous or downy beneath when young. *Flowers* few, 1–1½ in. diam., pink and white, proterogynous. *Calyx-segments* woolly. *Fruit* 1 in. diam., yellow.—**DISTRIB.** Europe, W. Asia, Himalaya.

*P. Malus* proper (*P. acer’ba, DC.*); young leaves and tube of calyx glabrous, pedicels slender glabrous or nearly so, fruit drooping.—**VAR. mu’tis**; young leaves tube of calyx and stout pedicels pubescent, fruit erect.

**SECTION 2.** **Sor’bus, L.** (gen.). *Fruit* small, 2–5-celled; cells 1–2-seeded; endocarp brittle. *Flowers* in compound corymbose cymes. **Styles** 2–5.


4. **P. A’ria, Sm.**; leaves simple or pinnatifid rarely pinnate at the base, deeply lobed white and flocculent beneath. *White Beam.*

Copses and borders of forests, from Sutherland to Kent and Devon, local; ascends to 1,500 ft. in Yorkshire; fl. May–June.—A bush or small tree, 4–40 ft. *Leaves* 2–6 in., very variable, glabrous above, plaited, coarsely irregularly serrate lobed or pinnatifid. *Flowers* ½ in. diam., in lax corymbs, white. *Fruit* ½ in. diam., subglobose, dotted red, usually 3-celled.—**DISTRIB.** Europe, N. Africa, N. and W. Asia.

*P. A’ria* proper; leaves broad ovate or oblong crenate-serrate lobulate or hardly lobed beyond the middle, permanently snow-white beneath, nerves 8–13 very prominent on each side, fruit ½ in. diam., scarlet.—Mid. England southd., Ireland. *P. rupicola, Syme,* has nerves fewer, fruit smaller.

Sub-sp. **P. latifoli’a, Syme**; leaves from ovate-oblong to suborbicular more or less lobed grey-tomentose beneath, lobes deltoid serrate acuminate, nerves 5–9 on each side less prominent beneath. *Sorbus latifolia,* Pers. *P. scan’dica*, Bab.—Considered by foreign authors to be a hybrid between *A’ria* and *tormina’lis*; but it is found in Cornwall (Briggs) where *A’ria* is not known.

Sub-sp. **P. scan’dica, Syme**; leaves less coriaceous oblong deeply lobed or pinnatifid glabrous above loosely grey-tomentose beneath, lobes oblong or rounded. *Sorbus scan’dica*, Fries. Arran.

*P. hybr’ida, L.* (*P. pinnatifida, Sm.* in part, *Sorbus fen’ica, Fries*), of Arran, which resembles *P. scan’dica*, but with the leaves pinnatifid towards the base, is a supposed hybrid between *A’ria* and *Aucupa’ria*, of which latter it has the sweet-scented flower and other characters.

5. **P. Aucupa’ria, Gærtn.**; leaves pinnate, leaflets serrate glabrous beneath when old or nearly so, fruit globose. *Mountain Ash,* *Rowan-tree.*
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Woods and hillsides; ascends to 2,600 ft. in the Highlands; Ireland; fl. May–June.—Tree 10–40 ft. Leaves 5–8 in.; leaflets 6–8 pair, 1–1 ½ in., linear-oblong, subacute, pale beneath and hairy along the midrib and nerves. Cymes 4–6 in. diam., compound, corymbose, dense-flowered. Flowers ½ in. diam., cream-white, proterogynous; pedicel and calyx villous. Fruit ½ in. diam., globose, scarlet, flesh yellow; endocarp usually 3-celled, almost woody.—Distrib. Europe, Madeira, N. and W. Asia, Himalaya, N. America (a form).


P. German’ica, L. (Mes’pilus); leaves obovate or oblong-lanceolate entire or serrulate. Medlar.

Hedges and thickets, Mid. and S. England, Channel Islands, naturalized; fl. May–June.—A small much-branched spiny tree. Leaves subacute, pubescent beneath. Flowers 1½ in. diam., white; peduncle ½ in. Calyx woolly, lobes with dilated foliaceous tips. Fruit ½–1 in. diam., globose, with a large depressed area at the top, and persistent calyx-lobes.—Distrib. Greece, Asia Minor, Persia.

13. CRATÆ’GUS, L. HAWTHORN, WHITETHORN.

Shrubs or small trees, often spiny. Leaves simple lobed or pinnatifid; stipules deciduous. Flowers in terminal corymbose cymes, white or red, honeyed, proterogynous; bracts caducous. Calyx-tube urceolate or campanulate; mouth contracted; lobes 5, superior. Petals 5, inserted at the mouth of the calyx. Stamens many. Carpels 1–5, adnate to the calyx-tube; styles short, stigma truncate; ovules 2 in each cell, ascending. Fruit ovoid or globose, with a bony 1–5-celled stone, or with 5 bony 1- rarely 2-seeded stones.—Distrib. N. temp. regions, chiefly American, extending into New Granada; species about 50.—Etym. ἱππατός, from the strong wood.

C. Oxyacan’tha, L.; spinescent, leaves deeply pinnatifid.

Forests and hedges, N. to Shetland, often only where planted; ascending to 1,800 ft. in Yorkshire; Ireland; Channel Islands; fl. May–June.—A small round-headed tree, 10–20 ft., much branched. Leaves 1–2 in., very variable, cuneate, shortly petioled, lobes cut or crenate; stipules leafy, ½-sagittate, toothed. Cymes corymbose, many-flowered. Flowers ¼ in. diam., white; pedicel and calyx glabrous or pubescent. Anthers pinkish-brown. Carpels 1–2 very rarely 3. Fruit ovoid or subglobose, usually scarlet, rarely yellow or black.—Distrib. Europe, N. Africa, N. and W. Asia, Himalaya; introd. in N. America.

C. oxyacan’tha proper; peduncle and calyx-tube glabrous, carpels 2–3. C. oxyacanthoïdes, Thuill.

Sub-sp. O. monog’yna, Jacq.; leaves more deeply lobed or pinnatifid, peduncle and calyx-lobes pubescent, flowers and fruit smaller (appearing later), carpel solitary.
14. COTONEASTER, Lindl.

Shrubs or small trees. Leaves coriaceous, often downy; stipules deciduous. Flowers solitary or in few-fld. cymes, small white or pink, sometimes polygamous. Calyx-tube turbinate or campanulate; lobes 5, superior, short, persistent. Petals 5. Stamens many, inserted at the mouth of the calyx. Carpels 2-5, adnate wholly or by their backs only to the calyx-tube; styles 2-5, distinct, stigma truncate; ovules 2 in each cell, erect. Fruit small, with 2-5 bony 1-seeded stones.—Distrib. Europe, temp. Asia, N. Africa, Mexico; species 15.—Etym. The Latin name.

C. vulgare, Lindl.; leaves broadly elliptic-oblong densely pubescent beneath, cymes lateral few-fld.

Great Orme’s Head, on limestone cliffs, very rare; fl. May–June.—A small erect shrub; branchlets pubescent. Leaves ⅔-1⅔ in., rounded or acute at the tip; petiole very short; stipules scarious. Flowers ⅓ in. diam., pink; pedicels short, decurved, pubescent; bracts minute. Calyx turbinate, lobes obtuse, margins woolly. Petals small, persistent. Styles about 3. Fruit ¼ in. diam., globose, shining, red.—Distrib. Europe, N. and W. Asia, Himalaya.

Order XXVII. SAXIFRAG’EÆ.

Tribes SAXIFRAG’EÆ proper and RIBESI’EÆ.

Shrubs or herbs. Leaves alternate or opposite; stipules 0, or adnate to the often dilated petiole. Calyx free or more or less adnate to the ovary, 5- rarely 4-lobed, valvate or imbricate in bud. Petals 5, rarely 4 or 0, imbricate in bud. Stamens 5 or 10, rarely 4 or 8, perigynous; anthers dorsally inserted, connective frequently glandular at the back. Disk various. Carpels 2 or more, usually connate into a 2- rarely a 1-celled ovary; styles distinct or combined, stigmas capitellate; ovules many, 2-seriate, placentas attached to the inner angles of the carpels. Fruit a 1-3-celled berry or capsule, or of 2 or more follicles, many-seeded. Seeds small, albumen copious fleshy or horny; embryo minute, terete or clavate. —Distrib. (of the British tribes). N. temp. and Arctic regions; a few occur on the Andes and in the S. temp. zone; genera 20; species 300.—Affinities. So close to Rosaceæ and Crassulaceæ as to be scarcely separable; also allied to Lythraceæ, Rhizophoræ and Droseraceæ.—Properties unimportant.


Petals 0. Stamens 8 or 10. Ovary 1-celled; styles 2...2. Chrysosplenium.

Petals 5. Stamens 5. Ovary 1-celled; stigmas 3-4...3. Parnassia.

Tribe II. RIBESI’EÆ. Shrubs. Ovary 1-celled. Fruit a berry. 4. Rites.
1. **Saxifraga, L. Saxifrage.**

Perennial, rarely annual herbs. **Leaves** various, radical and cauline; petiole sheathing. **Flowers** cymose, white or yellow, rarely red or purple, honeyed, proterandrous. **Calyx-tube** free or partially adnate to the ovary; lobes 5, imbricate. **Petals** 5. **Stamens** 10, rarely 5, incurving and another opening in succession. **Ovary** superior or partially inferior, 2-lobed, 2-celled; **styles** 2. **Capsule** 2-beaked, 2-valved between the beaks, many-seeded. **Seeds** small, smooth or rough.—**Distrib.** N. temp. and Arctic zones, Andes; species 160.—**Etym.** Saxum and frango, from some species rooting into rocks and breaking them up.

**Section 1. Porphyroion, Tausch.** Perennial. **Stems** trailing, leafy. **Leaves** opposite, small, with a pore at the tip, ciliate. **Flowers** solitary, subsessile. **Sepals** erect in fruit.

1. **S. oppositifolia, L.**; tufted, leaves small 4-fariously ovate-oblong.

Alpine rocks, from N. Wales and Yorkshire to Shetland; ascends to near 4,000 ft. in the Highlands; N.W. and N. Ireland; fl. April–May.—Glabrous, dark green, depressed. **Stems** 6–8 in., creeping. **Leaves** \( \frac{4}{1} \) in., 4-fariously imbricate, thickened and obtuse at the tip, ciliate with stout bristles. **Flowers** \( \frac{4}{1} \) in. diam., sessile on short annual shoots, campanulate. **Sepals** obtuse, connate to the middle. **Petals** obovate, bright purple. **Capsule** free, \( \frac{4}{3} \) in.; beaks diverging, subulate.—**Distrib.** Arctic and Alpine Europe, Asia (to W. Tibet) and America.

**Section 2. Micranthes, Haw.** (gen.). Perennial, stemless, scapigerous. **Radical leaves** petioled. **Cymes** dense-flowered. **Sepals** adnate to the base of the carpels. **Petals** white.

2. **S. nivalis, L.**; leaves broadly spatulate crenate-dentate.

High alps, alts. 2,000–4,300 ft., of Snowdon, the Lake district, and the Highlands; Sligo; fl. July–Aug.—Glandular-hairy on the leaf-margins, scape, bracts and pedicels, elsewhere glabrous. **Rootstock** small. **Leaves** \( \frac{4}{1} \) in. diam., subcoriaceous, red beneath; petiole 1–2 in. **Scape** 3–6 in., erect, simple. **Flowers** \( \frac{4}{4} \) in. diam., white, in capitate 4–12-flowered cymes. **Bracts** linear. **Calyx-lobes** connate, purplish. **Capsule** with short divergent beaks.—**Distrib.** Arctic Europe, Silesia, N. Asia, N. America.

**Section 3. Hydatica and Arabidi'a, Tausch.** Perennial, scapigerous. **Stem** short or 0. **Cymes** lax-flowered. **Sepals** almost free, reflexed. **Petals** white with 2 purple dots above the base.

3. **S. stella'ris, L.**; stemless, leaves rosulate subsessile cuneate-lanceolate usually coarsely toothed, scape leafless, filaments subulate.

Alpine and subalpine rills, from N. Wales and York to Caithness; ascends to 4,300 ft.; Ireland; fl. June–July.—Glabrous or sparsely hairy. **Rootstock** small, branched. **Leaves** \( \frac{4}{1} \) in., subsucculent, ciliate, usually quite entire (var. integrifolia, Hook.). **Scape** 3–8 in.; cyme panicled. **Flowers** few, \( \frac{4}{3} \) in. diam., white; anthers and pistils red; bracts linear. **Sepals** lanceolate.
Capsule with suberect slender beaks.—Distrib. Arctic and Alpine Europe, N. Asia, N. America.

4. **S. umbro'sa**, L.; leaves orbicular obovate or broadly ovate narrowed into the stout petiole coarsely crenate or toothed. *St. Patrick's Cabbage, London Pride.*

W. and S.W. Ireland; ascends to 3,400 ft.; naturalized elsewhere; fl. June-July.—Glabrous or laxly hairy. Leaves 1½-2 in. diam., rosulate, coriaceous; petiole ⅓-1 in., flattened. Scape 6-12 in., leafless. Cyme panicked, bracts linear. Flowers ⅓ in. diam., white, sometimes spotted with red. Sepals reddish. Filaments slightly dilated upwards; anthers red. Capsule with short, divergent beaks.—Distrib. N. Spain, Portugal, Corsica.—*S. punctata*, Haw., with loosely rosulate orbicular crenate-serrate leaves, and *S. serratifolia*, Mackay, with sharply toothed ascending obovate leaves, are slight varieties.—*S. hirsuta*, L. (*S. graveolens*, Mackay MSS.) is a more hairy form with sharply toothed leaves rounded or obtuse at the base.—*S. elegans*, Mackay, with acutely toothed leaves abruptly narrowed into the very short petiole is probably a hybrid with *S. Geum* (Ball.).

5. **S. Ge'um**, L.; leaves orbicular or reniform crenate or toothed, base cordate, petiole slender.

Mountains of Kerry and Cork; ascends to about 2,000 ft.; fl. June.—Very similar in habit and floral character to *S. umbro'sa*, and as variable in hairiness, but distinguished by the leaf base. I doubt its being more than a sub-species.—Distrib. N. Spain, Pyrenees.

Section 4. **Hir'culus**, Haw. (gen.). Perennial. Stem leafy. Leaves alternate, linear-lanceolate or oblong, entire or toothed. Sepals free or ⅓-adnate to the ovary, spreading or reflexed. Petals yellow.


Bogs and wet moors, rare and local; Chester (formerly), Perth to York (ascending to 2,100 ft.); Ireland, local; fl. Aug.—Pubescent above, 4-8 in., branched from the base. Radical leaves ⅓-1⅔ in., rosulate, petioloed, lanceolate or spatulate; cauline linear, sometimes faintly serrulate. Flowers ⅓-⅔ in. diam. Sepals ciliate. Petals obovate dotted red at the base, where there are 2 tubercles. Capsule with short divergent beaks.—Distrib. Alpine N. and Mid. Europe (Arctic), N. Asia, Himalaya, N. America.

7. **S. aizoi'des**, L.; stems tufted decumbent leafy much branched, leaves linear-oblong crowded below, scattered on the flowering stems, sepals erect connate adnate below to the ovary.

Stony mountain rills, from York to Orkney; ascends to 3,000 ft. in the Highlands; Ireland; not in Wales; fl. June-July.—Often forming bright green cushions a foot across; branches 3-8 in. Leaves ⅓-2 in., spreading, lower reflexed, often ciliate (*S. autumnalitis*, L.); on the flowering stem narrower, strongly ciliately. Flowers 1-10, ½ in. diam., orange or golden yellow, dotted red. Calyx-tube obconic. Petals narrowly obovate-spathulate, distant. Ovary orange; depressed. Capsule with erecto-patent, subulate beaks.—Distrib. Alpine N. and Mid. Europe (Arctic), N. Asia, N. America.
Section 5. *Neprophyllum*, Gaud. Annual or perennial. Leaves chiefly radical, broad, palmately lobed. Sepals suberect, more or less connate and adnate to the ovary. Petals white.—Hairs articulate.


Alpine wet rocks and streams, alt. 3,000–3,600 ft., Ben Lawers, Braemar, Ben Nevis; fl. July–Aug.—Tufted, slender, succulent, 1–4 in., slightly glandular-hairy. Leaves 3/8–1 in. diam., lobes entire; petiole as long as the stems. Flowers 1–2, 1/4 in. diam., erect, white; bracts leafy, opposite, usually undivided. Calyx-tube 1/2 as long as the lobes, hemispherical. Petals distant, small, obovate-oblong. Capsule with short divergent beaks.—Distr. Scandinavia, Arctic Europe, Asia, and America.

10. *S. granulata*, L.; glandular-pubescent, stem erect bulbiferous at the base branched and many-flowered above, leaves petioled reniform palmately lobulate, cauleine sessile, calyx-lobes erect obtuse.

Sandy banks and meadows, from Elgin to Somerset and Kent; ascends to 1,500 ft. in Yorkshire; rare in Ireland; fl. April–May.—Gregarious. Bulbs as large as a pea, brown. Stem 6–18 in. Radical leaves 3/8–1 1/4 in. diam., petiole slender; cauleine deeper and more acutely cut. Flowers 1 in. diam., campanulate, inclined or drooping, white. Petals large, obovate. Calyx-lobes as long as the tube. Stigmas large, reniform. Capsule with slender beaks.—Distr. Europe, N. Africa, W. Asia, Himalaya.

11. *S. cerinua*, L.; perennial, stem erect simple 1–3-fld., leaves petioled reniform palmately deeply crenate or lobulate, cauleine sessile with axillary scarlet buds, calyx-lobes erect obtuse.


Section 6. *Dactyloides*, Tausch. Perennial, tufted, with many flowerless leafy shoots (except *S. oespito'sa*). Leaves alternate, palmately-partite or -lobed. Sepals connate at the base and adnate to the ovary, suberect. Flowers white.—Hair articulate, glandular.
12. *S. hypnoi'des*, L. ; barren shoots elongate, leaves 3–5-cleft, lobes divergent acute, those of the shoots often entire, calyx-tube short obconic or hemispheric, lobes usually spreading.

Hilly subalpine districts, from N. Somerset and Glamorgan to Caithness; Ireland; fl. May–July.—Often forming large cushions, glabrous or glandular-hairy. *Leaves* lax or dense, with the broad compressed petiole ¼–1 in.; lobes entire, or the lateral cleft, flat or channelled. *Flowering-shoots* 3–8 in., stout or slender, leafy or nearly naked, their leaves simple, linear, or broad and more or less lobed like the radical. *Flowers* ¼–1 in. diam., few or many, campanulate, white. *Sepals* rarely connate above the middle, oblong linear or ovate, obtuse or acute. *Capsule* not concealed in the calyx-tube, beaks sub-erect.—I have repeatedly studied the forms of *S. hypnoi'des* and its allies, and always with the result that the passage from *hypnoi'des* proper to *caespito'sa* is undefinable. Mr. Baker's exposition of the sequence of the forms (*Seeman's Journ. Bot.* viii. 280) very well expresses their relationship, and is here followed.


Small, succulent, annual or perennial herbs. *Leaves* alternate or opposite, exstipulate. *Flowers* minute, green or yellow, in axillary or terminal cymes. *Calyx-tube* ureolate or obconic, adnate to the ovary; lobes 4–5, obtuse, imbricate in bud. *Petals* 0. *Stamens* 8 or 10, inserted on the margin of an epigynous disk, filaments short. *Ovary* inferior, 1-celled, 2-lobed at the top; styles short, recurved; ovules many, placentas 2 parietal. *Capsule* ¼–superior, 2-lobed, membranous, opening at the top by a cruciate mouth. *Seeds* oblong or compressed.—DISTRIB. N. temp. and Arctic regions, temp. S. America; species 15.—ETYM. χρυσός and σπλήν, golden spleen, of doubtful application.

1. *C. alternifo'lium*, L. ; stem simple erect, leaves alternate.
Banks of streams and wet places, from Argyll and Elgin to Kent and Devon; ascends to near 3,200 ft. in the Highlands; Ireland; Channel Islands; fl. April–June.—Perennial. **Stems** 2–4 in., tufted, glabrous above, clothed below with soft white hairs. **Radical leaves** ¼–2 in. diam., long-petioled, reniform, crenate; cauline few. **Flowers** ½ in. diam., 4-merous, yellow, in compact leafy cymes, homogamous. **Calyx-lobes** obtuse, spreading. **Capsule** almost inferior, beaks short. **Seeds** smooth.—**Distr.** Europe (Arctic), N. and W. Asia to the Himalaya, N. America.

2. **C. oppositifolium**, **L.**; **stem** creeping below, **leaves** opposite. Marshy and shady places, from Orkney to Cornwall and Kent; ascends to 3,300 ft. in the Highlands; Ireland; Channel Islands; fl. May–July.—Size and general habit of **C. alternifolium**, but stem more leafy, branched, creeping and rooting at the base; leaves ¼–1 in. diam., nearly orbicular, suddenly contracted into a short broad petiole; cauline many. **Flowers** proterogynous.—**Distr.** Europe, Siberia.

3. **Parnassia**, **L.** Grass of Parnassus.

Slender, simple, glabrous, erect, perennial herbs. **Leaves** chiefly radical, quite entire, exstipulate. **Flower** solitary, large, yellow or white. **Calyx-tube** short, free or adnate to the base of the ovary; lobes 5, imbricate, persistent. **Petals** 5, thickish, persistent. **Stamens** 5, hypogynous or perigynous, alternating with 5 large scales. **Ovary** superior or ⅔-inferior, 1-celled; style short or 0, stigmas 3–4 opposite the parietal placentas; ovules many. **Capsule** membranous, loculicidally 3–4-valved, many-seeded. **Seeds** small, testa lax, albumen scanty.—**Distr.** Arctic and temp. regions from S. India northwards; species 12.

**P. palustris**, **L.**; **leaves** ovate-cordate, stamens hypogynous.

Wet moors and bogs, from Dorset and Surrey to Shetland; ascends to 2,700 ft. in the Highlands; Ireland; fl. Aug.–Sept.—Glabrous. **Radical leaves** 1–2 in., ovate cordate; petiole slender 2–3 in. **Stem** slender, angular, twisted, with one sessile leaf about the middle. **Flower** ½–1 in. diam., honeyed, proterandrous. **Sepals** nearly free, obtuse. **Petals** coriaceous, with strong veins. **Stamens** incurving and anthers ripening in succession. **Scales** obovate, fringed with a comb of capitellate filaments, and with 2 glands on the surface facing the ovary. **Ovary** ovoid, superior; stigmas 4.—**Distr.** Europe, N. Africa, N. and W. Asia to W. Tibet, N. America.

4. **Ribes**, **L.** Currant, Gooseberry.

Shrubs, often glandular and spinous, buds scaly. **Leaves** alternate, entire or lobed, plaited or convolute in bud; stipules 0, or adnate to the petiole. **Flowers** solitary or racemose, white red yellow or green, often unisexual, honeyed; pedicels bracteate (often minutely), 2–3-bracteolate. **Calyx-limb** tubular or campanulate, 4–5-fid, imbricate or subvalvate in bud. **Petals** small and stamens 4–5, inserted in the throat of the calyx. **Ovary** inferior, 1-celled; styles 2; ovules few or many, on 2 slender parietal placentas. **Berry** ellipsoid or globose, 1-celled, few- or many-
seeded. *Seeds* horizontal, testa with a gelatinous coat, raphe free, albumen adhering to the testa; embryo minute.—DISTRIB. N. temp. regions and Andes of S. America; species 56.—ETYM. *Ribs*, in Danish.


Copses in various counties; indigenous only in N. England, where it ascends to 1,000 ft.; fl. April–May.—A small spreading shrub with 1-3 spines under the leaf-buds. *Leaves* 1-2 in. diam., fascicled on short lateral branches, lobes irregularly crenate. *Flowers* \(\frac{1}{3}\) in., greenish, drooping, proterandrous; peduncle short, pubescent, 1-3-bracteate about the middle. *Calyx*-lobes reflexed, purplish, throat and stamens bearded. *Petals* white, erect, minute. *Fruit* \(\frac{1}{2}\)-1 in.—DISTRIB. Europe, N. Africa, W. Asia, N.W. Himalaya. *R. Uva-crispa*, *L.*, the small form with glabrous fruit, is that found wild in Europe most commonly.


2. *R. alpi’num*, *L.*; dioecious, leaves deeply 3-5-lobed coarsely serrate almost glabrous and shining beneath, racemes glandular erect in flower and fruit, bracts exceeding the pedicels.

Woods in the N. of England, probably indigenous; not so in Scotland; fl. April–May.—A small all but glabrous bush; branches slender. *Leaves* 1\(\frac{1}{2}\)-2 in. diam., broadly ovate, lobes usually 3 acute cut and serrate, slender petiole and both surfaces sparingly hairy. *Racemes* glandular-pubescent; male 2-2\(\frac{1}{2}\) in., 20-30-flowered; female shorter, 8-10-flowered. *Flowers* \(\frac{1}{6}\) in. diam., yellowish, females greener; bracts linear. *Petals* much shorter than the calyx-lobes. *Styles* very short, cleft. *Fruit* \(\frac{1}{4}\) in. diam., globose, scarlet, insipid.—DISTRIB. Europe, N. and W. Asia, N. America.


Woods and thickets; indigenous in N. England and the Highlands; ascends to 1,000 ft. in Yorkshire; fl. April–May.—*Leaves* 2-4 in. diam., glabrous or pubescent above, usually tomentose beneath; petiole pubescent or setose. *Racemes* 1-3 in., many-flowered, pubescent or glabrous, never glandular; bracts ovate. *Flowers* \(\frac{1}{4}\) in. diam., homogamous. *Calyx* glabrous, limb flat. *Petals* minute. *Fruit* \(\frac{1}{4}\) in. diam., red, acid.—DISTRIB. Europe, N. and W. Asia, N.W. Himalaya, N. America. *R. ru’brum* proper (*R. sylvestre*, Reichb.); leaves hairy above tomentose beneath, raceme pubescent usually suberect in flower and drooping in fruit, flowers purplish, filaments very short, fruit contracted at the top, pedicels equalling or exceeding the fruit. Vars. *Smithia*’na and *Bromfieldia*’na, *Syme. R. petra’rum*, Sm. not Wulfen.—VAR. *R. spica’tum*, *Robson*, leaves hairy above when young and tomentose beneath, racemes erect in flower and fruit. Yorkshire and Skye.—VAR. *sati’va*, Reichb., the cultivated
form, has leaves glabrous on both surfaces when mature, racemes glabrous always drooping, flowers green, fruit globose.


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**Order XXVIII. C R A S S U L A C E Ė E.**

Herbs or shrubs, usually succulent. *Leaves* opposite or alternate, exstipulate. *Flowers* in terminal or axillary cymes, bracteate or not. *Sepals* 3-5, rarely 10-12 or more, distinct or connate. *Petals* as many, distinct or connate, imbricate in bud. *Stamens* perigynous or subhypogynous, as many as the petals, or twice as many, when those opposite the petals are adnate to their bases; anthers dorsally fixed. *Hypogynous scales* opposite each carpel, rarely 0. *Carpels* 3-5, rarely more, 1-celled, distinct, rarely connate; styles short or long, stigma small; ovules many, rarely few, attached to the ventral suture, ascending or pendulous. *Fruit* of 3 or more 1-celled 2- or more-seeded follicles. *Seeds* oblong, minute, albumen fleshy; embryo terete.—*Distrib.* Arctic, temp. and warm regions, chiefly S. African; genera 14; species 400.—*Affinities.* Separable from *Saxifragae* by habit and the hypogynous scales.—*Properties.* Astringent roots, acid foliage, emetic and purgative qualities; tartaric and malic acids occur.

**1. TILLe'A, L.**

Small or minute subsucculent herbs. *Leaves* opposite, quite entire. *Flowers* minute, axillary, solitary or cymose, white or reddish. *Calyx* 3-5-lobed or -parted. *Petals* 3-5, distinct or connate at the very base. *Scales* 3-5, linear, or 0. *Carpels* 3-5; styles short; ovules 1 or more. *Follicles* few or many-seeded.—*Distrib.* Ubiquitous; species 20.—*Etym.* M. A. Tilli, an early Italian botanist.

**T. musco'sa**, L.; leaves oblong, flower solitary subsessile 3-merous.
Sany heaths, rare, Norfolk to Hants and Devon; Channel Islands; fl. June—July.—Annual. Stem 1–2 in., tufted, decumbent, glabrous, reddish; branches slender, leafy and flowering throughout. Leaves thick, concave, obtuse or apiculate. Flowers rarely 4-merous. Sepals ovate, acuminate, green. Petals smaller, subulate, white. Scales 0. Follicles constricted, 2-seeded.—DISTRIB. W. Europe from Holland southd., N. Africa.

2. COTYLE'DON, L. PENNYWORT, NAVELWORT.

Herbs or small shrubs. Leaves alternate rarely opposite, sometimes peltate. Flowers in terminal spikes or racemes. Calyx 5-parted. Corolla-tube urceolate or cylindric, terete or 5-angled; lobes 5, small, twisted in bud. Stamens 10, inserted in the tube of the corolla. Scales 5, linear-oblong or 4-angular. Carpels 5; styles filiform; ovules many. Follicles many-seeded.—DISTRIB. W. and S. Europe, all Africa, temp. Asia, Mexico; species 60.—ETYM. korv'lan, from the cup-like leaf of some species.

C. Umbili'cus, L.; leaves peltate orbicular crenate, raceme long.

Rocks and walls, especially on the W. coasts from Argyll to Kent and Cornwall; ascends to 1,000 ft. in Wales; (absent from the E. counties); Ireland; Channel Islands; fl. June—July.—Glabrous, succulent. Rootstock tuberous. Stem 6–18 in., simple, stout, terete. Radical leaves 1–3 in. diam., petioled, depressed in the centre; cauline spathulate, upper cuneate. Raceme continued almost throughout the stem, sometimes leafy (var. folioida); bracts minute; pedicel short, slender. Flowers close-set, drooping, green. Corolla cylindric, shortly 4–5-lobed. Stamens adnate to the corolla-tube, included.—DISTRIB. From France southd., W. Asia, N. and trop. Africa.

3. SE'DUM, L. ORPINE, STONECROP.

Succulent herbs, erect or prostrate. Leaves alternate rarely opposite or whorled. Flowers cymose, rarely axillary and solitary, sometimes decious, honeyed. Calyx 4–5-lobed. Petals 4–5, distinct. Stamens 8–10. Scales 4–5, entire or notched. Carpels 4–5, distinct or connate at the base; styles short; ovules many. Follicles many- or few-seeded.—DISTRIB. N. temp. and cold regions, rare in America; species 120.—ETYM. sedeo, from the squatting habit of the species.

SECTION 1. Tele'phium. Rootstock stout, perennial. Stems annual. Leaves broad, flat or concave.

1. S. Rhodi'ola, DC.; leaves alternate sessile, flowers 4-merous dicious. Rhodi'ola ro'sea, L. Rose-root.

Moist alpine and subalpine rocks, from S. Wales and York to Shetland; ascends to nearly 4,000 ft. in the Highlands; maritime rocks in Scotland; Ireland; fl. May—Aug.—Rootstock 2–3 in., as thick as the thumb, branched, woody, cylindric, scent of roses; buds scaly. Stems 6–18 in., fleshy. Leaves 1–1½ in., glaucous, larger and more crowded upwards, obovate-oblong or lanceolate, acute, toothed at the tip. Cymes compact, corymbose. Flowers ¼ in. diam., yellow or purplish. Sepals narrow. Petals linear, smaller or 0
in the female flower. Scales notched.—Distrib. N. and Mid. Europe (Arctic), Himalaya, N. America.


Stony hedgebanks and copses, &c., from Perth southd., local, often a garden escape; ascends to 1,200 ft. in Yorkshire; Derry only in Ireland; fl. July-Aug.—Rootstock short, stout; roots many, elongate, tuberous. Stems 6-24 in., stout, green or spotted red. Leaves 1-3 in., rarely opposite below, ovate or oblong, obtuse, flat or concave, obtusely toothed or serrate. Cymes dense, corymbose. Flowers ¾ in. diam., rosy white or speckled, proterandrous. Sepals ovate-lanceolate. Petals twice as long, lanceolate.—Distrib. Europe, N. and W. Asia, Himalaya.

*S. Tele'phium* proper; upper leaves sessile rounded at the base, carpels furrowed at the back. *S. purpurascens*, Koch.—Var. *S. Fabaria*, Koch; more slender, upper leaves all cuneate at the base, carpels not furrowed. Very local.

**SECTION 2. Cepæ'a.** Annual or biennial. Stem simple. Leaves subcylindric.


Bogs and marshes in hilly districts from York and Westmoreland to Argyll and Elgin; ascends to 2,000 ft. in Yorkshire; fl. June-July.—Biennial. Stem with a tuft of leaves the first year, lengthening in the second, then slender, 3-6 in., and flowering. Leaves 1-½ in., scattered, linear, obtuse. Cyme few-fld., subschorpioid. Flowers 1 in. diam., white or purplish. Sepals ovate, obtuse. Petals broad, acute.—Distrib. Europe (Arctic), Norway to Italy and Hungary, Greenland.

**SECTION 3. Sédum** proper. Perennial. Stems branched, with many flowerless leafy prostrate or ascending shoots. Leaves subcylindric or ½-cylindric.

* Flowers white


*S. al'bum* proper (*S. teretifolium*, Haw.); leaves flattened above, sepals and petals obtuse.—Var. *S. micranthum*, Bast.; leaves flattened on both surfaces, sepals rounder, petals more acute.—Naturalized in Sussex, Ireland, &c.


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top of the flowering stem, white or pink. Sepals obtuse, short. Carpels pink.—Distrib. W. Europe.

S. Dasypyl' lum, L.; glandular-pubescent, glaucous, leaves on the flowerless shoots mostly opposite subglobose or shortly ovoid, equal at the base below.


** Flowers yellow.


Rocks, walls, and sandy places, especially near the sea; ascends to 1,500 ft. in Yorkshire; Ireland; Channel Islands; fl. June–July.—Tufts or cushions 3–10 in. diam. Stems 3–5 in. Leaves ¼–½ in., obscurely 6-seriate, broadest at the base, the gibbosity in contact with the stem. Flowers ⅛ in. diam., subsessile, few, golden-yellow, proterandrous. Sepals obtuse, not half as long as the petals. *Anthers yellow.—Distrib.* Europe, W. Asia, N. Africa, W. Siberia.—Taste acrid; is a vesicant, emetic and cathartic.

S. Sexangula're, L.; glabrous, leaves cylindric spreading obtuse gibbous at the base, sepals not gibbous at the base.


7. S. rupest're, Hud.s.; glabrous, leaves linear-lanceolate acute flattened gibbous at the base, sepals oblong not gibbous at the base.

Rocks, S.W. England and Wales, rare; Ireland; Channel Islands (naturalized); fl. June–July.—Stems stout, loosely tufted, green or tinged with pink; flowerless with closely rosulate leaves; flowering 6–10 in., with suberect scattered leaves. Leaves ¼–1 in., acute or acuminate, the gibbosity close to the stem. Cymes 3–4 in. diam., branches scorpionoid. Flowers ⅛ in. diam., pedicelled, golden-yellow. Sepals obtuse. Petals lanceolate, acute. *Anthers yellow.—Distrib.* From Belgium southd.

S. Rupe'stre proper; glaucous, cyme rather flat-topped. S. ol'egans, Lej.; S. pruina'tum, Brot.—Var. maj'or; stout, 6–12 in., leaves ¾–1 in., cyme 3–5 in. diam. Cheddar Cliffs.—Var. mi'nor; smaller and more slender. Bristol, Shropshire, Wales, indigenous; elsewhere in England an escape.

Sub-sp. S. Forstera'nnum, Sm.; more slender, cymes rather round topped sometimes capitate. Varieties glauces'cens and vires'cens, represent shades of colour in two forms. Wet rocks; Somerset, Gloster, Salop, Wales.

On rocks and housetops in England, Wales, and Ireland; fl. July–Aug.—Very similar to *S. rupestre*, but usually much larger, the leaves are in about 6 series, and almost cylindric with subulate tips; the flowers are usually bracteate, often 6-merous.—**Distrib.** N. and Mid. Europe.

*S. reflexum* proper; leaves green, those of the flowering shoots reflexed, flowers bright yellow. The common garden form, not indigenous.—**Var. S. albuscens**, Haw. (*S. glaucum*, Sm.); smaller, leaves glaucous, those of the flowering stems not reflexed, flowers pale yellow. Indigenous; Mildenhall, Suffolk; Babbicombe, Devon.

3*. *SEMPERVIVUM*, L. House-leek.

Succulent herbs or undershrubs. **Radical leaves** densely rosetulate, axils stoloniferous; cauline alternate. **Flowers** in corymbose or panicked cymes. **Calyx** 6–multi-fid or -partite. **Petals** as many, distinct or connate and adnate to the alternate filaments below, narrow, acute. **Stamens** usually twice as many, the alternate sometimes deformed or transformed into carpels. **Scales** simple, distinct or connate in pairs, 2-fid or fimbriate, rarely 0. **Carpels** as many as petals, free or connate and adnate with the calyx-tube; styles filiform; ovules many. **Follicles** many-seeded.—**Distrib.** Europe, N. Africa, especially Madeira and Canaries, W. Asia, Himalaya; species 40.—**Etym.** *sempervivum* and *vivo*, from their retention of vitality.

*S. tectorum*, L.; perennial, glandular-pubescent above, leaves ciliate.

Tops of walls and houses, not indigenous; fl. June–July.—Flowerless shoots 2–4 in. diam., in globose tufts; flowering-stems 1–2 ft., erect, stout, with scattered leaves. **Leaves** 1–2 in., very fleshy, oblong or obovate-lanceolate, mucronate, edged with purple, tips flat. **Cyme** 2–5 in. diam., branches scorpoid. **Flowers** ½–1 in. diam., dull red-purple. **Sepals** 12, narrow, acute. **Petals** lanceolate, ciliate. **Stamens** 12, with as many imperfect or transformed into carpels. **Scales** minute.—**Distrib.** Europe, W. Asia.

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**Order XXIX. DROSERA'CEÆ.**

Perennial glandular herbs, rarely shrubby below. **Leaves** radical and rosulate, or cauline and alternate, circinate in bud, stipulate. **Inflorescence** various, often circinate cymes. **Sepals** 4–8, imbricate in bud, persistent. **Petals** 4–8, hypogynous or perigynous, distinct or connate at the base, imbricate, persistent. **Stamens** 4–20, inserted with the petals, rarely adnate to them; anthers versatile or basifixed, bursting outwards. **Disk** 0, or obscure. **Ovary** free, 1–5-celled; styles 1–5, simple or divided, stigmas simple or multifid; ovules many, anatropous. **Capsule** 1–5-celled, loculicidally 2–5-valved, many-seeded. **Seeds** small, albumen fleshy, testa
often lax; embryo axile, straight.—Distrib. Sandy or marshy places; most common in temp. Australia; genera 6; species 110.—Affinities. Close to Saxifragae.—Properties. Yield a deep red-purple dye. For their carnivorous properties, see Darwin On Insectivorous Plants.

1. Drosera, L. Sundew.

Slender glandular herbs. Leaves alternate or rosulate; stipules scarious, adnate to the petiole, or 0. Flowers in scorpionid revolute cymes, rarely solitary. Sepals and petals 4–6 or 8. Stamens as many, hypogynous or perigynous. Ovary free, ovoid or globose, 1-celled; styles 2–5, distinct or connate below; ovules in many series, on 2–5 parietal placertas. Capsule oblong, 2–5-valved. Seeds minute, testa usually lax; embryo large or small.—Distrib. Of the Order; species 100.—Etym. δροσερός, from the dew-like glands.

1. D. rotundifolia, L.; leaves horizontal orbicular or broadly obovate, petiole hairy, testa loose reticulate.

Spongy bogs and heaths, N. to Shetland; ascends to 2,300 ft. in the Highlands; Ireland; Channel Islands; fl. July–Aug.—Rootstock slender. Stem very short. Leaves 1/2 in. diam., rosulate, margin glandular, nearly glabrous above; petiole 1–1 1/2 in., gradually dilated at the sheathing base. Scapes 3–6 in., in the centre of the rosette; bracts subulate; pedicels short. Flowers 3/4 in. diam., many, in 2 series, white, usually 6-merous, homogamous. Petals a little longer than the sepals. Styles 2-fid, incurved, segments clavate. Capsule acute, exceeding the sepals. Seeds elongate.—Distrib. Europe (Arctic), N. and W. Asia, N. America.

2. D. intermedia, Hayne; leaves erect obovate or oblong-spathulate, petiole glabrous, testa close granulate. D. longifolia, L. in part.

Bogs and moist heaths, from Caithness to Sussex and Cornwall; local in Scotland; Ireland; fl. July–Aug.—Stem short, leafy. Leaves gradually contracted into the petiole, together 1–2 in. Scapes 2–4 in., from the base of the rosette, curved at the base. Flowers much as in D. rotundifolia, usually 5–8-merous. Capsule pyriform, equalling the sepals. Seeds ovoid.—Distrib. Europe (Arctic), W. Asia, America from Canada to Brazil.


Wet moors, from Orkney to Devon, Dorset, and Suffolk; ascends to 1,700 ft. in the Highlands; rare in S. England; Ireland; fl. July–Aug.—Very similar to D. intermedia, but larger. Leaves 1/2 in. broad; petiole 2–4 in. Scapes 4–8 in., from the centre of the rosette. Flowers 3/4 in. diam., 5–8-merous. Capsule obovoid, longer than the sepals.—Distrib. Europe, N. Asia, America.—D. obovata, Mert. and Koch, with broader leaves, styles often notched, capsule half as long as the sepals, seeds imperfect, is probably a hybrid with D. rotundifolia.—Scotch moors.
Herbs or shrubs, often marsh or aquatic, with much-reduced or imperfect perianths. Leaves opposite alternate or whorled, exstipulate. Flowers often minute and 1-sexual. Calyx superior; lobes 2, 4, or 0, valvate or slightly imbricate in bud. Stamens 1–5, epigynous in the 2-sexual flowers, filaments usually short; anthers (except in Callitriche) long, 4-angled, basifixed, slits lateral. Disk small or 0. Ovary inferior, mostly of 2 or 4 connate (rarely of 1) carpels; styles or stigmas as many as the carpels, 2 in Callitriche; ovules 1 in each cell, pendulous, anatropous. Fruit 2-4-celled, indehiscent, or of 1-4 small 1-seeded drupes. Seed pendulous, testa membranous, albumen fleshy; embryo cylindric, axile, or minute. Distrib. Widely dispersed; genera 9; species 80. Affinities. Obscure, probably near Saxifragaceae and Rhizophoraceae. Properties unimportant.


1. HIPPURIS, L. MARÉ'S-TAIL.


H. vulgāris, L.; leaves 6–10 in a whorl linear acute.

Margins of lakes, ponds, &c., from Shetland to Kent and Cornwall, local; fl. June–July.—Rootstock submerged, stout, creeping. Stem 6–24 in., terete, very many-jointed, as thick as a goose-quill or less; rarely floating flaccid and flowerless. Leaves ½–1½ in., close-set, tips withered. Flowers green, sessile. Anthers red. Drupe minute, smooth, green.—Distrib. Of the genus.

2. MYRIOPHYLLUM, L. WATER MILFOIL.

Glabrous marsh or aquatic herbs; branches often floating. Leaves opposite alternate or whorled. Flowers small, axillary, solitary or spiked, anemophilous; upper male, lower female, intermediate often 2-sexual. —Male fl. Calyx 4–rarely 2-lobed or 0. Petals 2 or 4, concave. Stamens 2, 4, or 8.—Fem. fl. Calyx-tube 4-grooved; lobes 4, minute or 0. Petals minute or 0. Ovary 4–rarely 2-celled; styles 4, very short, plumose. Drupe deeply 2–4-lobed. Seeds oblong; albumen copious.—Distrib. Ubiquitous; species 15. —Etym. μυρίος and φύλλον, from the finely-divided leaves.
1. **M. verticillatum**, *L.*; spike erect in bud, floral leaves all whorled in about fives pinnatifid or pectinate all longer than the flowers, upper axils usually flowerless.


**Var. M. pectinatum**, DC., has very short floral leaves.

2. **M. alterniflorum**, *DC.*; spike curved at the tip in bud, female floral leaves whorled in threes or fours pectinate longer than the flowers, male opposite or alternate entire or serrate shorter than the flowers.

Ponds and ditches, from Shetland to Cornwall and Sussex; ascends to 1,200 ft. in the Highlands; Ireland; Channel Islands; fl. June-Aug.—Habit of *M. spicatum*, but more slender and flowers fewer, and inhabits lakes in hilly and upland districts.—*Distrib.* Europe (Arctic), N. Africa, Arctic America.

3. **M. spicatum**, *L.*; spike erect in bud, floral leaves all whorled in about fours pectinate shorter than the flowers.

Ponds and ditches, from Orkney to Devon and Kent; ascends to 1,200 ft. in the Highlands; Ireland; fl. June-Aug.—The small floral leaves, giving the inflorescence a more spicate appearance than *M. verticillatum*, is its best character; the fruit also is less globose.—*Distrib.* Europe (Arctic), N. Africa, N. and W. Asia, India, N. America.


Slender glabrous marsh or aquatic plants. *Leaves* opposite, quite entire, upper often rosulate. *Flowers* unisexual, minute, solitary, axillary.—*Male* fl. *Perianth* 0. *Stamen* 1, subtended by two caducous bracts, filaments slender; anther-cells confluent above.—*Female* fl. *Bracts* 2 or 0. *Ovary* sessile or shortly peduncled, 4-lobed longitudinally, 4-celled; styles 2, slender, stigmatose all over. *Fruit* compressed, 4-lobed, 4-celled, lobes angled margined or winged at the back, at length separating, indehiscent.—*Distrib.* Chiefly temp. waters; species 3 or 4.—*Etym.* καλός and θηλή, from the elegance of its *capillary* ramification.—I have followed Hegelmaier's limitation of the British forms of this very variable genus. Its affinities are very doubtful.

1. **C. verna**, *L.*; leaves not dilated at the base, flowers bracteate, carpels slightly keeled connate for about half their breadth.

Ponds, ditches and sluggish streams, from Shetland southd.; ascends to 2,200 ft. in the Highlands; Ireland; Channel Islands; fl. April–Oct.—Very variable in size and habit, covered with scattered stellate hairs or scales. *Stems* 3–12 in., submerged, terete, sparingly branched. *Leaves* ¼–1 in., submerged linear; floating rosulate, obovate, notched, 3-nerved. *Flowers*, male and female often in opposite axils. *Bracts* white, deciduous,
incurved. Filaments very slender. Furrow on the carpels shallow, not extending to the base of the lobes.—Distrib. All temp. and cold climates (Arctic).

C. verna proper; fruit sessile, carpels turgid sharply keeled sinus shallow, styles erect or spreading, pollen ellipsoid. C. verna'lis, Kuetz.; C. aqua'tica, Sm.

Sub-sp. C. platyca'ra, Kuetz.; fruit sub sessile, carpels large flattish sharply keeled sinus deep, styles at length reflexed persistent, pollen subglobose. C. stagnalis, Scop., is a terrestrial form.—Ascends to 1,500 ft. in Derby.

Sub-sp. C. hamula'ta, Kuetz.; fruit sub sessile, carpels flattish shortly broadly keeled sinus shallow, styles long at length reflexed deciduous, pollen subglobose.

Sub-sp. C. obtu'san'gula, Leg.; leaves obovate, fruit sub sessile, styles spreading, carpels turgid obtusely trigonous at the back.—C. Lachii, Warren MSS., has almost linear upper leaves and longer styles; it is intermediate between obtusan'gula and hamula'ta (Warren).

Sub-sp. C. peduncu'la, DC.; leaves always linear, fruit peduncled or sessile, carpels flattish shortly sharply keeled, styles long at length reflexed deciduous, pollen subglobose.—Flowers earlier.

2. C. autumn'alis, L.; leaves all submerged dilated at the base, bracts 0, carpels keeled or winged connate towards the axis only.

Lakes, rare and local, Orkneys to Devon; Ireland; fl. June-Oct.—Stem brittle and leaves without stellate hairs. Leaves \( \frac{3}{2}-\frac{3}{2} \) in., all linear, truncate, dark green. Fruit much larger than in C. verna.—Distrib. N. and Mid. Europe (Arctic), Siberia, N. America.

C. autumn'alis proper; fruit nearly sessile, winged.—Var. C. truncata, Guss. fruit shortly pedicelled, keeled.

Order XXXI. Lythra'rieæ.

Herbs, shrubs (or trees), branches usually 4-angled. Leaves opposite or whorled, quite entire, exstipulate. Flowers regular or irregular. Calyx inferior, tubular or campanulate, persistent; lobes 3-6, valvate in bud, alternating with as many teeth. Petals 3-6 rarely 0, inserted in the calyx-tube, crumpled in bud. Stamens usually definite, inserted in the calyx-tube, equal or unequal, inflexed in bud; anthers versatile, often recurved. Disk annular, unilateral, or 0. Ovary 2-6-celled; style straight or flexuous, stigma capitate; ovules many, on the inner angles of the cells, anatropous, horizontal or erect. Capsule enclosed in the calyx-tube, 2-6-celled, or 1-celled by the septa vanishing; placentas usually forming a central seed-bearing column. Seeds various, albumen scanty or 0; cotyledons oblong or orbicular, 2-auricled.—Distrib. Chiefly trop.; genera 30; species 250.—Affinities. With Onagrarieæ, Myr'taceæ, and Haloro'gaeæ.—Properties. Astringent, acrid, and vesicatory. Pomegranate bark is astringent.

1. **LYTHRUM, L.** Loosestrife.

Herbs or shrubs, branches 4-angled. **Leaves** opposite, whorled or alternate, quite entire. **Flowers** axillary, red or purple, honeyed. **Calyx-tube** cylindric, straight; teeth and ribs 8-12. **Petals** 4-6, sometimes unequal or 0. **Stamens** 8-12, 1-2-seriate in the calyx-tube, filaments filiform often declinate. **Ovary** sessile, 2-celled; style filiform, stigma obtuse; ovules very many. **Capsule** 1-2-celled, septicidally 2-valved or bursting irregularly. **Seeds** plano-convex or angular.—**Distrib.** Temp. and trop. regions; species 12.—**Etym.** λυθρον, gore, from the blood-red flowers.

1. **L. Salicaria, L.**; leaves opposite or whorled lanceolate cordate at the base, flowers whorled 3-morphic, stamens 12.

River-banks and ditches, &c., from Argyll and Perth southd.; Ireland; Channel Islands; fl. July–Sept.—Glabrous and pubescent. **Rootstock** creeping. **Stem** 2–5 ft., branched, 4-6-angled or winged. **Leaves** 2–5 in., often 3–4 in a whorl, acute. **Cymes** glomerate, in terminal spiked racemes. **Flowers** 3/4–1 in. diam., red-purple, homogamous; bracts small or 0. **Calyx-tube** ½ in., 12-ribbed, outer-teeth lanceolate longer than the inner. **Petals** narrow-oblung, wrinkled. **Capsule** ovoid.—**Distrib.** Temp. N. regions (Arctic), Australia.—Flowers trimorphic in respect of length of style and of filaments and of size of pollen in 3 sets of individuals. Of those growing by the Thames at Kew, the long-styled is glabrous, slender, with small narrow leaves, and bright flowers; that with very short styles is a larger, coarser, very pubescent plant, with dull purple flowers.—The 3 forms have—1. Long style, medium stamens, medium yellow pollen.—2. Long style, short stamens, small yellow pollen.—3. Medium style, long stamens, large green pollen.—4. Medium style, short stamens, small yellow pollen.—5. Short style, long stamens, large green pollen.—6. Short style, medium stamens, medium yellow pollen.—These admit of 9 modes of cross-fertilization.


Moist places, often inundated, very local, Northampt., Cambridge, Norfolk, Herts, Cornwall; Channel Islands; fl. June–Sept.—Glabrous, annual. **Stem** ½–1½ ft., prostrate or ascending. **Leaves** ½–1 in., sessile, cuneate at the base, very narrow. **Flowers** small, pink. **Calyx** 2-bracteolate; teeth subulate, subequal. **Petals** oblong. **Capsule** cylindric.—**Distrib.** From Hanover, southd., N. and S. Africa, N. and W. Asia, India, America.

2. **PEPLIS, L.** Water-Purslane.

Small weak annual herbs. **Leaves** alternate and opposite, quite entire. **Flowers** minute, axillary, subsessile, 2-bracteolate. **Calyx** campanulate, 6-lobed, with as many alternate spreading teeth. **Petals** 6, in the throat of the calyx, fugacious, or 0. **Stamens** 6 or 12, in the middle of the calyx-tube. **Ovary** subglobose, membranous, 2-celled; style short, stigma capitata; ovules very many, placentas on the septum semicylindric. **Capsule** 2-celled, 2-valved, or bursting irregularly, many-seeded. **Seeds** minute,
LYTHRARIEÆ.

Plano-convex.—Distrib. Europe, N. Africa, temp. Asia; species 3.—Étym. περάνων, the old name for Portulaca transferred.

P. Portula, L.; leaves obovate obtuse, flowers solitary.

Moist places, from Caithness southd.; ascends to 1,200 ft. in Yorkshire; Ireland; Channel Islands; fl. July-Aug.—Glabrous, branched, tufted. Stems 3-8 in., 4-angled, creeping, fragile. Leaves ½-1 in. opposite, short-petioled. Flowers very minute, in almost all the leaf-axis, purplish. Calyx 12-ribbed, hemispheric; teeth triangular. Petals minute or 0. Stamens 6 or 12. Capsule globose.—Distrib. Europe, N. Africa.

Order XXXII. ONAGRA'RIÆ.

Herbs (rarely shrubs or trees). Leaves opposite or alternate, exstipulate. Flowers regular. Calyx superior; lobes 2-4, valvate in bud. Petals 2-4, rarely 0, perigynous, fugacious, twisted in bud. Stamens 1-8, 1-2-seriate, sometimes declinate; anthers oblong. Disk epigynous and coating the calyx-tube. Ovary 4- (rarely 1-6-) celled; style filiform, stigma entire or 4-lobed; ovules 1 or more in the inner angle of each cell, pendulous or ascending, anatropous. Fruit a drupe, berry, or capsule. Seeds 1 or more, smooth papillose or hairy, albumen 0 or very scanty; embryo ovoid, cotyledons plano-convex.—Distrib. Temp. regions, rarer in tropical; genera 22; species 300.—Affinities. With Lythraceae and Melastomaceae. Properties unimportant.

Petals 4, pink or purple. Stamens 8.................................1. Epilobium.
Petals short or 0. Stamens 4.................................2. Ludwigia.
Petals 4, yellow. Stamens 8.................................2*. Enothera.
Petals 2, white. Stamens 2.................................3. Circæa.

1. Epilóbium, L. Willow-herb.

Herbs or under-shrubs, stolons creeping. Leaves alternate or opposite. Flowers solitary, axillary, or in terminal leafy spikes, pink or purple, rarely yellow. Calyx-tube long, slender; limb 4-partite, deciduous. Petals 4, usually 2-lobed. Stamens 8, the alternate shorter. Ovary 4-celled; style filiform, stigma obliquely clavate or 4-lobed; ovules many, 2-seriate, ascending. Capsule elongate, 4-celled, loculicidally 4-valved; valves separating from a 4-winged seed-bearing axis. Seeds broadest above, tipped with a long pencil of hairs, minutely tubercled.—Distrib. Arctic, temp. and cold regions, abundant in New Zealand; species 50.—Étym. ἐπί and λόβων, from the position of the corolla, &c., on the pod.

Hybrids abound in this genus; the following are proved or suspected:

lanceolatum with obscurum; parviflorum with montanum; obscurum with parviflorum and palustre; palustre with alsinefolium; and parviflorum with tetragonum. Many others occur on the Continent.

1. **E. angustifolium**, *L.*; stem tall simple, leaves lanceolate. **Rose-bay or French Willow.**

Banks and copses from Shetland to Devon and Kent; ascends to 2,700 ft. in the Highlands; Ireland; Channel Islands; fl. July–Aug.—Glabrous, inflorescence pubescent. **Stem** 2–4 ft., erect, terete. **Leaves** 3–6 in., petioled, alternate, obscurely toothed, glaucous beneath. **Racemes** elongate. **Flowers** 1 in. diam., bracteate, dark rose-purple, honeyed, protérandrous. **Petals** obovate-spathulate, 2 lower smaller. **Style** bent down, stigmas 4, erect then revolute. **Capsule** 2–4 in. **Seeds** obovoid.—**Distr.** Temp. and Arctic Europe, N. and W. Asia to the Himalaya, and America.

**E. brachycarpum**, Leight., with stem 4–6 ft., buds very oblique, capsules 1–1 ½ in., is the cultivated form, sometimes found as an escape.

**SECTION 2. Lysimachion.** **Flowers** regular, corolla campanulate or funnel-shaped. **Calyx-lobes** connate at the base. **Stamens** erect.

* Stem terete. **Stigma** 4-cleft, lobes erect or revolute.

2. **E. hirsutum**, *L.*; glandular-pubescent and hirsute, leaves opposite oblong-lanceolate ½-amplexicaul serrulate, buds erect. **Codlins-and-cream.**

Sides of ditches and rivers, from Sutherland southd.; ascends to 1,200 ft. in Derby; Ireland; Channel Islands; fl. July–Aug.—Odorous. **Stolons** subterranean, thick, fleshy, scaly, leafless. **Stems** 3–5 ft., terete with raised lines from the leaf-bases. **Leaves** 3–5 in., teeth incurved. **Flowers** very many, ¼–¾ in. diam., rose-purple, homogamous. **Petals** broad, notched. **Filaments** bearded at the base. **Stigma-lobes** revolute. **Capsule** 2–3 in.—**Distr.** Europe, N. Africa, N. and W. Asia, Himalaya; introd. in N. America.

3. **E. parviflorum**, Schreb.; villous pubescent or glabrate, leaves mostly alternate sessile lanceolate obscurely toothed, buds erect.

Ditches and river-banks, from Ross and the Hebrides southd.; Ireland; Channel Islands; fl. July–Aug.—**Stolons** autumnal, with subsessile rosulate leaves. **Stem** 1–3 ft., terete, branched above. **Leaves** 1–2 in., linear or oblong-lanceolate, rounded at the base. **Flowers** ½ in. diam., many, rose-purple, honeyed, homogamous. **Stigma-lobes** short, not revolute. **Capsule** 1 ½–2 in., nearly glabrous or pubescent.—**Distr.** Europe, N. Africa, Himalaya.

**E. rivulare**, Wahl., is an almost glabrous variety; and **E. intermedium**, Merat, has most or all the leaves alternate.

4. **E. montanum**, *L.*; stem glabrous or pubescent, leaves mostly opposite glabrous oblong-ovate acute toothed, buds drooping.

Shady banks, walls and cottage roofs, from Shetland southd.; ascends to near 1,700 ft. in the Lake district; Ireland; Channel Islands; fl. June–July.—**Stolons** autumnal, subterranean and fleshy, or subaerial with suberect rosulate leaves. **Stem** 6–24 in., erect, slender. **Leaves** 1–3 in., sometimes petioled, or whorled in threes. **Flowers** ¼–½ in. diam., pale purple, homogamous. **Stigma-lobes** short, not revolute. **Capsule** 2–3 ½ in., finely pubescent.—**Distr.** Europe (Arctic), N. and W. Asia, Himalaya.
5. **E. lanceola'tum**, Sebast. and Maur.; finely pubescent, leaves mostly alternate petioled oblong-lanceolate toothed, buds inclined.


**Stem often more or less 2–4 angled, or with 2–4 raised lines. Stigma oblique clavate.**

6. **E. ro'seum**, Schreb.; pubescent above, stem with 2 or 4 raised lines, leaves petioled mostly alternate ovate-oblong narrowed above and below toothed glabrous, buds inclined acuminate.


7. **E. tetrago'num**, L.; pubescent above, stem usually with 2 or 4 raised lines, leaves sessile oblong- or ovate- or linear-lanceolate toothed, buds erect acute.

Wet places, from the Orkneys southd.; ascends to 2,100 ft. in the Highlands; Ireland; Channel Islands; fl. July—Aug.—**Stem** 1–2 ft., erect, branched, rather tough, obtusely angled or with 2 or 4 raised lines or almost terete. *Leaves* 1–3 in., narrow, lower or all below the branches opposite, rarely slightly petioled, base decurrent. *Flowers* ¼–½ in., erect, rose-lilac. *Pods* 2–4 in.—**Distrib.** Europe (Arctic), N. and S. temp. zones, Himalaya.

**E. tetrago'num** proper; stolons autumnal with rosulate leaves, leaves linear-oblong or -lanceolate shining above, capsule 2–4 in. slightly incurved.

Sub-sp. **E. obscu'rum**, Schreb.; stolons aestival with few distant pairs of opposite leaves, leaves ovate-lanceolate not shining above, capsule 1–2 in. suberect or rather spreading. **E. virgatum**, Gren. and Godr.—The most common form; ascends to 1,500 ft. in Derby.

8. **E. palus'tre**, L.; finely pubescent above, stem terete without raised lines, leaves subsessile mostly opposite lanceolate from a cuneate base, buds nodding obtuse, seeds fusiform, testa produced at the tip.

Bogs and ditches, from Shetland southd.; ascends to near 2,000 ft. in Yorkshire; Ireland; Channel Islands; fl. July—Aug.—**Stolons** aestival, subterranean, filiform, scaly, bearing in autumn scaly buds. *Stem* 6–24 in., with often two lines of pubescence. *Leaves* 1½–2½ in., almost all opposite, flaccid, spreading, scarcely toothed, tip narrowed but obtuse. *Flowers* horizontal, ¼ in. diam., rose-lilac. *Capsule* 2–2½ in., pubescent. *Seeds* much narrower than in all preceding species, with a distinctly produced testa.—**Distrib.** N. temp. and Arctic zones, Himalaya.—**Var.** *ligul'a* Baker, with leaves lanceolate faintly toothed, and seeds shorter, is a hybrid with *obscurum.*


2. **Ludwig'ia**, L.

Annual or perennial herbs, sometimes aquatic. Leaves opposite or alternate, quite entire. Flowers usually axillary solitary and sessile; peduncles 2–bracteate. Calyx-tube cylindric or angled or turbinate; lobes 3–5, persistent. Petals 3–5 or 6, and stamens (3–5) inserted under the margin of an epigynous disk. Ovary 4–5-celled; style short, stigma 3–5-lobed; ovules many, in many series, on prominent axile placentas. Capsule septicedial or dehiscing by terminal pores, or irregularly rupturing longitudinally. Seeds minute.—Distrib. Temp. and warm regions, chiefly of N. America; species 20.—Etym. C. G. Ludwig, a Leipsic botanist.

**L. palustris**, Elliot; leaves all opposite ovate or elliptic. *Is-|nar'dia*, L.


2*. **Œnothe'ra**, L. **Evening Primrose**.

Herbs, rarely shrubby. Leaves alternate. Flowers axillary, solitary or in leafy spikes or racemes, large, yellow red or purple, honeyed. Calyx-tube elongate, 4-angled; limb cylindric, 4-lobed, deciduous. Petals 4.
Stamens 8; anthers usually long. Ovary 4-celled; style filiform, stigma capitate entire or 4-lobed; ovules many, 1–2-seriate, horizontal or ascending. Capsule 4- rarely 1-celled, splitting from the top downwards into 4 septiferous valves, usually leaving the seeds on the axis, sometimes indehiscent. Seeds many or few, sometimes appended.—DISTRIB. Temp. N. and S. America, rarely tropical; one Tasmanian; species 100. —ETYM. obscure.

E. bienn'nis, L.; erect, leaves ovate-lanceolate, capsule oblong subcylindric.

E. odor'a'ta, Jacq.; erect, leaves linear-lanceolate waved, capsule elongate cylindric.

3. CIRCAE'A, Tourn. ENCHANTER'S NIGHTSHADE.
Slender erect herbs, with creeping rootstocks. Stem simple. Leaves opposite, petioled, toothed. Flowers small, white, in terminal and lateral peduncled racemes, honeyed. Calyx-tube ovoid; limb 2-parted, reflexed, deciduous. Petals obcordate and stamens 2, inserted under the margin of an epignous disk. Ovary 1–2-celled; style filiform, stigma capitate 2-lobed; ovules 1 in each cell, ascending, placentas axile. Fruit ovoid or pyriform, 1–2-celled, indehiscent, covered with hooked bristles, cells 1-seeded. Seeds oblong, attached by the middle.—DISTRIB. Europe, temp. Asia, and N. America; species 2 or 3.—ETYM. Circe, the enchantress.

1. C. lutet'iana, L.; glandular-pubescent, leaves ovate faintly toothed not shining, fruit broadly obovoid 2-seeded.
Damp woods, from Argyll and Aberdeen southd.; ascends to 1,200 ft. in Yorkshire; Ireland; Channel Islands; fl. June–Aug.—Stem 1–2 ft., erect or ascending, terete, subsimple; nodes swollen. Leaves 1–3 in., petiole almost as long, covered with translucent dots, rounded truncate or cordate at the base. Flowers ½ in. diam. in lax erect terminal racemes, white or pink, proterandrous; pedicels ½ in., slender, jointed at the base, patent, reflexed in fruit; bracts usually 0. Disk tumid. Fruit ½ in.—DISTRIB. Europe, N. Africa, N. and W. Asia to the Himalaya, N. America.

2. C. alp'i'na, L.; smaller, less hairy, leaves shining more deeply toothed, ovary less hispid, fruit 1-seeded.
ONAGRARIEÆ. [CIRCEA.]

Hilly districts from Gloster, N. Wales and Stafford to Sutherland; ascends to 1,300 ft. in the Lake district; Ireland; fl. July–Aug.—Usually a well-marked plant; comparatively stouter, 6–8 in.; leaves with longer and winged petiole; pedicels with minute subulate bracts, but supposed hybrids or intermediates are designated as C. lutetiana, var. intermedia, and C. intermedia, Ehrh., according to their affinities with one or the other parent.—Distrib. as C. lutetiana, omitting N. Africa, and extending to within the Arctic circle and to mountains of South India.

ORDER XXXIII. CUCURBITACEÆ.

Tribe Cucumerineæ.

Prostrate or climbing, annual or perennial herbs. Leaves alternate, exstipulate. Tendrils lateral, simple or divided. Flowers usually cymose, unisexual. Calyx superior, lobes 5, valvate in bud. Petals 5, inserted on the calyx-limb, distinct or connate below, valvate or induplicate in bud. Stamens 3; filaments and anthers distinct or connate, the latter adnate to the filaments, bursting outwards, one 1-celled, two 2-celled, cells straight or flexuous. Ovary inferior, 3-celled; placentas 3, fleshy, projecting to and confluent in the axis of the ovary and thence reflexed to its walls; style simple or divided, stigmas various; ovules 2-seriate, parietal, horizontal, anatropous. Berry 1-celled, many-seeded. Seeds usually flattened, testa coriaceous or crustaceous, albumen 0, embryo flattened, cotyledons plano-convex or foliaceous, radicle short.—Distrib. Of the Tribe, chiefly Indian and African; genera 50; species 360.—Affinities. With Passifloræ.—The above Tribe comprises the mass of the Order.—Properties. Purgative and bitter, but many yield by cultivation esculent fruits.

1. Bryonia, L. Bryony.

Slender climbing perennial herbs. Leaves 3–5-angled or -lobed.—Male fl. in racemed corymbose or fascicled cymes. Calyx-tube campanulate, 5-toothed. Corolla rotate or campanulate, 5-partite. Filaments 3, rarely 5; anthers distinct or slightly cohering, cells flexuous.—Female fl. solitary or crowded, calyx and corolla of the male. Ovary ovoid or globose; style slender, 3-fid, stigmas simple or 2-lobed. Berry spherical, many or few-seeded. Seeds tumid or compressed.—Distrib. Temp. and trop.; species 12.—Etym. ῥυόνω, to shoot, from the rapid growth of the shoots.

B. dioica, L.; hispid, dioecious, leaves palmately 5-lobed.

ORDER XXXIV. **UMBELLIFERÆ.**

Herbs; internodes usually fistular. *Leaves* alternate, pinnately or 3-nately compound, rarely simple; petiole dilated at the base. **Inflorescence** of usually simple or compound umbels, with an involucre of whorled bracts at the base of the primary rays, and of bracteoles at the secondary; rarely capitate. *Flowers* small, usually honeyed and proterandrous, all 2-sexual and similar, or outer in each umbel male with large unequal petals and long stamens, inner female or 2-sexual. *Calyx* superior; limb 0 or 5-toothed. *Petals* 5, epigynous, usually obovate or obcordate, tip often inflexed, imbricate induplicate or valvate in bud, white, rarely pink yellow or blue. *Stamens* 5, at the base of the disk, filaments incurved; anthers versatile. *Disk* epigynous, usually of 2 lobes confluent with the bases of the styles. *Ovary* 2-celled; *styles* 2, erect or recurved, stigmas obtuse; ovules 1 in each cell, pendulous, anatropous, raphe ventral. *Fruit* of 2 indehiscent, dorsally or laterally compressed carpels, separated by a commissure; carpels each 5- or 9-ridged, adnate to or pendulous from an entire or split slender axis (carpophore); pericarp often traversed by oil-canals (*vittae*). *Seed* pendulous, usually adherent to the pericarp, testa membranous, albumen copious dense; embryo minute, next the hilum, cotyledons ovate-oblong or linear, often very unequal.—**Distrib.** Chiefly N. Europe, N. and W. Asia, and N. Africa; genera 152; species 1,300.—**Affinities.** Intimate with *Araliaceæ* and *Corneæ.*—**Properties.** 1. Poisonous, acrid, watery sap in *Conium, Cicuta, Enanthe.* 2. Esculent in *Angelica, Samphire, Parsley, Celery,* &c. 3. Sugar and starch abound in *Carrot, Parsnip, Pig-nut.* 4. Milky fetid gum-resins in stems of *Asafoetida, Galbanum,* &c. 5. Essential oils in the fruit of *Anise, Dill, Caraway, Coriander,* and *Cummin.*—The ridges are normally 9 on each carpel; viz. 5 primary, of which 2 are lateral next the commissure, 1 dorsal, 2 intermediate; and 4 secondary, alternating with these. The *vitta* occur between the ridges, rarely in them; normally there are 6 in each carpel, 4 between the primary ridges and 2 on the commissural face.

**Series I. HETEROSCIADIEÆ.** Umbels simple, or very irregularly compound, or flows capitatae. *Vitae* 0 or obscure. See 35. *Caucalis.*

**Tribe I. HYDROCOTYLEÆ.** Fruit laterally much compressed, commissure narrow...........................................1. *Hydrocotyle.*

**Tribe II. SANICULEÆ.** Fruit subterete, or dorsally compressed; commissure broad.


*Leaves* palmate. Bracts very large...............................................................2*. *Astrantia*


**Series 2. HAPLOZYGETÆ.** Umbels compound. Ridges subequal or primary the most conspicuous (except in 22*. *Coriandrum.*). *Vitae* usually obvious.

**Tribe III. AMMI'NEÆ.** Fruit laterally compressed; commissure narrow.

**Section I. SMYR'NIEÆ.** Fruit short, ovoid or didymous; ridges not winged. *Seed* grooved ventrally.

*Vitae* solitary in the furrows; ridges slender.......................4. *Physospermum.*
Vittæ several. Disk-lobes depressed; ridges elevated. 5. Conium.

Section 2. Ammi’æae proper. Fruit as in 1, but seed flat ventrally.
* Petals entire, tip acute or shortly inflexed. Vittæ 1–2.
Leaves compound. Flowers white, dioecious. 8. Trinia.
** Petals 2-lobed, tip long inflexed. Vittæ solitary in the furrows.
Calyx-teeth obsolete. Vittæ as long as the fruit. 10. Carum.
*** Petals as in *; but vittæ several in each furrow (except in Ægopodium).

* Vittæ many in each furrow, often faint. 16. Conopodium.
** Vittæ 0, or 1 in each furrow.
Fruit ½–1 in.; ridges almost winged. 17. Myrrhis.
Fruit 1–3 in.; ridges prominent. 18. Scandix.
Fruit ½ in.; ridges vanishing upwards. 19. Chaerophyllum.
Fruit ½–¾ in.; ridges 0 or obscure. 20. Anthriscus.

Tribe IV. SESELI’ÆE. Fruit globose or ovoid, not laterally compressed; commissure broad; lateral ridges distinct (except in 22*. Coriandrum), rarely winged, if so wings of opposite carpels not in contact.

Sub-tribe 1. SESELI’ÆE proper. Fruit subterete; ridges not thickened or corky.

Sub-tribe 2. Coriandrææ. Fruit globose; ridges low, secondary broadest. 22*. Coriandrum.

Sub-tribe 3. CACHRY’dææ. Fruit subterete; primary ridges acute; outer coat of pericarp lax. 23. Crithmum.

Sub-tribe 4. ÆNAN’THEÆÆ. Fruit subterete; primary ridges thick, lateral forming a corky rim round the carpel.
Bracteoles whorled. 24. Ænanthe.
Bracteoles unilateral. 25. Æthusa.

Sub-tribe 5. SCHULTZ’ÆEÆ. Fruit subterete; lateral ridges thickened or winged. 26. Silaus.

Sub-tribe 6. SELI’ÆÆ. Fruit dorsally compressed; primary ridges broad, thick.
Seed concave ventrally; vittæ several. 27. Meum.
Seed almost flat ventrally; vittæ many or obscure. 28. Ligusticum.
Seed biconvex; vittæ solitary in the dorsal furrows. 29. Selinum.
UMBELLIFERAE.


Tribe V. Peucedanæ. Fruit much dorsally compressed; lateral ridges broadly winged, wings of opposite carpels appressed (face to face); other ridges filiform. Styles short, stout.
Wings with thin margins; vittae as long as the fruit. ....31. Peucedanum.
Wings with thin margins; vittae club-shaped. ....32. Heracleum.
Wings with thick margins. ....33. Tordylium.

Series 3. Diplozyg'ieæ. Umbels compound (sometimes simple in Caucalis); secondary ridges more distinct than the primary (see also 22*. Coriandrum), spinous in the British genera.
Bracts pinnatifid or laciniate. Seed flat in front. ....34. Daucus.
Bracts entire or 0. Seed grooved in front. ....35. Caucalis.

Artificial Key to the Genera.

I. Leaves undivided.
Creeping. Leaves peltate ..................................................1. Hydrocotyle.

II. Leaves palmate, or simply 3-nately divided.
Umbels in dense heads. Fruit scaly. Leaves spiny. ....2. Eryngium.
Umbels many-rayed. Leaves 3-foliolate. ....31. Peucedanum (Imperatoria).
Bracts large, coloured. Leaves palmate ....2*. Astrantia.

III. Leaves simply pinnate, rarely compound at the base.
a. Fruit dorsally much compressed, winged.
Border of wings very thick. Petals pink. ....33. Tordylium.
Border of wings not thickened. Petals white. ....32. Heracleum.
β Fruit not much compressed, terete or didymous.
* Fruit spiny. Seed grooved ventrally. ....35. Caucalis.
** Fruit glabrous. Seed flat or nearly so ventrally.
† Petals entire.
Carpophore 2-partite ........................................10. Carum.
Carpophore entire or 2-fid. ........................................9. Apium.
‡‡ Petals notched or 2-lobed.
Ridges of fruit slender; vittae clavate, solitary, short ....11. Sison.
Ridges of fruit prominent; vittae several, long. ....15. Pimpinella.
Ridges of fruit slender; vittae several, long. ....13. Sium.

IV. Leaves 2-3-pinnate or 2-3-ternate.
A. Fruit terete or angled, not much dorsally compressed or flattened.
* Seed grooved ventrally, or with involute margins.
† Fruit muricate or prickly
Ridges of fruit elevated, with strong spines .................................. 35. Caucaulis.
Ridges obscure ............................................................... 20. Anthriscus.

†† Fruit smooth, glabrous, rarely pubescent.
† Fruit short, ovoid, subglobose, or didymous.
Flowers white.  Ridges filiform; vittae solitary ............ 4. Physospermum.
Flowers white.  Ridges thick, waved; vittae several ............... 5. Conium.
Flowers yellow.  Ridges stout, even; vittae several .............. 6. Smyrnium.

††† Fruit narrow, but not beaked.  Flowers white.
Ridges slender; vittae numerous .................................... 16. Conopodium.
Ridges obtuse; vittae solitary ....................................... 19. Chærophyllum.
Primary ridges winged; vittae 2-3 .................................. 27. Meum.

†††† Fruit narrow, beaked.  Flowers white.
Beak short; ridges sharp............................................... 17. Myrrhis,
Beak long; ridges obtuse............................................ 18. Scandix.
Beak moderate; ridges obscure ...................................... 20. Anthriscus.

** Seed flat ventrally or nearly so.  (Fruit short in all.)
† Petals white, entire, with an incurved point.
Ridges stout, sharp; vittae numerous ............................... 23. Crithmum.

†† Petals yellow, entire or with an incurved point.
Ridges slender; carpophore 2-partite ............................ 10. Carum.
Dioecious.  Vittae within the stout ridges ...................... 8. Trinia.
Bracteoles 0.  Vitta solitary ....................................... 22. Foeniculum.

††† Petals white, obcordate, notched or 2-lobed.
† Calyx-teeth distinct.
Fruit didymous; ridges depressed; vittae solitary ............ 12. Cicuta.
Fruit subterete; ridges depressed; vittae 1-2 .............. 21. Seseli.
Fruit globose; ridges obscure; vittae 0 ......................... 22*. Coriandrum.
Fruit subterete; ridges stout; vittae solitary ................. 24. Enanthe.

†† Calyx-teeth obscure or 0.
Fruit covered with hooked bristles.............................. 34. Daucus.
Bracts and bracteoles linear ........................................ 10. Carum.
Bracteoles 0.  Ridges slender; vittae 0; styles slender..... 14. Sicopodium.
Bracts and bracteoles unilateral, deflexed ................... 25. Ethusa.
Bracts few or 0, bracteoles many.  Ridges almost winged... 28. Ligusticum.

B. Fruit much dorsally compressed, broadly winged.
* Lateral wings of the opposite carpels closely contiguous.
Petals white, notched.  Wings thin, vittae club-shaped ...... 32. Heracleum.
Petals variou Wings thin, vittae long ....................... 31. Peucedanum (proper).
Petals white.  Wings with a thickened border.................. 33. Tordylium.
1. HYDROCOTYLE, L. WHITE-ROT, PENNY-WORT.

Small perennial herbs, often creeping. Leaves entire, lobed, or 3-5-foliolate. Umbels usually simple; bracts few or 0. Calyx-teeth 5 or obsolete. Petals not inflexed, valvate or imbricate in bud. Fruit much laterally compressed; commissure narrow, carpophore undivided 2-fid or 0; carpels nearly orbicular, with 1-5 ridges on each side; vittae 0 or slender; styles filiform, on the flattened disk.—Distrib. Temp. and trop.; species 76.—Etym. ðwop and κορέλη, from the cupped peltate leaf.

** Lateral wings of opposite carpels with a space between them.

Bracts deciduous. Fruit large .................................................. 30. Angelica.
Bracts 0. Fruit small .......................................................... 29. Selinum.

H. vulgaris, L.; leaves orbicular peltate crenate, petiole hairy.
Marshes, bogs, &c., from Shetland south. ; ascends to 1,000 ft. in the Lake district; Ireland; Channel Islands; fl. May-Aug.—Stem filiform, white, creeping, rarely floating. Leaves ½-2 in. diam., 1 or more at the nodes; petiole 2-6 in. Umbels axillary, shortly peduncled. Flowers small, capitate, pinkish-green; bracts minute, triangular, concave. Fruit § in. diam.; carpels covered with resinous points, with 2 ridges on each face.—Distrib. Europe, W. Asia, N. Africa.

2. ERYNGIUM, L. ERYNGO.

Rigid, branched, often glaucous, perennial herbs. Leaves spinous-toothed, lobed or cut. Flowers sessile, in very dense bracteolate heads, surrounded at the base by a whorl of rigid bracts. Calyx-tube scaly; teeth rigid, acute, longer than the petals. Petals narrow, deeply notched, point long inflexed. Disk concave, crenulate. Fruit ovoid; commissure broad, carpophore 0; carpels ½-terete, primary ridges obscure 1-vittate; styles filiform, slender, erect. Seeds flat or subconcave ventrally.—Distrib. Temp. and sub-trop. regions, chiefly S. American; species 100.—Etym. uncertain.—Very slender vittae often occur in the endocarp.

E. maritimum, L.; very glaucous, radical leaves suborbicular 3-lobed spinous, cauline plicate. Sea Holly.
Sandy shores, from Aberdeen and Argyll south.; Ireland; Channel Islands; fl. July-Aug.—Rootstock creeping, stoloniferous. Stems 1-2 ft., stout, 3-chotomously branched. Radical leaves 2-5 in. diam., margins cartilaginous. Heads about 3 together, ½-1 in. diam., at length ovoid. Primary involucre of 3 bracts; partial of 5-7 ovate spinous-serrate bracts; bracteoles 3-fid, equalling the flowers. Flowers ½ in. diam., bluish-white.—Distrib. Shores of Atlantic, Mediterranean and Black Seas.—Roots formerly candied as a sweetmeat.

E. campestre, L.; pale green, radical leaves pinnately 3-5-foliolate, cauline 2-pinnatifid.
Reported wild in Kent, and formerly in Suffolk; supposed to be introduced at Plymouth, Weston-super-Mare, the Tyne, Waterford, &c.; Channel

2*. Astrantia, L.

Erect herbs. Rootstock short, creeping. Leaves palately lobed or cut. Umbels simple or irregularly compound; bracts many, radiating, often coloured; flowers polygamous, males on shorter pedicels. Calyx-limb campanulate; teeth exceeding the petals, with long points. Petals notched; point long, inflexed. Disk cup-shaped. Fruit ovoid or oblong, nearly terete; commissure broad, carpophore 0; carpels dorsally compressed, primary ridges equal, with plaited wrinkled or toothed inflated ribs, furrows 1-vittate; styles filiform.—Distrib. Europe, W. Asia; species 4 or 5.—Etym. ἀστρόν, from the star-like umbels.

A. major, L.; leaves with 3-7 ovate-lanceolate serrate lobes.


Slender, erect, perennial herbs. Rootstock stout, short, creeping. Leaves palately cut. Umbels small, subglobose, irregularly compound; bracts leafy; bracteoles few; flowers polygamous. Calyx-teeth as long as the petals, subherbaceous, pungent. Petals minute, deeply notched, point long inflexed. Disk dilated. Fruit ovoid; covered with hooked prickles; commissure rather broad, carpophore 0; carpels ½-terete, ridges inconspicuous, furrows 1-vittate; styles filiform. Seed flat ventrally.—Distrib. N. temp. regions; species 10.—Etym. sano, to heal.

S. europaea, L.; fertile flowers subsessile, males pedicellated.

Copes, &c., from Caithness southd.; ascends to 1,000 ft. in N. England; Ireland; fl. June-July.—Glabrous. Stem 1-2 ft., simple, almost leafless. Radical leaves 1-3 in. diam., long petioled, suborbicular, 3-5-lobed or -partite; lobes cuneate, cut, acutely serrate. Umbel ½-4 in. diam., irregular, rays few; bracts 2-5, unequal, simple or pinnatifid, serrate. Flowers pink or white, outer male, central few proterandrous. Fruit ¾ in.; styles spreading.—Distrib. Europe, Himalaya and S. India, N. and trop. Africa.


Erect, perennial herbs; root fusiform. Leaves 3-nately compound, segments cuneate. Umbels compound; bracts and bracteoles few, linear; flowers white. Calyx-teeth small or 0. Petals with a long inflexed point. Disk-lobes conical. Fruit didymous, bladdery, broader than long; commissure narrow, carpophore simple; carpels terete, smooth, primary ridges slender, furrows 1-vittate. Seed loose, concave ventrally.—Distrib.
Europe, W. Asia; species 2 or 3.—Etym. φόσα and σπέρμα, from the bladdery fruits.

**P. cornubien'se, DC.**; branches panicked, umbels long-peduncled.

Thickets, S. Devon and Cornwall; fl. July–Aug.—Glabrous except the puberulous margins and ribs of the leaf. **Stem** 1–2 ft., erect, striate. **Radical leaves** long-petioled, flat, 2–3-ternate; segments 1/3–1/2 in., deeply laciniate, long petioled. **Umbel-rays** 10–20, 1–3 in., suberect, furrowed.—Regarded by Nyman and others as a sub-species of the S. European and Oriental *P. aquilegifolium*, Koch.—**Distrib.** S. of France and Spain eastward.

**5. CONJ'UM, L.** Hemlock.

Tall, glabrous, biennial herbs. **Leaves** pinnately compound. **Umbels** compound, many-rayed; bracts and bracteoles many, small; flowers white, polygamous. **Calyx-teeth** 0. **Petals** obtuse, or the tip shortly inflexed. **Disk** depressed. **Fruit** broadly ovoid, laterally compressed; commissure constricted, carpophore undivided; carpels 5-angled, primary ridges prominent obtuse, lateral distinct; vittae many, slender, irregular; styles short, reflexed. **Seed** deeply grooved ventrally.—**Distrib.** Europe, Asia, N. Africa; species 2.—**Etym.** The old Greek name.

**C. macula'tum, L.**; stem spotted, leaf-segments pinnatifid.

Banks, roadsides, &c., from Orkney southd.; ascends to near 1,000 ft. in Yorkshire; Ireland; Channel Islands; fl. June–July.—**Foetid.** **Stem** 2–5 ft., stout, leafy, furrowed, purple-spotted, paniculately branched above. **Leaves** large, deltoid, finely 2-pinnate; segments 1/2 in., ovate oblong or deltoid, flaccid, lower petioled, ultimate serrate. **Umbels** terminal and axillary, shortly peduncled; bracts reflexed, short, unilateral; rays 10–20, 1/2–1 in.; first open flowers small male, later larger female. **Fruit** 1/2 in., greenish-brown.—**Distrib.** Europe, N. Africa, N. and W. Asia; introd. in N. America.

**6. SMYRN'UM, L.** Alexanders.

Stout, erect, glabrous, biennial or perennial herbs. **Radical leaves** 3-nately compound, segments broad. **Umbels** compound; bracts and bracteoles few or 0; flowers yellow, polygamous. **Calyx-teeth** minute or 0. **Petals** with a short inflexed point. **Disk-lobes** conical or depressed. **Fruit** ovoid, laterally compressed or didymous; commissure much constricted, carpophore 2-partite; carpels subterete or angular, with 3 prominent ribs; vittae many; styles short, recurved. **Seed** deeply grooved ventrally.—**Distrib.** Europe, W. Asia, N. Africa; species 6 or 7.—**Etym.** The old Greek name.

**S. Olus'a'trum, L.**; cauline leaves petioled 3-foliolate serrate.

Waste places, especially near the sea and amongst ruins, from Aberdeen and the Clyde southd.; Ireland; Channel Islands; a doubtful native; fl. April–June.—Shining. **Root** stout, biennial. **Stem** 1–3 ft., solid, furrowed, panicked, branches often opposite. **Petioles** large, sheathing, margins hairy. **Leaflets** 1 1/2–2 in., broadly obovate or ovate, obtusely serrate or lobed. **Umbels** lateral
and terminal, subglobose; rays few or many, long or short. *Fruit* \( \frac{1}{2} \) in., dark brown; ridges variab'le in prominence and number; outer coat of the pericarp often loose; vittae adhering to the inner.—*DISTRIB.* From Holland southd., native only in Mediterranean region, *Ball.*—Formerly cultivated as a pot-herb.

7. BUPLEURUM, L. HARE'S-EAR.

Annual or perennial, glabrous herbs or shrubs. *Leaves* simple, quite entire. *Umbels* compound, many-rayed, or irregular and few-rayed; bracts and bracteoles many and leafy, or few and small, or 0; flowers yellow, sessile or pedicelled. *Calyx-teeth* 0. *Petals* hooded, with an inflexed point. *Disk-lobes* tumid or dilated. *Fruit* laterally compressed; commissure broad, carpophore 2-fid; carpels 5-angled, primary ridges prominent or winged or 0; vittae 0 or 1 or more in the furrows, continuous or interrupted; styles short, reflexed. *Seed* suberete, flat concave or deeply grooved ventrally.—*DISTRIB.* Europe, temp. Asia, N. and S. Africa, N.W. America; species 60.—*ETYM.* obscure.

1. **B. rotundifo'lium**, L.; annual, stem fistular, leaves perfoliate.

Chalky fields, rare, E. and S. counties, from York to Kent and Somerset; fl. June–July.—Glaucous. *Stems* 8–18 in., simple or branched above, terete. *Leaves* 1–2\( \frac{1}{2} \) in., lower oblong, upper suborbicular apiculate; nerves radiating. *Bracts* 0; bracteoles 3–5, ovate, leafy, longer than the many short rays, connate at the base, suberect in fruit. *Fruit* broad, \( \frac{1}{2} \) in.; vittae 0; ridges slender.—*DISTRIB.* Europe, W. Asia; introd. in N. America.

2. **B. falca'tum**, L.; perennial, stem erect slender fistular, leaves oblong-lanceolate, nerves many parallel, upper broader \( \frac{1}{2} \)-amplexicaul.

Hedgerows and fields, Surrey and Essex; a doubtful native; fl. Aug.—*Root-stock* branched. *Stems* 1\( \frac{1}{2} \)–4 ft., simple or branched above. *Radical leaves* 1–3 in., acute; petiole \( \frac{3}{4} \)-amplexicaul; caudine recurved. *Umbels* very small; bracts 2–5, short, unequal; bracteoles 4–5, oblong, awned. *Flowers* minute. *Fruit* \( \frac{3}{4} \) in., narrow; ridges prominent; vittae in threes.—*DISTRIB.* From Belgium southd., W. Asia to India and Japan.


Waste places and salt marshes, local, from Durham to Devon and Kent; fl. Aug.–Sept.—*Stem* 6–18 in., erect or procumbent, flexuous, ribbed. *Leaves* \( \frac{1}{2} \)–1 in., rigid, lowest slightly dilated upwards. *Umbels* axillary, very small, racem'd or subspicate along the branches; bracts 3–5, unequal; bracteoles similar. *Fruit* broad, minute, granulate; ridges prominent; vittae 0.—*DISTRIB.* Europe, N. Africa, W. Asia.


Sandy and rocky banks, Devon, very rare, E. Sussex; Channel Islands; fl. July.—*Stem* 2–8 in., rigid, simple, or forked; branches stout, divaricate, ribbed. *Leaves* \( \frac{1}{2} \)–1 in. lowest sometimes petioloed. *Bracts* 3–5, concealing...
the umbels, rigid; nerves strongly reticulate; margins scarious. Fruit minute, oblong; ridges slender, smooth; vitæ solitary.—Distrib. From France southd. and eastd.

8. TRIN'IA, Hoffmann. Honewort.

Glabrous, branched herbs. Leaves pinnately compound. Umbels compound, few-rayed; bracts and bracteoles 1, 2, or 0; flowers white, usually diocious, males with narrower petals. Calyx-teeth 0 or small. Petals acute or with an inflexed point. Disk-lobes conical or depressed; margins undulate. Fruit broadly ovoid, laterally compressed or didymous; commissure narrow, carpophore 2-partite; carpels subterete or 5-angled, primary ridges subequal, thick, smooth rugose or plaited, with a large vitta in each. Seed terete.—Distrib. S. Europe and temp. Asia; species 8.—Etym. Dr. Trinius, a Russian botanist.

T. vulga'ris, DC.; glabrous, bracts 0 or solitary, ridges smooth. Pimpinella dioica, Sm. P. glauca, L., in part.

Limestone rocks, rare; S. Devon, N. Somerset; fl. May–June.—Glaucous. Root fusiform, biennial, fibrous at the top. Stem 3–6 in., branched from the base, solid, stout, deeply grooved; branches divaricate. Leaves spreading, petiole and linear segments very slender. Male umbels depressed; female irregular, rays longer; bract 3–left or 0; bracteoles 2–3, linear. Flowers minute. Fruit 1/10 in., ovoid; styles slender; segments of carpophore flattened.—Distrib. From Belgium southd. to Greece.


Annual or perennial, glabrous herbs. Leaves pinnate or 3-nately compound. Umbels compound, often leaf-opposed, or in the forks; bracts few or 0; bracteoles many or 0; flowers white. Calyx-teeth 0. Petals entire, acute, or with a short incurved point. Disk-lobes depressed or conical, margins entire. Fruit broadly ovoid, laterally compressed; commissure constricted, carpophore simple; carpels 5-angled, primary ridges equal prominent obtuse; vitæ solitary in the furrows. Seed subterete.—Distrib. Temp. and subtrop; species 14.—Etym. obscure.

Section 1. A'pium proper. Bracteoles 0. Petals much incurved.

1. A. grave'olens, L.; leaves pinnate or 3-foliolate. Wild Celery.


Section 2. Heloscia'dium, Koch (gen.). Bracteoles many. Petals nearly straight.—Aquatic or subaquatic.
2. A. nodiflorum, Reichb.; prostrate or creeping, leaves pinnate or 3-foliolate, leaflets slightly lobed serrate.

Marshy places, from Isla, the Clyde, and Fife southd.; Ireland; Channel Islands; fl. July-Aug.—Perennial. Stems 1–3 ft., slender. Leaflets $\frac{1}{4}$–$\frac{3}{8}$ in., very variable, sessile, oblong, crenate serrate or lobulate. Umbels leaf-opposed, sessile or shortly peduncled; rays unequal; bracts usually 0; bracteoles many, oblong, scarios. Flowers small. Fruit $\frac{1}{6}$ in.; styles short, divergent.—Distrib. From Belgium southd., W. and N. Asia, N. Africa.

A. nodiflorum proper; stem decumbent, flowering branches rooting at the base only, peduncles short, bracts 0 or 1–2.—Var. H. repens, Koch (Sium repens, Sm.); smaller, creeping, leaflets sharply toothed, peduncles long, bracts 2–3 unequal unilateral. Rather rare.—Var. ochrætum, DC.; dwarf, creeping, leaflets small obtuse, peduncles $\frac{1}{4}$–$\frac{1}{2}$ in., bracts 1–3 lanceolate. Barnes, Surrey.

3. A. inundatum, Reichb.; decumbent or floating, submerged leaves 2–3-pinnate, leaflets capillary rarely linear, floating leaves pinnate, lower leaflets deeply 3-cleft.

Wet places, local, from Orkney southd.; ascends to 1,600 ft. in Yorkshire; Ireland; Channel Islands; fl. June-July.—Perennial, flaccid, small, straggling. Stems 4–10 in., stout, flexuous. Leaflets of upper leaves $\frac{1}{4}$ in., cuneate, cut or lobed. Umbels very small, leaf-opposed, peduncles short, rays 2–4 unequal; bracts 0; bracteoles 4–6, lanceolate, 3-nerved. Flowers minute. Petals incurved. Fruit $\frac{1}{10}$ in., subsessile, elliptic-oblong; styles recurved.—Distrib. From Gothland southd. (excl. Greece).

10. CA'RUM, L. Caraway.

Annual or perennial, glabrous herbs. Leaves pinnate or decompound. Umbels compound, few- or many-rayed; bracts few or 0; bracteoles more numerous or 0. Flowers white or yellow, 2-sexual or polygamous. Calyx-teeth minute or 0, sometimes unequal. Petals with an inflexed point and usually very deep notch; of the male flowers often irregular. Disk-lobes conical. Fruit ovoid or oblong, often hispid, laterally compressed, hardly constricted at the commissure, carpophore 2-fid; carpels 5-angled, primary ridges obtuse equal, lateral close to the commissure; vittae 1 (rarely 2) in the furrows. Seeds $\frac{1}{3}$-terete.—Distrib. Temp. and subtrop.; species 50.

—Etym. The old Latin name.


1. C. verticillatum, Koch; root of fascicled fibres, leaves linear pinnate, leaflets sessile short whorled palmately multifid, segments capillary. Meadows in the W. counties, from Argyll to Devon and Cornwall, local; Ireland; Channel Islands; fl. July–Aug.—Root-fibres 1–2 in., thickened downwards. Stem 1–2 ft., erect, striate. Radical leaves 6–12 in., sub-cylindric; leaflets curved upwards, capillary-multifid. Umbels regular, flat-topped; rays 1–2 in., peduncles slender; bracts and bracteoles many, slender, short, reflexed. Flowers white or pink. Fruit ovoid; ridges
strong; vittæ large; styles recurved.—Distrib. W. Europe from Holland southd.

C. Car’ui, L.; root fusiform, leaves narrow triangular- or linear-oblong 2-pinnate, leaflets cut to the base into linear lobes, bracts 1 or 0, bracteoles 0. Caraway.


UMBELLIFERÆ.

11. SISON, L.

Characters of Ca'rum, but vittae very short, often obscure, occupying only the upper half of the fruit.—DISTRIB. West Europe, Italy, and the East; 2 species.—ETYM. unknown.

S. Amo'mum, L.; leaves pinnate or 2-pinnate below, upper smaller 3-lobed toothed or entire.

Moist places, hedgebanks, &c., from York and Chester southd., rare in N. England; (a native? Wats.); Channel Islands; fl. Aug.–Sept.—Biennial, glabrous, nauseous-smelling. Root fusiform. Stem 2–3 ft., erect, branched, slender, leafy, solid. Leaves 6–12 in., deltoid-oblong, leaflets 1–3 in., shortly petioled, linear-oblong or ovate, base cuneate. Umbels terminal and axillary, compound; rays few, slender, unequal; bracts and bracteoles 2–4, short, subulate, rarely 0. Flowers minute, white. Petals broadly obcordate, notch deep, point long inflexed. Fruit ovoid or subglobose; ridges strong; vittae very short, narrowed upwards; styles short, recurved; disk-lobes thick depressed. —DISTRIB. of the genus.—Closely resembles Ca'rum seget'tum.

12. CICUTA, L. WATER-HEMLOCK, COWBANE.

Tall, perennial, glabrous herbs. Leaves pinnate or decompound. Umbels compound, many-rayed; bracts few or 0; bracteoles many, small; flowers white. Calyx-teeth acute. Petals with an inflexed point. Disk-lobes depressed, entire. Fruit orbicular or broadly ovoid, constricted at the commissure, didymous, carpophore 2-partite; carpels slightly compressed, primary ridges thick broad flat; vittae solitary in the furrows. Seeds slightly convex ventrally.—DISTRIB. Marshes of the N. hemisphere; species 3.—ETYM. A Latin name of the Hemlock.


Watery places, from Dumbarton and Forfar to Suffork and Somerset; Ireland; Channel Islands; fl. July–Aug.—Rootstock short, stout, hollow, septate. Stem 2–4 ft., stout, leafy, furrowed. Leaves large, deltoid, 2–3-pinnate; petiole stout; leaflets 2–4 in., oblique. Umbels terminal and leaf-opposed, 3–5 in. diam., long-peduncled, flat-topped, rays long slender; bracts 0; bracteoles many, short, slender. Flowers minute. Calyx-teeth ovate. Fruit ½ in. broad, broader than long; styles slender, recurved.—DISTRIB. N. and Mid. Europe (Arctic), N. Asia, Himalaya.

13. SI'UM, L. WATER-PARSNIP.

Glabrous herbs. Leaves pinnate; leaflets toothed. Umbels compound, terminal or lateral; bracts and bracteoles many; flowers white. Calyx-teeth acute. Petals with an inflexed point. Disk-lobes thick, conical or depressed. Fruit ovoid or oblong, laterally compressed or constricted at the commissure, carpophore undivided; carpels 5-angled, primary ridges equal prominent obtuse or thickened, lateral next the commissure; vittae many, in the furrows. Seed subterete.—DISTRIB. N. temp. regions, S. Africa; species 4.—ETYM. unknown.
1. **S. latifo'lium**, _L._; leaflets regularly serrate, umbels terminal.

Watery places, from Stirling and Ayr to Kent and Devon; Ireland; Channel Islands; fl. July-Aug.—Rootstock short, stoloniferous. Stem 5–6 ft., erect, stout, fistular, grooved, branched above. Leaves large; leaflets 4–6, 2–6 in., sessile, linear- or oblong-lanceolate; submerged sometimes pinnatifid. Umbels large, flat-topped, rays many; bracts and bracteoles often foliaceous, large. Flowers small, outer rather larger. Fruit ½ in., broadly ovoid, ridges prominent; styles rather slender.—Distrib. Europe, N.W. Asia, N.W. America.


Wet places, from Elgin southd.; Wigton only in W. Scotland; Ireland; Channel Islands; fl. summer.—Rootstock creeping, stoloniferous, leafing at the nodes. Stem 1–3 ft., leafy. Leaves 4–8 in.; leaflets of lower leaves 5–10, 1–2 in., sessile, ovate-oblong; of cauline leaves fewer, smaller. Umbels with few and unequal rays; bracts irregularly cut. Fruit shorter than in _S. latifolium_, with more immersed vittae and conical disk-lobes.—Distrib. Europe.—_S. erectum_, Huds., is a rather earlier name, but less appropriate.


Stem stout, glabrous. Rootstock creeping. Leaves 2–3-ternate; leaflets broad. Umbels compound, many-rayed; bracts and bracteoles few or 0; flowers white. Calyx-teeth 0. Petals broad, unequal, point inflexed. Disk-lobes tumid; styles slender, reflexed. Fruit ovoid, laterally compressed, carpophore 2-fid; carpels 5-angled, primary ridges slender equal distant; vittae 0. Seed subterete.—Distrib. N. and Mid. Europe, W. Asia.—Etym. _alium_ and _pouς_, from the likeness of the leaf to a goat’s foot.


15. **PIMPINEL'LA**, _L._ Burnet-Saxifrage.

Perennial, rarely annual herbs. Leaves pinnate or 3-nately compound. Umbels compound; bracts 0; bracteoles few or 0; flowers white or yellow. Calyx-teeth small or 0. Petals deeply notched, point long inflexed. Disk-lobes thick, conical. Fruit ovoid or oblong, laterally compressed, constricted at the broad commissure, carpophore 2-fid; carpels 5-angled, primary ridges equal slender; vittae many in the furrows; styles short or long. Seed subterete, nearly flat ventrally, usually free from the pericarp.—Distrib. N. temp. regions, S. Africa, S. America; species 70.—Etym. _bipennula_, from the 2-pinnate leaves.
1. **P. Saxifraga**, L.; stem terete, radical leaves pinnate, leaflets sub- 
oborbicular, cauline 2-pinnate.

Dry pastures from Sutherland southd.; ascends to 1,800 ft. in Yorkshire; 
Ireland; Channel Islands; fl. July.—Perennial, glabrous or pubescent. 
*Rootstock* slender, hot, acrid. *Stem* 1–3 ft., slender, furrowed, branched. 
*Leaflets* 4–8 pair, very variable, serrate lobed or almost pinnatifid or finely 
cut (*P. dissecta*, Retz.); lobes of cauline much narrower. *Umbels* flat- 
topped. *Flowers* small, white. *Fruit* ½ in., glabrous, broadly ovoid; *styles* 
short, reflexed.—**Distrib.** Europe (Arctic), N. and W. Asia, Himalaya.

2. **P. major**, Huds.; stem angular, leaves all pinnate, leaflets of radical 
ovate subcordate, of cauline narrower. *P. magna*, L.

Busby waste places, local, from Perth southd. (E. Scotland only); rare in 
Ireland; fl. July–Aug.—Much larger than *P. Saxifraga*, but similar, 3–4 ft.; 
leaflets often 1–2 in., membranous and broad; styles longer and more 
slender; outer flowers 2-sexual, inner male.—**Distrib.** Chiefly W. and 
Mid. Europe, Caucasus.

16. **CONOPO'DIUM**, Koch. **Earth-nut, Pig-nut.**

*Umbels* compound, many-rayed; bracts and bracteoles 0 or membranous; 
flowers white, polygamous, outer sometimes radiating. *Calyx-teeth* obsolete. 
*Petals* of outer flowers often irregular, 2-fid, with an inflexed point. *Disk- 
lobes* conical or depressed. *Fruit* ovoid or oblong, often shortly beaked; 
commisure constricted, carpophore 2-fid; carpels subterete, primary 
ridges slender; *vitta* several in the furrows, often obscure or inter- 
rupted. *Seed* deeply grooved ventrally.—**Distrib.** Europe, N. Africa, 
temp. Asia; species 8.—**Etym.** κόνος and πούς, from the conical disk- 
lobes.

**C. denuda'tum**, Koch; leaf-lobes linear, bracts and bracteoles 0. 
*Bunium flexuosum*, With. **B. denudatum**, DC. *Carum flexuosum*, 
Fries.

Woods and fields, N. to Shetland; Ireland; Channel Islands; fl. summer.— 
Glabrous. *Rootstock* size of a chestnut, brown. *Stem* 2–3 ft., slender, 
terete, flexuous. *Leaves* 3-ternate, broadly deltoid; petiole slender; seg- 
ments pinnatifid, the central lobes largest. *Umbels* terminal, drooping when 
young, 6–10-rayed. *Flowers* small. *Fruit* ½ in., narrow-ovoid, ridges 
obscure; styles short, erect.—**Distrib.** W. Europe.—Very similar to *Carum 
Bulbocastanum*.

17. **MYR'RHIS**, Scop. **Cicely.**

Perennial, tomentose herbs. *Leaves* decompound. *Umbels* compound, 
many-rayed; bracts few or 0; bracteoles many, membranous; flowers 
white, polygamous. *Calyx-teeth* minute or 0. *Petals* with a very short 
inflexed point. *Disk-lobes* tumid. *Fruit* much elongate, beaked, com- 
missure broad, carpophore 2-fid; back of carpels very convex, primary 
ridges equal, hollow, often rough, prominent; *vitta* in the furrows
solitary, slender, or 0. Seed concave or deeply grooved ventrally.—DISTRIB. Mts. of Europe and temp. S. America; species 2.—ETYM. The old Greek name.

**M. odora'ta, Scop.**; leaves whitish beneath, bracteoles lanceolate.

Pastures, usually near houses, from S. Wales and Lincoln to Caithness; ascends to 1,200 ft. in Derby; not indigenous in Ireland; (a denizen or alien, *Wats.*); fl. May–June.—Sparingly and finely hairy. Root fleshy, fusiform. Stem 2–3 ft., leafy, terete, fistular, grooved, branched above. Leaves deltoid, 3-pinnate; leaflets pinnatifid, lobes serrate; sheaths large. Umbels terminal; bracteoles membranous, awned. Flowers small, outer only fertile, latest male only. Fruit 3/4–1 in., linear, dark brown, ridges often scabrid; styles very slender, diverging.—DISTRIB. From France southd. and eastd. to Caucasus.—Aromatic and stimulant; once cultivated as a pot-herb, still used in salads in Italy.

**18. SCAN'DIX, L. SHEPHERD'S NEEDLE.**

Annuals. Leaves pinnately decompound; segments small. Umbels simple or compound; bracts 1 or 0; bracteoles entire or cut; flowers white, polygamous, outer often radiating. Calyx-teeth minute or 0. Petals often unequal, point short infl exed or 0. Disk dilated, undulated. Fruit slender, subcylin dric, produced into a long beak, carpophore undivided or 2-fid; carpels subterete, primary ridges broad or filiform, secondary 0; vittae solitary in the furrows, often obscure. Seed deeply furrowed ventrally.—DISTRIB. Europe, N. Africa, temp. Asia; species 8 or 10.—ETYM. The Greek name for a Chervil.

**S. Pecten-Ven'eris, L.;** fruit ciliate rough dorsally compressed.

A cornfield weed from Caithness southd.; ascends to 1,000 ft. in Yorkshire; Ireland; Channel Islands; (a colonist, *Wats.*); fl. June–Sept.—Branched from the base, pubescent with spreading hairs, branches 6–18 in., rarely more. Leaves oblong, 2–3-pinnate, segments very slender. Umbels terminal and lateral; rays 1–2; bracteoles many, green, sometimes leafy at the point. Flowers very irregular. Fruit 1–3 in., very slender, scabrid; styles very short.—DISTRIB. Europe, N. Africa, W. Asia to N.W. India.

**19. CHÆROPHYL'UM, L. CHERVIL.**

Herbs, often hairy. Leaves pinnately, rarely 3-nately decompound. Umbels compound, many-rayed; bracts 1–2 or 0; bracteoles many; flowers white, rarely yellow, often polygamous. Calyx-teeth subulate or 0. Petals with a long or short infl exed point. Disk-lobes small. Fruit oblong or linear, not beaked, laterally compressed, commissure constricted, carpophore undivided or 2-fid; carpels subterete, primary ridges equal obtuse; vittae solitary in the furrows. Seed deeply grooved ventrally.—DISTRIB. N. temp. regions, species 30.—ETYM. χαρώ and φύλλον, from the agreeable odour of the leaf.

**C. tem'ulum, L.;** stem swollen below the nodes purple-spotted, fruit glabrous, bracteoles reflexed. **C. temulentum, Sm.**
Fields and waste places from Caithness southd.; ascends to 1,200 ft. in Yorkshire; rare in Ireland; Channel Islands; fl. June-July.—Perennial, laxly hairy. Stem 1-3 ft., slender, solid, grooved, leafy, branched. Leaves deltoid, 2-pinnate, petioles and peduncles very slender; leaflets ovate, membranous, pinnatifid, crenate. Umbels lateral, drooping when young; rays unequal, slender; bracteoles small, oblong-lanceolate. Flowers small, white. Fruit ¼ in., ovoid, narrowed upward, not beaked; styles very short, spreading.—Distrb. Europe, Caucasus, N. Africa.

20. ANTHRIS'CUS, Hoffm. BEAKED-PARSLEY.

Annual or biennial, hairy herbs. Leaves deltoid, pinnately or 3-nately decompound. Umbels compound; nodding when young; bracts 1, 2, or 0; bracteoles many, entire; flowers white, often polygamous. Calyx-teeth minute or 0. Petals with an inflexed point. Disk-lobes conical or depressed. Fruit ovoid or oblong, shortly beaked, commissure constricted, carpophore undivided or 2-fid; carpels sub- or ½-terete, primary ridges confined to the smooth or rough upper part; vittae very slender, solitary in the furrows, or 0. Seed deeply grooved ventrally.—Distrb. Temp. Europe, Asia, N. Africa, N.W. America; species 10. Etym. diminutive of ἀβρῆνος, small-flowering.

1. A. vulgaris, Pers.; stem glabrous, umbels peduncled leaf-opposed, fruit mucrurate. Scandix Anthriscus, L.; Charophyllum Anthriscus, Lamk. Hedgebanks and roadsides, N. to Shetland; rather rare in Ireland; Channel Islands; fl. May-June.—Sparingly hairy. Stem 2-3 ft., branched, leafy, fistular, swollen below the nodes. Leaves 3-pinnate; leaflets ovate, pinnatifid; segments short, obtuse. Umbels of unequal rays; bracts 0; bracteoles short, oblong. Flowers minute. Fruit ½ in., ovoid, mucrurate, beak short glabrous, pedicel with a ring of hairs at the tip; styles very short.—Distrb. Europe, N. Africa, Siberia, W. Asia.—Formerly cultivated as a pot-herb.

2. A. sylvestris, Hoffm.; stem hairy below, umbels peduncled terminal, fruit glabrous. Charophyllum sylvestre, L. Hedgebanks and woods, N. to Shetland; Ireland; Channel Islands; fl. April-June.—Hairy. Stem 2-3 ft., stout, erect, leafy, fistular, furrowed. Leaves 2-3-pinnate; leaflets pinnatifid, ovate, coarsely serrate. Bracts 0; bracteoles oblong-lanceolate, ciliate, green, spreading or reflexed, often pink. Flowers white. Fruit ¼-½ in.—Distrb. Europe (Arctic), Caucasus, N. Asia, N. Africa.

A. CEREFO'LIUM, Hoffm.; stem hairy above the nodes, umbels sessile lateral and leaf-opposed, fruit glabrous. Scandix, L.; Charophyllum sativum, Gärtn. Chervil.

Waste places, rare; always an escape from cultivation; fl. May-July.—Habit of A. vulgaris, but stouter, leaflets broader and flowers larger. Fruit ½ in., very narrow.—Distrb. E. Europe, W. Siberia, W. Asia.—Root reputed poisonous.
21. SES'ELI, L.

Biennial or perennial, erect, branched herbs. Leaves 2–3-pinnate or decompound. Umbels compound; bracts many, few, or 0; bracteoles many, entire; flowers white. Calyx-teeth prominent or minute. Petals notched, point long inflexed. Disk depressed or conic, undulate or crenate. Styles very short. Fruit ovoid or oblong, subterete, commissure broad, carpophore 2-partite; carpels dorsally compressed, primary ridges prominent; vittae 1 rarely 2 in the furrows. Seed flat ventrally.—Distrib. Europe, N. Asia, N. Africa, Australia; species 40.—Etym. A Greek name.

S. Liban'otis, Koch; glabrous or slightly pubescent, leaves 2-pinnate, leaflets pinnatifid. Athamanta, L.; Libanotis montana, All.


22. POENIC'ULUM, Adanson. Fen'nel.

Tall, glabrous, biennial or perennial herbs. Leaves pinnately decompound, segments slender. Umbels compound; bracts and bracteoles 0; flowers yellow. Calyx-teeth 0. Petals with a short obtuse point. Disk-lobes large, conical, entire. Styles short. Fruit ovoid or oblong, subterete, commissure broad, carpophore 2-partite; carpels 1⁄2-terete, primary ridges stout; vittae solitary in the furrows. Seed furrowed, flat or subconcave ventrally.—Distrib. S. Europe, E. Asia, N. Africa; species 4.—Etym. The old Latin name.

F. officina'le, All.; leaves shortly petioled, segments slender. F. vulgare, Gärtn.

Sea-cliffs, perhaps native from N. Wales and Norfolk to Cornwall and Kent, not N. of it, nor in Ireland; Channel Islands; fl. July–Aug.—Perennial. Stem 2–3 ft., terete, striate, polished, almost solid. Leaves much divided; segments very many, linear. Umbels large, glaucous; rays very many. Flowers small. Fruit 1⁄10 in. long, ovoid.—Distrib. From Belgium southd. N. Africa, W. Asia to India.

22*. CORIAN'DRUM, L. Cori'an'der.

An annual, slender, branched, glabrous herb. Leaves pinnately decompound. Umbels compound; rays few; bracts 0; bracteoles few, filiform; flowers white or pink, outer often irregular. Calyx-teeth acute. Petals 2-lobed, point inflexed. Disk-lobes conical. Fruit subglobose or ovoid, carpophore 2-fid; carpels 1⁄2-terete, ridges depressed slender, secondary broadest; vittae obscure, solitary under each secondary ridge. Seed globose, dorsally compressed, top and base incurved.—Distrib. S. Europe, N. Africa, W. Asia; species 2.—Etym. kōps, from the bug-like smell.
C. sativum, L.; leaflets of lower leaves ovate lobed and crenate.
Waste places in S. and E. of England; an escape from cultivation; fl. June.—

Stem 1–2 ft., slender, erect, fistular. Leaves membranous, lowest 1–2- upper
2–3-pinnate with narrow leaflets. Umbel peduncled, rays 5–10; bracteoles
short, linear, acute. Flowers small, very irregular. Fruit ½ in. diam., sub-
globose; carpels cohering; styles slender, flexuous.—Distrib. S.E. Europe,
W. Asia.—Three carpels and styles occur. Footid of bugs.

23. CRITH'MUM, L. SAMPHIRE.
A fleshy, glabrous, much-branched herb, woody at the base. Leaves
3-nately compound; segments quite entire. Umbels compound, many-
rayed; bracts and bracteoles many, short. Calyx-teeth 0. Petals minute,
broad, fugacious, point long inflexed. Disk-lobes thick, depressed or
subconic. Fruit ovoid-oblong, terete, commissure broad, carpophore
2-partite, outer layer corky loose; carpels ½-terete, primary ridges thick,
acute; vittae many; styles short. Seed flat ventrally.—Distrib. Coasts
of N. Atlantic, Mediterranean and Black Seas.—Etym. obscure.

C. maritimum, L.; leaflets linear lax fleshy.
Maritime rocks from Ayr southd.; Ireland; Channel Islands; fl. June–Aug.

Stem 6–10 in., ascending, flexuous, solid, striate. Leaves deltoid; leaflets
few, 1–2 in., terete, subulate or subfusciform; petiole short, sheaths long
adnate membranous. Umbels flat-topped; peduncle stout fleshy; bracts
and bracteoles acute, spreading; flowers small, white. Fruit ¼ in., oblong,
dark green or purplish.—Yields the well-known pickled condiment.

24. CENANTH'HE, L. WATER DROPWORT.
Glabrous herbs, often aquatic. Roots fibrous or tuberous. Leaves 1–2–3-
pinnate, rarely reduced to a fistular petiole. Umbels compound; bracts
or bracteoles many few or 0; flowers white, often polygamous and outer
rayed. Calyx-teeth acute. Petals notched or 2-lobed, point long inflexed.
Disk-lobes conical. Fruit ovoid cylindric or globose, commissure
broad, carpophore 0; carpels ½-terete, 2 lateral primary ridges grooved
or much thickened, sometimes obscure; vittae solitary in each furrow.
Seed flat or convex ventrally.—Distrib. N. temp. regions, S. Africa,
Australia; species 20.—Etym. olvos and &vbos, from the vinous scent of
the flowers.

* Root-fibres many, fleshy. Umbels terminal or terminal and lateral, peduncled;
outer flowers of each partial umbel often irregular and male.

1. C. fistulosa, L.; leaves pinnate, stem and petioles terete swollen
fistular, fruit narrow obconic angular.
itches and marshes from Ayr and Berwick southd.; Ireland; Channel
Islands; fl. July–Sept.—Roots burrowing deep. Stem 2–3 ft., stoloniferous,
and with whorls of slender root-fibres below, thin-walled, nodes constricted.
Leaves long-petioled; segments few, narrow, distant. Peduncles stout
fistular; rays short, few; bracts 0; partial umbels ½ in. diam., spherical in
fruit. **Fruits** $\frac{1}{2}$ in., crowded, angular; styles long, erect, spinescent; carpels cohering; pedicel not thickened at the top.—**DISTRIB.** Europe, N. Africa, W. Asia.

2. **CE. pimpinelloides**, L.; root-fibres usually tuberous beyond the middle, leaves 2-pinnate, segments broad short entire or acutely cut, fruit cylindric grooved and ribbed.

Meadows and banks, rare; Worcester and Essex to Sussex and Cornwall; Channel Islands; fl. June–Aug.—**Root-fibres** slender, their tuber $\frac{1}{2}$ in. or less. **Stem** 1–3 ft., erect, furrowed. **Lower leaves** with broad small segments, upper with few long ones, or reduced to petioles. **Umbels** 6–12-rayed, flat-topped; bracts 1–8; partial umbels crowded; bracteoles subulate. **Fruit** 1–$\frac{1}{2}$ in.; pedicel short, stout, top much thickened; styles erect, rigid.—**DISTRIB.** Europe from Belgium southd., N. Africa, Asia Minor.


Marshes fresh and salt, from Argyll and Haddington southd.; Ireland; fl. July–Sept.—Very similar to **CE. pimpinelloides**, but root-fibres never tuberous; root-leaves soon withering; partial umbels not crowded; fruit 1 in., much broader, rounded at the top; styles shorter and slender; pedicel very short, not thickened at the top.—**DISTRIB.** From Denmark southd., E. to the Caspian.


5. **CE. croca'ta**, L.; root-fibres large fusiform, leaves large deltoid 3–4-pinnate, segments cuneate 2–3-lobed, fruit narrow oblong subcylindric.

Marshes and ditches, from Ross southd.; Ireland; Channel Islands; fl. July.—**Root-fibres** as thick as the thumb, juice yellow or colourless. **Stem** 2–5 ft., stout, branched, grooved, fistular. **Petioles** large, sheathing throughout. **Umbels** many, rays long; bracts and bracteoles 0 or many. **Fruit** $\frac{1}{2}$–1 in.; styles erect, rigid; top of pedicel not thickened.—**DISTRIB.** From France to Spain and Italy.—Poisonous, often mistaken for celery.

**Aquatics.** Root simple, fusiform, with many slender fibres. **Umbels** lateral or leaf-opposed, sub sessile. **Flowers** all 2-sexual.

6. **CE. Phellan'drium**, Lamk.; erect floating or ascending, leaves 2–3-pinnate finely cut, segments pinnatifid, fruit terete narrow-oblong or ovoid twice or thrice as long as the styles. **Phellan'drium aquaticum**, L.

Ponds and ditches, from Haddington southd.; rare in Scotland; Ireland; Channel Islands; fl. July–Sept.—**Stem** 1–4 ft., very stout. **Leaves** sometimes submerged with capillary segments; emersed with broad small obtuse segments. **Umbels** 7–10-rayed; bracts 0; bracteoles many; outer flowers
slightly irregular. *Fruit* variable, $\frac{1}{3}$–$\frac{1}{2}$ in.; styles slender, flexuous; pedicel not thickened at the top.—**DISTRIB.** Europe, to the Caspian, Siberia.  
OE. *Phellan*d'rium proper; erect, leaves 3-pinnate, segments of submerged leaves capillary, fruit twice as long as its styles.  
Sub-sp. OE. *Fluviat'illis, Colem.*; ascending, leaves 2-pinnate, segments of submerged leaves obtuse, fruit three times as long as its styles.—S. half of England; Kildare Canal, Ireland.

**25. ÆTHU'SA, L.** Fool's Parsley.

An annual, leafy, glabrous herb. *Leaves* 3-nately pinnate. *Umbels* compound, terminal and leaf-opposed; bracts 1 or 0; bracteoles 1–5, de-flaxed, on the outer side of the umbel; flowers white, outer often rayed. *Calyx-teeth* small or 0. *Petals* notched, point inflexed. *Disk-lobes* broad, depressed. *Fruit* broadly ovoid, subterete, carpophore slender 2-partite; carpels dorsally compressed, primary ridges very thick keeled, or the lateral narrowly winged; vittae in the furrows solitary; styles very short. *Seed* flattish ventrally.—**DISTRIB.** Europe, Siberia; introd. in N. America. —**ETYM.** altha, because of its supposed burning qualities.

**Æ. Cyna'pium, L.**; leaves deltoid, leaflets pinnatifid.

A weed in cultivated grounds, from Elgin and the Clyde southd.; Ireland; Channel Islands; fl. July–Aug.—**Root** fusiform. *Stem* 1–2 ft., corymbose branching, terete, striate, fistular. *Leaves* 6 in.; segments $\frac{1}{3}$–1 in., membranous, cuneate at the base, lobes acute; petiole slender. *Umbels* small; rays spreading, irregular; bracteoles 3–5, slender. *Flowers* irregular, small. *Fruit* $\frac{1}{10}$ in., green.—Odour nauseous.

**26. SILA'US, Besser.** Pepper Saxifrage.

Perennial, glabrous herbs. *Leaves* pinnately decompound; segments slender. *Umbels* compound; bracts 1, 2, or 0; bracteoles many, small; flowers yellowish. *Calyx-teeth* 0. *Petals* with an incurved tip, base broad truncate. *Disk-lobes* depressed, crenate. *Fruit* ovoid or oblong, subterete, commissure broad, carpophore 2-partite; carpels $\frac{1}{2}$-terete, ridges obtusely winged, vittae obscure; styles short, recurved. *Seed* flattish ventrally.—**DISTRIB.** Europe, Siberia; species 2.—**ETYM.** unknown.

**S. praten'sis, Besser;** leaflets linear-lanceolate entire or 3-lobed.

Meadows and commons, from Fife to Kent and Devon; E. Scotland only; Ireland, rare; fl. July–Sept.—**Rootstock** elongate. *Stem* 1–3 ft., angular, grooved, solid, leafless above. *Leaves* 1–3-pinnate; leaflets few, $\frac{1}{3}$–$\frac{1}{3}$ in. *Umbel-rays* 1–2 in., few or many, incurved; bracteoles short, margins scarious. *Flowers* small. *Fruit* $\frac{1}{6}$ in., dark brown.—**DISTRIB.** Finland to Hungary.

**27. ME'UM, Jacquin.** MEU, BALD-MONEY, SPIGNEL.

A perennial, glabrous, very aromatic, tufted herb. *Leaves* mostly radical, pinnately decompound; segments setaceous, densely crowded.
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Umbels compound; bracts linear, 1–3, or 0; bracteoles 4–8, small; flowers white or purplish. Calyx-teeth obsolete. Petals acute, narrowed to the base, sometimes with a short inflexed point. Disk-lobes depressed, margins entire. Fruit ovoid-oblong, subterete, commissure broad, carpophore 2-partite; carpels ½-terete, primary ridges acute; vittæ many; styles very short. Seeds concave ventrally.—Distrib. Mts. of W. Europe.—Etym. Perhaps the Greek μέων.

M. athamanticum, Jacq.; stem subsimple, leaves oblong. Alpine pastures, from Wales and York to Aberdeen andArgyll; ascends to near 1,400 ft. in the Highlands; fl. June–July.—Rootstock elongate, crowned with fibres. Stem 6–15 in. Leaf-segments multifid, spreading in all directions; petiole as long as the blade. Umbels many-rayed; bracts few; bracteoles membranous, subunilateral; some flowers often male only. Fruit brown, ½ in.—Rootstock eaten in Scotland.

28. LIGUSTICUM, L. Lovage.

Perennial, glabrous herbs. Leaves 1–3-ternately pinnate. Umbels compound, many-rayed; bracts many, few, or 0; bracteoles many; flowers white pink or yellow. Calyx-lobes small or 0. Petals notched, point long inflexed. Disk-lobes conical, thick. Fruit ovoid or oblong, subterete or dorsally compressed, commissure broad, carpophore 2-partite; primary ridges prominent, acute or winged, lateral often broadest; vittæ many, slender, or obscure. Seed flat, or sub-concave ventrally.—Distrib. N. temp. regions; species 20.—Etym. Liguria, where a species abounds.


29. SELI'NUM, L.

Perennial herbs. Leaves pinnately decompound. Umbels compound, rays many; bracts few or 0; bracteoles many, small; flowers white or yellowish. Calyx-teeth obsolete. Petals 2-lobed, point inflexed. Disk-lobes entire, conical or depressed. Fruit ovoid or oblong or rounded, commissure broad, carpophore 2-partite; carpels ½-terete, primary ridges winged, lateral broadly; vittæ 1 to each dorsal furrow; styles short or long. Seed biconvex.—Distrib. Temp. N. hemisphere and S. Africa; species about 25.—Etym. σελήνη, from the moon-shaped carpels.

S. carvifo'lium, L.; nearly glabrous, stem angled furrowed, leaves 2-pinnate, leaflets ovate lower pinnatifid, segments lanceolate. Milk Parsley.
Moist copses, &c., N. Lincoln and Cambridge, very rare; fl. July–Aug.—
Rootstock short. Stem 2–4 ft., ridges almost winged. Leaves 6–12 in.,
leaflets ½–3 in., with thickened margins; petiole long, very slender. Umbels
puberulous, flat-topped; rays 10–20; bracts 0, or very few subulate;
bracteoles subulate. Petals white. Styles slender, recurved. Fruit ½ in.
long, lateral winged ridges spreading.—Distrib. From Norway southd.,
and eastd. to Russia.

30. ANGELICA, L. ANGELICA.

Tall perennial herbs. Leaves ternately 2-pinnate, segments large. Umbels
compound, many-rayed; bracts few or 0; bracteoles usually many,
small; flowers white or purplish. Calyx-teeth small or 0. Petals with a
short inflexed point. Disk-lobes depressed. Fruit ovoid, dorsally compressed,
commisure broad, carpophore 2-partite; carpels broad, flat, lateral primary
ridges with broad membranous wings, dorsal and intermediate elevated;
vitae 1–2 in the furrows. Seed dorsally compressed, flat or subconcave
ventrally.—Distrib. N. temp. and sub-Arctic regions; species 18.—
Etym. Angelicus, from its properties.

A. sylvestris, L.; leaflets petioloed obliquely oblong-ovate serrate.

Damp copses and banks of streams, N. to Shetland; ascends to 2,700 ft. in the
Highlands; Ireland; Channel Islands; fl. July–Aug.—Glabrous, except
the pubescent umbels. Stem 1–5 ft., stout, fistular, striate, green or purple.
Leaves 1–2 ft., deltoid; leaflets 1–2 in.; sheaths large. Umbels large; rays
very many, 1–3 in.; bracts 0, or 1–2, deciduous; bracteoles few, subulate,
persistent; flowers white or purple, nearly regular. Fruit ½–¾ in.; styles
slender, reflexed.—Distrib. Europe (Arctic), N. and W. Asia.—Aromatic
and bitter.

31. PEUCED'ANUM, L. HOG'S-FENNEL.

Perennial, rarely annual. Leaves pinnately or 3-nately compound. Umbels
compound, many-rayed; bracts many, few, or 0; bracteoles many
or 0; flowers white, yellow, or pink, often polygamous. Calyx-teeth 0
or small. Petals with an inflexed, often 2-fid point. Disk-lobes small;
often expanded, undulate. Fruit ovoid, oblong or suborbicular, much
dorsally compressed, commissure very broad; carpels flattish, lateral
primary ridges of each forming flat contiguous wings, dorsal and inter-
mediate filiform; vitæ 1–3 in each furrow. Seed nearly flat.—Distrib.
Trop. and temp. regions; species 100.—Etym. obscure.

Section 1. Peuced'anum proper. Perennial. Bracts few or many,
bracteoles many. Calyx 5-toothed. Fruit with narrow wings.

1. P. officinale, L.; leaves 3-ternately pinnate, segments long and
narrow, bracts few deciduous; flowers yellow. Sulphur-wort.

Salt marshes, very rare, Kent, Essex; Channel Islands; fl. July–Sept.—
Glabrous. Stem 2–3 ft., terete, solid, furrowed. Leaves oblong; segments
1–4 in., flaccid. Umbels on spreading subopposite branches; rays many,
2–4 in., spreading; bracteoles short, filiform. Flowers minute, central
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imperfect, pedicels slender. Fruit $\frac{1}{4}$ in.; wings narrow; styles stout, recurved.—Distrib. From Belgium southd., Siberia.—Root yields a stimulant resin; odour of sulphur.

2. P. palus'tre, Mæch.; leaves 3-pinnate, leaflets pinnatifid, segments narrow, bracts many persistent, flowers white. Milk Parsley.

Marshes, local, from York, Lincoln, E. counties, Somerset; fl. July–Aug.—Glabrous; juice milky. Stem 3–5 ft., terete, fistular, grooved. Leaves $\frac{1}{2}$–1 in., deltoid; leaflets petioled, lanceolate. Umbels 1–2 in.; rays many, stout, scabrid; bract deflexed. Flowers minute. Fruit $\frac{1}{2}$ in., broadly obovate; wings narrow, thick; styles very short.—Distrib. Europe, Siberia.

—Root yields a yellow foetid gum-resin.

SECTION 2. Imperator'ia, L. (gen.). Perennial. Bracts 0; bracteoles many. Calyx-teeth 0. Fruit with broad wings.

P. Ostru'thium, Koch; leaves 1–2-ternate, leaflets ovate or suborbicular inciso-serrate, base unequal, flowers white. Master-wort.

Moist meadows, rare, N. England and Scotland, naturalized; fl. July–Aug.—Glabrous. Stem 2–3 ft., stout, terete, fistular, furrowed. Leaves deltoid; leaflets few, 1–4 in., large, often confluent; petiole very long. Umbels large, many-rayed. Fruit $\frac{1}{2}$ in.; wings very broad; styles short.—Distrib. Mid. Europe.—Formerly cultivated as a pot-herb and medicine.

SECTION 3. Pastina'ca, L. (gen.). Bracts and bracteoles 0. Calyx-teeth 0. Fruit with rather narrow wings.


Roadsides and waste places, from Durham and Lancaster southd.; an escape in Scotland; native? Ireland; Channel Islands; fl. July–Aug.—Annual or biennial, pubescent. Stem 2–3 ft., stout, angled, furrowed, fistular. Leaves shining; leaflets 2–5 pair, 1–3 in. Umbel-rays many, stout, long. Flowers small. Fruit $\frac{1}{2}$ in., broadly obovate; styles very short.—Distrib. Europe, Siberia; introd. in N. America.—Cultivated since the time of the Romans.

32. HERAC'LEUM, L. Cow-Parsnip, Hogweed.

Biennial or perennial herbs, sometimes gigantic. Leaves 1–3-pinnate; segments broad, lobed and toothed. Umbels compound, many-rayed; bracts few many or 0; flowers often polygamous and outer rayed, white pink or yellowish. Calyx-teeth small or 0. Petals often unequal, the larger or all notched or 2-lobed, point inflexed. Disk-lobes depressed or conical. Fruit orbicular obovate or oblong, much dorsally compressed, commissure very broad, carpophore 2-partite; carpels flat, lateral primary ridges expanded into flat contiguous membranous wings, dorsal or intermediate slender; vitæ 1 in each furrow, short, thickened downwards. Seed flattened.—Distrib. Europe, N. and trop. Africa, temp. Asia, N. America; species 50.—Etym. The god Hercules.
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**H. Sphondyl'ium, L.**; leaves pinnate, leaflets few large lobed.

Moist woods and meadows, N. to Shetland; ascends to 2,700 ft. in the Highlands; Ireland; Channel Islands; fl. June–Aug.—Rough, hairs spreading, close or scattered. **Stem** very stout, 3–6 ft., fistular, grooved, branched above. **Leaves** 1–3 ft.; segments 2–6 in., variable in size lobing and toothing, sometimes narrow and pinnatifid (*H. angustifolium*, Sm.), terminal confluent; sheath of petiole broad. **Umbel-rays** 1/2–1 1/2 in., many, stout; flowers large, outer very irregular; petals very broad deeply obcordate, white or pink. **Fruit** 1 1/2–3 in., orbicular or obovoid, retuse; styles short.—**Distr.** Europe, N. Africa, N. Asia.—Stem eatable.

**33. TORDYL'ium, L.**

Annual, hairy or woolly herbs. **Leaves** simple or pinnate. **Umbels** compound; rays many, or few and unequal; bracts and bracteoles linear, small or 0; flowers white or purplish, outer often rayed. **Calyx-teeth** subulate and unequal or 0. **Petals** with an incurved point, the larger or all 2-lobed. **Disk** flat and undulate, or coni-cal. **Fruit** orbicular or oblong, much dorsally compressed; lateral primary ridges appressed, broad, thickened, dorsal and intermediate slender; vittae 1–3 in each furrow. **Seed** flattened.—**Distr.** Europe, N. Africa, temp. Asia; species 12.—**Etym.** The old Greek name.

**T. max'imum, L.**; leaves pinnate, leaflets 1–3 pair pinnatifid.

Hedge-banks, Essex, Middlesex, Oxford, and Bucks; (an alien or denizen, *Wats.); fl. June to July.—Hispid with short hairs, reflexed on the stem. **Stem** 1–2 ft., slender, erect, deeply grooved, fistular. **Leaflets** 1–3 in., oblong or lanceolate, more or less cut and toothed; petiole with a small sheath. **Umbels** small; rays 6–8, stout, short, hispid; bracts and bracteoles as many, stiff, short. **Flowers** small, white or pink, sub sessile. **Fruit** broadly-oblong, hispid, thickened margin glabrous; styles short, stiff, erect.—**Distr.** From Belgium southd.

**34. DAU'cus, L. Carrot.**

Annual or biennial, hispid herbs. **Leaves** pinnately decompound, segments small. **Umbels** compound; rays many, outer arching over the inner, or few and irregular; bracts and bracteoles many or 0, entire or cut; flowers white, outer often rayed. **Calyx-teeth** slender or 0. **Petals** notched, point inflexed, often unequal. **Disk-lobes** depressed or conical. **Fruit** ovoid or oblong, carpophore undivided or 2-fid; carpels convex, secondary ridges more prominent than the primary, all, or the secondary only, with rows of spines; vittae solitary under each secondary ridge. **Seed** flattish ventrally.—**Distr.** Europe, N. Africa, W. Asia; species 20.—**Etym.** The old Greek name.

**D. Car'o'ta, L.**; leaves 3-pinnate, leaflets ovate cut.

Fields, road-sides, and sea-shores; fl. June–Aug.—Hispid. **Stem** 1–2 ft., branched, solid, furrowed. **Leaflets** very many, small. **Umbels** peduncled, rays 1–2 in.; bracts usually pinnatifid; bracteoles lanceolate. **Flowers**
white, central purplish. *Fruit* \(\frac{1}{2}\) in., broadly oblong; styles short, stout, straight.—**Distrib.** Europe, N. Africa, N. and W. Asia to India; introd. in N. America.

D. *Caro*′ta proper; erect, branches above spreading, leaf-segments narrow subdistant, umbels concave, spines of the fruit distinct usually hooked at the tip.—Common N. to Shetland.

Sub-sp. *D. gum*′mi*fer*, Lamk.; branches spreading from the base, leaf-segments broader closer, umbels convex, spines of fruit dilated and connate at the base. *D. marit*′i*mus*, With.—Shores from Wigton southd.; Ireland Channel Islands.

### 35. CAU′CALIS, L.

Annual, hispid herbs. *Leaves* 1–3-pinnate. *Umbels* simple or compound, terminal or leaf-opposed, usually of few rays, sometimes capitate; bracts few or 0; bracteoles more numerous; flowers white or purplish, polygamous, outer often rayed. *Calyx*-teeth acute or 0. *Petals* often unequal, the larger notched, point inflexed. *Disk*-lobes thick, conical. *Fruit* ovoid or oblong, commissure constricted, carpophore undivided or 2-fid; carpels subterete, ridges with 1 or 2 series of spines; **vitae** solitary in each secondary ridge. *Seed* deeply grooved ventrally.—**Distrib.** Europe, N. Africa, temp. Asia; species 18.—**Etym.** The old Greek name.

**Section 1. Cau′calis** proper. **Secondary ridges** very prominent, with 1 row of spreading spines. *Bur*-Parsley.

1. *C. dauco*′i*des*, L. ; leaves 2–3-pinnate, segments oblong pinnatifid.

Chalky fields on the E. and S. coasts, from Durham to Kent and Somerset; Channel Islands; (a colonist, *Wats.); fl. July.—*Stem* 6–18 in., erect, nodes hispid, angular, grooved, solid; branches spreading. *Leaves* 3–4 in., segments small. *Umbel-rays* 2–5; bracts few or 0; bracteoles linear. *Male* flowers (outer) white or pink, pedicelled, female subsessile. *Fruit* \(\frac{1}{2}\)–\(\frac{3}{4}\) in., oblong; spines hooked, of the secondary ridges longest; styles short, stout, erect.—**Distrib.** From Denmark southd., N. Africa, W. Asia, Himalaya.

**Section 2. Turge′nia, Hoffm.** (gen.). **Secondary ridges** with 2–3 rows of spreading spines.

C. *Latifo*′lia, L. ; leaves pinnate, leaflets few subpinnatifid.

Cornfields, very rare, Cambridge to Gloster, Herts, S. Wales, Somerset; fl. July.—Hispid. *Stem* 6–18 in., simple, terete, striate, fistular. *Leaflets* narrow-oblong, lobes \(\frac{1}{3}–\frac{2}{3}\) in. *Umbel-rays* 2–4, stout; bracts broadly lanceolate, membranous. *Flowers* much as in *C. dauco*′i*des*, pink. *Fruit* \(\frac{1}{2}\)–\(\frac{3}{4}\) in., broad; spines long, nearly equal, rough; styles short, stout, erect.—**Distrib.** From Belgium southd., N. and W. Asia, Himalaya.

**Section 3. Tori′lis, L.** (gen.). *Fruit* covered between the primary ridges with spreading or appressed bristles. *Hedge* Parsley.

2. *C. Anthris′cus*, *Huds.* ; leaves 1–3-pinnate, leaflets broad, umbels terminal compound, braacts 4–6, spines of fruit incurved not hooked.
Hedges and waste places, N. to Caithness; ascends to 1,350 ft. in Yorks.; Ireland; Channel Islands; fl. July–Sept.—Hispid more or less. Stem erect, branched, solid, striate, hairs reflexed. **Leaflets** many, close set, $\frac{1}{4}$-1 in., pinnatifid or lobed. **Umbels** 5-12-rayed; bracts small, subulate. **Flowers** minute, white or pink, outer pedicelled fertile. **Fruit** $\frac{1}{8}$ in., ovoid; styles short, straight.—**Distributio**n. Europe, N. Africa, W. Asia to N.W. India.


Fields and waste places, from York and N. Wales southd.; (a colonist, **Wats.**); fl. July–Sept.—Hispid. Stem 6–10 in., much branched, often from the base, angled, solid, leafy. **Leaflets** pinnatifid, or cut and serrate, oblong. **Umbel-rays** 2–8, short; bracteoles linear or setaceous. **Flowers** white or pink, irregular, outer fertile. **Fruit** oblong, covered with spines; styles rather slender.—**Distributio**n. From Belgium southd., N. Africa.

4. **C. node'sa**, Scop.; leaves 1–2-pinnate, leaflets very small, umbels leaf-opposed simple, spines of fruit spreading hooked and barbed.

Dry banks, from Banff southd.; Ireland; Channel Islands; fl. May–July.—Hispid. Stem 6–18 in., often prostrate, slender, flexuous, angled, solid. **Leaflets** pinnatifid. **Umbels** shortly peduncled, subglobose; pedicels very short, stout; bracts 0. **Flowers** small, regular, pink; female subsessile. **Fruit** $\frac{4}{4}$ in., ovoid, inner of each umbel tubercled, outer with one or both carpels furnished with hooked spines; styles very short.—**Distributio**n. From Denmark southd., W. Africa, W. Asia to India.

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**[Order XXXV. ARALIA'CEAE. ]**

Erect or climbing shrubs or trees; pubescence often stellate. **Leaves** alternate, simple or compound; stipules adnate to the petiole or 0. **Flowers** regular, umbellate or capitate. **Calyx-limb** superior, very short, entire toothed or lobed. **Petals** 5, often coriaceous, very deciduous, valvate or slightly imbricate in bud. **Stamens** 5, filaments inflexed; anthers didymous, versatile. **Disk** epigynous. **Ovary** 2- or more-celled; styles or stigmas as many as the cells; ovule 1 in each cell, pendulous, anatropous, rapha ventral, integuments confluent with the nucleus. **Drupes** or berry with 1 or more 1-seeded cells. **Seed** pendulous, testa membranous, albumen dense fleshy; embryo minute.—**Distributio**n. Chiefly trop.; genera 31: species 340.—**Affinitia**. Close with **Coriaceae** and **Umbelliferae**.—**Properties** unimportant.

1. **HED'ERA, L. **IVY.

Climbing shrubs. **Leaves** undivided or lobed, exstipulate. **Umbels** panicled; bracts minute or 0; pedicels not jointed; flowers polygamous. **Calyx-limb** entire or 5-toothed. **Petals** and **stamens** 5. **Disk** tumid. **Ovary** 5-celled; styles short, connate, stigmas terminal. **Berry** subglobose,
cells with a parchment-like endocarp closely investing the ovoid seed. *Alnus* lobulate.—Distrib. Temp. regions of the Old World; species 2.—Etym. unknown.

**H. Helix, L.**; shrubby, climbing by adhesive rootlets. Rocks, woods, and walls; ascends to 1,500 ft. in Yorkshire; Ireland; Channel Islands; fl. Oct.–Nov.—Trunk 4–10 in. diam., trailing and flowerless, or ascending and flowering at the terminal free branches. *Leaves* very variable, 1–3 in. broad, cordate; lobes 5, deep or shallow, acute or obtuse; those of flowering branches ovate or lanceolate. *Umbels* subracemose, subglobose, clothed with stellate hairs; bracts small, concave; peduncles ⅜–1 in. *Flowers* yellow-green, ⅓ in. diam., proterandrous; calyx-teeth deltoid; petals triangular ovate. *Berry* black, rarely yellow, globose, ⅓ in. diam.—Distrib. Europe, N. Africa, W. Asia to the Himalaya and Japan.—The small sylvestral form, with longer leaf-lobes and often pale nerves, never flowers. The so-called *Irish Ivy* (*H. canariensis*, Willd.), with broad rather fleshy leaves and 8-rayed stellate hairs, is a doubtful native of Ireland.—Var. *Hodgen'si*, another doubtful native Irish form, has deeply 5–7-lobed leaves and 12–15 rayed scale-like hairs.

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**Order XXXVI. CORNA'CEÆ.**

Shrubs or trees, rarely herbs. *Leaves* opposite or alternate, exstipulate. *Flowers* small, regular, in terminal or axillary cymes umbels or heads, sometimes involucrate. *Calyx-limb* superior, small or 0, open or valvate in bud. *Petals* 4–5, at the base of the disk, valvate or imbricate in bud. *Stamens* 4–5, inserted with the petals, free; anthers adnate or versatile. *Disk* epigynous, annular. *Ovary* 1–4-celled; style 1, stigma simple or lobed; ovules solitary in each cell, pendulous, anatropous; integuments confluent with the nucleus. *Drupe* with a 1–4-celled stone, or 1–4 stones. *Seed* oblong, testa membranous, albumen copious fleshy; embryo minute or elongate.—Distrib. Chiefly N. temp. regions; genera 12; species 76.—Affinities. Close to *Caprifoliaceæ* and *Araliaceæ*.—Properties unimportant.

**1. COR'NUS, L.** Cornel, Dogwood.


**1. C. sanguin'ea, L.**; shrubby, cymes corymbose ebracteate. Dogwood, Dogberry, Prickwood.
Cropses and hedges from Westmoreland southd.; ascends to 1,050 ft. in Derby; Ireland, rare; Channel Islands; fl. June–July.—Pubescent, 6–8 ft., branchlets and leaves red in autumn. Leaves 2–3 in., petioled, ovate, or ovate-oblong, acute; lateral nerves sub-basal. Cymes terminal, peduncled, subglobose, dense-flowered. Flowers ½ in. diam., cream, homogamous. Berry small, black.—Distrib. Europe, N. and W. Asia, Himalaya.—Wood used for skewers, formerly for arrows; and by gunpowder makers. Berries yield an oil used in France for soapmaking.

2. C. suecica, L.; herbaceous, umbels involu rate.

Alpine moors, Yorkshire to Sutherland; ascends to 3,000 ft.; fl. July–Aug.—Puberulous with appressed hairs. Rootstock slender, creeping. Stem 6–8 in., erect, forked at the top, 4-angled, scaly beneath. Leaves ½–1 in., sessile in few pairs, oblong or ovate, acute, 5–7-nerved, glaucous beneath. Umbel in the fork, peduncled; bracts 4, ½ in., white, ovate, acute. Flowers minute, purplish. Drupe ½ in. diam., red.—Distrib. N. and Arctic Europe, Asia, N. America.

Order XXXVII. Caprifoliaceae.

Shrubs or small trees, rarely herbs. Leaves opposite, simple, ternately cut or pinnate, usually exstipulate. Flowers cymose. Calyx-limb superior, 3–5-toothed or -lobed. Corolla regular or irregular, sometimes 2-lipped; lobes 5, imbricate in bud. Stamens 4, 5, 8, or 10, inserted on the corolla-tube, equal or unequal; anthers versatile. Disk epigynous, glandular or 0. Ovary 1–6-celled; style simple or 3–6-lobed or 0, stigmas capitate; ovules solitary, pendulous from the top of the cell, or many from its inner angle, or solitary in one cell and several in others, anatropous, integuments confluent with the nucleus. Fruit a berry or drupe, rarely capsular, 1- or many-seeded. Seeds small, testa usually membranous, albumen copious fleshy; embryo minute, ovoid, rarely large and terete.—Distrib. Temp. and sub-trop. regions of the N. hemisphere; rare in the south, absent from trop. and S. Africa; genera 14; species 200.—Affinities. With Cornaceae and Rubiaceae.—Properties unimportant.


Shrubs. Leaves simple..................................................1. Viburnum.
Herbs, shrubs, or trees. Leaves pinnate..................................2. Sambucus.
Herbs. Leaves 3-nately compound........................................3. Adoxa.

Tribe II. Lonicerae. Corolla tubular or campanulate. Ovary-cells 1- or many-ovuled; style slender.

Ovary 2–3-celled, cells with several ovules..................................4. Lonicera.
Ovary 3-celled, 1 cell one-ovuled, 2 cells many-ovuled......................5. Linnaea.

1. Viburnum, L.

Shrubs or trees; branches opposite. Leaves simple; stipules 0 or small. Flowers in terminal or axillary corymb or panicles, white or pink, jointed
on the pedicel, 1–2-bracteolate; outer sometimes male or neuter, with larger petals. Calyx-tube turbinate or ovoid; limb 5-toothed. Corolla rotate, tubular or campanulate, 5-lobed. Stamens 5. Disk 0. Ovary 1–3-celled; style conical, 3-fid, or stigmas 3 sessile; ovules 1 in each cell, pendulous. Drupe dry or fleshy, terete or compressed, 1- or 3-celled, 1-seeded. Seeds compressed; embryo minute.—Distrib. Temp. and subtrop. regions of the N. hemisphere, Andes.—Etym. unknown.

1. V. Lanta'na, L.; scurfily pubescent, leaves broadly oblong-cordate serrulate exstipulate, flowers all perfect. Wayfaring tree.


2. SAMBU'CUS, L. Elder.

Large herbs, shrubs, or trees; branches stout, pith thick. Leaves pinnate. Flowers small, in umbellate corymbs or panicles, jointed on the pedicel, bracteolate. Calyx-limb 3–5-toothed. Corolla rotate or campanulate, 3–5-partite. Stamens 5. Disk convex. Ovary 3–5-celled; style short, 3–5-partite, or stigmas 3–5 sessile; ovules 1 in each cell, pendulous. Drupe with 3–5 cartilaginous cells. Seeds compressed; embryo long.—Distrib. All temp. regions (S. Africa excepted) and trop. mountains; species 10–12.—Etym. σαμβοκτη, being formerly used for musical instruments.


2. S. ni'gra, L.; a tree, stipules small or 0, cymes 5-rayed. Elder.
Hedges and thickets from Ross southd.; ascends to 1,350 ft. in Yorkshire; (a denizen in Scotland, Wats.); Ireland; Channel Islands; fl. June.—Trunk often as thick as the thigh; bark corky; buds scaly; branchlets angular, lenticellate. Leaflets 2–4 pair, 1–3 in., ovate oblong or lanceolate, rarely orbicular (var. rotundifolia, Bromf.), serrate. Cymes 4–6 in. diam., flat-topped. Corolla ½ in. diam., white, rotate, lobes rounded. Filaments slender. Berry small, globose, black, rarely green.—Distr. Europe, W. Asia, N. Africa.—Berries used for wine; flowers for perfumes. The "Cut-leaved Elder," a laciniate-leaved variety, occurs as a garden escape.

3. Adoxa, L. Moschatel.

A small glabrous succulent herb. Rootstock creeping; buds scaly; stem simple, 2-leaved. Leaves ternately cut. Flowers small, honeyed, green, in a 5-fld. peduncled head, terminal 4- lateral 5-merous. Calyx-tube hemispheric; limb ½-superior, 2-3-lobed. Corolla rotate, 4-5-lobed. Stamens 8–10, on the corolla-tube, in pairs alternating with its lobes; anthers petalate, 1-celled. Disk 0. Ovary 3–5-celled; style short, 3–5-partite, stigmas terminal; ovules solitary in each cell, pendulous. Drupe girt by the calyx-teeth, with 4–5 compressed cartilaginous cells. Seeds obovate; embryo minute.—Distr. Europe, N. Asia, Himalaya, N. America.—Etym. à and δέξα, in allusion to its insignificance.—Each pair of stamens is perhaps one, with separate anther-cells.

A. Moschatelli'na, L.; leaflets broadly triangular-ovate.

Damp hedgebanks and tree-roots, rather local, from Ross southd.; ascends 3,300 ft. in the Highlands; Ireland; fl. April–May.—Stems 6–8 in., 4-angled. Radical leaves 1–2-ternate, leaflets ½–¾ in., irregularly 3-lobed; petiole slender, dilated at the base; cauline 3-foliolate. Head ½–¾ in. diam., sub-4-angular, yellow-green. Corolla ½ in. diam. Fruit succulent, green.—Odour musky. A Kashmir variety has 5–6-merous flowers.

4. Lonice'ra, L. Honeysuckle.

Erect, prostrate, or climbing shrubs, with scaly buds. Leaves opposite, entire, exstipulate, of the young shoots sometimes lobed. Flowers in peduncled cymes or heads, often connate in pairs by the ovaries, and subtended by connate bracteoles. Calyx-tube ovoid or subglobose; teeth 5, often unequal. Corolla tubular, funnel- or bell-shaped; tube equal or gibbous at the base, honeyed; limb oblique or 2-lipped, 5-lobed. Stamens 5. Disk tumid. Ovary 2–3-celled; style filiform, stigma capitate; ovules many in the inner angle of each cell. Berry fleshy, 2–3-celled; cells few-seeded, septa sometimes wanting. Seeds ovoid or oblong, testa crustaceous.—Distr. Temp. and warm regions of the N. hemisphere; species 80.—Etym. A. Lonicer, a German botanist.

L. Pericly'menum, L.; twining, leaves ovate or oblong upper sessile, flower-heads terminal peduncled. Woodbine or Honeysuckle. Hedges and copses, N. to Shetland; ascends to 1,500 ft. in Durham; Ireland; Channel Islands; fl. June–Sept.—Glabrous or slightly pubescent. Stem
Lonicera. \[CAPRIFOLIACEÆ.\] 191


L. *Caprifolium*, L.; twining, upper leaves connate by very broad bases, flower-heads terminal sessile.


L. *XYLOSTEUM*, L.; leaves petioled, flowers axillary in pairs.


5. **LINNAEA**, Gronov.

A very slender, creeping, evergreen shrub; branches ascending, ending in a slender, erect, 2-fld. peduncle. Leaves opposite, exstipulate. Flowers nodding, on slender 2-bracteolate pedicels, honeyed. Calyx-tube ovoid; lobes 5, narrow, deciduous. Corolla subcampanulate; lobes 5, subequal. Stamens 4, inserted near the base of the corolla, 2 longer than the others. Disk obsolete. Ovary 3-celled; style filiform, stigma capitate; ovules many in one cell, solitary in the others, pendulous. Fruit subglobose, 3-celled, one cell 1-seeded, the others seedless. Seed oblong; embryo cylindrical.—Distrib. Lapland to N. Italy, cold and Arctic Asia and N. America.—Etym. Linnaeus.

L. *borealis*, Gronov.; leaves broadly ovate obtuse crenate.

Fir forests and plantations, York to Ross; chiefly in Mid. and E. Scotland, ascends to 2,400 ft.; fl. July.—Almost glabrous, except the glandular inflorescence. Stems 3-16 in., filiform. Leaves in distant pairs, \(\frac{1}{4}-\frac{1}{2}\) in., petioled, rarely obovate or orbicular, coriaceous. Peduncles erect, filiform, 2-bracteate at the top. Corolla \(\frac{1}{2}\) in., pink, sweet-scented. Fruit very small.—Fruit very rare; I have taken Wahlenberg’s description of it.

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**ORDER XXXVIII. RUBIA'CEÆ.**

**Tribe STELLA'TÆ.**

Slender herbs, sometimes woody below; stems 4-angled. Leaves and foliaceous stipules together forming whorls, entire. Flowers very small, in axillary or terminal sub sessile or peduncled cymes; pedicels jointed with the flower. Calyx-limb superior, annular or 4-6-toothed or 0. Corolla
rotate, bell- or funnel-shaped; lobes 3–5, valvate in bud. Stamens 3–5, inserted on the corolla-tube, filaments usually short; anthers didymous. 

Ovary 2-celled; styles 2, stigmas terminal; ovules solitary in each cell, attached to the septum, pendulous, amphitropous, integuments confluent with the nucleus. Fruit didymous, of 2 plano-convex or globose indehiscent 1-seeded lobes. Seed ascending, plano-convex, testa membranous adnate to the pericarp, albumen horny; embryo axile, cotyledons foliaceous, radicle terete.—This tribe is the N. temp. representative of the enormous Order Rubiaceae.—Distrib. All cold and temp. regions; genera 7; species about 300.—Affinities. With Caprifoliaceae and Valerianaceae.—Properties unimportant. Rubia yields Madder.

Calyx-limb entire or obsolete.

Corolla rotate or bell-shaped, 5-lobed. Fruit fleshy.............1. Rubia.
Corolla rotate, 4-lobed. Fruit dry..............................2. Galium,
Corolla bell-shaped. Fruit dry..................................3. Asperula

Calyx-limb 4–6-toothed. Corolla funnel-shaped. Fruit dry.....4. Sherardia,

1. Rubia, L. Madder.

Perennial herbs, often woody below. Cymes axillary and terminal. Calyx-limb 0, or annular. Corolla bell-shaped or rotate, 5-lobed. Styles 2, short. connate at the base, stigmas capitate. Fruit didymous or globose, succulent.—Distrib. Chiefly temp. regions; species about 50.—ETYM. ruber, from the red dye.

R. Peregrina, L.; leaves 4–6 in a whorl elliptic or oblong.

Rocks and copses, chiefly near the sea, Wales, Hereford, and from Cornwall to Kent; E. and S. Ireland; Channel Islands; fl. June–Aug.—Evergreen, shining, 1–2 ft., glabrous except for the recurved prickles on the angles of stem, midrib, and margins of the leaves. Leaves 1–3 in. Cymes panicled, longer than the leaves. Corolla yellowish, ½ in. diam., lobes spreading. Stamens short. Fruit small, black, globose and 1-celled, or didymous.—Distrib. W. Europe, N.W. Africa.

2. Galium, L. Bedstraw.

Annual or perennial herbs. Flowers minute, in axillary or terminal cymes, honeyed. Calyx-limb annular. Corolla rotate, 4–rarely 5-lobed. Stamens 4. Styles 2, short, connate at the base; stigmas capitate. Fruit didymous, dry, often hispid or tubercled.—Distrib. Chiefly temp. climates; species about 150.—ETYM. γάλα, from some species being used to curdle milk.

* Perennial. Flowers yellow. Fruit glabrous, smooth.

1. G. Ve'rum, L.; leaves in whorls of 8–12. Lady's Bedstraw.

Sandy banks, shores, &c., N. to Shetland; ascends to 2,000 ft. in the Highlands; Ireland; Channel Islands; fl. June–Sept.—Pubescent, black when dry; rootstock stoloniferous. Stems many, 1–3 ft., erect or ascending, 4-angled. Leaves ½–1 in., linear, deflexed, rough above, mucronate, margin
recurred. *Cymes* very compound, axillary and terminal, leafy; flowers 2-sexual, protandrous. *Fruit* small, black.—*Distrib.* Europe, N. Asia, Himalaya, N. Africa; introd. in N. America.—Flowers used to curdle milk.

A hybrid (var. *ochroleucum*, Syme) with *G. Mollugo* occurs at Deal. It is greenish when dry, and has pale yellow flowers.


**Perennial.** *Cymes* both axillary and terminal. *Flowers* white. *Fruit* glabrous, smooth granulate or rough, very minute.

3. **G. palus'tre, L.**; stems lax rough prickly, leaves 4–6 in a whorl obtuse, cymes diffuse, fruit smooth, pedicels divaricate.


*G. palus'tre* proper; stem smooth, leaves short and narrow, branches of cyme patent or reflexed after flowering, corolla and fruit smaller.—*Var.*

*G. elong'atu'tum*, Presl; stem thick, branches of cyme not reflexed after flowering, corolla 1/4 in. diam., fruit 1/10 in. diam.—*Var.* *G. Witherin'gii, Sm.*; stem rough with recurved bristles, leaves linear recurved, cyme narrow, its branches short.

4. **G. uligino'sum, L.**; stem rough prickly, leaves 6–8 in a whorl aristate, cymes small few-fld., fruit granulate, pedicels erect.

Marshes and ditches, from Caithness southd.; ascends to 1,600 ft. in Northumbd.; Ireland, very rare; Channel Islands; fl. July–Aug.—Habit and appearance of *G. palus'tre*, L., but green when dry; leaves 6–8 in a whorl (rarely 4), always narrower, more rigid, mucronate; angles of stem more bristly; panicle narrower and fruit smaller.—*Distrib.* N. and Mid. Europe (Arctic), N. Asia.

5. **G. saxat'ile, L.**; tufted, stem prostrate smooth, leaves usually 6 in a whorl mucronate, cymes small, fruit rough, pedicels erect-patent.


6. **G. sylves'tre, Poll.**; diffuse, stem smooth glabrous or pubescent below, leaves 6–8 in a whorl narrow ciliate aristate, cymes much longer than the leaves, fruit rough, pedicels spreading.
Dry rocky hills and pastures, local from Orkney and Forfar to Somerset and Dorset; absent from W. Scotland, Wales, and E. England; ascends to 2,400 ft. in Yorkshire; Ireland; fl. July-Aug. — Very similar to G. saxatile, but less tufted, more erect and rigid; leaves narrower, stiffer, awned. — **Distrib.** Mid. and W. Europe, Iceland to Spain and Servia.

*G. sylvestre* proper (*G. montanum*, Vill.; *G. pusillum*, Sm. not L.); stem strict glabrous acutely 4-angled, leaves suddenly acuminate, margins slightly revolute, cymes lax-fl. — **Var.** *G. nitidulum*, Thuill. (*G. commutatum*, Bab. not Jord.); stem glabrous or hairy below obtusely 4-angled, leaves narrower, margin strongly revolute, cymes rather compact.

7. **G. Mollugo**, L.; stem flaccid glabrous or hairy, leaves 6–8 in a whorl, cymes horizontal, corolla-lobes with slender tips.

Hedges and copses, from Perth and Lanark southd.; ascends to 1,000 ft. in Yorkshire; Ireland, very rare; Channel Islands; fl. July-Aug. — Rare when dry. **Stem** 1–4 ft., erect or decumbent, angles hairy or searbrd. **Leaves** variable, margins with erect or reversed bristles. **Cymes** large, panicled, many-fl. **Fruit** \( \frac{1}{2} \text{ in. diam.} \), black, shagreened. — **Distrib.** Europe (Arctic), N. Asia, Himalaya, N. Africa.

*G. Mollu'g* oproper (*G. elatum*, Thuill., *G. scabrum*, With., *G. insubricum*, Gaud.); decumbent, branches divaricate, leaves obovate-lanceolate, cymes with spreading branches. — **Var.** *Bak'eri*, Syme, has linear leaves and few-fl. cymes.

Sub-sp. **G. erec'tum**, Huds. (*G. aristatum*, Sm. not L.); suberect, leaves linear or lanceolate, cyme with slender ascending branches. — York to Kent and Dorset; Ireland; Channel Islands.

***Perennial.** **Flowers** white. **Fruit** hispid with hooked hairs.

8. **G. borea'le**, L.; stem erect, leaves 4 in a whorl lanceolate, cymes axillary and terminal many-fl.

Moist rocks in mountain districts, from York and Brecon N. to Shetland; ascends to 2,800 ft. in the Highlands; Ireland; fl. June-Aug. — Glabrous or pubescent; blackish when dry. **Rootstock** creeping. **Stems** 1–2 ft., tufted, rigid, sparingly branched above. **Leaves** \( \frac{1}{2}–1\frac{1}{2} \text{ in.}, 3-	ext{nerved.} \) **Cymes** panicled; branches suberect; bracts ovate. **Flowers** \( \frac{1}{2} \text{ in. diam.} \) **Fruit** \( \frac{1}{2} \text{ in. diam.} \) — **Distrib.** N. and Mid. Europe (Arctic), N. Asia, Himalaya, N. America.

****Annual.** **Flowers** white or greenish. **Fruit** often large, usually hispid or tubercled. **Angles** of stem and margins of leaves prickly.


Hedges and waste places, N. to Shetland; ascends to 1,200 ft. in Yorkshire; Ireland; Channel Islands; fl. June–July. — **Stem** 1–5 ft., weak, straggling, often forming matted masses, very rough. **Leaves** \( \frac{1}{2}–2 \text{ in.}, \) narrow-lanceolate, usually hispid all over. **Fruit** purplish. — **Distrib.** Europe (Arctic), N. Africa, N. and W. Asia to India, temp. N. and S. America.

*G. Apari'ne* proper; cymes usually 3-flowered, flowers white, fruit tubercled, tubercles crowned by hooked bristles.

Sub-sp. **G. Vaillan'tii**, DC.; cymes 3–9-flowered, flowers very minute greenish, fruit hispid with hooked bristles. — Saffron Walden, in fields.

11. **G. anglicum**, HUDS.; leaves about 6 in a whorl, cymes axillary and terminal panicked few-fld., fruit minute tubercled. Walls and sandy places, S.E. England, from Norfolk to Kent, and Cambridge to Sussex; fl. June-July.—Stem diffuse, branched, 6-12 in., without barren shoots. Leaves $\frac{1}{3}-\frac{1}{2}$ in., narrow, mucronate, finally reflexed, margins rough with prickles that point forwards. Flowers greenish-white.—Distrib. From Holland southd., Canaries to Persia.

### 3. Asperula, L.

Herbs or small shrubs. **Flowers** in terminal or axillary cymes, small, honeyed. Calyx-limb 4-toothed, deciduous or 0. Corolla funnel- or bell-shaped, 4-fld. Stamens 4. Styles 2, more or less connate, stigmas capitate. Fruit dry or rather fleshy.—Distrib. Temp. regions; species 50?—Etym. asper, from the rough hairs of many.

1. **A. odorata**, L.; upper whorls 7-9; lower 2-6-leaved. Wood-ruff. Shaded hedgebanks, copses, &c., N. to Shetland; ascends to 1,200 ft. in Scotland; Ireland; Channel Islands; fl. May-June.—Almost glabrous, odoriferous in drying, shining. Rootstock perennial, creeping, often stoloniferous. Stems 6-18 in., subsimple, hairy beneath the nodes. Leaves 1-1$\frac{1}{2}$ in., oblong-lanceolate, cuspidate, ciliate. Cymes subterminal, subumbellate. Corolla $\frac{1}{3}$ in. diam., tube as long as the limb, white, lobes obtuse. Fruit small, hispid with hooked hairs.—Distrib. Europe, excl. Spain and Portugal, N. and W. Asia.

2. **A. cyanan'chica** L.; leaves 4 in a whorl. Squinancy-wort. Dry banks, local, from York and Westmoreland southd.; S. and W. Ireland; fl. June-July.—Glabrous or nearly so, tufted; branches 6-10 in., ascending. Leaves $\frac{1}{2}$-1 in., close set, 2 of each whorl much smaller than the others, narrow-linear, mucronate, rigid, recurved, not ciliate. Cymes lax-fld. Corolla $\frac{1}{3}$ in. diam., pink and papillose outside, white inside. Fruit minute, papillose.—Distrib. Holland to N. Africa, N. and W. Asia, Himalaya.


Annual or biennial. **Flowers** small, blue or pink, in terminal involucrate heads, honeyed. Calyx-limb 4-6-toothed, persistent. Corolla funnel-shaped, tube slender; limb 4-fld. Stamens 4, filaments slender. Style 2-fld, stigmas capitate. Fruit didymous, dry, crowned with the enlarged calyx-limb, separating into 2 plano-convex lobes.—Distrib. Europe, N. Asia, Canaries to Persia.—Etym. James Sherard, an eminent botanist.

**S. arven'sis**, L.; leaves 4-6 in a whorl, lower often opposite.

**Order XXXIX. VALERIA'NEÆ.**

Herbs, rarely shrubs. *Leaves* opposite, exstipulate. *Flowers* small, usually irregular, in dichotomous cymes. *Calyx-limb* superior, lobed, or a feathery pappus involute in bud. *Corolla* funnel-shaped, base equal gibbous or spurred; lobes 3–5, unequal, obtuse, imbricate in bud. *Disk* small. *Stamens* 1–3 or 5, inserted at the base of the corolla-tube, filaments slender, anthers exserted, versatile. *Ovary-cells* 3, 2 empty or suppressed, 1 with a solitary pendulous anatropous ovule; style filiform, stigma obtuse or 2–3-lobed. *Fruit* small, indehiscent; 1 cell fertile, 2 small empty suppressed or confluent. *Seed* pendulous, testa membranous, albumen 0; embryo straight, cotyledons oblong, radicle cylindrical.—**Distrib.** Temp. N. zone, Andes, one S. African; genera 9; species 250.—**Affinities.** Close with *Dipsacece* and *Compositæ.—Properties.** Aromatic, antispasmodic, sometimes stimulant.

*Corolla* pappose. *Corolla-tube* equal or gibbous. *Stamens* 3...1. *Valeriana.*


*Corolla* toothed or lobed. *Corolla-tube* obconic.............2. *Valerianella.*

1. **Valeriana'na, L.** Valerian.


1. **V. dioica, L.**; cauline leaves pinnatifid, flowers tetramorphous.

Wet meadows and bogs, local, from Fife and Ayr southd.; ascends to 2,000 ft. in Northumberland; fl. May–June.—Glabrous, nodes and leaf-margins ciliate. *Rootstock* creeping, stoloniferous. *Stem* 6–18 in., ascending. *Leaves* ½–1 in., radical long-petioled, ovate or spatulate; cauline with a large terminal lobe and narrow lateral segments. *Cymes* terminal, corymbose; flowers ¾ in. diam., pinkish; females denser, darker; bracts linear. *Fruit* small.—**Distrib.** N. and Mid. Europe, Himalaya.

The forms of flowers are:—1. ♂, corolla large, pistil 0; 2. ♂, corolla smaller, pistil rudimentary; 3. ♀, corolla smaller still, anthers rudimentary; 4. ♀, corolla smallest, anthers 0.
2. **Valeriana officinalis**, L.; leaves all pinnate, flowers homomorphous. *Cat's Valerian, All-heal.*


*V. officinalis* proper (*V. Mika'ni*, Wats.); leaflets 6–10 pairs, toothed on one side.—VAR. *V. sambucifolia*, Mikan; leaflets, 4–6 pairs, toothed all round. Very local.

V. **Pyrena'ica**, L.; leaves very large cordate deeply toothed.


1*. **CENTRAN'.THUS, DC.** **Spur-Valerian.**


C. **Ruber**, DC.; lower leaves lanceolate, upper triangular ovate.


2. **Valerianell'la, Tournef.**


1. **V. oloto'ria, Manch**; cymes capitate, bracts leafy toothed, fertile cell of fruit corky on the back, empty ones contiguous or confluent, calyx-limb 0. *Valeriana Locusta*, L. in part. *Lamb's Lettuce*.

Cornfields and hedgebanks, N. to Shetland; Ireland; Channel Islands; (native? Wats.); fl. April–June.—Glabrous, flaccid, brittle, 6–12 in. *Leaves*
1–3 in., linear-oblong or oblong-lanceolate, quite entire or toothed, cauline ½-amplexicaul. Flowers minute, pale lilac; bracts linear, ciliate. Fruit minute, glabrous or hairy.—Distrib. Europe, N. Africa, W. Asia; introd. into N. America.—An excellent salad.

V. carinata, Lois. ; cymes capitate, fruit oblong boat-shaped, fertile cell not corky, empty cells contiguous inflated, calyx-limb indistinct. Corn Salad.

Cultivated ground, &c.; naturalized; from Yorkshire southd.; Co. Down; Channel Islands; fl. April–June.—Probably a variety of F. olitoria, which it resembles in all characters, save those of the fruit given above.—Distrib. From Holland southd., N. Africa, W. Asia.

2. V. Auricula, DC. ; cymes lax, fruit broadly ovoid turgid narrowly grooved in front, fertile cell not corky, empty cells contiguous inflated, calyx with one large unilateral lobe. V. rimosum, Bast. (oldest name); V. dentata, DC. F. tridentata, Reichb. not Stev.

Cornfields, rare, from Fife southd.; Ireland; Channel Islands; (a colonist, Wats.); fl. June–Aug.—Very similar in size, habit, and foliage to F. olitoria, but more slender.—Distrib. From Holland southd., W. Asia.

3. V. dentata, Poll.; cymes lax, fruit narrow-ovoid slightly compressed, fertile cell not corky, empty cells remote slender on one side of the fruit, calyx small oblique 3–4-toothed. V. Morisonii, DC.

Cornfields, &c., from Moray and Lanark southd.; Ireland; Channel Islands; (a colonist, Wats.); fl. June–Aug.—Habit, &c., of V. Auricula. Flowers flesh-coloured. Fruit glabrous, or hispid (V. mixta, Dufr.).—Distrib. From Gothland southd., N. Africa, N.W. India.

4. V. eriocarpa, Desv.; cymes crowded, fruit ovoid, hairy or glabrous, fertile cell not corky, empty cells remote slender, calyx large campanulate obliquely truncate reticulate toothed.


Order XL. Dipsaceae.

Perennial or biennial herbs. Leaves opposite, rarely whorled, exstipulate. Flowers small, capitate; outer bracts involucriform; inner 0 or beneath the flowers; floral bracts forming an involucel embracing the calyx-tube. Calyx-limb superior, cup-shaped, entire lobed or ciliate. Corolla funnel-shaped or cylindric, often curved; lobes 4–5, obtuse, imbricate in bud, the larger or anterior overlapping. Stamens 4, inserted on the corolla-tube; filaments filiform, often unequal, incurved in bud; anthers exserted, versatile. Ovary 1-celled; style filiform, stigma oblique or notched, ovule solitary, pendulous from the top of the cell, anatropous. Fruit indehiscent, enclosed in the involucel, often crowned by the calyx-limb. Seed pendulous, testa membranous, albumen fleshy;
embryo axile, straight, cotyledons broad flat, radicle short.—Distr. Chiefly Oriental; genera 5; species 125.—Affinities. With Composita. —Properties unimportant.

Floral bracts spinescent, exserted, covering the head.............1. Dipsacus. Floral bracts concealed, scale-like or 0 ..................2. Scabiosa

1. DIP'SACUS, Tournef. Teasel.

Erect, biennial, hairy or spinulose herbs, stems angular. Leaves usually connate, toothed or cut. Heads oblong or cylindric; receptacle columnar; invol. bracts many, rigid, spreading; floral bracts exserted, spinescent; involucel 4-angled. Flowers proterandrous. Calyx-limb discoid or cupular, lobulate. Corolla-tube slightly dilated upwards; lobes 4, short, unequal. Stamens 4. Stigma dilated, obliquely decurved.—Distr. Europe, W. Asia; species 12.—Etym. obscure.


Copses and hedges from Perth and Dumbarton southd.; Ireland?; Channel Islands; fl. Aug.–Sept.—Glabrous. Stem 3–4 ft., stout, rigid, ribs prickly. Leaves radical on the first year only, spreading; cauline 6–8 in., oblong-lanceolate, entire or crenate, midrib prickly. Heads 2–3 in.; bracts linear, rigid, longer than the head; floral bracts very long, rigid, subulate, strict, ciliate; involucel pubescent. Calyx-limb deciduous. Corolla purplish.—Distr. From Denmark southd., Canaries to Persia.—D. Fullo'num, L. (Fuller's Teasel), known by its hooked bracts, is probably a form of this plant only known in cultivation.

2. D. pilo'sus, L.; leaves petioled with usually a pair of basal leaflets, heads subglobose hairy, invol. bracts deflexed.

Moist hedges and banks, local, York to Devon and Kent; fl. Aug.–Sept.—More or less hairy. Stem 2–4 ft., slender; ribs with soft short hair-pointed prickles. Leaves, radical petioled, hairy, crenate; cauline 6–12 in., oblong, crenate-serrate. Heads ½–1 in. diam., drooping in bud; bracts many, shorter than the head, linear, toothed and ciliate; floral bracts obovate, with long cuspidate ciliate points; involucel calyx-tube and corolla white, very hairy.—Distr. N. and Mid. Europe, Caucasus.

2. SCABIO'SA, L.

Perennial herbs. Leaves entire or pinnatifid. Heads hemispheric or depressed; invol. bracts 1–2-seriate; receptacle hemispheric or columnar, hairy or with scaly floral bracts; outer flowers often larger and rayed. Involute calyces tubular, 4–8-angled, truncate, or 4–5-lobed. Flowers honeyed, proterandrous. Calyx-limb cup-shaped, with 4–16 rigid bristles or teeth. Corolla curved, oblique or 2-lipped; lobes 4–5, obtuse. Stamens 4. Stigma capitellate, notched.—Distr. Europe, W. Asia, all Africa; species about 80.—Etym. scabies, from its use in skin-diseases.
DIPSACEÆ.


1. **S. succi'sa**, L.; leaves entire, involucral bracts shorter than the 4-lobed subequal corollas. Devil’s-bit-Scabious. Pastures and open places, N. to Shetland; ascends to 2,500 feet in the Highlands; Ireland; Channel Islands; fl. July–Oct.—Rootstock short, abruptly truncate. Stem 1–2 ft., branched above. Leaves glabrous or hairy; radical oblong or ovate, petioled; cauline few, toothed. Heads $\frac{2}{3}$–1 1/2 in. diam., some $\varphi$ only; peduncle with appressed hairs; invol. bracts lanceolate, floral linear-spathulate. Flowers blue-purple or white; involucel villous, with 4 ovate teeth. Calyx-bristles 4, rigid. Corolla hairy, tube curved. Anthers red-brown, opening in succession. Fruit oblong.—Distrib. N. and Mid. Europe (Arctic), Siberia, N. Africa.

2. **S. Columba'ria**, L.; cauline leaves pinnatifid, invol. bracts longer than the 5-lobed corollas, outer corollas larger very irregular. Dry pastures and banks, from Perth southd.; ascends to 1,600 ft. in Yorks.; absent in W. Scotland; Channel Islands; fl. July–Sept.—Rootstock tufted, often woody. Stem 1–2 ft., simple or branched above, hairy. Leaves glabrous or pubescent, very variable; radical narrow, petioled, entire or divided; cauline segments often cut. Heads 1–1 1/2 in. diam.; peduncle slender; invol. bracts 1-seriate, slender, floral linear-spathulate. Flowers lilac or blue-purple; involucel subcampanulate, white, membranous, many-nerved. Calyx-bristles 5, rigid, rough. Corolla pubescent, of inner flowers regular, of outer rayed. Anthers yellow. Fruit narrow-obovoid, shortly beaked.—Distrib. Europe, Mediterranean region.

SUB-GEN. II. Knau'tia, Coulter (gen.). Receptacle hemispheric, hairy. Involucel 4-furrowed. Calyx-bristles 8–16, deciduous.

3. **S. arven'sis**, L.; invol. bracts shorter than the usually 4-lobed corollas, of which the outer are much larger and 2-lipped. Dry banks and fields, N. to Orkney; Ireland; Channel Islands; fl. July–Sept.—Rootstock stout. Stem 2–5 ft., stout, very hairy, usually branched above. Leaves variable, hairy; radical oblong-lanceolate, entire serrate or crenate; cauline toothed lobed or pinnatifid. Heads 1–1 1/2 in. diam., depressed; peduncle long, stout; invol. bracts broad, leafy, 2-seriate. Flowers pale lilac or blue, sometimes $\varphi$, with imperfect anthers; involucels villous, obscurely 4-toothed. Corolla hairy, inner redder, outer larger radiating. Anthers yellow. Fruit ovoid, beaked; calyx-limb deciduous.—Distrib. Europe (Arctic), Caucasus, Siberia, N. Africa.

Order XII. COMPOS'ITÆ.

Herbs (most British species). Leaves alternate, rarely opposite or whorled, stipules 0. Inflorescence a centripetal head of many small flowers sessile on the dilated top of the peduncle (receptacle), enclosed in an involucre of
COMPOSITÆ.

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whorled bracts; floral bracts 0, or reduced to paleæ scales or bristles on the receptacle. Flowers usually protandrous and honeyed; all tubular (head discoid), or the outer, or all, ligulate (head rayed), 2-sexual, or the inner 2-sexual or male, the outer female or neuter. Calyx-limb superior, of hairs (pappus) or scales, or 0. Corolla of 2 forms: 1st, tubular, or campanulate, 4–5-lobed, lobes valvate with marginal nerves; 2ndly, ligulate, lobes elongate and connate into a strap-shaped or elliptic ligule. Disk epigynous. Stamens 4–5, inserted on the corolla-tube, filaments usually free; anthers basi-fixed, usually connate; connective produced upwards; cells simple or tubed at the base; pollen subglobose, rough. Ovary 1-celled; style 1-fid, arms (sometimes connate) linear, naked or pubescent or tipped by pubescent cones, margins stigmatic; ovule solitary, basal, erect, anatropous. Fruit dry, indehiscent. Seed erect, testa membranous, albumen 0; embryo straight, cotyledons plano-convex, radicle short.—AFFINITIES. Close with Dipsacaceæ, Valerianaceæ, and Lobelineaceæ.—DISTRIB. All regions; genera 768; species 10,000.—PROPERTIES. Too numerous to mention here.

SERIES I. TUBULIFLÓRÆ. Flowers all tubular or the outer only ligulate. Juice watery.


TRIBE II. ASTEROI’DEÆ. Leaves alternate. Ray-flowers female or neuter, ligulate, rarely all tubular; style-arms linear, obtuse, glabrous, stigmatic lines confluent. Disk-flowers 2-sexual; anther-cells not tailed; style-arms linear, glabrous, tipped with a pubescent cone. Pappus-hairs or scales rigid or 0.

Ray-flowers purple, 1-seriate, or 0. Pappus rigid………….2. Aster.
Ray-flowers in 2 or more series. Pappus-hairs rigid…………3. Erigeron.
Ray-flowers white or pink. Pappus 0…………………4. Bellis.
Ray-flowers yellow. Pappus hairs rigid or 0…………5. Solidago.

TRIBE III. INULOI’DEÆ. Leaves alternate. Ray-flowers ligulate, yellow, or 0; disk-flowers tubular; anther-cells with slender tails. Style-arms and pappus as in Asteroideæ.

* Ray-flowers ligulate. Pappus scabrid.

Pappus simple………………………………………………………………………………6. Inula.

** Ray-flowers slender, tubular. Pappus silky.

Heads 2-sexual. Receptacle conical; scales few………………10. Filago.

TRIBE IV. HELIANTHÔI’DEÆ. Leaves opposite. Ray-flowers 0 or ligulate, yellow, female or neuter. Disk-flowers 2-sexual.

Pappus of broad ciliate scales…………………………………………………………11*. Galinsoga.
TRIBE V. ANTHEMIDÆ. Leaves alternate. Ray-flowers ligulate, or tubular and very slender. Anther-cells not tailed. Style-arms linear with truncate papillose or penicillate tips; stigmatic margins confluent below. Pappus 0 or minute.

'Outer flowers ligulate, white, or 0. Receptacle with scales or bristles.


Outer flowers ligulate, white or yellow. Receptacle naked.


* Style-arms of disk-flowers connate.


** Style-arms of disk-flowers free.


TRIBE VI. SENECEOIDEÆ. Leaves alternate. Flowers all yellow, tubular and 2-sexual, or outer ligulate. Receptacle naked. Anther-cells without tails. Style-arms connate, or free and obtuse, or tipped with short cones (as in Asteroidæ). Pappus-hairs usually very soft (rigid in Doronicum).


TRIBE VII. CYNA'REÆ. Leaves alternate, usually spinous-toothed. Involucræ often globose, bracts spinous. Flowers all tubular, 2-sexual, or the outer female or neuter (dioecious in Serratula and some Cardui), tube slender, ventricose above, lobes very narrow. Anthers much exserted; connective elongate, stiff. Style-arms usually combined into a pubescent 2-fid cylinder, with a ring of hairs or swelling at their base.

Anther-cells tailed.


Anther-cells not tailed or scarcely so.

Pappus short unequal or 0..........................25. Centaurea. Pappus-hairs long.


Eupatorium.]  COMPOSITÆ.  203

Series 2. LIGULIFLO'RAE.  Flowers all ligulate.  Juice milky.

Tribe VIII. CICHORIA'CEÆ.  Leaves alternate.  Style cylindric, pubescent above; arms linear, \( \frac{1}{2} \)-terete, obtuse, pubescent at the back; stigmatic lines not confluent.

1. Pappus of small scales or 0.

Fruit ovoidal crowned with a ring; pappus 0 .................. 32. Arnoseris,
Fruit obtuse.  Pappus 0 ........................................... 33. Lapsana.

2. Fruit contracted at both ends.  Leafy herbs without wool or stellate hairs.

Pappus simple or feathery ........................................ 34. Picris.

3. Fruit truncate; pappus-hairs rough, brown.  Scapigerous or leafy herbs

with stellate hairs ........................................ 35. Crepis.

4. Fruit contracted below, beaked above; pappus-hairs simple or feathery.

Scapigerous herbs ........................................ 36. Hieracium.

5. Fruit usually narrowed below and beaked above; pappus-hairs copious, simple.  Leafy glabrous or hispid herbs.

Receptacle naked.  Pappus-hairs feathery ......................... 38. Leontodon.

6. Fruit slender, curved, beak long; pappus-hairs feathery below, tips naked.

Involute-bracts connate below .................................. 40. Lactuca.

1. Eupato'r'ium, L.  Hemp Agrimony.

Herbs or undershrubs.  Leaves usually opposite.  Heads few-fld., white
or purplish, in terminal corymbs; invol. bracts imbricate, 2-3-seriate;
receptacle flat, naked.  Flowers all tubular, 2-sexual, 5-fld.  Anther-
cells without tails.  Style-arms long, exserted, cylindric, obtuse, grooved
in front, pubescent all over.  Fruit angular or striate; pappus-hairs
1-seriate, hairy or scabrous.—Distrib.  Chiefly American, rarer in the
Old World; species about 400.—Etym.  The classical name.

E. canabi'num, L.; leaves 3-5-foliolate, leaflets lanceolate serrate.

River banks and moist places from Sutherland southd., uncommon in Scot-
land; Ireland; Channel Islands; fl. July-Sept.—Pubescent, perennial,
woody below.  Stem 2-4 ft., subsimple, terete; branches short.  Leaves
opposite, radical petioled, oblanceolate; cauline subsessile; leaflets 2-4 in.
Heads in dense terminal 5-6-fld. corymbs, whitish or pale purple; invol.
bracts about 10, \( \frac{3}{4} \) in., scarious, linear-oblong, obtuse, outer shorter.  Flowers
5-6, longer than the involucre.  Pappus white, scabrous.  Fruit angled, and
corollas covered with resinous points.—Distrib.  Europe, N. and W. Asia,
Himalaya, N. Africa.—Leaves reputed tonic.
2. ASTER, L.

Perennial herbs. Leaves alternate or radical, quite entire or toothed. Heads solitary or many, usually radiate; disk yellow, ray white blue or purple; invol. bracts many-seriate, herbaceous or leafy; receptacle flat, pitted, edges of the pits toothed. Ray-fl. 1-seriate, ligulate, female; disk-fl. tubular, 5-toothed, 2-sexual. Anther-cells simple. Style-arms of the ray-fl. linear with thickened margins, of the disk-fl. short tipped with papillose cones. Fruit compressed; pappus-hairs many-seriate, persistent, scabrid, unequal.—Distrib. Most temp. and cold regions, chiefly American; species about 150.—Etym. from the star-like flowers.

1. A. Tripoli'um, L.; leaves lanceolate or obovate-lanceolate.
Salt marshes, N. to Sutherland; Ireland; Channel Islands; fl. July–Sept.—Root fusiform. Stem 2–3 ft., erect, sparingly branched, stout. Leaves 3–5 in., scattered, fleshy, slightly toothed or not, faintly 3-nerved, upper linear. Heads ¼–½ in., corymbose, campanulate; peduncle slender, bracts small; invol. bracts few, oblong, obtuse, appressed. Ray-fl. whitish or purple, many few or 0 (var. discoides). Fruit hairy; pappus dirty white.—Distrib. Sea coasts and salt regions of Europe (Arctic), N. and W. Asia. A bad substitute for Samphire.


3. ERIG'ERON, L. Fleabane.

Characters of Aster, but ray-flowers many-seriate; fruit narrower.—Distrib. Temp. and cold regions; species about 80.—Etym. ἑρύγερων, the name given to groundsel, from its hairy down.

1. E. alpi'num, L.; leaves radical, scape with 1 or few broad heads, ligules much longer than the reddish pappus. E. uniflorus, Sm. not L.

2. E. a'cre, L.; stem leafy branched above, heads ½–3 in. diam. panicled, ligules scarcely longer than the reddish pappus.

E. CANADEN'SE, L.; stem leafy branched above, heads ¼ in. diam. paniced, ligules white scarcely longer than the white pappus.


4. **BEL'LIS, L.** DAISY.


B. perenni_s, L.; perennial, stemless, leaves obovate-spathulate.

Pastures and meadows, N. to Shetland; ascends to near 3,000 ft. in the Highlands; Ireland; Channel Islands; fl. all the year.—Glabrous or hairy. *Rootstock* short, fibres stout. *Leaves* 1–3 in., fleshy, obtuse or rounded at the crenate tip, midrib broad. *Scape* 2–5 in. *Head* ½–1 in. diam.; invol. bracts green, obtuse, often tipped with black. *Ray-fl.* white or pink, disk bright yellow.—*Distrib.* Europe, except N. Russia and Greece, Asia Minor.

5. **SOLIDA'GO, L.** GOLDEN-ROD.

Herbs, often shrubby below. *Leaves* alternate, entire or serrate. *Heads* usually in branched scorioid cymes, yellow, rayed; involucre oblong, bracts many-seriate, appressed; receptacle naked, smooth or pitted. *Ray-fl.* 1-seriate, ligulate, female or 0; style-arms slender, linear, obtuse. *Disk-fl.* tubular, 2-sexual, 5-fid; anther-cells simple; style-arms ½-terete, tipped with papilllose cones. *Fruit* many-ribbed; pappus-hairs 1–2-seriate, scabrid.—*Distrib.* Arctic and N. temp. regions, chiefly N. American; species about 80.—*Etym.* obscure.

S. Virgau'rea, L.; leaves linear- or lanceolate-oblong.

Thickets, rocky banks, &c.; ascends to 2,800 feet in the Highlands; Ireland; Channel Islands; fl. July–Sept.—*Rootstock* stout. *Stem* erect, sparingly
branched, 4-24 in., glabrous or pubescent with curled hairs. *Leaves* 1-4 in., obscurely toothed, obtuse or acute. *Heads* crowded, \( \frac{1}{3} \) in., shortly peduncled, golden yellow; invol. bracts linear, acute, glabrous, green, margins scarious. *Ray-fl.* 10-12, spreading; *disk-fl.* 10-20. *Fruit* pubescent; pappus white.—**Distrib.** Europe (Arctic), N. Asia, Himalaya, N. America.

*S. Virgaurea* proper; tall, leaves all oblong-obovate quite entire.—**Var.** angustifolia, Gaud.; tall, leaves oblong-lanceolate upper narrower often serrate. —**Var.** *S. cambrica*, Huds.; short, leaves broader ciliate, cyme simple, heads larger. Usually in mountainous situations.

6. *I'NULA, L.*

Rather rigid herbs. *Leaves* alternate, erect, entire or toothed. *Heads* paniced corymbose or solitary, rayed, yellow; involucrue campanulate, bracts in many series, herbaceous, outer often leafy; receptacle flat, naked. *Ray-fl.* female or neuter, 1-seriate, ligulate; style-arms slender, obtuse. *Disk-fl.* tubular, 2-sexual; anther-cells tailed; style-arms short. *Fruit* terete or angled; pappus-hairs 1-seriate, scabrid, or outer row short. —**Distrib.** Europe, temp. and subtrop. Asia; species about 56.—**Etym.** The old Latin name.

* Pappus without an outer series of short bristles or scales.


Maritime marshes and rocks, from Essex, Gloster, and Wales to Kent and Cornwall; Wigton and Kirkcudbright in Scotland; S. and E. Ireland; Channel Islands; fl. July-Aug.—Perennial, glabrous, yellow-green. *Stem* 6-18 in., stout, rarely branched, very leafy. *Leaves* 1-2 in., sessile, gradually narrowed to the base, entire or shortly 2-4-lobed. *Heads* 1 in., diam., on long bracteate peduncles; invol. bracts linear-lanceolate; ligule short. *Pappus-hairs* rigid, unequal, dirty white.—**Distrib.** W. coasts from Belgium southd., N. Africa.

3. **I. Salic'na, L.**; leaves linear-oblong toothed and ciliate, upper sessile auricled, heads solitary, fruit terete glabrous.

Shores of Lough Derg, Galway; fl. July-Aug.—Perennial, glabrous or slightly hairy. *Stem* 12-18 in., leafy. *Leaves* 2-3 in., rigid, lower obovate-lanceolate, glabrous above, slightly hairy beneath with reticulate nerves. *Heads*

4. *Helé'nium, L.* ; tall, stout, downy, leaves large toothed, heads very large, invol. bracts leafy, fruit 4-angled glabrous. *Elecampane.*

Copses and meadows, from Ross southd. and in Ireland, local, and usually naturalized; wild in Yorkshire (Baker); Channel Islands; fl. July–Aug.—*Root-stock* large, succulent. *Stem* 2–5 ft., very stout, branched. *Leaves* velvety beneath; radical 1–1½ ft., oblong-lanceolate, long petioled; cauleine sessile, auricled, ovate-cordate, acute. *Heads* 3 in. diam.; peduncle long, stout, naked; invol. bracts broadly ovate, velvety; ligules long, slender. *Pappus* pale reddish.—Distrib. From Gothland southd., Siberia; (doubtful if native W. of Russia); introd. in N. America.—Formerly cultivated as an aromatic and tonic; rootstock still used candied.

7. *Pulicaria, Gærtn.*

Characters of *Inula*, but pappus with an outer row of short scales.—Distrib. Species 24, European and Asiatic.—Etym. *Pulex*, from being obnoxious to *fleas*.

1. *P. dysenter'ica, Gærtn.* ; woolly or cottony, leaves oblong-cordate ½-amplexicaul, ligules long, scales of pappus connate toothed.


2. *P. vulg'aris, Gærtn.* ; pubescent, leaves sessile oblong-lanceolate, ligules very short, scales of pappus free. *Inula Pulicaria*, L.


Herbs, sometimes woody below, usually tomentose or woolly. *Leaves* radical, or radical and cauline. *Heads* small, usually in terminal or axillary fascicled cymes or corymb; invol. bracts appressed, scarios, as long as the flowers; receptacle flat, naked. *Outer fl.* female, in 1 or more series, very slender; style-arms slender, tips truncate, papillose. *Disk-fl.* 2-sexual, limb dilated 5-lobed; anther-cells tailed; style-arms short. *Fruit* terete or compressed; pappus-hairs 1 seriate, very slender.—Distrib.
Temp. and subtrop. regions; species about 100.—ETYM. γνάφαλιον, from their woolly habit.

* Stem leafy. Female flowers in many series. Fruit terete.

1. **G. luteo-album**, L.; annual, stems simple, heads very glistening in dense ebracteate corymbs.

Light soils; sporadic in Norfolk, Suffolk, and Sussex; Channel Islands; fl. July–Aug.—Densely cottony. **Stems** many, 6–12 in., decumbent below, leafy. **Leaves** 1–2 in., linear-oblong, obtuse or acute, ½-amplexicaul, margin sinuate. **Heads** ½ in. diam., pale yellow; invol. scales hyaline. **Fruit** papillose.—**DISTRIB.** All warm countries.

2. **G. sylvaticum**, L.; perennial, stems simple, heads in leafy racemes or spikes, or in alternate fascicles along the spikes.

Woods, pastures, and copses; N. to Shetland; fl. July–Sept.—White, cottony. **Rootstock** woody. **Stems** 2–12 in. **Leaves** 1–3 in., narrowly linear or obovate-lanceolate, acute 1-nerved; petiole not ¾-amplexicaul. **Heads** subcylindric, ½ in.; invol. bracts unequal, yellow or red-brown above, obtuse, outer cottony. **Fruit** puberulous.—**DISTRIB.** Europe (Arctic), N. and W. Asia, N. America.

G. **sylvaticum** proper; leaves narrow usually woolly beneath only, spike elongate, pappus white or brown. **G. rectum**, Sm.—N. to Shetland; Ireland; Channel Islands.

Sub-sp. **norvegicum**, Gunn.; leaves broader, woolly on both surfaces, floral suddenly smaller, spike short, invol. bracts very dark, fruit longer, pappus white. **G. sylvaticum**, Sm.—Perth, Forfar and Aberdeen; ascends to 1,600 ft.


Damp places, especially in light soils, N. to Shetland; ascends to 2,000 ft. in Ireland; Channel Islands; fl. July–Sept.—Cottony above, rarely glabrate. **Stems** 2–6 in., usually many, erect from the decumbent base. **Leaves** narrow, gradually dilated upwards, acute or obtuse; petiole not amplexicaul. **Heads** ½ in. long, sessile, clustered, subtended by long linear leaves; invol. bracts narrow, subacute, pale brown. **Fruit** very minute.—**DISTRIB.** Europe (Arctic), Siberia, N. America.—**G. pilula're**, Wahl., is a var. with papillose fruit, found at Toft in Cambridgeshire.

** Leaves chiefly radical. Female flowers in one series. Fruit compressed.**

4. **G. supinum**, L.; perennial, tufted, scapes with 1 or few heads.

Alpine and subalpine rocks, from Stirling and Argyll to Orkney; ascends to near 4,300 ft.; fl. July–Aug.—Dwarf; tufts 1–6 in. diam., covered with cottony appressed wool; roots fibrous, dark brown. **Leaves** ½–1 in., linear-lanceolate, subacute. **Scapes** ½–3 in., slender, with few linear leaves. **Heads** 1–3, ½ in. diam., sessile; invol. bracts scarious, brown above, woolly, outer obtuse, inner acute. **Fruit** pubescent; pappus white.—**DISTRIB.** Alpine and Arctic Europe, N. America, Asia Minor.


Characters of * Gnaphalium*, but heads dioecious or nearly so. **Flowers** all tubular; female filiform, 5-toothed; style slender, funnel-shaped;
male tubular, limb dilated above; anthers partly exserted, cells tailed; style undivided. Fruit nearly terete; pappus-hairs 1-seriate, of female flowers filiform, of males thickened upwards and serrate.—DISTRIB. Temp. and Arctic Europe, N. Asia, N. America; species about 10.—ETYM. From the likeness of the male pappus to the antennae of a butterfly.


Heaths and sandy pastures, from Cornwall and Devon in the west and Suffolk on the east to Shetland; ascends to 2,000 ft. in Scotland; Ireland; fl. June–Aug.—Perennial. *Barren shoots many.* Leaves chiefly radical, ½–1½ in., apiculate, silky beneath. Flowering stems 2–8 in., slender, cottony, with many linear bracts. Heads 2–8, crowded; male subglobose, ¼ in. diam., outer invol. bracts scarios cottony, inner longer with a white or pink radiating obtuse ligule, stamens exserted; female twice as large, invol. scales more numerous, shorter than the flowers. Fruit papillose; pappus-hairs silky.—DISTRIB. Of the genus.

**A. hyperborea**, Don, is a var. with leaves broader cottony above.—Skye.

**A. margaritacea**, Br.; half shrubby, corymb compound.

Naturalized in S. Wales and Scotland; Channel Islands; fl. July–Aug.—Perennial, stoloniferous. Stem 2–3 ft., leafy, stout, and leaves beneath and corymb densely clothed with white or buff cottony tomentum. Leaves 3–5 in., narrow-lanceolate, acuminate, sessile, ½-amplexicaul, glabrous above. Heads ½ in. diam., of male fl. globose; female more campanulate; invol. bracts oblong, brown below, white and radiating above.—DISTRIB. N. America.

### 10. FILAGO, L.

Slender, annual, cottony herbs. *Leaves* alternate, quite entire. Heads in axillary and terminal clusters; invol. bracts imbricate, often superposed in series, scarios, acuminate, woolly; receptacle elongate, slender, with scales under the outer flowers. Outer fl. in 1 or more series, female, outermost usually concealed in the concave inner invol. bracts; corolla very slender; style-arms slender. Disk-fl. numerous, 2-sexual or male; corolla-limb dilated, 4–5-toothed; anther-cells tailed; style-arms short. Fruit terete, papilloose; pappus-hairs of the central florets very slender, in 1 or more series, of the marginal often 0.—DISTRIB. Europe, N. Africa, W. Asia; species 8.—ETYM. *filum*, from the cottony hairs.

1. **F. germanica**, L.; leaves linear-oblong acute waved, heads 20 or more in terminal spherical clusters, invol. bracts in many opposite series not spreading acuminate and mucronate.

Dry pastures and banks, from Ross and Dumbarton southd.; rare in Scotland; common in Ireland; Channel Islands; fl. July–Aug.—Stem 6–18 in., stiff, erect or ascending, dichotomously branched, flower-heads in the forks; branches ascending, leafy. *Leaves* ½–1 in. Heads ½ in. broad; invol. bracts glistening, subulate-lanceolate, longer than the flowers, pale reddish-brown;
female flowers in several series. *Fruit* compressed, papillose.—*Distrib.* From Gothland southd., N. and W. Asia, India; introd. in N. America.

*germanica* proper (*F. canes'cens*, Jord.); heads obscurely 5-angled leafless, invol. bracts folded longitudinally, tips yellowish.—*Var.* *F. apiculata*.


2. *F. min'ima*, Fries; leaves small lanceolate, heads 3–6 in terminal and axillary clusters longer than the subtending leaves, invol. bracts in 1–2 series at length spreading. *F. montana*, DC. not L.


3. *F. gallica*, L.; leaves slender subulate, heads 2–6 in axillary clusters shorter than the subtending leaves, invol. bracts in 1–2 series subacute at length spreading.


11. *BI'DENS*, L.  **BUR-MARIGOLD.**

Annual herbs, usually glabrous. *Leaves* opposite, entire or divided, or upper alternate. *Heads* solitary or corymbose, rarely rayed, yellow; invol. bracts 2–3-seriate, outer often leafy; receptacle flattish, with a scale under each flower. *Ray-fl.*, if present, in 1 series, ligulate, neuter. *Disk-fl.* campanulate above, 5-toothed; anther-cells simple; style-arms linear, tipped by papillose cones. *Fruit* compressed, ribbed, ribs often aculeate; pappus of 2–5 rigid barbed bristles.—*Distrib.* Temp. and trop. regions; species about 50.—*Etym.* From the 2 stiff pappus-bristles of some species.

1. *B. cer'nu'a*, L.; leaves sessile undivided, heads drooping.

Watery places, from Elgin and Dumbarton southd.; Ireland; fl. July–Oct.—Glabrous, or slightly hispid above. *Stem* 1–2 ft., stout, succulent, terete, branched above, leafy. *Leaves* 2–3 in., in connate pairs, oblong-lanceolate, coarsely serrate. *Heads* 1–1 1/2 in. diam.; peduncle ebracteate; outer invol. bracts leafy, spreading or reflexed; inner shorter, broadly-oblong, obtuse, streaked with black. *Ray-fl.* few, short, broad or 0. *Fruit* narrow-obovoid, ribs and pappus-bristles usually 4, barbed.—*Distrib.* Europe, N. and W. Asia to India, N. America.—The rayed form is rare, and found in England only.
2. **B. tripartita**, L.; leaves petioled simple or 3-cleft, heads suberect. Watery places from Isla and Elgin southd.; Ireland; Channel Islands; fl. July–Sept.—Habit of *B. cernua*, but more slender; leaves often 3-partite; heads smaller; outer invol. bracts narrower, inner acute, and pappus-bristles 2 shorter.—A Thames form (Putney) has broader heads, more numerous florets and 3–4 pappus-bristles.—**Distrib.** Europe (Arctic), N. Africa, W. Asia to India, N. America.

**11*. **GALINSO'GA, Ruiz and Pavon.**

Annual trichotomously branched herbs. *Leaves* opposite, triple-nerved, serrate. *Flower-heads* small, yellow, rayed; invol. bracts 1-seriate, margins scarious; receptacle conical, with lanceolate scales under each flower. *Ray-fl.* female; tube short, pubescent; ligule very broad, short, 3-fid; style-arms linear, obtuse. *Disk-fl.* tubular, 2-sexual, 5-toothed; anthers short, with a short terminal appendage, cells shortly tailed. *Fruit* hispid; pappus of 1 series of ciliate scales.—**Distrib.** S. America; species 5.—**Etym.** M. de Galinsoga, a Spanish botanist.


**12. AN'THEMIS, L.**

Herbs, sometimes shrubby below, strong-scented. *Leaves* alternate, 2-pinnatifid. *Heads* solitary, yellow, with (rarely without) a broad white ray; invol. bracts imbricate, in few series; receptacle flat or conic; scales membranous, slender. *Ray-fl.* 1-seriate, ligulate, female or neuter; style-arms short, edges thickened, tips obtuse papilllose. *Disk-fl.* tubular, 2-sexual, 5-toothed; anther-cells not tailed; style-arms as in the female. *Fruit* subterete, grooved or striate, crowned with a tumid disk; pappus 0, or a short membrane.—**Distrib.** Europe, N. Africa, W. Asia; species about 60.—**Etym.** The old Greek name.

1. **A. arven'sis**, L.; annual, scales of receptacle mucronate longer than the flattened disk-fl., ray-fl. female white. *Corn Chamomile.*

A. an'glica, Spr. (A. maritima. Sm. not L.), is a maritime form, formerly found in Durham, with leaves fleshy pinnatifid, pinnules deeply serrate, and receptacle flat.

2. A. Cot'ula, L.; annual, erect, scales of receptacle setaceous shorter than the flattened disk-fl., ray-fl. usually neuter white. Stinking May-weed.

Cultivated fields, from Dumbarton and Fife southd.; rare in the N.; Ireland; Channel Islands; (a colonist, Wats.); fl. June-Sept.—Glabrous or hairy, foetid. Stem 8-18 in., corymbosely branched. Leaves glandular-dotted, segments very narrow. Heads as in A. arven'sis, but peduncles more slender and invol. bracts narrower at the tip. Fruit faintly ribbed, more strongly on the back.—Distr. Europe, N. and W. Asia, W. India; introd. in N. America.—Acrid, emetic; a troublesome weed; foliage blisters the hand.


Pastures and dry soils, in England, not indigenous in Scotland; Ireland; Channel Islands; fl. July-Sept.—Woolly or pubescent, aromatic. Branches spreading from the root, leafy. Leaf-segments linear. Heads 1-1½ in. diam., few; peduncle long, slender; invol. bracts pubescent, scarious. Ray-fl. sometimes 0. Fruit obovoid, terete; disk very small, concealed by the inflated base of the corolla.—Distr. W. Europe, N. Africa.—Tonic and febrifuge.

13. ACHILLE'A, L.

Perennial herbs. Leaves alternate, entire or divided. Heads corymbose, ray white, yellow, or purple; inner or all invol. bracts oblong, margins sometimes discoloured and scarious. Receptacle narrow, covered with chaffy scales. Ray-fl. female; ligule broad, short. Disk-fl. tubular, 2-sexual, compressed, 5-toothed; anther-cells not tailed. Fruit oblong, compressed, margined; pappus 0.—Distr. Europe, N. Asia, N. America; species about 80.—Etym. Mythical.


Meadows and waste places, N. to Shetland; ascends to 2,200 ft. in the High-
lands; Ireland; fl. July-Sept.—Glabrous or pubescent. Rootstock creeping extensively. Stem 1-2 ft., erect, rigid, ribbed, sparingly branched. Leaves 2-3 in., sessile, scattered, teeth cartilaginous. Heads corymbose, ⅔ in. diam., hemispheric; peduncle ebracteate; receptacle convex; invol. bracts pubes-
cent, rigid, outer lanceolate acute margins purple, inner oblong obtuse. Ray-fl. 8-12; ligule reflexed, broad, as long as the involucre; disk-fl. greenish-white. Fruit glabrous, shining.—Distr. Europe, Asia Minor, Siberia; introd. in N. America.—Rootstock pungent, a dialogogue.


Pastures, N. to Shetland, ascends to 4,000 ft. in the Highlands; Ireland; Channel Islands; fl. May-Sept.—Glabrous, pubescent or woolly. Rootstock extensively creeping, stoloniferous. Stem ⅔-1½ in., erect, furrowed, usually simple, leafy. Leaves 2-6 in., linear-oblong, radical petioled; leaflets and
linear-acute segments very close-placed. Heads many, \( \frac{1}{2} \) in. diam., corymbose, ovoid; peduncle short, stout, ebracteate; invol. bracts oblong, obtuse, rigid, brown-edged. Ray-fl. many, white pink or purple; ligule orbicular, shorter than the involucre, reflexed; disk-fl. white or yellowish. Fruit glabrous, shining.—Distr. Europe (Arctic), N and W. Asia, Himalaya, N. America.—A reputed astringent.


An erect, perennial herb, densely clothed with felted white grey or buff wool. Leaves alternate, oblong. Heads subglobose, discoid, yellow; involucre campanulate, bracts oblong; receptacle flattish, scaly. Flowers all tubular and 2-sexual, much compressed, 5-toothed, coryk, with 2 wings produced downwards over the ovary as persistent spurs; anther-cells not tailed. Fruit angular, crowned by the corolla-base; pappus 0.—Etym. Scis and obs, from the ear-like corolla-lobes.

D. maritima, Cass.; stems very many, leaves sessile obtuse.

Sandy shores, E. Suffolk, Essex, Kent to Cornwall, Anglesea (extinct in most); Kerry, Wexford, Waterford; Channel Islands; fl. Aug.–Sept.—Rootstock creeping, woody. Stems 6-12 in., stout, ascending, branched above. Leaves \( \frac{1}{2} \) in., entire or toothed. Heads \( \frac{1}{2} \) in. diam., in small dense terminal corymbs; scales of receptacle oblong, acuminate, tips woolly. Fruit curved, smooth, glabrous, 5-ribbed.—Distr. Shores of the Mediterranean, Canaries.

15. MATRICA'RIA, L.

Annual, rarely perennial, branched herbs. Leaves alternate, much divided; lobes narrow. Heads yellow, ray white or 0; invol. bracts in few series, nearly equal; receptacle broad, flat or conical, elongate after flowering, naked. Ray-fl. 1-seriate, ligulate, female, or 0. Disk-fl. tubular, 2-sexual, 4-5-toothed; anther-cells not tailed. Fruit ribbed or angled on the ventral face, not winged; disk large; pappus 0.—Distr. Europe, N. and S. Africa, W. Asia; species about 70.—Etym. Formerly used in uterine affections.

1. M. Chamomilla, L.; aromatic, leaves 2-pinnatifid, segments very narrow, invol. bracts without dark edges, fruit 5-ribbed ventrally only. Wild Chamomile.

Cultivated ground, from Cumberland southd.; sporadic in Scotland and Ireland; Channel Islands; fl. June–Aug.—Habit and appearance of glabrous forms of Anthemis arvensis and of the following, with the scent, &c., of A. nobilis, but fainter. Stem much branched. Heads \( \frac{1}{2}-\frac{3}{4} \) in. diam., corymbose, ligules reflexed after flowering or 0. Fruit small, grey; ribs slender, white; disk oblique.—Distr. Europe, N. and W. Asia to N.W. India.—A tonic.

2. M. inodo'ra, L.; inodorous, leaves 2-pinnatifid, segments very narrow, invol. bracts edged with brown, fruit with 3 thick ribs on the ventral face and 2 pits on the dorsal above. Pyrethrum, Gærtn.
COMPOSITÆ. [Matricaria.]

Fields, &c., N. to Shetland; ascends to 1,200 ft. in the Highlands; Ireland; Channel Islands; fl. June–Oct.—Glabrous, very similar to M. Chamomilla, but not aromatic, leaf-segments usually large and more slender; heads larger, 2 in. diam.; ligules narrower, not reflexed till long after flowering; receptacle much less conical. Disk of fruit entire or 4-toothed.—Distrib. Europe (Arctic), N. and W. Asia.

M. inodo'ra proper; annual or biennial, stem erect, barren shoots 0, leaf-lobes slender.—Var. salina, Bab.; maritime, leaf-segments short fleshy, close-set, obtuse convex.—Var. M. marit'ima, L.; maritime, more succulent, perennial, stem ascending, barren shoots 0, heads fewer, receptacle narrower, spaces between the ribs of the fruit narrower.

16. CHRYSAN'THEMUM, L.

Herbs or shrubs. Leaves alternate or radical, toothed or cut. Heads solitary or corymbose, ray yellow or white; involucre campanulate; bracts imbricate, margins scarious; receptacle flat or convex, naked. Ray-fl. 1-serial, ligulate, female. Disk-fl. tubular, 2-sexual, terete or compressed, 4–5-toothed; anther-cells simple. Fruit of the ray-fl. ribbed or winged, of the disk-fl. compressed; pappus 0 or a membranous ring.—Distrib. Europe, W. Asia, N. Africa; species about 80.—Etym. ἄχρυσος and ἄνθεμος, from the golden flowers.

1. C. seg'etum, L.; annual, ray-fl. golden yellow, invol. bracts very broad with broad scarios margins. Corn Marigold.

Fields and waste places, N. to Shetland; Ireland; Channel Islands; (a colonist, Wats.); fl. June–Sept.—Glabrous, glaucous. Stem 1–1 1/2 ft., erect, sparingly branched. Leaves petiolo'd, obovate, toothed and lobed, lower pinnatifid, upper oblong 1/2-amplexicaul. Heads 2 in. diam.; peduncle stout, thickened upwards Ligules with retuse or lobed tips. Fruit of the rays ribbed and narrowly 2-winged, of the disk not winged.—Distrib. Europe, N. Africa, W. Asia.


Meadows and waste places, N. to Shetland; ascends to 2,100 ft. in Wales; Ireland; Channel Islands; fl. June–Aug.—Glabrous or slightly hairy. Stem 1–2 ft., erect, simple or branched. Leaves obtusely cut or subpinnatifid; lower spathulate, petiolo'd; upper oblong or lyrately pinnatifid 1/2-amplexicaul bases. Heads 2 in. diam.; peduncle slender. Ligules notched at the tip. Fruits all terete, equally ribbed, of the ray with a small crown.—Distrib. Europe (Arctic), Siberia, N. and W. Asia; introd. in N. America.—A sport with bilabiate ray-fl. occurs (Dickson).


17. TANACETUM, L. TANSY.

Herbs, often shrubby below, strong-scented. *Leaves* alternate, usually much divided. *Heads* solitary or corymbose, subglobose, discoid, yellow; invol. bracts many-seriate, edges scarious; receptacle convex, naked. *Outer fl.* 1-seriate, female, tubular, 3-4-toothed. *Disk-fl.* tubular, male, 4-5-toothed; anther cells not tailed. *Fruit* 3-5-angled, disk large; pappus 0, or an irregular membrane.—**Distrib.** Europe, N. and S. Africa, temp. and cold Asia, N. America; species about 30.—**Etym.** Doubtful.

**T. vulgare, L.**; leaves 1-2-pinnatifid, segments inciso-serrate.

Waste places, from Shetland southd., and in Ireland and Channel Islands; probably naturalized only; fl. Aug.–Sept.—Perennial, glabrous or pubescent. *Stem* 2-3 ft., grooved and angled, leafy. *Leaves* 2-5 in., oblong, gland-dotted, upper 1/3-amplexicaul, lower petioled. *Heads* many, 1/4 in. diam., corymbose, dull yellow; peduncle stout, ebracteate; invol. bracts coriaceous, appressed, outer acute shorter, inner obtuse, edges narrow scarious. *Outer fl.* exceeding the involucre, rarely 0, obliquely truncate. *Fruit* obovoid, 5-ribbed; disk membranous, lobed.—**Distrib.** Europe (Arctic), Siberia, N.W. America; introd. in the U. States.—Bitter, tonic, vermicifuge and febrifuge.

18. ARTEMISIA, L.

Herbs, often shrubby below, bitter or aromatic. *Leaves* alternate, often much cut. *Heads* small, racemcd or panicled, discoid, yellow or purplish; invol. bracts few-seriate, margins scarious; receptacle very narrow, flat or convex, naked hairy or fimbriate. *Flowers* few, all tubular, anemophilous; outer female with 3-toothed corollas; the rest male or 2-sexual with 5-toothed minute corollas; anther-cells not tailed. *Fruit* obovoid or oblong, disk minute; pappus 0.—**Distrib.** N. temp. zone; species about 150.—**Etym.** "Apre'sus, the Greek Diana.

1. **A. campes'tris, L.**; leaves nearly glabrous, segments very slender, heads drooping glabrous, outer flowers only fertile.


2. **A. vulgaris, L.**; leaves broad white woolly beneath, segments broad acuminate, heads erect woolly, flowers all fertile. *Mugwort.

Hedgebanks, &c., N. to Shetland; ascends to 1,200 ft. in Northumbd.; Ireland; Channel Islands; fl. July–Sept.—Perennial, aromatic. *Stem* 2-4 ft., erect, reddish, angled, grooved, branched. *Leaves* 2-3 by 1-2 in., glabrous above, margins recurved; pediole with pinnatifid auricles. *Heads* in crowded, panicled, short, erect, woolly spikes, ovoid, reddish-yellow; receptacle glabrous. *Ray-corollas* slender, cylindric.—**Distrib.** Europe (Arctic), N. Africa, N. and W. Asia to India and China.—Formerly used to flavour drinks.
3. A. Absin' thium, L.; leaves silky on both surfaces, segments oblong obtuse, heads drooping silky, outer flowers only fertile. Wormwood.


4. A. marit'ima, L.; leaves white and woolly beneath, segments linear obtuse, heads erect or drooping cottony, flowers all fertile. Salt marshes and ditches, rare in Scotland, from Wigton and Aberdeen southd.; N.E. Ireland; Channel Islands; fl. Aug.–Sept.—Woolly or hoary, scarcely aromatic. Rootstock woody, branched. Stem 10–18 in., ascending. Leaves 1–2 in., 2-pinnatifid; segments many, very narrow, spreading. Heads crowded in short erect panicled spikes, reddish, narrow oblong; receptacle glabrous.—Distrib. Coasts of Europe and salt tracts of Asia, India.—A. gallica, Willd., is not distinguishable as a well-marked variety, either by its more compact habit or erect heads.

19. PETASI'TES, Tournef. BUTTER-BUR.

Perennial herbs. Leaves produced after the flowers, large, broad. Heads purplish or white, sub dic e ous, in a spiciform panicle terminating an erect bracteate scape; male heads with a few fem.; ray-fl., female with a few males in the disk; invol. bracts sub 2-seriate, outer few, small; receptacle flat, naked. Male fl. Corolla bell-shaped, 5-cleft; anther cells simple; style stout (arms connate), ovoid or clavate, papillose, terminated by 2 short small cones. Female fl. Corolla filiform, mouth oblique, minutely toothed; style much exserted, arms short. Fruit cylindric, glabrous; pappus of female copious, hairs soft slender (of male scanty).—Distrib. Europe, N. Asia, Arctic America; species about 12.—Etym. πέτασος, an umbrella, from the size of the foliage.

P. vulga'ris, Desf.; leaves reniform or orbicular-cordate irregularly toothed. Tussilago Petasites, L., and T. hybrida, L.

Wet meadows and roadsides, N. to Shetland, but local; ascends to 1,000 ft. in Northumbd.; Ireland; fl. March–May.—Rootstock extensively creeping, fleshy, stout. Leaves 3 in.–3 ft. diam., white or cobwebby beneath, young above also; petiole long, stout. Stem 4–18 in., stout, purplish below; sheaths ending in small leaves. Panicle cylindric, 3–10 in., female longest, elongating after flowering; pedicels slender, shortest in the male; bracts on pedicels subulate. Male heads ½, female ½ in. Fruit striate; pappus white.—Distrib. Europe, N. Africa, N. and W. Asia.

20. TUSSILA'GO, Tournef. COLTSFOOT.

A scapigrous herb, rootstock creeping. Leaves large, produced after the flowers. Heads yellow, solitary, many-fld.; invol. bracts 1-seriate,
with a few outer shorter ones; receptacle flat, naked. *Ray-fl.* female, multi-seriate, ligulate, narrow; *disk-fl.* male, campanulate, 5-toothed. *Anthers* without tails. *Style* clavate (arms connate), papilllose, with 2 very small cones. *Fruit* of the ray subcylindric; pappus-hairs very slender, multi-seriate, rough; of the disk imperfect, pappus 1-seriate.—**Distrib.** Europe (Arctic), N. Africa, N. and W. Asia, Himalaya; introd. in N. America.—**Etym. tussis,** from its use as a cough medicine.

**T. Farfara, L.**; leaves broadly cordate angled or lobed toothed.

Damp heavy soils, N. to Shetland; ascends to 2,700 ft. in the Highlands; Ireland; Channel Islands; fl. March–April.—**Rootstock** stout; stolons many, burrowing. *Leaves* 3–10 in. broad, cobwebby above, densely tomentose and white beneath. *Scapes* 1 or more, 4–10 in., tomentose, with many oblong appressed scales. *Head* 1–1 ½ in. diam., bright yellow, drooping in bud. *Pappus* soft, snow-white.—Leaves used for cigar-making and smoked in cases of asthma. Wool made into tinder.

**20*. **DORONICTUM, L. **LEOPARD’S-BANE.**

Herbs, rootstocks creeping or tuberous. *Radical leaves* petioled; cauline alternate, amplexicaul. *Heads* solitary or corymbose, rayed, yellow; invol. bracts in few series, linear, acuminate, nearly equal; receptacle conical, naked or pubescent. *Ray-fl.* ligulate, usually female only; style-arms truncate, tip penicillate. *Disk-fl.* dilated above, 5-toothed; anther-cells not tailed; style-arms obtuse. *Fruit* oblong-turbinate, furrowed; pappus-hairs of the ray 0 or 1–3, of the disk in many series.—**Distrib.** Europe, N. Asia, Mts. of India; species 10.—**Etym.** doubtful.

**D. PARDALICHES, L.**; radical leaves ovate-cordate, heads usually 3–5.


**D. PLANTAGIN’EUM, L.**; radical leaves ovate, heads usually solitary.

Naturalized in plantations; fl. June–July.—Habit of the preceding, but more slender and glabrous; leaves narrower, not cordate, usually narrowed into the petiole, repand-toothed, 3–5-ribbed, uppermost oblong.—**Distrib.** W. Europe, from Belgium southd.

**21. SENE’CIO, L.**

Herbs (the British species). *Leaves* alternate. *Heads* solitary or corymbose, usually yellow; invol. bracts 1-seriate with sometimes a few smaller at the base, narrow, appressed, herbaceous, tip usually discoloured; receptacle naked. *Ray-fl.* 1-seriate, female, or 0; style-arms truncate, tips penicillate. *Disk-fl.* tubular, 2-sexual, 5-toothed; anther-cells not
tailed; style-arms obtuse. Fruit terete or angled, furrowed; pappus-hairs in many series, soft, slender, equal in length, caducous.—All temp. and cold climates; species about 500.—Etym. senex, from the hoary pappus.

Section 1. Senecio proper. Involucre with a few (or 0) small bracts at the base.

* Leaves pinnatifid or 2-pinnatifid; except S. aquaticus.

1. S. vulgaris, L.; annual, eglandular, heads few drooping, outer invol. bracts many, ligules usually 0. Groundsel.

Waste places, N. to Shetland, ascending to 1,600 ft. in Northumbd.; Ireland; Channel Islands; fl. all the year.—Glabrous or cottony. Stem 6-15 in., often branched from the base, succulent. Leaves pinnatifid, irregularly coarsely toothed. Heads ½ in., cylindrical, conical after flowering; outer invol. bracts dark, ovate-subulate. Fruit ribbed, silky.—Distrib. Europe (Arctic), N. Africa; introd. in all cool climates.—Var. radiata, Koch; has ray-flowers with short ligules. Channel Islands.

2. S. sylvaticus, L.; annual, glandular-pubescent, heads many spreading narrow, outer invol. bracts few or 0, ligules short, fruit silky.

Dry banks and pastures, N. to Orkney; ascends to 1,000 ft. in the Highlands; Ireland; Channel Islands; fl. July–Sept.—Fetid. Stem ½–3 ft., erect, leafy. Leaves as in S. vulgaris, but more deeply cut. Heads ½ in., cylindrical; peduncle slender. Fruit faintly ribbed.—Distrib. Europe, Siberia.—S. lividus, Sm. not L., is a form with larger auricles to the upper leaves.

3. S. viscosus, L.; annual, viscid, heads few erect broad, outer invol. bracts few green ½ as long as the inner, fruit glabrous.

Waste dry ground, local, from Banff and Dumbarton to Kent and Sussex; Wales (not in W. or Midland counties); very rare in Ireland; fl. July–Aug.—Fetid. Stem 1–2 ft., stout, rigid, grooved and angled, flexuous, branched. Leaves broad, sub-2-pinnatifid. Heads campanulate, nearly ½ in. long and ¾ in. diam. Fruit slender, ribbed.—Distrib. Europe, Asia Minor.


Roadsides and pastures, N. to Shetland; ascends to 2,100 ft. in the Highlands; Ireland; Channel Islands; fl. June–Sept.—Glabrous or slightly cottony. Stem 1–4 ft., stout, leafy. Leaves pinnatifid or sub-2-pinnatifid, lobed and toothed, terminal lobe large or small, upper leaves auricled, sessile; lower petioled. Heads ¾–1 in. diam., bright, yellow, campanulate; outer invol. bracts few, small, subulate; peduncle slender, bracteate.—Distrib. Europe, N. and W. Asia to India.—S. flosculosus, Jord., a var. without ray, rarely occurs.

5. S. erucifolius, L.; perennial, tall, erect, cottony or pubescent, heads corymbose, fruits all ribbed hairy. S. temulifolius, Jacq.

Roadsides and banks from Berwick and Lanark southd.; E. Ireland; Channel Islands; fl. July–Aug.—Habit of S. Jacobæa, but more pubescent with
curled hairs, especially above; rootstock shortly creeping; leaves simply pinnatifid, lobes narrower; heads larger, and pappus dirty-white.—Distrib. From Gothland southd., N. and W. Asia.

6. *S. aquaticus*, Hudson.; biennial, tall, erect, rarely glabrous, heads in a very lax corymb, fruits all ribbed glabrous.

Sides of rivers, ditches, &c., N. to Shetland; ascends to 1,500 ft. in the Lake district; Ireland; Channel Islands; fl. July–Aug.—Like *S. Jacobea*, but usually of laxer growth, with longer petioles, and larger heads. Radical leaves very variable, ovate or oblong, irregularly toothed, undivided or lobed, base auricled or pinnatifid, often purple beneath; upper irregularly lyrate-pinnatifid. Heads 1–1 1/4 in. diam.; peduncle slender.—Distrib. Europe, N. Africa, Siberia.—*S. barbareafolius*, Krock. (*S. erraticus*, Bert.; Bab. Prim. fl. Sarn.), is a form with pinnatifid leaves.

S. *Squalidus*, L.; annual or biennial, glabrous, stem short flexuous leafy, heads in a very lax corymb, fruits all ribbed silky.

Naturalized on old walls, &c., Oxford, Bideford, Warwick, Cork; fl. June–Oct.—Stem 8–12 in., rather stout. Leaves irregularly lyrate-pinnatifid, lobes long or short, toothed lobulate or subentire, upper auricled and 1/3-amplexicaul. Heads 2 in. broad; involucre broadly campanulate, bracts narrower than in the other species of this section; outer numerous, small, all usually dark-tipped.—Distrib. S. Europe.

** Leaves undivided, toothed.**

S. *Saracenicus*, L.; leaves glabrous or nearly so, ray-fl. few.


7. *S. Paludosus*, L.; leaves cottony beneath, ray-fl. very many.

Fens of Lincoln, Norfolk, Suffolk, Cambridge (very rare); Channel Islands; fl. June–July.—Rootstock short. Stems 3–6 ft., stout, erect, branched at the top, glabrous or slightly cottony, leafy. Leaves 3–6 in., sessile, narrowly oblong-lanceolate, coarsely serrate. Heads 1 in. diam., in lax spreading simple or compound corymb; peduncle long, bracteate; involucre broadly campanulate, outer bracts long subulate, inner obtuse. Fruit glabrous.—Distrib. From Gothland southd., Siberia.

Section 2. Cinera'ria, L. (gen.). Outer invol. bracts 0. Ray-fl. spreading.

8. *S. palustris*, DC.; tall, erect, leafy, pubescent or villous, stem hollow, leaves sessile, heads many, fruit ribbed glabrous.
Fens of the Eastern counties, very rare; fl. June-July. — Biennial. Stem 2-3 ft., stout, ribbed, unbranched. Leaves 3-5 in., \( \frac{3}{4} \)-amplexicaul, oblong-lanceolate, sinuate-toothed, acute or obtuse. Heads 4-1 in. diam., pale yellow, crowded in compound corymbs, broadly campanulate, short, as is the peduncle, villous with crisped hairs; invol. bracts many, slender. Ray-fl. short. — Distrib. From Gothland to France and Austria, N. Asia, N. America (Arctic).

9. S. *campes'tris*, DC.; scapigerous, pubescent and cottony, leaves petioled, heads few, fruit ribbed silky. *Cineraria integrifolia*, With.

Dry banks and chalk downs, York, Lincoln, and from Cambridge to Gloster, and Sussex to Dorset; fl. May-June. Rootstock short, fibres thick. Radical leaves 1-2 in., spreading, coriaceous, shortly petioled, ovate, obtuse, entire or sinuate-toothed, pubescent under the cottony hairs. Scape 4-12 in., stout or slender; bracts narrow, long, appressed. Heads 1 in. diam., pale yellow; peduncle stout, erect, bracteate at the base; involucrally broadly campanulate; bracts narrow obtuse. Ray-fl. as long as the bracts. — Distrib. Europe (Arctic) to France and Italy, N. Asia, N. America.

Var. *marit'ima*, Syme (*S. spathulæfolius*, Bab. not DC.), is a tall form with broadly-toothed leaves. Maritime rocks, Anglesea; Mickle fell, Yorkshire.

### 22. ARC'TIUM, L. Burdock.

Stout, erect, branching, biennial herbs. Leaves alternate, the lower very large. Heads solitary racemose or corymbose, not rayed, purple or white; involucral glabrous; bracts very many, imbricate, coriaceous, appressed below, with long, stiff, spreading, hooked tips; receptacle flat; scales rigid, subulate. Corolla-tube narrow, limb campanulate; lobes 5, slender. Filaments papilllose; anthers with a long terminal appendage, cells with subulate tails. Style-arms connate, pubescent below, obtuse. Fruit large, oblong or obovate, laterally compressed, transversely wrinkled, base areolate; pappus-hairs multi-seriate, short, free, filiform, scabrid. — Distrib. Europe, N. and W. Asia; introd. into N. America; species 6 or 7. — Etym. ἀρκτός, a bear, from its coarse appearance.

A. *Lap'pa, L.*; leaves ovate-cordate entire or sinuate-toothed.

Waste places; fl. July-Aug. — Glabrous or cottony, 2-4 ft., very variable. Leaves often 1 ft., glabrous above, usually densely cottony beneath. Heads 4-1½ in. diam., webbed or not; peduncle very stout; invol. bracts slender, angled, rigid, spreading. Corolla and stamens purple, styles white. Fruit compressed, angled, ribbed, grey mottled with black. Young stalks formerly eaten boiled, and as salad. — The following forms present no constant characters.


Sub-sp. A. *mi'nus*, Schkuhr; heads subracemose more ovoid glabrous or cottony, inner invol. bracts purplish, corolla-tube as long as the limb. Advances North to Skye. — Var. *mi'nus* proper; root-leaves coarsely
toothed, petioles hollow; heads $\frac{3}{4}$ in. diam., subsessile cottony. Common.

—VAR. *A. intermedium*, Lange (*A. pubens*, Bab.); root-leaves crenate, petioles with a slender tube, heads arachnoid, lower ones $\frac{3}{4}$–1 in. diam., of the raceme peduncled purple.—VAR. *A. nemoro'sum*, Lej; root-leaves narrower coarsely crenate, crenatures apiculate, heads subsessile globose.

23. CARLI’NA, L. CARLINE-THISTLE.

Rigid, spinous, herby herbs. *Leaves* pinnatifid. *Outer invol. bracts* leafy, spinous-toothed, spreading; inner longer, narrower, scarios, coloured, shining; receptacle flat, deeply pitted, edges of the pits bristly. *Corollas* all tubular, glabrous, erect; limb campanulate, 5-toothed. *Filaments* glabrous; anthers with a terminal appendage, cells with short plumose tails. *Style-arms* connate into a pubescent cone. *Fruit* oblong, terete, silky with 2-fid hairs; pappus-hairs 1-seriate, feathery, connate in threes or fours at the base.—DISTRIB. Europe, N. and S. Africa, W. Asia; species about 14.—ETYM. After Charlemagne, who used it medicinally.

C. vulga'ris, L.; heads 2 or more, invol. bracts ciliate.

Dry fields and pastures, from Elgin and Arran southd.; ascends to 1,200 ft. in Northumbl.; local in Ireland; Channel Islands; fl. June–Oct.—Biennial. hoary, root tapering. *Stem* 6–18 in., stout, simple or branched above, purple, *Radical leaves* 3–5 in., spreading, lanceolate, spinous, cottony beneath; cauline many, shorter, $\frac{1}{3}$-amplexicaul. *Heads* $\frac{3}{4}$–1½ in. diam.; outer bracts cottony, spreading; middle purplish; inner $\frac{3}{4}$ in., narrow, rigid, acute, yellow, spreading, erect when moist. *Bristles* of receptacle rigid, yellow, longer than the soft pappus. *Flowers* purple. *Fruit* brown.—DISTRIB. Europe, N. Africa, N. and W. Asia.

24. SAUSSU'REA, DC.

Herbs. *Leaves* entire or divided. *Heads* corymbose, purple or violet; invol. bracts multi-seriate, imbricate, obtuse or acute; receptacle flat, covered with chaffy scales. *Corollas* all tubular, ventricose above, 5-fid. *Filaments* glabrous; anthers terminated by a long acute appendage, cells with ciliate tails. *Style-arms* connate below, pubescent, with a ring of hairs at the base. *Fruit* glabrous; pappus-hairs 2-seriate, outer filiform, rough, usually persistent; inner feathery, connate at the base, deciduous.—DISTRIB. N. temp. regions; species about 60.—ETYM. De Saussure, the Swiss philosopher.

S. alpi'na, DC.; leaves oblong-lanceolate toothed cottony beneath. Alpine rocks, N. Wales, Lake district, Dumfries; Highlands, N. to Shetland; ascends to 4,000 ft.; W. Donegal; fl. August.—*Rootstock* short, stoloniferous. *Stem* 6–8 in., stout, erect, leafy, simple, cottony. *Leaves*, lower petioled, 4–7 in., acuminate; upper smaller, sessile. *Heads* 2–3 in., in dense corymbs; involucre ovoid; bracts oblong, obtuse, woolly, inner longer. *Flowers* exerted, purple; anthers bluish. *Fruit* brown, ribbed; pappus dirty white.—DISTRIB. Scandinavia (Arctic), N. Russia, Alps of Mid. Europe, N. Asia, N. America (a form).
Herbs of various habit. *Leaves* entire or cut, often spinous-toothed. *Involucre* ovoid or globose; bracts appressed, imbricate, entire and scarious, or spinous, or dilated fringed or toothed; receptacle flattish, bristly. *Corollas* all tubular, oblique or 2-lipped, ventricose above; outer usually larger, neuter, inner 2-sexual; lobes 5, slender. *Filaments* glandular; anthers with a long terminal coriaceous appendage, cells tailed or not. *Fruit* compressed, basal areole oblique, top broad; pappus-hairs short, slender, scabrid, usually in many series, inner smaller often scaly, rarely 0.—**Distrib.** Europe, W. Asia, N. Africa, America; species 320.—**Etym.** Mythical.

**Section 1. Ja'cea.** *Invol. bracts* with a dilated broad appendage.

1. *C. ni'gra*, *L.*; leaves hispidulous lanceolate entire or distantly lobed, peduncles leafy, pappus-scales short unequal or 0. *Knapweed.*

Meadows and pastures, N. to Shetland; ascends to 1,600 ft. in Northumbld.; Ireland; Channel Islands; fl. June–Sept.—**Perennial. Stem** ½–3 ft., slender, grooved, simple or branched. *Leaves* scattered, variable, lower petioled, uppermost quite entire. *Heads* 1–1½ in. diam.; invol. appendage very variable, pale or dark brown, orbicular, pectinate on the margin or to the axis. *Flowers* purple, outer often larger. *Fruit* grey.—**Distrib.** W. Europe; introd. in N. America.

*C. ni'gra* proper; peduncles thickened, appendages of bracts dark brown deeply pectinate.—**Var. C. decip'iens**, Thuill. (*C. nigres'cens*, Bab.); peduncles slender, appendages paler, less deeply pectinate, spines much shorter, pappus 0.—S. counties.

**Section 2. Cy'anus.** *Invol. bracts* not appendaged, their upper part and margins scarious and pectinate or ciliate.

2. *C. Scabio'sa*, *L.*; erect, leaves deeply pinnatifid segments entire or lobed, peduncles glabrous, involucre globose, bracts with brown pectinate tip and margins, pappus as long as the fruit. *Hard-heads.*

Dry pastures and waste places, from Sutherland southd.; Ireland; Channel Islands; fl. July–Sept.—**Rootstock** woody. *Stem* 2–3 ft., grooved, sparingly branched, clothed with soft hairs. *Leaves* 4–10 in., almost pinnate, segments obovate. *Heads* 1½–2 in. diam., rayed; invol. bracts with a broad brown tip which is recurrent on the sides of the bracts; flowers bright purple. *Fruit* grey, pubescent.—**Distrib.** Europe, Siberia, W. Asia to Persia.

3. *C. Cy'anus*, *L.*; erect, leaves narrow entire or lobes few spreading, peduncles corynty, involucre ovoid, margins of bracts deeply toothed scarious, pappus shorter than the fruit. *Bluebottle, Cornflower.*

Cornfields, from Caithness southd.; ascending to 1,000 ft. in the Highlands; Ireland; Channel Islands; (a colonist, *Wats.*); fl. June–Sept.—**Annual or biennial. Stem** 1–2 ft., slender, grooved, sparingly branched. *Leaves* 2–4 in., variable, sessile, acute, lower ½–1 in., upper ½ in. broad. *Heads* ½–1 in. diam., cobwebby; teeth of bracts triangular, spreading, of outer white, of
inner brown and white; bristles of receptacle silky. Flowers of ray few, large, bright blue; of disk smaller, purplish. Fruit grey, silky; pappus dirty white. Distrib. Europe, N. Africa, W. Siberia, N.W. India; introd. in N. America.

4. C. paniculata, L.; erect, panically branched, woolly, leaves bipinnatifid, lobes linear, upper narrow, entire, involucre ovoid, bracts spiny-toothed or ciliate apiculate, pappus of very short scale-like bristles.


Section 3. Serid'ia. Invol. bracts tipped by spreading reflexed spines.

5. C. asp'era, L.; ascending, leaves linear-oblong entire toothed or lyrate, peduncles leafy, involucre globose, bracts tipped with 5 palmately spreading reflexed spines, pappus shorter than the fruit. C. Isnardi, L. Vazon Bay, Guernsey, very rare; fl. July–Sept.—Perennial. Stem 1–2 ft., slender; branches spreading, sparsely pubescent, tips cottony. Leaves very variable, lower sessile or petioled, lanceolate or oblong. Heads 1 in. diam.; bracts coriaceous, yellow-brown, spines 1/10–1/5 in.; bristles of receptacle white. Fruit grey, pubescent; pappus white.—Distrib. W. and S. Europe to Italy.

Section 4. Calci'trapa. Invol. bracts ending in a long strong spine.

6. C. Calci'trapa, L.; rigid, diffusely branched from beneath the heads, leaves pinnatifid, lobes recurved aristate, spines of bracts long spreading, with a few smaller basal, pappus 0. Star-thistle.

Dry waste places, rare, from Norfolk and S. Wales to Cornwall and Kent; Channel Islands; probably a denizen; fl. July–Sept.—Biennial, 1–2 ft., cottony or glabrous, branches leafy, spreading, stout. Leaves 1–3 in., often interruptedly pinnatifid, lobes distant, slender. Heads lateral and sessile, or terminating leafy branches, 1/3 in. diam.; spines as long, yellow and channelled above. Flowers rose-purple. Fruit white or mottled brown.—Distrib. From Holland southd., N. Africa, N.W. India; introd. in N. America.

C. solstitia'lis, L.; erect, branched, cottony, stem winged, lower leaves lyrate, upper linear entire decurrent, spines of upper bracts long spreading with a few smaller ones at the base, pappus soft.

Fields in E. and S. England, rare; introd. with lucern, &c.; fl. July–Sept. —Annual, much branched, 1–2 ft. Stem rigid, branches twiggy, terminated by peduncled heads. Leaves very variable. Heads globose, 1/3 in. diam., spines as long, not channelled, those of the outer bracts very small. Flowers yellow. Fruit white; pappus copious, white, as long as the fruit.—Distrib. Mediterranean region (naturalized in all warm climates.)
26. **SERRATULA, L.**  **Saw-wort.**

Perennial herbs. *Leaves* alternate, radical simple, cauline usually pinnatifid. *Heads* solitary, corymbose, sometimes dioecious, purple or white; invol. bracts many, imbricate, outer shorter, inner more or less scarious at the tip; receptacle scaly. *Corollas* regular, tubular, limb ventricose; lobes 5, narrow, oblique. *Filaments* papilllose; anther-cells simple or shortly tail. *Style* tumid or papilllose or with a ring of hairs at the tip; arms free or connate. *Fruit* oblong, compressed, glabrous, smooth; pappus-hairs many-seriate, rigid, scabrid, coloured, outer shorter, decidual.—**Distrib.** Europe, Asia, N. America; species about 30.—**Etym. serrula**, from the serrate foliage.

*S. tinctoria, L.*; leaves lyrate-pinnatifid, lobes distant serrate.

Copses, &c., from Dumfries and Northumbd. southd.; ascends to 1,000 ft.; Channel Islands; ft. Aug.—Glabrous or nearly so. *Stem* 2-3 ft., slender, erect, grooved, leafy, corymbose branched. *Leaves* 5-9 in., rarely entire; lobes linear-oblong, acute or acuminate; cauline sessile. *Heads* ½-2 in., corymbose, or subsessile (*S. monticola*, Boreau), cylindric-ovoid, subdioecious, female largest; invol. bracts ciliate, rigid, striate; outer oblong or ovate, acute; inner linear-oblong, purplish. *Flowers* red-purple; male with blue anthers and contiguous style-arms; female with white anthers and spreading style-arms. *Fruit* grey, glabrous; pappus dirty white.—**Distrib.** Europe, W. Siberia.

27. **CAR'DUUS, L.**  **Thistle.**

Erect herbs. *Leaves* usually spinous-toothed. *Heads* sometimes dioecious; involucre ovoid or globose; bracts many, imbricated, appressed, narrow, rigid, acuminate or spinous-tipped; receptacle deeply pitted, covered with bristles. *Corollas* all tubular, red or purple, rarely white, tube short, ventricose above, oblique; lobes 5, narrow, long. *Filaments* free or connate, hairy or glandular; anthers terminated by a linear appendage, cells usually with toothed tails. *Style-arms* connate into a cylindrical 2-fid pubescent column, with a ring of hairs at the base. *Fruit* oblong, compressed or terete, glabrous; pappus-hairs many-seriate, filament, scabrid, connate at the base, deciduous.—**Distrib.** Chiefly Europe and W. Asia; species about 30.—**Etym. doubtf.
2. *C. cris'pus*, L.; wings of stem continuous, heads small erect fascicled, peduncles leafy, involucre webbed, bracts erect very slender.

Hedgebanks and waste places, from Ross southd.; ascends to 1,200 ft. in Derby; indigenous (?) in Scotland; S. Ireland; Channel Islands; fl. June–Aug.—Annual or biennial. *Stem* 1–3 ft., erect, cottony or pubescent above; branches ascending; wings narrow, waved. *Leaves* variable, cottony beneath, usually pinnatifid; lobes broad, lobulate. *Heads* variable, \( \frac{3}{4} \)–3 in. diam.; involucre ovoid, bracts subulate webbed. *Flowers* purple or white. *Fruit* pale, shining, furrowed.—DISTRIB. Europe (Arctic), N. Asia, N.W. Himalaya.—A hybrid with *nuttans* occurs.

*C. cris'pus* proper; leaves downy beneath, heads small, crowded subglobose, bracts with a slender spine.—VAR. *C. polyan'themos*, Koch; leaves pubescent on the nerves beneath, heads small crowded ovoid.—VAR. *C. acanthoi'des*, L.; leaves broader, heads fewer much larger, bracts with a stout spine, fruit with an angled crown.

3. *C. pycnoceph'alus*, Jacq.; wings of stem continuous, heads small fascicled, involucre glabrous narrow, bracts broadly subulate-lanceolate with recurved spines.

Sandy places, especially on the coast, from Forfar southd.; rare in W. Scotland; common in Ireland; Channel Islands.—Annual or biennial, erect, 1–4 ft., branched, hoary. *Leaves* oblong-lanceolate, pinnatifid; lobes broad, sinuate-toothed. *Heads* \( \frac{3}{4} \)–1 in., sessile; invol. bracts few. *Flowers* pale purple. *Fruit* grey, shining, minutely pitted, not furrowed.—DISTRIB. Europe, from Denmark southd.; N. Africa.—*C. tenuiflo'rus*, Curt., is hardly distinguished from *C. pycnoceph'alus* by its broader-winged stem, usually more numerous and smaller heads, and outer invol. bracts with a narrow scarios border.

**28. CNICUS, L.**

Characters of *Carduus*, but often subdicesious and pappus feathery.—DISTRIB. Chiefly European and Oriental; species 150.—ΕΥΜ. *κνίκος*, the Greek name for a thistle.

* Upper surface of leaves scabrid.


Waste places, N. to Shetland; ascends to 1,500 ft. in Derby; Ireland; Channel Islands; fl. July–Oct.—Stout, erect, annual or biennial, 2–5 ft. *Leaves* \( \frac{3}{4} \)–1 ft., obvolate-lanceolate, setose above, cottony beneath; lobes few, large, 2-fid, toothed, with long stout spines. *Heads* \( \frac{3}{4} \)–1\( \frac{1}{2} \) in. diam., few, erect; peduncle short; invol. bracts very many, subulate, midrib strong, spines long. *Flowers* purple. *Fruit* striped, smooth, shining.—DISTRIB. Europe, N. Africa, Siberia; introd. in America.

2. *C. erioph'orus*, Hoffm.; stem not winged, leaves pinnate, heads very large woolly, involucre globose, bracts ciliate, spines slender recurved.
Waste dry places, local, from Durham to Somerset and Kent; fl. July–Sept.—Tall, stout, handsome, woolly, biennial, 3–5 ft., branched above. Leaves 1–2 ft., copiously setose above and cottony beneath; lobes distant, slender, usually 2-partite, the divisions spreading up and down, margins ciliate and spinous. Heads 2–3 in. diam.; invol. bracts very many. Flowers pale purple; anthers blue. Fruit shining, smooth, mottled.—Distrib. From Holland southd.—Young parts eatable as salad, and cooked.

** Upper surface of leaves hairy or pubescent.

† Stem branched, very leafy or 0. Leaves harsh, rigidly spinous.

3. C. acaulis, Hoffm.; stem usually very short, leaves pinnatifid, segments 3–4-lobed, heads sessile or on naked peduncles, involucre ovoid glabrous, bracts appressed ciliolate and spinous.
Gravelly and chalky pastures from York to Devon and Kent; Channel Islands; fl. July–Sept.—Perennial, glabrous or pilose, stemless with one subsessile head, or with a leafy branched stem 8–18 in., and several peduncled heads (C. dubius, Willd., possibly a hybrid with arvensis). Leaves sessile or petioled, oblong-lanceolate, rigid, very spinous. Heads 1–2 in.; involucral ovoid in flower, campanulate in fruit; bracts ovate-lanceolate, mucronate, inner very long linear. Flowers crimson. Fruit smooth, glabrous, brown; pappus dirty white.—Distrib. From Gothland southd., N. and W. Asia.
—A troublesome weed in pastures.

4. C. arvensis, Hoffm.; erect, subdioecious, rootstock creeping, leaves pinnatifid, heads many, male involucre subglobose, female ovoid, outer bracts with short spreading spines, inner acuminated.
Fields and waste places, N. to Shetland; ascends to 2,000 ft. in Northumbd.; Ireland; Channel Islands; fl. July–Sept.—Perennial, very spinous, 2–4 ft.; male and female plants in separate large patches. Stem angled and grooved, more or less cottony, rarely glabrous. Leaves oblong-lanceolate, lower petioled, upper slightly decurrent, sinuate lobed or pinnatifid, setose or spinous. Heads ½–1 in. diam., corymbose; peduncle short; involucral ½–¾ in., bracts appressed, ciliolate, tips rigid spinous; inner obtuse, tips toothed. Flowers dingy purple. Fruit smooth, shining; pappus dirty white.—Distrib. Europe, N. and W. Asia, India, N. Africa; introd. in N. America.
—The commonest pest of agriculture. A hybrid occurs between this and C. acaulis.
C. arvensis proper; stem flexuous, leaves pinnatifid very spinous, upper ½–amplexicaul. Var. horridus, Koch.
Sub-sp. C. serotinus, Bess.; stem less branched strict, leaves sessile oblong-lanceolate obtuse sinuate-lobed or subpinnatifid, margins setose.—Orkney, Fife, &c., casual in Ireland; very rare, always introduced?

5. C. palustris, Hoffm.; stem winged, leaves decurrent pinnatifid, lobes 2–3-fid, segments acuminate spinescent, heads in leafy clusters, involucre cottony, bracts appressed, outer mucronate, inner acuminated.
Wet meadows, ditches, &c., N. to Shetland; ascends to 2,400 ft. in the Highlands; Ireland; Channel Islands; fl. July–Sept.—Biennial, soft, stout, erect, 2–4 ft. branched, very spinous. Leaves very decurrent, hairy on both surfaces; lobes narrow. Heads ½ in. diam.; involucre ½ in., ovoid, bracts

†† Stem usually simple, not winged. Leaves soft, spines few. Heads 1 or few.


Wet meadows, rare, from York (ascending to 1,200 ft.) and N. Wales southd.; Ireland; fl. June-Aug.—Perennial. Stem 10–18 in., terete, cottony. Leaves few, 6–10 in., lower long-petioled, lobes angled not deep or long; upper $\frac{1}{2}$-amplexicaul, auricled. Heads 1–1$\frac{1}{2}$ in., peduncled; involucre cottony; bracts appressed, outer mucronate, inner slender purple acuminate. Flowers dark purple. Fruit pale, slender, smooth; pappus dirty white.—Distr. Holland, Spain, France.—C. Woodward'sii, Wats., is, according to Syme, probably a hybrid with acaulis. Wilts, Glamorgan.

7. C. tuberosus, Hoffm. ; not stoloniferous, root of fusiform tubers, leaves deeply pinnatifid, lobes remote narrow 2–4-cleft, heads 1–3, involucre ovoid depressed at the base.

Meadows, Boyton, Wilts, and near Swindon; fl. Aug.—Sept.—Very closely allied to C. pratensis, and regarded by Naegeli as a var. of it.—Distr. France, Germany, and southd.

8. C. heterophyllus, Willd. ; stoloniferous, roots fibrous, leaves lanceolate serrulate ciliate white beneath, upper entire or pinnatifid, heads few large intruded at the base. Melancholy Thistle.

Subalpine pastures and rivulets, from Caithness to S. Wales, Stafford, and Derby; ascends to 2,700 ft. in the Highlands; fl. July—Sept.—Rootstock creeping. Stem 2–3 ft., white, cottony, furrowed. Leaves soft, radical long-petioled, 8–18 in.; upper often ovate, $\frac{1}{2}$-amplexicaul, base cordate. Heads 1$\frac{1}{2}$–2 in. diam.; involucre ovoid, bracts finely pubescent, appressed, outer mucronate, inner linear. Flowers red-purple. Fruit smooth, small, brown; pappus-hairs brownish.—Distr. N. and Mid. Europe (Arctic), N. America.—C. Carolorum, Jenner, is a hybrid with C. palustris.

29. ONOPORDON, L. COTTON THISTLE.

Tall, erect, branched herbs. Stems broadly winged. Leaves alternate, decurrent, spinous-toothed. Heads large; involucre subglobose; bracts very many, imbricate, coriaceous, spinescent; receptacle fleshy, pitted, edges of the pits membranous toothed. Corollas all tubular, ventricose above, purple, rarely white; lobes 5, long, slender. Filaments nearly glabrous; anthers with a terminal appendage, cells shortly tailed. Style-arms connate into a 2-fid cylinder, with a ring of hairs at the base. Fruit obovoid, compressed, 4-ribbed, rugose; pappus-hairs many-seriate, filiform or flattened, barbed or toothed, connate at the base.—Distr. S. Europe, W. Asia, N. Africa; species 12.—Etym. The old Greek name.

O. Acanthium L.; leaves sinuate-pinnatifid woolly.
Waste dry places, from Fife southd.; Channel Islands; (an alien or denizen, Wats.); fl. July–Sept.—A stout, hoary or cottony biennial, 2–5 ft. Stem spinous-winged to the top. Leaves decurrent, toothed and strongly spinous. Head $1\frac{1}{2}$–2 in. diam.; involucre much contracted at the mouth, very cob-webby; bracts subulate, spinescent, recurved, green. Flowers pale purple. Fruit $\frac{3}{4}$ in., mottled grey; pappus-hairs white.—DISTRIB. Europe, Siberia; introd. in N. America.


A spinous glabrous shining herb. Characters of Carduus, but filaments glabrous and connate into a sheath.—ETYM. διαλυτον, a white spotted thistle.

S. Maria'num, Gærtn.; leaves sinuate or pinnatifid, nerves white.

Waste places near gardens, &c., not indigenous; fl. July–Sept.—Erect, annual or biennial. Stem 1–4 ft., grooved, not winged. Leaves large, spines stout. Heads globose, 1–2 in. diam.; invol. bracts coriaceous, closely appressed, very broad, each with one very stout recurved terminal subulate spine $\frac{1}{2}$–$\frac{3}{4}$ in., and several shorter ones at its base, outermost merely spinous-toothed, mucronate; receptacle fleshy, hairy, not pitted. Flowers rose-purple. Fruit $\frac{3}{4}$ in., oblong, transversely wrinkled, black or grey; pappus white.—DISTRIB. From Holland southd., but indigenous only in the Mediterranean region and East.—Stems formerly eaten.


Perennial herbs, with spreading branches; juice milky. Leaves radical and alternate, toothed or pinnatifid. Heads axillary; involucre cylindric; bracts in 2 series, inner erect connate at the base, outer shorter appressed; receptacle flattish, naked, pitted or bristly. Corollas all ligulate, blue or yellow; anther-cells not tailed; upper part of style and its slender arms hairy. Fruits crowded on the indurated receptacle, firmly embraced by the rigid invol. bracts, smooth, obovoid or turbinate, not beaked; pappus in 1–2 series of short obtuse scales.—DISTRIB. Europe, W. Asia; species 3.—ETYM. An old Greek name.

C. Int'bus, L.; lower leaves runcinate, heads usually in pairs.

Waste places, roadsides, &c., throughout England; rare, if native, in Scotland and Ireland; Channel Islands; fl. July–Oct.—Rather hispid. Root fleshy, tapering. Stem 1–3 ft., angled and grooved; branches straight, rigid. Leaves glandular-ciliate, oblong-lanceolate, upper ovate-cordate amplicicilial. Heads many, 1–1$\frac{1}{2}$ in. diam.; peduncle thickened in the middle; invol. bracts herbaceous, outer linear-lanceolate gland-ciliate. Flowers bright blue, rarely white; ligule rather broad, truncate, 5-toothed. Fruit angled, pale, mottled.—DISTRIB. Europe, N. Africa, Siberia, N.W. India; introd. in N. America.—The origin of the cultivated Chicory; the roots are boiled and eaten, or dried and used as Coffee.
32. Arnoseris, Gaertn. Lamb’s or Swine’s Succory.

A small, annual, scapigerous herb; juice milky. Leaves all radical. Heads few, small; peduncles clavate, fistular; invol. bracts in 1 series, many, after flowering arching over the fruit; receptacle flat, naked, pitted. Corollas all ligulate, yellow; anther cells not tailed; upper part of style and its short obtuse arms hairy. Fruit obpyramidal, furrowed and ribbed, not beaked, crowned by a coriaceous angular ring.—Distrib. Europe to Mid. Russia.—Etym. ἀπός, a lamb, and σέπις, succory.

A. pusilla, Gaertn.; leaves obovate-spathulate or -lanceolate toothed.

Dry pastures and fields, on the E. side of the Island, from Elgin to Dorset and Kent, local; (a colonist, Wats.); fl. June–July.—Glabrous or slightly hairy. Leaves 2–4 in., narrow. Scapes 4–12 in., many, slender, rigid, sparingly branched above. Heads campanulate, ⅓ in., inclined in bud; invol. bracts herbaceous, puberulous, linear-lanceolate, tips contracted obtuse. Fruit pale brown, rugose between the ribs.

33. Lap'sana, L. Nipplewort.

Slender, erect, annual, branched herbs; juice milky. Leaves alternate, petioled, lower lyrate, upper toothed or entire. Heads small; invol. bracts few, 1-seriate, erect, outermost small; receptacle flat, naked, dotted. Corollas all ligulate, yellow; anther-cells not tailed; tip of style and its linear obtuse arms hairy. Fruit slightly compressed, curved, striate, not beaked; pappus 0.—Distrib. Europe, W. Asia, N. Africa; species 4.—Etym. An old Latin name.


Waste and cultivated ground, N. to Orkney; ascends to 1,300 ft. in Northumbd.; Ireland; Channel Islands; fl. July–Sept.—Stem 1–2 ft., paniculately branched, hairs spreading. Leaves contracted into the petiole, membranous, terminal lobe very large, sinuate-toothed, lateral small. Heads many, ⅓ in.; peduncle short, slender, naked; invol. bracts 8–10, linear, rigid, keeled, green, glandular or glabrous, tip contracted obtuse. Fruit pale.—Distrib. Europe (Arctic), N. Africa, N. and W. Asia, Himalaya; introd. in N. America.—Formerly eaten as a salad.

34. Pi’cris, L.

Erect, branched, hispid herbs; juice milky. Leaves alternate, entire or sinuate-toothed. Heads solitary or corymbose, yellow; invol. bracts many, unequal, outer spreading; receptacle flat, naked, pitted. Fl. all ligulate; anther-cells shortly tailed; upper part of style and its slender obtuse arms hairy. Fruit curved, grooved, transversely rugose, beaked or not; pappus-hairs 2-seriate, deciduous, feathery, outer fewer slender, inner broader at the base.—Distrib. Europe, temp. Asia, Australasia; species about 24.—Etym. πυκός, from its bitterness.

* Outer invol. bracts narrow; fruit not beaked.

Waste places in a stiff soil, from Roxburgh southd.; Channel Islands; fl. July-Sept.—Hispid with stiff straight curled or hooked hairs. Stem 2–3 ft., stout, corymbose, or subcorymbose, or subumbellate (P. arvensis, Jord.); peduncles bracteate; involucre subcampanulate; outer bracts short, clothed with black hairs. Fruit red-brown, angled; pappus snow-white.—Distrib. Europe, Asia, Australasia.

** Outer invol. bracts cordate, fruit beaked. Helminthia, Juss.

2. *P. echioi'des*, L.; lower leaves sinuate-toothed, upper corolla. Ox tongue.

Waste places in stiff soil, from Durham southd.; Haddington to Berwick in Scotland; E. Ireland, rare; Channel Islands; fl. June—Oct.—Stout, erect, 2–3 ft., branched, hispid and setose, hairs with tumid bases. Leaves oblong-lanceolate, radical petioloed, upper amplexicaul. Heads 1 in. diam.; peduncles stout, stiff, rather swollen, diverging, naked; involucre hemispheric; outer bracts foliaceous, inner acuminate. Ligules short. Fruit red-brown, long, curved; pappus snow-white.—Distrib. From Holland southd., N. Africa.

### 35. CRE'PIS, L. Hawk's-beard.

Branched herbs; juice milky. Leaves chiefly radical. Heads paniced, or corymbose, small; invol. bracts many, linear, equal, with a few smaller at their base; receptacle flat, naked, pitted, margins of the pits hairy or toothed. Corollas all ligeulate, yellow or purplish; anther-cells not tailed; style-arms slender and upper part of style hairy. Fruit terete, striate, beak long short or 0; pappus-hairs in many series, slender, simple, white, silky, brown in *C. paludo'sa*.—Distrib. N. hemisphere, rare in the tropics; species about 130.—Etym. The classical name.

**Sub-gen.** 1. *Cre'pis* proper. Peduncles slender; buds erect. Fruit not beaked. Pappus white, silky.

1. *C. vi'rens*, L.; glabrous below, lower leaves toothed runcinate or lyrate, upper linear sagittate, inner bracts glabrous within as long as the pappus. *C. tectorum*, Sm. not L.

Waste and cultivated ground, cottage roofs, &c., from Caithness southd. ascends to 1,350 ft. in Derby; Ireland; Channel Islands; fl. June—Sept.—Annual, very variable. Stems 1 or more, 1–3 ft., furrowed, much branched; inflorescence usually glandular-hairy. Leaves often pinnatisect with narrow acute or obtuse lobes, petioloed. Heads 1/4–1 3 in. diam., campanulate; outer bracts subulate, inner linear. Fruit red-brown, ribs 10 or more, smooth.—Distrib. From Denmark southd., Canaries.

2. *C. bien'nis*, L.; hispid, leaves all runcinate-lyrate, upper simple sessile, inner bracts pubescent within shorter than the pappus.

Dry pastures, &c., in E. and Midland counties, from York to Kent and Sussex; Aberdeen; Dublin; Channel Islands; fl. June—July.—Biennial. Stem 1–4 ft., stout, channelled, ribbed. Leaves 6–13 in., lobes very irregular. Heads 4–1 in. diam.; involucre campanulate, bracts glabrous externally.
3. C. hirciaciodes, Waldst. and Kit.; glabrous or hairy, lower leaves oblong-spathulate, upper linear-oblong $\frac{3}{4}$-amplexicaul, bracts with gland-tipped hairs. C. succisefolia, Tausch.; Hiera'cium mol'le, Sm.

Mountain woods, from York to Dumbarton and Banff; ascends to 1,200 ft. in Northumbd.; fl. July—Aug.—Slender, perennial, variable in pubescence. Leaves 2–4 in., obtuse, entire or sinuate-toothed. Heads $\frac{3}{4}$–1 in. diam., few; involucre subcylindric, outer bracts appressed short about as long as the pappus. Fruit contracted at the base and tip; ribs many, smooth.—DISTRIB. Mid. Europe to the Caucasus.

SUB-GEN. 2. Barkhau'sia, Mæch (gen.). Peduncles slender or thickened upwards. Fruit beaked, many-ribbed, minutely hispid.

4. C. foe'tida, L.; hispid, stem branched from below, leaves runcinate-pinnatifid, peduncles bracteate incurved thickened upwards, buds drooping, invol. bracts tomentose inner hardening and enclosing the outer fruits.

Chalky and gravelly banks, rare, from Cambridge and Norfolk to Sussex and Kent; fl. June–July.—Annual or biennial. Stem 1–2 ft., terete, faintly furrowed, usually with many ascending corymbose branches. Heads $\frac{3}{4}$ in. diam., bright yellow; peduncles long; invol. bracts often setose and glandular, outer erect or spreading. Fruit yellow-brown, beak of outer shorter than the bracts, of inner longer.—DISTRIB. From Belgium southd., Himalaya, N. Africa.

5. C. taraxacifo'lia, Thuill.; hispid, stem branched above, leaves runcinate-pinnatifid, peduncles very slender not thickened, buds erect, inner invol. bracts not enclosing the outer fruits.

Dry banks and chalky pastures, local, from Yorkshire to Cornwall and Kent; Carnarvon; fl. June–July.—Habit and foliage of C. biennis, biennial. Stem 1–2 ft., ribbed and furrowed. Heads $\frac{3}{4}$–1 in. diam.; involucre cylindric-campanulate, often glandular as well as tomentose, outer bracts spreading, not hardening. Flowers yellow, outer striped with brown on the back. Fruits yellow-brown, all long-beaked and very slender.—DISTRIB. W. Europe from Belgium southd., N. Africa.

C. seto'sa, Haller fil.; hispid, lower leaves sinuate-toothed or runcinate-pinnatifid, upper amplexicaul, peduncles slender not thickened, buds erect, invol. bracts prickly, inner not enclosing the outer fruits.

A casual in clover fields; fl. Aug.—Biennial. Stem 1–3 ft., erect, branched from the base, angled and furrowed, leafy. Leaves very variable. Peduncles rigid, deeply grooved. Heads $\frac{3}{4}$ in. diam., campanulate; involucre contracted in fruit; bracts very rigid, slender, keeled, outer subulate spreading, inner linear shorter than the pappus, hardening. Fruits all slender with long beaks.—DISTRIB. Mid. and S. Europe.

SUB-GEN. 3. Ara'cium, Monn. (gen.). Peduncles very slender; buds erect. Fruit slender, not beaked, many-ribbed, quite smooth. Pappus of dirty-white fragile hairs.
6. C. paludo'sa, Mæch; radical leaves obovate-lanceolate, petiole slender, cauline sessile amplexicaul-auricled. _Hieracium paludosum_, L.

Moist mountain meadows, copses, &c., from S. Wales and Salop to Caithness; ascends to 2,000 ft. in the Highlands; N. Ireland; fl. July–Sept.—Perennial; glabrous, inflorescence covered with black glandular hairs. _Stem_ 1–3 ft., slender, furrowed. _Leaves_ membranous, runcinate-toothed, long-acuminate; radical 3–5 in.; cauline contracted in the lower third. _Heads_ few, \( \frac{3}{2}–1 \) in. dian., corymbose; bracts of peduncles minute, subulate with toothed bases; ligules yellow; styles slender; and upper part of style hairy. _Fruit_ cylindric, strongly ribbed, obscurely contracted at the top, pale.—_Distrib._ Europe (Arctic), W. Siberia.—A _Crepis_ with the pappus of _Hieracium._

### 36. HIERACIUM, L. Hawkweed.

Perennial herbs, often covered with glandular or stellate hairs; juice milky. _Leaves_ radical and cauline, alternate. _Heads_ solitary corymbose or panicled; invol. bracts many, imbricate, unequal; receptacle flattish, naked, pitted, margins of the pits toothed or hairy or fimbriate. _Corollas_ all ligulate, yellow, rarely orange; anther-cells not tailed; style-arms slender, and upper part of style hairy. _Fruit_ angled or striate, not beaked; pappus-hairs 1-seriate, simple, rigid, unequal, tawny or brownish, brittle, often girt with a short crenulate ring.—_Distrib._ N. temp. and Arctic regions; species about 150.—_Etym._ _leopax_, a hawk.

In the following attempt to classify the British _Hieracia_, I have been guided by Mr. Baker. I believe that there are no characters whereby the 9 forms, from _alpinum_ to _boreale_ inclusive, can be more than approximately defined; of these 9 Bentham makes 4, Nyman 21, and Backhouse, followed by Babington (having regard to a considerable amount of constancy under cultivation), makes 30, of which only 16 bear the same name in Nyman. Variable as the genus is, the sequence of its forms is so natural as to have been recognised by all botanists. This sequence represents to a considerable extent the spread of the forms in altitude and area in the British Isles.

#### Section 1. Piloselloidea.

Rootstock stoloniferous. _Stem_ scape-like. _Invol. scales_ irregularly imbricate. _Ligules_ glabrous. _Fruit_ minute, furrowed, crowned with a crenate disk; pappus-hairs slender, equal.

1. **H. Pilosel'la, L.**; stolons long, scape leafless, heads solitary, invol. bracts acute, ligules pale yellow, styles yellow. _Mouse-ear Hawkweed._

Banks, wall-tops, &c., N. to Orkney; ascends to 2,400 ft. in Yorks.; Ireland; Channel Islands; fl. May–Aug.—Villous with long soft hairs. _Stolons_ creeping. _Leaves_ 2–4 in., oblong-lanceolate or obovate-spathulate, stellately downy beneath. _Scapes_ 2–10 in., with 1–3 leaves or 0. _Heads_ \( \frac{3}{2}–1 \) in. diam.; involucre subcampanulate and top of scape stellately downy and with glandular hairs; ligule often striped with brown on the back. _Fruit_ \( \frac{1}{10} \) in., dark.—_Distrib._ Europe, N. Africa, N. and W. Asia.

**H. Peleteria'num, Mer.** (H. pilosis'simum, Fries), is a more densely silky form, with stolons shorter, heads larger.
H. aurantiacum, L.; rootstock creeping, stolons short or 0, heads corymbose, invol. bracts obtuse, ligules orange, styles brown.

Naturalized in copses in the N. of England and Scotland; fl. June–July.—A larger plant than H. Pilosella; leaves not pubescent beneath; flowers orange-red.—Distrib. Scandinavia, Pyrenees to the Carpathians.

Section 2. Pulmonairea. Stolons 0. Rootstock forming in autumn buds which in the following year develop rosettes of persistent leaves and a naked or 1–few-leaved scape. Invol. bracts irregularly imbricate. Ligules hairy at the back and tip, or tip only. Fruit short, furrowed, without a crenate disk; pappus-hairs rigid, unequal.

2. H. alpinum, L.; green, not glaucous, softly hairy and shaggy, scape 4–10 in., with 1–2 small leaves or 0, invol. bracts softly silky, outer lax or spreading, ligules hairy on the back or tip.

Alps, N. Wales, Westmoreland to Sutherland, alt. 2,000–4,000 ft., rare; fl. July–Aug.—Heads 1–1½ in. diam., bright or pale yellow.—Distrib. N. and Arctic zones, Alps of Mid. and S. Europe, exclusive of Pyrenees.—The following varieties appear to be very local.

H. alpinum proper (H. melanocephalum, Tausch.); leaves lanceolate or spatulate nearly glabrous above, head solitary, invol. hemispheric, hairs black, bracts all acute, outer lax, style yellow. Forfar, Aberdeen.—Var. H. holosericeum, Backh. (H. alpinum, Engl. Bot.); leaves spatulate or lanceolate obtuse entire hairy on both surfaces, heads solitary, invol. turbinate, hairs long white, outer bracts broad obtuse, inner acute appressed, style yellow. Scotland and Cumberland.—Var. H. eximium, Backh.; (H. villosum, Engl. Bot.); taller, 6–15 in., leaves lanceolate hairy on both surfaces, heads 1 or few, invol. truncate below, hairs black, bracts many slender acute, style yellow or livid. H. tenellum, Lond. Cat., is a slender form of this. Scotland.—Var. H. calenduliflorum, Backh.; stem simple or branched, leaves broadly obovate obtuse toothed, primordial orbicular, invol. rounded at the base, hairs silky black, bracts acute, style livid. Scotland. The handsomest form, indicating a passage to H. nigrescens.

3. H. nigrescens, Willd.; more or less covered with scattered soft hairs, scape 6–18 in. with 1–2 small leaves or 0, involucre villous, hairs black glandular, outer bracts lax, ligules glabrous or nearly so.

Alps, York to Sutherland; ascends to 4,500 ft.; fl. Aug.–Sept.—Intermediate between H. alpinum and Lawsoni in size, altitudinal distribution and area. Usually larger and more slender than alpinum, with broader, narrower, coarsely toothed leaves, much shorter soft hairs, and blacker bristles and glands on the involucre; heads as large.

H. nigrescens proper (H. pulmonarum, Sm.); leaves with large irregular teeth, cauline few, involucre dark green ovoid at the base, bracts rather broad outer obtuse tips woolly, flowers deep yellow, style dark. Scotland.—Var. H. gracilentum, Backh.; green, root-leaves lanceolate, cauline few large, involucre ventricose black with soft hairs and glands, bracts broad woolly at the tips, ligules nearly glabrous on the back, styles livid. Scotland. Very near alpinum indeed.—Var. H. globosum, Backh.; glaucous or green,
radical leaves ovate, cauleine few small bract-like or 0, buds globose, heads large, involucre rounded at the base at last spherically, bracts appressed, styles yellow. Scotland.—VAR. H. chrysanthum, Backh. (H. atratum, Bab.); green, radical leaves ovate sharply coarsely toothed long-petioled, cauleine minute narrow petioled, involucre rounded at the base, hairs and glandular hairs short, bracts many, styles yellow or faintly livid. (B. microcephalum, Lond. Cat., is a small-headed form.) Frequent in Scotland, rare in Cumberland.—VAR. H. senes'cens, Backh.; green, radical leaves lanceolate evenly toothed, cauleine linear-lanceolate petioled, heads 2 or more, involucre ovoid at the base, bracts woolly at the tip incurved in bud, styles yellow. Scotland.—VAR. H. lingulat'um, Backh. (H. saxif'ragum, Bab.; H. divaricat'um, Don); green, 15–24 in., radical leaves few toothed coarsely hairy above, petiole short, cauleine few sessile, heads several, involucre-broad, base at length truncate, dark with hairs, bracts straight in bud, styles livid. Scotland.

4. H. ang'licum, Fries; glaucous green, stem 1-2 ft. more or less leafy slightly hairy or glabrous below, radical leaves ovate-lanceolate, petioles shaggy, cauleine oblong or ovate broad sessile amplexicaul, heads 1-5, 1-1½ in. diam., ligules many, styles livid. H. Lawso'nii, Sm. in part, not Villars.

Mountain districts, York to Orkney; ascends to 2,700 ft.; Ireland; fl. July–Aug.—A handsome species, best characterised by its size, ovate-lanceolate leaves, shaggy petioles, several (rarely 1) large bright-coloured heads, and livid styles.—DISTRIB. Pyrenees.

H. ang'licum proper (H. cerin'hoìdes, Backh. not L.; H. decipiëns, Syme); petioles long shaggy winged, cauleine leaves 1-2 ovate, heads 2-5, involucre ventricose rounded at the base, bracts slender, ligules hairy at the tip (b. amplexicau'le and c. acutifo'lium of Lond. Cat. are forms of this).

Sub-sp. tric'um, Fries (H. Lapey'roussii, Bab. not Froel.); more robust and leafy, radical leaves in a less marked rosette or scattered, petioles shorter, cauleine broadly ovate not contracted above the base, involucre truncate at the base constricted after flowering, ligules glabrous. This, which is confined to Britain and Ireland, bears much the same relation in foliage to Lawso'nii that tridentat'um does to vul'ga'tum.

5. H. muro'rum, L.; green or glaucous, stem 1–2 ft. glabrous or hairy below, primordial leaves suborbicular, radical in a distinct rosette ovate acute cordate or rounded at the base entire or toothed, cauleine 0 or very few, heads 2–6 3/4–1 in. diam., peduncles floccose and covered with scattered simple and gland-tipped hairs.

Woods, heaths, walls and rocks, N. to Shetland; ascends to 2,000 ft.; Ireland; fl. July–Sept.—The commonest Hieracium of Britain except Pilosell'la and sylva'ticum, and best distinguished from H. ang'licum by the smaller heads and less robust habit; and from H. nigres'cens by its large size and less villous or hairy stem and involucres; but there is every transition between these and the following.—DISTRIB. Europe (Arctic), N.W. Asia, Himalaya, N. America.—I can make nothing of the following sub-species and varieties, which are adopted from Backhouse's monograph.
Hieracium.]  **COMPOSITÆ.**

H. **muro'rum** proper; green, radical leaves toothed slightly hairy, petioles slender, cauline often large and petioloed, heads many small, peduncles short, involucre rather ventricose more or less villous with black and gland-tipped hairs, styles livid or yellow. The common form.—**Var. H. nit'idum,** Backh.; radical leaves dark green lanceolate coarsely toothed, involucre more ventricose, style yellow. Aberdeen and Argyll. The passage to **H. nигres'cens.** Sub-sp. **H. ca'sium,** Fries (**H. muro'rum,** Sm.); dull glaucous green, radical leaves coriaceous usually narrowed to a toothed base glabrous above, cauline 0 or very small and sessile, heads few large, involucre subglobose almost glandless and less hairy hoary with stellate down, ligules bright yellow glabrous, styles livid. English, Welsh, and Scotch Mts. The passage to **H. sylvaticum.**—**Var. H. flocculo'sium,** Backh. (**H. stelliger'um,** Backh. not Fröel.); ashy-green, stem floccose throughout rather leafy, radical leaves more or less toothed narrowed into long petioles stellately downy on both surfaces, cauline large ½-amplexicaul, involucre hoary hoary with whitish hairs, bracts acuminate. Clova Mts.—**Var. H. obtusifo'lium,** Backh.; yellow green, stem 1-leaved, petioles densely villous, peduncles spreading, involucre ventricose truncate at the base, ligules hairy at the tips. Clova Mts.

Sub-sp. **H. pal'lidum,** Fries; very glaucous, radical leaves ovate or lanceolate conspicuously fringed with long hairs, cauline sessile or the lower petioloed, heads 2–6, involucre ventricose base ovoid constricted above with few simple or gland-tipped hairs, bracts appressed acute, styles yellow. England, Scotland, and Ireland. Very near **H. ang'licum.**—**Var. H. cineras'cens,** Jord. (**H. lasiophyll'um,** Bab.); still more hairy and glaucous, stem hairy fragile, peduncles and involucres more densely setose and hoary.—**Var. H. argen'teum,** Fries; very glaucous, almost glabrous, stem fragile fistular and sub-entire radical leaves almost glabrous, cauline sessile or the lower petioloed, peduncles long rigid and small involucres with scattered hairs.—**Var. H. Gibso'ni,** Backh. (**H. hypocheeroi'des,** Gibs.); stem wiry often forked, radical leaves broadly ovate, base obtuse spotted with purple, teeth small, petioles slender short, peduncles rigid floccose and setose, invol. bracts short broad obtuse margins downy, styles yellow. Yorkshire and Ireland on mountain limestone.—**Var. H. aggrega'tum,** Backh.; radical leaves broader obtuse toothed below glabrous or hairy beneath and ciliate, cauline subsessile, peduncles erect crowded umbellate and narrow turbinate involucres densely floccose, bracts obtuse. Aberdeen and Forfar alps.

6. **H. sylvaticum**, Sm.; green or glaucous, stem 1–3 ft. nearly glabrous below, primordial leaves lanceolate, radical petioloed distinctly alternate lanceolate sharply toothed or subpinnatifid, teeth pointing forwards, cauline 2–8, heads ½–1 in. diam. panicled or corymbose and peduncles floccose and with simple and gland-tipped hairs rarely naked, ligules glabrous, styles livid.

Banks and copses, from Ross southd.; ascends to 3,500 ft. in the Highlands; rare in Ireland; fl. July–Sept.—Best distinguished from **H. muro'rum** by the narrower leaves less crowded in a rosette, and more leafy stem; but some vars. of **muro'rum**, as **ca'sium** and **nit'idum**, show this foliage. The most leafy states, as **goth'icum** and **tridenta'tum**, show a passage to **boreale** and **croca'tum.**—**Distrib.** Europe (Arctic), N. Asia, N. America.
H. sylvaticum proper (H. vulgatum, Fries; H. maculatum, Sm.); green or glaucous, stem 1-1½ ft. hardly leafy, radical leaves petioled in a persistent loose rosette toothed in the middle or nearly entire often spotted, cauline petioled upper sessile, heads many, peduncles straight, involucre cylindrical in bud floccose and with gland-tipped hairs, bracts equal alternate subacute. Very common.—Var. cinereum, Backh.; ashy green or glaucous, stem branched, radical leaves few, cauline subentire, heads nearly glabrous, bracts broad more obtuse. Orme’s Head.—Var. rubescens, Backh.; green, stem robust purplish, leaves ovate, cauline 1-2, heads few large, bracts broad subacuminate. Settle, Yorkshire.—H. nemoro’sum is a leafy form passing into tridentatum; montana I do not know; macrocephalum is a large-headed alpine form.

Sub-sp. H. gothicum, Fries; dark green, stem 2-4 ft. rigid slender leafy simple or branched above, radical leaves withering in summer shortly petioled, cauline ovate or lanceolate acute toothed in the middle, upper sessile, heads small few, involucre subglobose dark green glabrous or nearly so, bracts imbricate broad obtuse, ligules glabrous, styles yellow or with livid hairs.—Subalpine districts, N. Wales, York to Aberdeen; Ireland.—Very distinct at first sight, but intermediates occur with H. sylvaticum, as also with boreale.—Var. latifolium, Backh., is a Clova Mt. plant with more numerous and broader leaves.

Sub-sp. H. tridentatum, Fries; green, stem 2-5 ft. rigid leafy subcorymbose branched, radical leaves 0 or withering in summer obtuse, cauline ovate or lanceolate sparingly toothed in the middle acute rounded at the base, branches and peduncles slender leafless, involucre constricted in the middle after flowering.—Hilly districts, York to Devon and Kent; N. Wales.—Forms the passage to the Accipitri’na group.

Sub-sp. H. Dewa’ri, Syme; bright green, stem 1-3 ft. sparingly leafy corymbose branched, lower leaves elliptic petiole winged, cauline ovate-lanceolate ½-amplexicaul, heads few loosely panicked and peduncles sparingly hairy and setose, involucre cylindrical from a conic base, bracts dark green obtuse, outer few short appressed, inner with pale margins.—Scotland.

Section 3. Accipitri’na. Stolons 0. Rootstock forming in autumn buds which develop in the following year early withering radical leaves and an erect very leafy stem. Invol. bracts imbricate in 2 or many series. Ligules glabrous or tip minutely hairy. Fruit short, furrowed, without a crenate disk; pappus-hairs rigid, unequal.

7. H. prenanthoi’des, Villars; stem 2-3 ft., leaves oblong or linear-oblong reticulate and glaucous beneath denticulate, lower petioles amplexicaul, upper cordate and auricled, heads in branched leafy corymbose panicles usually thickly clothed with black gland-tipped hairs, peduncles short floccose, ligules hairy at the tip, styles dark or yellowish. H. denticulatum, Sm.

Subalpine regions, York to Orkney; ascends to 2,400 ft.; Wicklow in Ireland; fl. Aug.—Sept.—Stem rigid, hairy or glabrous, leafy, often much branched. Leaves ciliate, hairy on both surfaces. Peduncles spreading, short, hoary. Heads ½ in. diam.; involucre cylindrical in bud; bracts few, outer short.—Distr. Europe (Arctic and Alpine), Siberia, Himalaya.

Of H. strictum, Fries, I have seen no British specimens; Fries’ specimen differs from prenanthoi’des chiefly in the larger heads.
8. **H. umbellatum**, L.; stem 1–2 ft. wiry hairy or shaggy below, leaves sessile narrowly linear or oblong-lanceolate base narrowed toothed, heads subumbellate, and peduncles stellately downy but hairless, bracts many tips recurved, ligules glabrous, styles yellow.

Thickets, &c., in dry and rocky places, from Roxburgh and Dumfries to Cornwall and Kent; ascends to 1,200 ft. in Yorks.; local in Ireland; Channel Islands; fl. July–Sept.—Usually very distinct, from its short stem, wiry habit, many narrow leaves, large subumbellate glabrous heads and recurved bracts, but varieties pass into *crocatum*. Leaves generally uniform, teeth distant, reticulate, stellately downy beneath. *Involucre* ovoid or sub-cylindrical, dark or pale; peduncles slender, rigid.—**DISTRIB.** Europe (Arctic), N. and W. Asia to the Himalaya, N. America (*H. canadense*, Fries).  
**Var. filifolium**, Backh.; stem leafy throughout, leaves very narrow margins revolute quite entire. Lough Neagh.

9. **H. crocatum**, Fries; stem 2–4 ft., glabrous or hairy, leaves lanceolate or oblong sessile base rounded narrowed or truncate toothed or entire often glaucous beneath, heads and peduncles downy glabrous or hairy, bracts appressed obtuse, ligules glabrous, style livid or yellow, pappus almost white or discoloured.

Mountain districts, from Wales and York to Orkney; ascends to 1,200 ft.; Ireland, rare; fl. July–Sept.—Intermediate between *umbellatum* and *boreale*.  
—*H. jura'num*, Fries (*H. Borrei*, Syme), a plant from Selkirk? with evident root leaves and few broad stem leaves, seems intermediate between this and *sylvaticum*. Syme refers it to *prenantho'ides*, but to me it appears quite different.—**DISTRIB.** Arctic, Mts. of N. and Mid. Europe, Himalaya.  
**H. crocatum** proper; leaves sessile base rounded lower narrowed below, nerves obscure, heads simple subcorymbose, base broad, invol. bracts usually glabrous. *H. involo'ides*, Tausch.—Mountain districts.

Sub-sp. **H. corymo'sum**, Fries; more robust, branches spreading or ascending, leaves ovate irregularly toothed hairy above glaucous and loosely reticulate beneath, heads many panicled, involucre ultimately truncate sparsely hairy, pappus tawny. *H. rig'idum*, Backh. not Fries.—York to Orkney; Antrim.—**Leaves of H. boreale**, but upper ampelicaul more glaucous and nervèd.

10. **H. boreale**, Fries; stem 2–4 ft. very hairy below stellately downy above, leaves broad at the base ovate or ovate-lanceolate toothed lower petioloed upper broader sessile, heads many in leafy panicles or corymb, peduncles floccose, involucre ovoid dark nearly glabrous, bracts broad obtuse, ligules glabrous, style livid. *H. sabau'dum*, Sm.; *H. heterophyl'rum*, Bladon.

Hedgebanks, copses, &c., Skye, and from Banff and Dumbarton southd.; rarer in Scotland; Ireland; fl. Aug.–Oct.—Stem often reddish, leafy throughout. **Leaves** with teeth pointing forwards, lowest with villous petioles. **Heads** 2–1 in. diam.—**DISTRIB.** Mid. and S. Europe, rare in Scandinavia.—Allied to *gothicum*, but without radical leaves, heads smaller, invol. bracts more numerous.
37. HYPOCHÆRIS, L. Cat's-ear,

Annual or perennial scapigeroes herbs; juice milky. Leaves radical, pinnatifid. Heads on simple or dichotomously branched scapes; invol. bracts in many series, imbricate; receptacle flat, with narrow membranous scales. Corollas all ligulate; anther-cells shortlyailed; upper part of style and its short obtuse arms hairy. Fruit striate, scabrous, beak of the outer very short or 0, of the inner long, slender; pappus of one row of feathery hairs with usually an outer row of short, stiff bristles.—Distrib. Europe, W. Asia; species 30.—Etym. doubtful.

1. H. glabra, L.; annual, leaves narrowly obovate-oblong toothed or sinuate, scapes many branched, involucre as long as the flowers, outer pappus short.

Dry fields, &c., from the Clyde and Elgin to Devon and Kent; rare in Scotland; Channel Islands; fl. June–Aug.—Almost glabrous. Leaves spreading, 2–4 in., rarely pinnatifid, obtuse or subacute. Scapes several, 6–12 in., slender or stout, naked or with 1–2 scale-like leaves; peduncles erect. Heads ½–3 in., yellow, cylindric; involucre subcylindric; bracts very unequal, few, green, linear, acute. Fruit red-brown; pappus dirty white, longer than the involucre.—Distrib. From Gotland south, N. Africa, W. Asia.

H. glabra proper; marginal fruits not beaked.—VAR. H. Balbisii, Lois.; all the fruits beaked.—Kent, Shropshire, Channel Islands.

2. H. radicata, L.; perennial, leaves narrowly obovate-oblong sinuate- or runcinate-pinnatifid, scapes many branched, involucre shorter than the flowers, outer pappus short.

Meadows, waste places, &c., N. to Orkney; ascends to 1,600 ft. in the Highlands; Ireland; Channel Islands; fl. June–Sept.—Hispid, rarely glabrous. Leaves many, 3–10 in., hispid on both surfaces. Scapes 6–18 in., stout; peduncles with small scale-like leaves. Heads 1–1½ in. diam., yellow; involucre subcampanulate; bracts many, green, attenuated to the tip, often strongly ciliate on the margin and back. Fruits red-brown, all beaked, strongly muricate.—Distrib. Europe, N. Africa.

3. H. maculata, L.; perennial, leaves obovate-spathulate sinuate-toothed, scapes 1 or few, involucre shorter than the flowers ciliate with curly hairs, outer pappus 0. Achyrophorus maculatus, Scop.

Chalk and limestone pastures, rare, Westmoreland, N. Wales, Cornwall, Cambridge, Suffolk, Essex; Channel Islands; fl. July–Aug.—Hispid. Leaves sessile, 1–4 in., often spotted above. Scape stout, glabrous above, rarely forked, with 1–2 scale-like leaves. Heads 1 in. diam., yellow; involucre broadly campanulate; bracts many, slender. Fruits all beaked; faintly muricate; pappus white.—Distrib. Europe, N. Asia.

38. LEON'TODON, L. Hawkbit.

Perennial, scapigeroes herbs; juice milky. Leaves all radical, obovate, sinuate-toothed or pinnatifid. Heads on simple or branched scapes,
yellow; invol. bracts many, in several series, outer smaller; receptacle flat, naked. Flowers all ligulate; anther-cells not tailed; style-arms linear' obtuse, and upper parts of style hairy. Fruit terete, grooved, transversely rugose; beak short; pappus-hairs rigid, 1–2-seriate, slightly dilated at the base, outer simple and rough, or the outer of toothed scales and the inner of one series of feathery hairs.—DISTR. Europe, W. Asia; species about 25.—ETYM. λεών and ὀσόβ, from the toothed leaves.

SECTION 1. Pappus of outer flowers of toothed scales, of inner of feathery hairs. Buds drooping.


Gravelly pastures, &c., from Durham southd.; Edinburgh to Roxburgh only in Scotland; Ireland; Channel Islands; fl. July–Aug.—A hispid biennial; hairs often forked. Leaves 3–6 in., long-petioled. Scapes very many, 4–8 in. Heads 1/4–1/2 in. diam.; involucre campanulate; bracts lanceolate, subacute, keeled, glabrous, edges and back hispid or ciliate. Fruit 1/4 in., closely grooved and minutely muricate, outer stouter curved almost smooth; pappus white.—DISTR. From Gothland southd.

SECTION 2. Pappus of all the flowers 2-seriate, slender; outer short, scabrid; inner longer, base dilated, feathery. Buds drooping.


Meadows, &c., on dry soil, from Isla and Forfar southd.; ascends to near 2,000 ft. in Northumbd.; Ireland; Channel Islands; fl. June–Sept.—A hispid biennial; rootstock truncate; hairs often forked. Leaves 3–5 in. Scapes 6–18 in., few, slender, swollen at the top. Heads 1/3 in. diam.; involucre obconic; bracts linear lanceolate, tips woolly, obtuse. Fruit slender. ribs very muricate above; pappus brownish-white.—DISTR. Europe.


3. **L. autumnalis**, L.; leaves glabrous lanceolate. *Apar gia*, Willd. Pastures and waste places, N. to Shetland; ascends to 3,000 ft. in the Highlands; Ireland; Channel Islands; fl. July–Sept.—Glabrous below; hispid above; rootstock truncate. Leaves 4–10 in., variable, entire or pinnatifid. Scape ascending, usually solitary, branched, rarely simple, bracteate; peduncles swollen above. Heads 1/2–1 1/2 in. diam., involucre obconic or campanulate; bracts glabrous, hispid, or in subalpine districts clothed with black hairs (*L. praten sis*, Koch.; *Apar gia Taraxaci*, Hornem.), outer subulate, inner linear obtuse. Fruit very slender, ribbed, slightly muricate; pappus brownish-white.—DISTR. Europe (Arctic), N. and W. Asia, Greenland introd. in N. America.

39. **TARAXACUM**, Juss. DANDELION.

Perennial, scapigerous herbs; juice milky. Leaves all radical, entire or pinnatifid. Heads solitary, scapes fistular leafless; invol. bracts
imbricate; inner equal, erect; outer often recurved; receptacle flat, naked, pitted. Corollas all ligulate, yellow; anther-cells not tailed; style-arms slender and upper part of style pubescent. Fruit compressed, ribbed, muralate above the middle, abruptly beaked; pappus-hairs in many series, simple, white.—Distr. All temp. and cold climates; species about 6.—Etym. ταφάσω, from its alterative effects.

T. officinale, Web.; leaves toothed sinuate or runcinate-pinnatifid. Leon'todon Tarax'acum, L.

Meadows and waste places, N. to Shetland; Ireland; Channel Islands; fl. March-Oct.—Glabrous, or cottony at the crown and involucre. Root long, stout, black. Leaves oblong-ovate or spatulate, lobes usually toothed. Scapes 1 or more, ascending or erect. Head ½-2 in. broad, bud erect; involucre campanulate, outer bracts more or less recurved, inner erect. Corollas bright yellow, outer often brown on the back. Fruit brown, with a beak of equal length.—Distr. Arctic and N. and S. temp. regions.—A well-known medicine.

T. officinale proper (T. Dens-le'onis, Desf.); leaves bright green runcinate-pinnatifid, outer bracts recurved, fruit pale. The common form in cultivated ground; ascends to 2,700 ft. in the Highlands.—Var. T. erythrosper'mum, Andr.; leaves dull green often glaucous runcinate-pinnatifid, outer bracts spreading, inner appendiculate below the tip, fruit dark brown. Dry places.—Var. T. laviga'dum, DC.; leaves dull green pinnatifid, outer bracts erect broader, inner appendiculate or gibbous below the tip, pale. Sandy places.—Var. T. palus'tre, DC.; leaves sinuate-toothed or pinnatifid, lobes broad, outer bracts ovate spreading or erect, inner simple at the tip, fruit pale.—Moist moorlands; ascends to 4,000 ft. in the Highlands.

40. LACTU'CA, L. Lettuce.

Erect, annual or perennial, leafy, branched herbs; juice milky. Leaves alternate, upper often sagittate. Heads corymbose, small, few-fl.; involucre narrow, cylindric; bracts few, in several series; receptacle flat, naked. Corollas all ligulate, yellow, purple or blue; anther-cells shortly tailed; style-arms slender and upper part of style hairy. Fruit flattened terete or angled, beak short or long slender; pappus of many soft, slender, silvery, fugacious hairs.—Distr. N. temp. regions, S. Africa; species about 60.—Etym. The classical name.

* Leaves with the keel usually bristly. Beak as long as the bordered fruit.

1. L. viro'sa, L.; sparsely scabrous, leaves spreading, radical obovate-oblung sinuate-toothed, caulinle amplexicaul with deflexed auricles, branches of panicle long spreading, fruit black.

Hedgebanks and waste places, from Perth and Ayr southd.; rare in Scotland; Channel Islands; fl. July-Aug.—Erect, 3-6 ft., prickly, glaucous, biennial. Leaves 6-18 in., radical petioled, often spotted with black; caulinle oblong, hardly narrowed at the base. Heads ½-¾ in., pale yellow, in slender panicles, subsecund; peduncles slender, bracteate; involucre narrow, conical; bracts few, green, tips red. Fruit with a thick cellular wing and ribbed faces.—
DISTRIB. From Belgium southd., N. Africa, W. Siberia.—Juice foetid acrid, narcotic, used as an opiate.

2. **L. Scari'ola,** L.; rather scabrous below, leaves suberect, radical ob-obovate-oblong sinuate-toothed or runcinate, upper sagittate amplexicaul, auricles acute spreading, branches of panicle long spreading, fruit grey.

Waste places, rare, Worcester, Norfolk, Cambridge, Essex, Kent, and Surrey; (native? *Wats.)*; fl. July—Aug.—Closely allied to *L. viró'sa,* but prickly only towards the base; branches more erect; leaves usually more runcinate; heads smaller; fruit narrower.—DISTRIB. Europe, Siberia, Himalaya; introd. in N. America.—Apparently the origin of the garden lettuce.

3. **L. salig'na,** L.; almost glabrous, leaves entire or runcinate acute, cauline hastate amplexicaul, auricles spreading acute, uppermost narrow entire, branches of panicle very short erect, fruit grey.

Waste grounds, Suffolk and Hunts to Sussex and Kent, especially near the sea, rare; fl. July—Aug.—More slender than the preceding, much less bristly, with the flowers often fascicled on short erect branches, subspicate.—DISTRIB. From Holland southd., N. Africa, W. Asia.

** Leaves not bristly. Beak shorter than the terete or 4-gonous fruit, or 0.

4. **L. mural'is,** Fresen.; glabrous, leaves broad lyrate-pinnatifid, upper amplexicaul auricled, flowers yellow, fruit terete. *Prenanthes muralis,* L. Old walls and rocky copses, in England, rare; ascends to 1,300 ft. in Yorks.; Perth and Stirling in Scotland; Wicklow and Louth in Ireland; fl. June—Aug.—Tall, slender, annual or biennial, 1–3 ft. Leaves membranous, glaucous beneath, narrow; radical with a winged petiole; lobes few toothed, terminal large 3-angular sinuate-lobed. Branches of panicle slender diverging. Heads θ in., yellow; peduncles slender, bracteate; invol. bracts few, linear, green and purplish. Fruit black, ribbed and muricate.—DISTRIB. Europe, W. Asia.

5. **L. alpi'na,** Benth.; nearly glabrous, leaves sagittate lyrate or runcinate toothed, terminal lobe very large deltoid, flowers blue, fruit 4-gonous. *Sonchus,* L.; *S. caeruleus,* Sm.; *Mulgedium,* Less.

Alpine rocks, Forfar, Aberdeen, alt. 2,000–3,000 ft.; fl. Aug.—Glabrous except the glandular-pilose inflorescence. Stem 3–4 ft., simple, stout, succulent, grooved. Leaves 4–8 in. broad, membranous, narrowed into θ-amplexicaul auricled winged petioles; upper broadly ovate or triangular-cordate, acute, shortly petioled. Heads 1 in. diam., pale blue, in erect simple or branched racemes; peduncles ascending, bracteate; involucr subcylindrical, bracts linear. Fruit slightly compressed.—DISTRIB. Arctic and Alpine Europe, W. Siberia.

**41. SON'CHUS,** L. SOWTHISTLE.

Annual or perennial, often succulent brittle herbs; juice milky. Leaves alternate, toothed or pinnatifid. Heads corymbose or subumbellate, involucre conical after flowering, scales in many series, imbricate; receptacle
flat, naked, pitted. Corollas all ligulate, yellow; anther-cells shortly tailed; style-arms slender, and upper part of style hairy. Fruit truncate, much compressed, grooved, ribbed, usually transversely rugose; pappus-hairs in many series, simple, silky.—Distrib. N. and S. temp. regions; species about 24.—Etym. doubtful.


Cultivated fields, N. to Shetland; ascends to 1,000 ft. in Northumbd.; Ireland; Channel Islands; fl. Aug.–Sept.—Stem 2–4 ft., fistular, angled, simple or branched. Leaves very variable, margins waved, almost spinous; glaucous beneath. Heads 1–2 in. diam.; involucre broadly campanulate. Fruit light-brown.—Distrib. Europe (Arctic), N. Africa, temp. Asia, India; introd. in America.—A robust form (glabra, Lond. Cat.) occurs with eglandular inflorescence.

2. **S. palustris**, L.; rootstock branched, leaves minutely toothed, lower runcinate with few segments, upper entire sessile sagittate, auricles acute, inflorescence glandular-hispid.

Marshes in England, very rare, Norfolk, Suffolk, Cambridge, Hunts, Kent and Essex, now all but extinct; fl. July–Sept.—Stem 5–9 ft., strict, stout, fistular, angled, leafy. Leaves long-acuminate, lower very large and long, often reduced to one sagittate blade and a broad winged petiole, very glaucous beneath. Heads ½–1 in. diam., pale yellow, subumbellate; peduncle stout, very hispid and glandular. Fruit 4-ribbed, pale.—Distrib. From Denmark southd.

3. **S. oleraceus**, L.; annual, leaves lanceolate ½-amplexicaul sharply toothed entire or pinnatifid, auricles rounded, inflorescence subumbellate glabrous rarely glandular.

Fields and waste places, N. to Shetland; ascends to 1,200 ft. in Yorkshire; Ireland; Channel Islands; fl. June–Sept.—Stem 2–3 ft., erect, usually branched, tubular, grooved. Leaves sessile or petioled, glaucous beneath, usually much lobed, often spinous-toothed. Heads crowded, ½–1 in. diam.; peduncle sometimes cottony. Fruit pale brown.—Distrib. Europe, N. and W. Asia, India, N. Africa, S. Australia, N. Zealand; introd. in America.

**S. oleraceus** proper; auricles hastate, fruit ribbed and transversely wrinkled.

Sub-sp. **S. asper**, Hoffm.; leaves waved spinous, auricles suborbicular deflexed and recurved, fruit ribbed but not transversely wrinkled.

### 42. **Tragopogon**, L.

Erect, usually simple glabrous herbs, with biennial or perennial tap-roots, juice milky. Leaves alternate, entire, amplexicaul. Heads solitary; invol. bracts 1-seriate, usually exceeding the flowers, narrow, nearly equal, connate at the base; receptacle convex, naked or fimbriate. Corollas all ligulate, yellow or purple; anther-cells tailed, upper part of style hairy, arms slender obtuse. Fruit slender, muricate, beak long; pappus-hairs
in many series, rigid, feathery with naked tips, the hairs of the bristles horizontal and interlacing.—Distrib. Europe, N. Africa, W. Asia; species about 30.—ETYM. ἑλέος and ἑλέω, goat’s beard.


Meadows, pastures, and waste places, from Lanark and Caithness south.; rare in Scotland and Ireland; Channel Islands; fl. June–July.—Glabrous or slightly cottony on the involucre, glaucous. Stem 1–2 ft., stout, erect, simple or sparingly branched above. Leaves flexuous, slender, gradually contracted upwards from above the dilated sheath, tip linear; radical with shorter sheaths, keeled, channelled above, midrib tubular. Heads ½–2 in. diam., yellow; involucre obconic, bracts about 8, 2-seriate, flat, often streaked with brown. Fruit variable in roughness; beak about as long as the body.—Distrib. Europe, N. and W. Asia, Himalaya.—Root edible. Flowers close at noon.

**T. pratensis** proper; flowers as long as the invol. bracts.—VAR. **T. mi’nor**, Fries; flowers ½ as long as the invol. bracts. The most common form.—VAR. **grandiflóra**, Syme; flowers much longer than the invol. bracts. Kent and Surrey, rare.


Wet meadows, rare and local, nowhere wild; fl. May–June.—Habit and chief characters of **T. pratensis**, but usually larger, with more muricate fruits; ligule as long as or shorter (var. **parviflóra**, Bosw.) than the invol. bracts.—Distrib. N. and Mid. Europe, N. and W. Asia.—Occasionally cultivated.

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**Order XLII. Campanula’ceæ (including Lobelia’ceæ).**

Herbs, rarely shrubs; juice milky. Leaves alternate, exstipulate. Calyx-limb 5-cleft, ½ or wholly superior. Flowers honeyed, proterandrous. Corolla epigynous, usually persistent, tube entire or cleft posteriorly; limb regular or oblique or 2-labiate, 5-lobed, valvate or induplicate in bud. Stamens 5, epigynous or epipetalous; anthers conniving round the style, basifixed, equal or unequal, naked or tipped with a pencil of hairs. Ovary 2–8-celled; style simple, tipped with a ring of hairs or clothed with deciduous hairs; stigmas 2–8, hairy on the back, coherent till protruded beyond the anthers, then spreading; ovules many, horizontal, anatropous, placentas axile, fleshy. Fruit a berry or capsule, 2- or more-celled, many-seeded. Seeds minute, testa usually pitted, albumen fleshy; embryo subcylindric.—Distrib. All regions, most abundant in temp. climates; genera 53; species 1,000.—AFFINITIES. With Goodeniaceæ and Cichoraceæ.—PROPERTIES. Acrid and often poisonous, diuretic.

**Sub-order I. Lobeli’ceæ.** Corolla irregular. Anthers cohering in a tube.

1. Lobelia.
SUB-ORDER II. Campanulaceae. Corolla regular. Anthers usually free.

Capsule dehiscing within the calyx-lobes.
Corolla campanulate, 5-lobed; lobes broad .................3. Wahlenbergia.

Capsule dehiscing at the sides, below the calyx-lobes.
Corolla 5-toothed or lobed. Ovary short, broad...........5. Campanula.

1. LOBE'ELIA, L.

Perennial herbs. Flowers in terminal racemes. Calyx-tube ovoid or obconic, limb 5-fid. Corolla very irregular; tube split at the back; limb 2-labiate, 2 upper lobes smaller erect or recurved, 3 lower pendulous. Stamens 5, epipetalous; anthers connate, all, or the 2 lower only, bearded at the tip. Ovary 2-3-celled; style filiform, included, girt with a ring of hairs, stigmas 2 broad spreading. Capsule 2-3-celled, top exserted and loculicidally 2-3-valved. Testa pitted.—Distr. All but very cold regions; species about 200.—Etym. Mathias Lobel, a Flemish botanist.

1. L. Dortman'na, L.; leaves all radical submerged subcylindrical 2-fistular, scape slender cylindric fistular, flowers drooping.


2. L. u'rens, L.; stem leafy, leaves obovate or oblong-spathulate obtuse sinuate-toothed, upper linear decurrent, flowers erect or spreading.


2. JASI'ONE, L. Sheep's-bit.

J. montana, L.; hispidly pubescent, leaves obovate-oblong.


3. WAHLENBER'GIA, Schrad.

Characters of Campanula, but capsule dehiscing within the calyx-lobes.
—DISTRIB. Trop. and temp. regions; species 80.—ETYM. G. Wahlenberg, Professor of Botany, Upsala.

W. hedera'cea, Reichb.; glabrous, very slender, creeping, leaves all petioled orbicular or cordate angled or obscurely lobed, peduncles 1-ßld. leaf-opposed, corolla cylindric campanulate, lobes short. Campanula, L.

Bogs and damp woods, in the W. and S. counties, from York to Kent and Cornwall; Argyll to Ayr only in Scotland; S. and E. Ireland; Channel Islands; fl. July–Aug.—Rootstock creeping. Stems filiform. Leaves ⅔–⅓ in. diam., membranous, subacutely 5-angled or -lobed, upper often opposite; petiole slender, dilated upwards. Peduncles much longer than the petioles. Calyx-tube shortly turbinate; lobes triangular-subulate, erect. Corolla ⅔ in., pale blue; lobes obtuse, recurved. Capsule subglobose, membranous.
—DISTRIB. W. Europe, from France to Spain.

4. PHYTEU'MA, L.

Perennial herbs. Radical leaves petioled, cauleine usually narrow, sessile. Flowers in dense spikes or heads; involucre of several bracts. Calyx ovoid or obconic; limb superior, 5-ßld. Corolla curved in bud, 5-cleft, segments linear, tardily opening, sometimes at length free. Stamens 5, epigynous, filaments linear dilated at the base; anthers free. Ovary 2–3-celled; style filiform, hairy above, stigmas 2–3 short filiform. Capsule ovoid, dehiscing below the middle by longitudinal valves. Seeds many, ovoid or compressed; embryo straight, cotyledons divaricating.—DISTRIB. Europe, W. Asia; species about 30.—ETYM. obscure.

1. P. orbicula're, L.; glabrous or slightly hairy, heads globose in flower oblong in fruit, stigmas usually 3.


2. P. spica' tum, L.; glabrous, heads oblong or cylindric in flower elongate in fruit, styles very long, stigmas 2.
Woods and thickets, E. Sussex; (native? Wats.); fl. May–June.—Taller and more robust than R. orbiculare; stem 2–3 ft., ribbed. Radical leaves cordate at the base, ovate or oblong; cauline spreading and recurved. Heads 1–4 in., yellowish. Capsule usually 2-celled.—DISTRIB. Europe to S. Russia.—Formerly cultivated and the root eaten.

5. CAMPAN'ULA, L.

Perennial, rarely annual herbs. Radical leaves usually petioled, cauline alternate. Flowers spiked or racemed, white blue or lilac. Calyx-tube ovoid or subglobose; limb 5-fid, lobes flat or folded at the sinus. Corolla campanulate or rotate, 5-lobed. Stamens 5, epigynous, filaments short, bases broad dilated; anthers linear, free. Ovary-cells 3–5, opposite the sepals; style clavate, with rows of deciduous hairs opposite the anther-cells, stigmas 3–5 filiform. Capsule ovoid or turbinate, 3–5-celled, cells dehiscing below the calyx-limb by pores or valves. Seeds usually flattened.—DISTRIB. All temp. and most trop. climates; species about 230.—

* Stem-leaves linear or linear-lanceolate, usually nearly entire. Terminal flower of the raceme opening first.

1. C. rotundifo'lia, L.; glabrous, stem angled slender, cauline leaves lanceolate, upper narrow linear quite entire acute, flowers solitary or racemed drooping, corolla campanulate, lobes short recurved. Hare-bell.

Pastures, heaths, &c., N. to Shetland; ascends to 3,500 ft. in the Highlands; Ireland; fl. July–Sept.—Glabrous or slightly pubescent. Rootstock slender. Stem ½–2 ft., ascending, simple or branched, sparingly leafy. Primordial leaves long-petioled, broadly ovate-cordate, crenate. Pedicels slender; bracts minute or 0; buds erect. Calyx-lobes erect, subulate. Corolla ½–1 in., blue, sometimes white, lobes subacute. Capsule subglobose, valves basal.—DISTRIB. Europe (Arctic), N. Africa, N. Asia, N. America.—VAR. lancifolia, Koch (montana, Syme), has broader cauline leaves and sub solitary flowers; and VAR. speciosa, More, from W. Ireland, is a beautiful form with much larger flowers and shorter calyx-lobes.

2. C. RAP'UN'CULUS, L.; hispid or glabrous, stem angled, cauline leaves oblunget or obovate-lanceolate obscurely toothed, flowers panicled erect, calyx-lobes very long subulate, corolla broadly campanulate 5-lobed almost to the middle, lobes recurved. Rampion.


3. C. pat'ula, L.; scabrid, stem slender angled, cauline leaves linear or lanceolate, flowers subcorymbose erect, calyx-lobes linear, corolla broadly campanulate 5-lobed to the middle, lobes spreading.
C. persicifo'lia, L.; glabrous, stem terete, leaves coriaceous, cauleine linear-oblong obtuse finely serrate, flowers few racemed, calyx-lobes triangular-lanceolate, corolla-tube hemispheric, lobes short erect.


C. latifo'lia, L.; pubescent, stem tall stout furrowed, cauleine leaves oblong-ovate, lower-petioled, upper sessile obtusely serrate, flowers large, lower bracts large leafy.

4. C. latifo'lia, L.; pubescent, stem tall stout furrowed, cauleine leaves oblong-ovate, lower-petioled, upper sessile obtusely serrate, flowers large, lower bracts large leafy.

C. rapunculo'ides, L.; puberulous, stem tall nearly terete, cauleine leaves ovate, lower petioled, upper sessile obtusely serrate, flowers large, bracts all small linear.


5. C. Trache'lium, L.; hispid, stem tall angled, leaves all petioled ovate-lanceolate from a broad base irregularly coarsely obtusely serrate, bracts leafy.

Woods and copses in dry soil, from Lanark and Fife to Cornwall and Kent; Kilkenny, Ireland; fl. Sept.–Oct.—Rootstock short, stout. Stem 1–3 ft., hairs reversed. Leaves doubly serrate; radical long-petioled, cordate; cauleine gradually attenuated from the base, acute. Racemes panicled, peduncles short; bracteoles lanceolate; flowers 1 or many, erect or inclined. Calyx-tube hispid, very short and broad; lobes ovate-lanceolate. Corolla
1 in., blue-purple, broadly campanulate; lobes suberect, acute. Capsule drooping, valves basal.—**Distrib.** Europe, N. Africa, Siberia.—The uppermost flower in each raceme opens first.

6. **Campanula**, L.; pubescent, stem short terete leafy, leaves crenate, radical very long-petioled oblong- or ovate-cordate, cauline sessile ovate 1/2-amplexicaul, flowers erect in leafy heads or irregularly spiked. Chalky and dry pastures, from Forfar to Somerset and Kent; rare in the W. counties, and in Ireland; fl. Sept.–Oct.—**Rootstock** short, stout. **Stem** 6–18 in., slender. **Cauline leaves** 1/2–3 in. **Flowers** bright blue, mostly in a terminal head with a few axillary buds below it. **Calyx-tube** short, obconic, 5-ribbed; **lobes ovate**. **Corolla** 1/2–2 in., lobes recurved, acute. **Capsule** short, valves basal.—**Distrib.** Europe, N. and W. Asia.—The central flower opens first.

6. **Specula'ria**, Heist.

Characters of **Campanula**, but ovary and capsule very long and slender.—**Distrib.** Temp. Europe and Asia, N. and S. America; species 8.—**Etym.** Speculum, a mirror, from the form of the corolla-limb.

**S. hy'brida**, DC.; annual, hispid or puberulous, leaves oblong waved, flowers axillary subsessile, calyx-lobes exceeding the corolla. Cornfields and dry soils, from Durham to Cornwall and Kent, chiefly in the E. counties; introduced in Scotland; (a colonist, Wats.); fl. June–Sept.—**Stem** 6–10 in., erect or decumbent, simple or branched from the base, angled. **Leaves** small; radical with broad petioles, ovate or spatulate; cauline sessile, obtuse. **Calyx-tube** longer than the floral leaves, sharply angled; **lobes linear-oblong**, subfoliaceous. **Corolla** rotate, blue inside, lilac outside, cleft to near the middle; lobes acute. **Capsule** 1–1 1/2 in., angled. **Seeds** polished, ovoid.—**Distrib.** From Holland southd., N. Africa.

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**Order XLIII. Erica'ceae**.

Shrubs, rarely herbs or trees, mostly evergreen. **Leaves** alternate opposite or whorled, simple, often articulate with the stem, exstipulate. **Flowers** regular or nearly so. **Calyx** superior or inferior, 4–5-fid or -partite. **Corolla** hypogynous or epigynous, campanulate, 4–5-toothed or -lobed, rarely of 5 petals; lobes imbricate in bud. **Stamens** 4, 5, 8, or 10, hypogynous or epigynous; **anthers** 1–2-celled, cells obtuse or with tubular tips, opening by terminal pores or slits, often with basal or dorsal awns. **Disk** annular and lobed or of glands or scales. **Ovary** 4–5-celled; style terminal, stigma small simple or 4–5-lobed; ovules many in each cell, rarely few or solitary, pendulous. **Fruit** 3–5-celled, a berry or 3–5-valved capsule; **cells many—rarely 1-seeded**. **Seeds** small, testa reticulate, albumen fleshy; embryo minute, clavate.—**Distrib.** Chiefly temp. and cold climates; **genera** about 87; **species** about 1,300.—**Affinities.** With Epacridae.—**Properties** unimportant.


1. Vaccinium, L. Shrubs; buds clothed with usually persistent scales. Leaves alternate, often evergreen. Flowers solitary or racemose, white or red, drooping, honeyed. Calyx-tube short; limb 4-5-toothed. Corolla epigynous, globose or campanulate, 4-5-fld. Stamens 8-10, epigynous; anther-cells with tubular tips, awned or not. Ovary 4-5-celled; style filiform, stigma obtuse; placentas prominent, many-ovuled. Berry 4-5-celled, areolate. Seeds angled, testa reticulate.—Distrib. Europe, temp. and subtrop. Asia and America; species about 100.—Etym. obscure.

* Corolla globose or campanulate.

1. V. Myrtillus; L.; erect, glabrous, branches angular, leaves deciduous ovate serrate, peduncles 1-fld., anthers with dorsal awns. Whortleberry, Bilberry, Blueberry.

1 3/16 in. diam., dark blue, glaucous.—Distrib. Europe (Arctic), N. and W. Asia, N.W. America.—Berries used for preserves, &c.

2. *V. uliginosum*, L.; procumbent, glabrous, branches terete ascending, leaves deciduous oblong or obovate quite entire glaucous beneath, peduncles 1-fld., anthers with dorsal awns.

Mountain bogs and copses, from Westmoreland and Durham to Shetland; ascends to 3,500 ft. in the Highlands; fl. May–June.—Stems 6–10 in., woody, rigid, naked below. Leaves 3/4–1 in., coriaceous, obtuse or acute, veins reticulate beneath. Peduncles 1–3 together, 1/3 in. Calyx-tube hemispheric; lobes 4–5, broad, obtuse. Corolla 1/3 in., pale pink, subglobose. Berry smaller than in *V. Myrtillus*, of the same colour.—Distrib. Europe (Arctic), N. and W. Asia, N. America.


Woods and heaths, chiefly in mountain districts, from Devon, S. Wales, and Noth to Shetland (absent in S.E. half of England); ascends to 3,300 ft. in the Highlands; Ireland; fl. June–July.—Stems wiry, tortuous, branched and naked below; branches 6–18 in., trailing or ascending. Leaves 3/4–1 1/4 in., glossy green above (like box), bifarious, very coriaceous, margins thickened entire or obtusely serrulate, pale beneath; nerves not reticulate. Flowers crowded; pedicels 2-bracteolate. Calyx-tube hemispheric; lobes 4, broadly ovate, ciliolate. Corolla campanulate. Berry 3/5 in. diam., globose, red, acid.—Distrib. Europe (Arctic), N. Asia, N. America.

** Corolla rotate.


2. *Arbutus*, L.

Shrubs. Leaves alternate, evergreen. Flowers in terminal panicked racemes, bracteate, white or pale red. Sepals 5. Corolla hypogynous, globose or subcampanulate; lobes 5, reflexed. Stamens 10, on the base of the corolla, filaments short dilated below; anthers deflexed, ovoid, opening by 2 pores, awns 2 reflexed. Disk annular. Ovary 5-celled; style simple, stigma obtuse; ovules many, placentas pendulous from the upper angles of the cells. Berry globose, granulate; cells 5, 4–5-seeded. Seeds angled, testa coriaceous.—Distrib. N. temp. regions; species about 10.

—Etym. The old Latin name.
**A. Une’do, L.**; leaves obovate- or oblong-lanceolate acute doubly-serrate, panicles drooping many-fld. *Strawberry-tree.*


### 3. ARCTOSTAPH’YLOS, Adanson. **Bearberry.**

Characters of *Arbutus*, but cells of ovary 5–10, 1-ovuled; disk of 3 fleshy scales; and fruit a drupe with 5–10 stones.—**DISTRIB.** of *Arbutus*, but more abundant in America; species about 15.—**ETYM.** ἄρτος and σταφύλι, the fruit being a food of bears.

1. **A. alpi’na, Spreng.**; branches depressed, leaves deciduous obovate or spathulate crenate-serrate above the middle, nerves netted, drupe black.

Dry barren Scotch Mts., rare, from Forfar, Perth, and Inverness to Shetland; ascends to 2,700 ft.; fl. May–July.—Forms woody patches; branches stout, leafy, interlaced; bark scaly. *Leaves* ⅓–1¼ in.; petiole short, wrinkled above, ciliate. *Flowers* 2–3, appearing with the young leaves, shortly pedicelled; bracts ciliate. *Calyx* minute. *Corolla* ⅜ in. broad, white; lobes 4–5, pubescent within. *Filaments* subulate; anthers brown, awns very short. *Berry* ⅔ in. diam.—**DISTRIB.** Scandinavia (Arctic), Mts. of Mid. Europe, cold and Arctic Asia and America.

2. **A. Uva-ur’si, Spreng.**; branches trailing, leaves evergreen obovate or spathulate quite entire very coriaceous, drupe red.

Heathy rocky places from York and Derby to Shetland; ascends to near 3,000 ft. in the Highlands; N.W. Ireland; fl. May–June.—Forms depressed trailing masses; branches 1–2 ft., stout, woody, young puberulous; bark dark, scaling. *Leaves* ½–1 in., petiole and margin finely woolly, deep green, nerves reticulate on both surfaces. *Racemes* crowded, very short, few-fld.; scales and bracteoles persistent, ciliate; pedicels very short. *Sepals* short, broad. *Corolla* ⅜ in., pink, urceolate; teeth 4–5, hairy within. *Anthers* with long awns. *Berry* ⅔ in. diam.—**DISTRIB.** Arctic and Alpine Europe (excl. Greece, Turkey), Siberia, N. America.

### 4. ANDROM’EDA, L.

A. polifolia, L.; leaves elliptic-lanceolate glabrous shining.


5. ERICA, L. Heath.

Rigid, much-branched, evergreen shrubs. Leaves whorled, rarely alternate or scattered, narrow, rigid. Flowers usually nodding; pedicels 2–3-bracteate. Sepals 4. Corolla hypogynous, ovoid globose campanulate or tubular, 4-lobed, persistent, honeyed. Stamens 8, inserted on the disk; anther-cells awned or not, opening by pores or slits. Ovary 4-celled; styles filiform, stigma capitate dilated 4-lobed; ovules many. Capsule 4-celled, loculicidally 4-valved, many-seeded. Seeds attached to a central column, ovoid or compressed, testa smooth or reticulate.—DISTR. Europe, N. Asia, N. Africa, abundant in S. Africa; species about 400.—ETYM. Classical.


Heaths, abundant, N. to Shetland; ascends to 2,400 ft. in the Highlands; Ireland; Channel Islands; fl. July–Sept.—Sometimes almost woolly; glandular hairs stiff or slender or 0. Stems 12–18 in., wiry; branches slender. Leaves ½–1 in., in close or distant whorls, spreading, linear, obtuse, rarely glabrous; margins revolute to the midrib. Flowers drooping, homogamous; pedicels short, bracteolate in the middle. Sepals oblong-lanceolate. Corolla ½ in., mouth scarcely oblique, rose-red, upper side darkest. Ovary usually woolly and with gland-tipped hairs.—DISTR. N. and W. Europe to Russia.

E. Tetralix proper; pubescent and usually glandular, irregularly branched, leaves linear-oblong pubescent above, ovary pubescent.

Sub-sp. E. Mackayi, Hook. (E. Mackaiana, Bab.); nearly glabrous, more corymbosey branched, leaves ovate-oblong glabrate, flowers laxly umbel led, ovary glabrous.—Galway. (Spain.)

2. E. cinea, L.; glabrous, leaves 3 in a whorl, flowers whorled, corolla ovoid mouth regular, anthers included with toothed appendages at the base.

Heaths and commons, N. to Shetland; ascends to 2,200 ft. in the Highlands; Ireland; Channel Islands; fl. July–Sept.—Stems 1–2 ft., much-branched; branches slender, ultimate pubescent. Leaves ½–1 in., irregularly whorled, with short leafy branches in the axils, linear, acute, margins revolute. Flowers drooping or horizontal, homogamous; pedicels short, puberulous; bracteoles under the calyx. Sepals ovate-lanceolate. Corolla ½–¾ in.,
crimson-purple. Ovary glabrous.—Distrib. W. Europe to Germany and N. Italy.


A much-branched, gregarious shrub. Leaves minute, decussate, imbricate (whence the branches appear tetragonal). Flowers on axillary peduncles with 2 pairs of opposite bracts under the calyx, honeyed, homogamous. Sepals 4, scarious, coloured. Corolla shorter than the sepals, hypogynous, 4-partite, persistent. Stamens 8, inserted on the disk; anthers awned, slits short lateral. Ovary 4-celled; stigma dilated; ovules 2, pendulous from the top of each cell. Capsule 4-celled, septicidally 4-valved, septa attached to the axis. Seeds 1–2 in each cell, attached to the central column.—Distrib. Europe (Arctic), (excl. Greece, Turkey,) W. Siberia, Azores, Greenland, N. America (very rare).—ETYM. κάλλινα, the twigs being used for sweeping.

**C. vulg'a'ris**, Salisb.; leaves 3-gonous gibbous at the base.

Heaths and moors, N. to Shetland; ascends to 3,300 ft. in the Highlands; Ireland; Channel Islands; fl. July–Sept.—Stem 1–2 ft., woody, inclined;
branches elongate. Leaves \(\frac{1}{4}\) in., linear-oblong, glabrous (E. glabrata, Seem.) or ciliate or pubescent or hoary (var. incana). Flowers very many; pedicels very short; outer bracts leaf-like, inner scarious. Sepals \(\frac{1}{10}\) in., concave, obtuse, rose-purple or white, shining. Corolla-lobes triangular. Anthers short, dorsally fixed, 2-fld. Style exserted. Ovary pubescent.

7. DABEO'CIA, D. Don. St. Dabeoc’s Heath.


D. polifo’lia, Don; leaves elliptic-ovate obtuse ciliate.

Boggy heaths, Connemara and Mayo; fl. Aug.—Stem 1–2 ft., decumbent; bark flaking; branches slender, erect, hairy and glandular. Leaves \(\frac{1}{2}\)–\(\frac{3}{4}\) in., shortly petioled, margins recurved, bright green, glossy above, white and woolly beneath. Raceme terminal, lax, 5–10-fld., glandular; flowers drooping; pedicels stout, curved; bracts leafy. Sepals ovate-lanceolate, ciliate. Corolla \(\frac{3}{4}\) in., crimson purple or white, lobes short. Filaments flat; anthers sagittate, 2-fld, purple. Ovary villous and glandular.

8. PHYLLODO’CE, Salisb.


P. cæru’lea, Bab.; leaves shortly petioled crowded spreading linear obtuse denticulate glabrous. P. taxifolia, Salisb.; Menziesia, Wahlb.

Heathy moors, Sow of Atholl, Perthshire, alt. 2,400 ft., extremely rare; fl. June.—Short, depressed, much branched, woody; branches 5–10 in., tubercled. Leaves \(\frac{1}{2}\)–\(\frac{3}{4}\) in., rigidly coriaceous, glossy and channelled above, margins reflexed to the puberulous midrib. Flowers few, drooping, in terminal umbellate corymb; pedicels \(\frac{1}{2}\)–\(\frac{3}{4}\) in. Sepals ovate-lanceolate, glandular-pubescent. Corolla \(\frac{3}{4}\) in., lilac, urceolate. Anthers purple. Ovary glandular-pubescent.—Distrib. Scandinavia (Arctic), Mts. of W. France, Pyrenees, N. Asia, N. America.

9. LOISELEU’RIA, Desvaux.

A small, glabrous, depressed, branching, rigid, evergreen shrub; buds scaly. Leaves small, opposite, quite entire, margins revolute. Flowers on terminal 1-fld. peduncles, pink, small. Sepals 5. Corolla hypogynous,
broadly campanulate, 5-fid. **Stamens** 5, hypogynous, slightly adnate to the corolla; anthers short, included, slits lateral. **Ovary** subglobose, 2-3-celled; style short, straight, stigma capitate; ovules many. **Capsule** 2-3-celled, septicidally 2-3-valved, valvules 2-fid. **Seeds** several, ovoid, testa thick pitted.—**Distr.** Arctic and Alpine Europe, Asia, America.—**Etym.** Loiseleur-Deslongchamps, a French botanist.

**L. procumbens,** Desv.; leaves rigidly coriaceous recurved linear-oblong obtuse. **Azalea,** L.

Scotch Alps, alt. 1,500-3,600 ft., from Ben Lomond to Shetland; fl. May–June. —Forms flat patches with interlaced rigid woody branches. **Leaves** ½-¼ in., crowded, petioled, deep green, glossy, deeply channelled above, beneath densely pubescent, midrib very stout. **Flowers** usually 2-3, inclined, sub-corymbose, proterogynous; peduncle red, ½-¼ in., stout, ebracteolate. **Sepals** ovate-lanceolate, red. **Corolla** ½ in. diam., pink; lobes obtuse. **Capsule** minute.

**10. PY'ROLA,** Tournef. WINTER-GREEN.

Biennial or perennial herbs; rootstock slender, creeping; stems short, almost woody; buds scaly. **Leaves** chiefly radical, broad petioled, evergreen. **Flowers** secund, racemose, rarely solitary, white pink or yellowish, nodding; scapes bracteate; pedicels bracteolate at the base. **Sepals** 5. **Corolla** globose, rarely spreading, of five free or subconnate orbicular petals. **Stamens** 10, in pairs opposite the petals, hypogynous, erect or declinate, filaments subulate, tip incurved; anther-cells opening by terminal pores. **Ovary** 5-celled; style erect or declinate, stigma capitate 5-lobed or -cleft; ovules many. **Capsule** globose, 5-celled, loculicidally 5-valved; valvules septiferous, usually with tomentose edges; axis bearing the seeds on fungous placentas. **Seeds** very minute, elongate, testa produced loose.—**Distr.** N. temp. zone; species about 15.—**Etym.** Pyrus, from a supposed similarity in the foliage to that of the pear.

**Sub-gen. 1. Py'rola** proper. **Flowers** racemose. **Petal** 5, free, incurved. **Anther-cells** short, obtuse. **Stigmatic** lobes short. **Valves** of **capsule** cohering by fibres.

1. **P. mi'nor,** Sw.; leaves orbicular-ovate obscurely crenate, stamens erect as long as the short straight style, stigma-rays large.

Woods and heaths, from Sutherland to Kent and Devon; ascends to 1,500 ft. in the Highlands; Ireland, rare; fl. June–Aug.—**Stem** 1–3 in., ascending. **Leaves** usually in a rosette, but sometimes alternate, coriaceous, 1-1½ in., blade contracted into the longer petiole. **Scape** 8–12 in., slender. **Raceme** short, bracteoles subulate-lanceolate. **Flowers** ¾ in. diam., drooping, globose, white tinged with rose. **Stamens** very short. **Style** without a ring below the stigma, not lengthening in fruit. **Capsule** drooping.—**Distr.** Europe (Arctic) (excl. Turkey), N. America.

2. **P. me'dia,** Sw.; leaves orbicular-ovate crenate, stamens erect shorter than the straight or slightly decurved style, stigma-lobes minute erect.
Woods and heaths, local, from Warwick and Worcester to Shetland; ascends to 1,800 ft. in the Highlands; N. and W. Ireland; fl. July–Aug.—Very like P. minor, but larger and stouter; leaves broader, sometimes orbicular and 1½ in. diam., and bracts larger. Flowers ½ in. diam. Style with a ring round the base of the stigma.—Distr. Europe (excl. Greece, Turkey).

3. P. rotundifo'lia, L.; leaves orbicular-ovovate, stamens ascending shorter than the long decurved style, stigma-lobes minute erect.

Moist woods and copses, rare, E. Kent, and from Norfolk and Salop to Aberdeen and Inverness; ascends to 2,500 ft. in Scotland; Westmeath in Ireland; Channel Islands; fl. July–Sept.—Habit and stature of P. minor, but petioles all longer and very slender; raceme usually longer; bracts larger, spreading; flowers ½ in. diam., pure white; style with a ring below the stigma.—Distr. Europe (Arctic) (excl. Greece, Turkey), N. Asia, Himalaya, N. America.

P. rotundifo'lia proper; bracts on the scape few, pedicles a little longer than the lanceolate sepals.—Var. aren'dria, Koch (P. maritima, Kenyon); leaves smaller, bracts many on the scape, pedicels as long as the ovate sepals. Sand-hills, Lancashire. (Belgium.)

4. P. secun'da, L.; leaves ovate acute serrate, raceme secund, stamens incurved shorter than the long ascending style, stigma broad lobed.


Order XLIV. MONOTROPEÆ.

Leafless simple erect brown or red root-parasites or saprophytes. Stem scaly, upper often passing into bracts. Flowers solitary spicate or racemose. Sepals or bracts 2–6, erect, deciduous. Petals 3–6, rarely connate, erect or spreading, imbricate in bud. Stamens 6–12, hypogynous, filaments free or connate below; anthers various. Ovary 4–6-celled, 1- or 4–6-celled; style simple, stigma capitulate peltate lobed or funnel-shaped; ovules numerous, minute, naked; placentas thick, parietal or in the inner angles of the cells. Capsule membranous, 4–6-lobed, 4–6-celled. Seeds minute, testa lax reticulate rarely coriaceous; embryo minute, in fleshy albumen.—DISTRIB. N. temp. regions.—AFFINITIES. Close with Ericæ. —PROPERTIES 0.


Flowers racemose, upper 5–6-merous, the rest 4-merous. Petals saccate at the base. Stamens 8–10; anther-cells confluent, valves very unequal. Disk of 8 or 10 recurved glands. Ovary 4–5-celled, 8–10-furrowed; style columnar, stigma discoid; placentas fleshy, filling the cells. Capsule loculicidally 5-valved. Testa loose, reticulate, produced at both ends.—DISTRIB. N. temp. regions; species 3 or 4.—ETYM. φηθις and πτερίς, from growing in pine woods.

H. multifio'ra, Scop.; flowers racemose, sepals and petals erose obtuse. Monot'rope Hypopithys, L.

Woods near roots of fir and beech, from Aberdeen and Inverness to Kent and Somerset; Mid. Ireland, very rare; fl. July–Aug.—A glabrous or pubescent saprophyte, feeding on decayed vegetable matter. Stem 6–12 in., stout, fleshy, cream-white. Scales oblong. Raceme drooping till after fertilization, then erect. Flowers ½ in., many, drooping; pedicels short, erect in fruit; bracts scale-like. Sepals irregularly disposed. Filaments incurved, the alternate longer. Style short. Fruit ovoid or globose.—DISTRIB. Europe (Arctic) (excl. Turkey), N. Asia, N. America.

Order XLV. PLUMBAGINÆAE.

Herbs, often maritime, rarely shrubs. Leaves alternate or radical, exstipulate. Flowers regular, 2-sexual; bracts and bracteoles usually 3. Calyx inferior, tubular; limb 5-cleft, plaited, often scarious and coloured. Petals 5, hypogynous, claws long free or cohering, twisted in bud, or corolla monopetalous imbricate. Stamens 5, opposite the corolla-lobes, epipetalous or hypogynous, filaments filiform; anther-cells bursting inwards. Ovary free, 1-celled; styles 5, rarely 3–4, distinct or cohering, stigmas capillary or linear; ovule solitary, anatropous, suspended from a basal funicle. Fruit enclosed in the calyx-tube, membranous, bursting irregularly or 5-valved. Seed pendulous, albumen scanty floury; embryo straight, cotyledons flat, radicle cylindric superior.—DISTRIB. All
regions; genera 10; species about 200.—AFFINITIES. Nearest to Primulaceae, but distant.—PROPERTIES. Astringent, unimportant.


1. ARME'RIA, Willd. THRIFT, SEA-PINK.

Perennial herbs. Leaves all radical, very narrow. Flowers pedicelled, fascicled in small bracteate cymes, which are collected into a dense hemispheric head; involucre (formed of the connate downward prolongation of the bases of the outer bracts) tubular, scarious, sheathing the top of the scape downwards. Calyx funnel-shaped, scarious. Petals cohering at the very base, persistent and covering the utricle. Filaments inserted on the petals, base dilated. Ovary obovoid; stigma capillary, papillose. Utricle with 5 hard bosses at the top, dehiscing transversely or irregularly below.—DISTRIB. Alpine, Arctic and maritime N. temp. regions, Chili; species 30.—ETYM. The monkish Latin Flos Armeria, applied to a Pink.

1. A. vulg'aris, Willd.; pubescent or ciliate, leaves linear 1-3-nerved. A. maril'ima, Willd.; A. pu'bes'cens, Link; A. pubig'era, Boissier; A. durin'scula, Bab.; Statice Arme'ria, L.

Rocky and stony sea-shores and on lofty mountains, N. to Shetland; ascends to 3,800 ft. in the Highlands; Ireland; Channel Islands; fl. April–Oct.—Root-stock woody, branched. Leaves densely fascicled, 1-6 in., ½-1 in. broad, obtuse or acute, covered with impressed points on both surfaces, broader in the alpine form (var. planifo'lia, Syme). Scape 3-12 in., hairs spreading or reflexed; heads ½-1 in. diam.; involucre ½-1 in., lacerate, outer bracts shorter than the head, ovate, acute or produced into long brown or green points; inner oblong, obtuse, scarious; pedicel ½-3 in., equalling the calyx. Calyx decurrent on the pedicel, with 5 pubescent ribs, lobes cuspidate. Petals ½ in., rose-pink or white, limb obvate. Utricle exceeding the calyx-tube.—DISTRIB. Europe (Arctic), Asia, N. America, Chili.

2. A. plantagin'ea, Willd.; glabrous, leaves narrow-lanceolate usually 3-5-nerved, calyx-lobes awned.

Sandy banks, &c., Jersey; fl. June–Aug.—More rigid, stouter and larger than A. vulg'aris; leaves ¼-½ in. broad, narrowed into long points, margins cartilaginous and undulate when dry; scapes taller; involucre longer and less deeply cut; outer bracts with usually a long herbaceous point exceeding the head; flowers darker, on shorter pedicels.—DISTRIB. Mid. and S. Europe.—Syme describes a probable hybrid with A. vulg'aris, as growing with them.

2. STAT'ICE, L. SEA LAVENDER.

Perennial herbs. Leaves all radical. Flowers shortly pedicelled, in 1- or more-fld. 3-bracteate cymes, which are alternately distichously or secundly arranged in branched panicles. Calyx obconic; limb scarious, 5-lobed. Petals free or united at the very base. Filaments inserted on the petals. Ovary obovoid or oblong; styles free or connate at the base,
stigmas capillary papilllose. *Fruit* as in *Armeria*.—**Distrib.** Chiefly saline districts and shores of temp. seas, most common in W. Asia; species 50–60.—**Etym.** The Greek name for some astringent herb.

* Leaves pinnately-nerved. Calyx-lobes with intermediate teeth.

1. *S. Limonium*, *L.*; leaves usually long-petioled 1-ribbed, scape branched above, branches nearly all flowering.


*S. Limonium* proper; inner bract about twice as long as the intermediate. Absent from Ireland.—**Var.** *S. belchen*, Drejer; spikelets on corymbose compact or spreading or recurved branches.—**Var.** *S. serot'ina*, Reichb.; spikelets in pyramidal panicles with flexuous spreading branches, spikelets rather lax short. *S. coast.*

Sub-sp. *S. rariplora*, Drejer; spikelets lax on distant erect or incurved branches, inner bract once to once and a half as long as the intermediate. *S. bahusten'is*, Fries.

** Leaves 1–3-nerved. Calyx-lobes without intermediate teeth.

2. *S. auri'culaefo'lia*, Vahl; leaves shortly petioled 3-nerved at the base, scape branched from about the middle, branches nearly all flowering, calyx-lobes obtuse. *S. spathula'ta*, Hook. not Desf.

Sea-shores, from Lincoln on the E. and Wigton on the W. to Cornwall and Kent; Ireland; Channel Islands; fl. July–Aug.—Glabrous. *Rootstock* short, stout, branched. *Leaves* 1–4 in., often mucronate. *Scapes* 4–10 in., paniculately branched; spikelets unilaterial, often imbricate; bracts often coloured, inner twice as long as the intermediate; flowers as in *S. Limonium*. *Calyx-limb* white. *Corolla* blue-purple. —**Distrib.** Coasts of France, Spain, and the Mediterranean.—Boissier (who has examined Vahl’s plant) refers this (in *Herb. Hook.* ) to *auriculaefolia*, and in DC. *Prodr.* he refers the latter to his *oxylepis*.

*S. auri'culaefo'lia* proper (*S. occidenta'lis*, Lloyd; *S. binervo'sa*, G. E. Sm.); leaves obovate-lanceolate, branches of panicle ascending, lower sometimes flowerless, spikelets slender erect or ascending.—**Var. intermedia**, Syme; leaves obovate-lanceolate, branches of panicle ascending usually all flowering, spikelets stout spreading or ascending.—**Var. S. Dodar'tii**, Gir.; leaves spathulate, branches of panicle short spreading often in pairs all flowering, spikelets crowded stout spreading. Portland.

3. *S. bellidi'fo'lia*, Gouan; leaves shortly petioled 1-ribbed, scape branched from near the base, branches flexuous most of them flowerless, calyx-lobes mucronate. *S. cas'pia*, Willd. ; *S. reticula'ta*, L.
Salt marshes, Norfolk, Suffolk, Cambridge; fl. July–Aug.—Glabrous, except the scaberulous panicle. Rootstock much branched. Leaves 3/4–1 1/2 in., few, obtuse. Scape 4–8 in., rather slender, excessively branched; branches spreading, recurved; spikelets unilateral, usually fascicled at the ends of the branchlets; bracts with broad scarious margins, inner 1/4 longer than the intermediate; flowers much smaller than in S. Limonium, 1/ in., pale lilac. —DISTRIB. Atlantic, Mediterr., and Black Seas, E. Asia.—The commonest Mediterranean species, I doubt not the Limo'nium reticula'tum of Ray, and if so it is the S. reticula'ta of Linnaeus, founded on a Maltese plant.

ORDER XLVI. PRIMULA'CEÆ.

Perennial, rarely annual herbs. Leaves radical or cauline, extipulate. Flowers 2-sexual, regular. Calyx inferior, superior in Samolus, 5- (rarely 4–9-) cleft. Corolla usually hypogynous (0 in Glaux), rotate bell- or funnel-shaped, 5- (rarely 4–9-) cleft. Stamens inserted in the corolla-tube opposite its lobes, with sometimes alternating staminodes (hypogynous in Glaux), filaments usually short; anthers bursting inwards by slits, rarely by terminal pores. Ovary 1-celled; style simple, stigma undivided; ovules many, amphitropous rarely anatropous, placenta free-central. Capsule 1-celled, dehiscing by simple or 2-fid valves or transversely. Seeds sunk in cavities of the placenta, testa thin, hilum usually ventral, albumen fleshy or horny; embryo terete parallel to the hilum. —DISTRIB. N. temp., Arctic and mountain regions, Chili and Fuegia; genera 21; species about 250.—AFFINITIES. With Myrsineæ and Plumbagineæ.—PROPERTIES unimportant.

Leaves radical. Corolla-lobes incurved or spreading ...............1. Primula.
Leaves radical. Corolla-lobes reflexed ................................1*. Cyclamen.

Calyx 4-partite. Filaments glabrous ............................5. Centunculus.


1. PRI'MULA, I.

Scapigerous, perennial herbs. Flowers in involucreat umbels, white yellow rose, or purple, honeyed. Calyx 5-toothed or -fid. Corolla funnel- or salver-shaped, throat naked or with 5 swellings; lobes 5, incurved or spreading. Stamens 5, included. Ovary ovoid or globose; style filiform, stigma capitate; ovules many, amphitropous. Capsule 5-valved at the top, many-seeded, valves simple or 2-fid. Seeds plano-convex, peltate. —Distrib. Of the Order; species about 80. —Etym. primus, from flowering early. —Flowers usually dimorphic, having long styles with anthers deep in the tube, or the reverse.

* Leaves not mealy beneath, wrinkled and toothed. Calyx-tube 5-angled.

1. P. vulga'ris, Huds.; leaves and umbels subsessile, flowers spreading or suberect, calyx-teeth acuminate, corolla pale yellow, limb flat, throat contracted with thickened folds. P. acu'lis, L. Primrose.

Copses, pastures, and hedgebanks, N. to Shetland; ascends to 1,600 ft. in Yorkshire; Ireland; Channel Islands; fl. April—May.—Rootstock stout. Leaves 3–6 in., obovate-spathulate, beneath and inflorescence softly hairy. Umbels so sessile that the pedicels resemble scapes, which are about as long as the leaves; bracts linear. Calyx ¼–¾ in., a little inflated, 5-angled. Corolla 1–1½ in., rarely white lilac or purplish, greenish when dry; lobes orbicular, notched. Capsule as long as the calyx-tube, ovoid, on prostrate pedicels.—Distrib. Europe, except the N.E.; N. Africa.—Varies in the inflorescence being sessile (P. acu'lis, Jacq.) or a peduncled umbel (vars. caules'cens and interme'dia), if these be not hybrids, as suggested by Baker (see P. ve'ris). The origin of the Polyanthus.—Rootstock emetic.

2. P. ela'tior, Jacq.; petioles winged, umbels peduncled, flowers horizontal or drooping, calyx-teeth acuminate, corolla pale yellow, limb concave, throat open without folds. Oxlip.

Copses and meadows in Bedford, Suffolk, Cambridge, Essex; fl. April—May.—Intermediate between P. vulga'ris and ve'ris, differing from the former in the less inflated calyx, shorter pedicels, inodorous flowers, and capsule longer than the calyx-tube; it hence resembles hybrids between P. ve'ris and offici'nalis, but differs from those by the more villous calyx, paler flowers, and absence of folds at the mouth of the corolla.—Distrib. From Gothland southd. (excl. Greece, Turkey), Siberia.


Meadows, pastures, and hedgebanks, from Caithness southd.; rare in Scotland; Ireland; Channel Islands; ascends to 1,600 ft. in Northumbd.; fl. April—May.—Besides the characters given above, P. ve'ris differs from P. ela'tior in the short and often glandular pubescence of the shorter pedicels and calyx; odorous flowers; much smaller corolla-limb; and capsule much shorter than the calyx-tube; corolla rarely scarlet or orange-brown.—Distrib. Europe, W. Asia, N. Africa?—Hybrids with P. vulga'ris include P. ela'tior of older English botanists, probably P. ve'ris, & ela'tior, L., and P. variabilis, Goupil, often taken for the Oxlip.
** Leaves very mealy beneath, not wrinkled. Calyx-tube terete.

4. **P. farinos'a**, L.; calyx-lobes longer than its tube a little shorter than the corolla-tube, corolla-lobes lilac distant, capsule cylindric-oblong twice as long as the calyx. *Bird's-eye Primrose.*

Bogs and meadows from York and Lancashire to the border; Peebles (ascends to 1,800 ft.); fl. June–July.—Leaves 1½–2 in., obovate-spathulate, variable in breadth, crenulate, obtuse or subacute, glabrous above, meal below white or sulphur-coloured. Scapes stout, 2–8 in., rarely 0. Flowers erect or spreading, crowded, dimorphic; bracts small, saccate at the base. Calyx-tube oblong-obovoid, mealy; lobes linear-oblong, obtuse. Corolla ¼–½ in. diam.; lobes flat, wedge-shaped, 2-fld.; mouth yellow, contracted, with rounded folds.—Distrib. Europe (Arctic), N. Asia, Tibet, Greenland, N. U. States.

5. **P. scot'ica**, Hook.; calyx-lobes equalling its tube much shorter than the corolla-tube, corolla-lobes blue-purple contiguous, capsule shortly oblong scarcely exceeding the calyx.

Pastures in Orkney, Caithness, and Sutherland; fl. June–Sept.—Perhaps only a sub-species of *P. farinos'a*, but smaller; bracts less saccate; leaves broader in proportion, calyx shorter and flowers homomorphic.—Distrib. Lapland (Arctic), Norway and Sweden.

1*. **CYC'LAMEN, Tournef.** SOWBREAD.

Herbs with large tuberous rootstocks. Leaves all radical, petioled, broad. Scapes 1-fld., erect, naked, coiled spirally when fruiting. Flowers nodding, white, pink, or lilac. Calyx 5-partite. Corolla-tube short, throat thickened; lobes 5, large, reflexed. Stamens 5, inserted at the base of the corolla, included; anthers cuspidate. Ovary globose; style short, stigma simple; ovules many, amphitropous. Capsule 5-valved, many-seeded, valves reflexed. Seeds subglobose, angled, peltate; embryo with one cotyledon.—Distrib. S. Europe, N. Africa, W. Asia; species 8.—Etym. κόκλαος, from the spiral peduncle.

C. hederæfo'lium, Willd. in part; tuber fibrous all over, leaves and flowers autumnal. C. europa'cum, Sm. not L.; C. neapolita'num, Tenore.

Hedgebanks and copses in Kent, Sussex; (a denizen, Wats.); fl. Sept.—Tuber 1–3 in. diam., turnip-shaped. Leaves appearing after the flowers, ovate-cordate, crenulate, 5–9-angled, dark green with a whitish mottled border, often purple beneath. Scapes 4–8 in. Calyx-lobes ovate-lanceolate, acute. Corolla-lobes 1 in., pink, red at the base, or white (var. ficari'i fo'lium, Syme). Fruit ½ in. diam.—Distrib. Central and S. Europe.—Root acrid and purgative.

2. **LYSIMA'CHIA, L.** LOOSE-STRIFE.

Erect or procumbent herbs. Leaves alternate opposite or whorled, quite entire, sometimes glandular-dotted. Flowers axillary or terminal, solitary racemed or spiked, yellow (British sp.). Calyx 5–6-partite. Corolla rotate; segments 5–6, spreading or conniving. Stamens 5–6, inserted on
the corolla-throat. **Ovary** subglobose; style filiform, persistent, stigma obtuse; ovules many, amphitropous. **Capsule** subglobose, 5-valved, many-seeded. **Seeds** plano-convex, peltate.—**Distrib.** N. temp. zone, S. Africa, Australia; species 60.—**Etym.** obscure.

**Section 1. Lysimach'rium, Duby.** Flowers axillary, solitary or in terminal panicled cymes. **Corolla-lobes** without alternating teeth. **Stamens** included. **Seeds** margined.

1. **L. vulga'ris, L.** ; erect, pubescent, leaves opposite and whorled ovate-lanceolate punctate, cymes panicled, filaments connate below. River-banks, &c., from Mull and Aberdeen southd.; rare in Scotland; local in Ireland; fl. July–Aug.—**Rootstock** creeping, stoloniferous. **Stem** 2–4 ft. **Leaves** 2–4 in., sessile, with black glands, glabrous or pubescent beneath. **Cymes** panicled in the upper axils; bracts linear. **Flowers** dimorphic, **Calyx-lobes** lanceolate, ciliate, margins red. **Corolla** ½ in., subcampanulate, deep yellow with orange dots inside; lobes ovate, not ciliate. **Capsule** globose. **Seeds** 3-gonous, rough.—**Distrib.** Europe (Arctic), N. Africa, N. Asia, with a closely allied Australian representative.

2. **L. nem'orum, L.** ; procumbent, leaves opposite slightly petioled ovate acute, peduncles slender solitary axillary 1-fld., sepal linear-subulate, filaments free eglandular. *Yellow Pimpernel.*

Copses, hedgebanks, &c., from Caithness southd.; ascends to 2,500 ft. in the Highlands; Ireland; Channel Islands; fl. May–July.—**Glabrous**, shining, eglandular. **Stems** slender, 3–12 in. **Leaves** 1–2 in. **Peduncles** capillary, curved, as long as the leaves or longer. **Corolla** rotate, ¾-2 in. diam.; lobes spreading, not ciliate. **Filaments** very slender, glabrous. **Capsule** small, globose.—**Distrib.** Europe (excl. Russia, Greece).

3. **L. Nummula'ria, L.** ; prostrate, leaves opposite ovate-cordate or orbicular obtuse, peduncles axillary 1-flowered, sepals broad, filaments connate at the base eglandular. *Creeping Jenny, Moneywort.*


**Section 2. Naumbur'gia, Mænch (gen.).** Flowers in dense axillary racemes. **Corolla-lobes** with minute alternating teeth. **Stamens** and slender style exserted. **Seeds** scarcely margined.

4. **L. thyrsifo'ra, L.** ; erect, leaves opposite sessile lanceolate. Marshes and canal-banks, local, from Dumbarton and Forfar to York, Lancaster and Notts; fl. June–July.—**Glabrous** or nearly so. **Rootstock** creeping, stoloniferous. **Stem** 1–3 ft., stout, simple. **Leaves** rarely whorled, lower small, upper 2–3 in., covered with black dots. **Racemes** ¾–1½ in., from the lower axils, cylindric, peduncles long, suberect; pedicels ½ in., as

3. TRIENTALIS, L. CHICKWEED WINTER-GREEN.

Erect, simple, glabrous herbs; rootstock slender, creeping. Leaves in one whorl of 5–6, with a few small alternate scales beneath the whorl. Flowers white, ebracteate, solitary on slender peduncles. Calyx 5–9-partite. Corolla rotate, 5–9-partite. Stamens 5–9, filaments filiform. Ovary globose; style filiform, stigma obtuse; ovules few, amphitropous. Capsule globose, 1-celled, few-seeded, valves 5 revolute. Seeds flattened, peltate, crowded, cohering by the membranous epidermis of the testa.—Distrib. A European and a N. American species.—Etym. doubtful.

T. europaëa, L.; leaves obovate or obovate-lanceolate.


4. GLAUX, Tournef. SEA MILKWORT.

A small succulent glabrous herb; rootstock creeping, stoloniferous. Leaves decussate. Flowers small, axillary, sessile, white or pink. Calyx 5-partite, coloured. Corolla 0. Stamens 5, hypogynous, alternate with the calyx-lobes. Ovary subglobose; style filiform, stigma obtuse; ovules few, amphitropous. Capsule globose, 5-valved, few-seeded. Seeds peltate.—Distrib. Europe (Arctic), N. and W. Asia, Tibet, N. America.—Etym. γλαυξ, of a sea-green colour.

G. marit‘ima, L.; glabrous, leaves 4-farious sessile quite entire.


5. CENTUN'CULUS, L. BASTARD PIMPERNEL.

Very small annual herbs. Leaves subopposite or alternate. Flowers minute, solitary, axillary, subsessile, ebracteate, white or pink. Calyx 4–5-partite. Corolla short, urceolate, persistent; limb 4–5-partite. Stamens 4–5, on the corolla-throat, exserted, filaments flattened. Ovary subglobose; style filiform, stigma obtuse; ovules many, amphitropous.
Capsule globose, bursting transversely, many-seeded. Seeds peltate.—DISTRIB. Europe, Asia, America; species 3.—ETYM. doubtful.

C. min'imus, L.; glabrous, leaves ovate or ovate-lanceolate.
Wet turfy and sandy places, local, from Inverness and Elgin southd.; rare in Ireland; fl. June–Oct.—Stem 1–3 in., branched from below. Leaves $\frac{1}{10}$–$\frac{1}{3}$ in., very shortly petioled, ovate or ovate-lanceolate. Flowers numerous, white or pink, homogamous. Sepals lanceolate, longer than the erect usually 4-lobed corolla. Filaments naked. Capsule mucronate. Seeds 3-gonous, testa areolate.—DISTRIB. Europe (excl. Greece, Turkey), Azores, Siberia, Andes, Brazil, Australia.

6. ANAGAL'lis, Tournéf. PIMPERNEL.

Slender annual or perennial herbs. Leaves opposite, quite entire. Flowers on axillary 1-fld. peduncles, ebracteate, red or blue, rarely white. Calyx 5-partite. Corolla rotate or funnel-shaped, 5-partite. Stamens 5, on the base of the corolla-tube; filaments filiform, villous. Ovary globose; style simple, stigma obtuse; ovules many, amphitropous. Capsule globose, bursting transversely, many-seeded. Seeds plano-convex, peltate.—DISTRIB. Europe, temp. Asia, N. Africa, S. America; species 12.—ETYM. The Greek name.

1. A. arven'sis, L.; annual, erect or procumbent, leaves sessile ovate or lanceolate dotted beneath, sepalas almost equalling the rotate corolla. Poor Man's Weather-glass, Scarlet Pimpernel.

Fields and waste places, Elgin southd., rare or absent in W. Scotland; Ireland; Channel Islands; (a colonist, Wats.); fl. May–Oct.—Glabrous, glandular-dotted. Stem 6–18 in., branched from the base, 4-angled; branches ascending. Leaves $\frac{1}{10}$–$\frac{1}{3}$ in., rarely in whorls of 3–4, sometimes cordate, acute. Peduncles 1–2 in., slender, erect in flower, decurved in fruit. Flowers homogamous. Sepals narrow, acuminate. Corolla $\frac{3}{4}$–$\frac{3}{2}$ in. diam., opening in clear weather, lobes often ciliate. Capsule size of a small pea. Seeds 3-gonous.—DISTRIB. Europe, N. Africa, N. and W. Asia, India; introd. in many countries.

A. arven'sis proper (A. phaen'ic'ea, Lamk.); corolla scarlet rarely pink, or white with a purple eye (var. pall'idu), lobes usually glandular-ciliate.—VAR. A. caru'le'a, Schreb.; more erect, corolla bright blue, lobes rarely ciliate. Rare.

2. A. tenel'la, L.; perennial, creeping, leaves shortly petioled broadly ovate or orbicular not dotted, sepalas much shorter than the funnel-shaped corolla. Bog Pimpernel.

7. HOTTONIA, L. Water Violet.


H. palustris, L.; *sepal* subacute equalling the corolla tube.


8. SA'MOLUS, Tournef. Brook-weed.

Annual or perennial herbs. *Leaves* alternate or mostly radical. *Flowers* in terminal racemes or corymbs, white; pedicels bracteate. *Calyx* ½ superiour, limb 5-fl.d. *Corolla* perigynous, subcampanulate, 5-partite. *Stamens* 5, on the tube or throat of the corolla, alternating with staminodes, filaments very short. *Ovary* subglobose; style short, stigma obtuse or capitate; ovules many, anatropous. *Capsule* ½-inferior, ovoid, 5-valved above the calyx-tube, many-seeded. *Seeds* angular, hilum basilar.—*Distrib.* Temp. climates; species about 8.—*Etym.* obscure.

S. Valerandi, L.; *leaves* obovate or spatulate obtuse or apiculate, quite entire, radical rosulate.

Order XLVII. OLEACEÆ.

Shrubs or trees; branches opposite; buds scaly. Leaves opposite, simple, or impari-pinnate, exstipulate. Flowers in 3-chotomous cymes, small, white or greenish, 1–2-sexual; pedicels opposite, 2-bracteolate. Calyx inferior, 4-lobed or 0. Corolla hypogynous, regular, 4-partite, deciduous, rarely 0, or of 4 free petals, valvate in bud. Stamens 2, epipetalous or hypogynous. Disk 0. Ovary 2-celled; style simple or 0, stigma entire or 2-fid; ovules 2 collateral in each cell, rarely 3 pendulous from the septum, anatropous. Fruit 1–2-celled, cells 1- rarely 2-seeded. Seed pendulous, testa sometimes winged, albumen fleshy or horny; embryo straight, cotyledons flat thin.—Distrib. Trop. and temp. regions, chiefly northern; genera 18; species 280.—Affinities. With Jasminæ.—Properties. Olea europaea yields oil in its drupe, a bitter bark, and hard durable wood. The flowers of O. fragrans used to scent China tea. Manna is the produce of several Ashes. Ash bark is cathartic.

Corolla funnel-shaped, 4-lobed. Fruit a berry.................1. Ligustrum.
Corolla 0 (in the Brit. sp.) Fruit a samara.................2 Fraxinus.

1. LIGUSTRUM, Tournef. Privet.

Shrubs, rarely small trees. Leaves often evergreen, quite entire. Flowers in terminal thyrsoid cymes, honeyed, homogamous. Calyx shortly tubular, 4-toothed, deciduous. Corolla funnel-shaped, 4-lobed. Stamens 2, rarely 3, included in the corolla-tube. Ovary ovoid; stigma 2-fid lobes obtuse; ovules 2 in each cell. Berry globose, 2-celled, cells 1–2-seeded, flesh oily. Seeds ovoid or angled, albumen hard; cotyledons ovate-lanceolate.—Distrib. Europe, N. Asia, especially Japan; species about 25.—Etym. ligare, to bind, from a use of the twigs.

L. vulgare, L.; shrubby, leaves oblong-lanceolate quite entire.

2. FRAXINUS, Tournef. Ash.

Deciduous trees. Leaves simple or pinnate, leaflets opposite with an odd one, toothed or serrate. Flowers polygamous or dioecious. Calyx 4-fid or 0. Petals 0, or 4 connate at the base. Stamens 2, hypogynous. Ovary oblong; stigma subsessile 2-fid; ovules 2–3 in each cell. Fruit a compressed 1–2-celled samara, winged at the tip, cells 1-seeded. Seed compressed, albumen fleshy; embryo straight, cotyledons broad.—Distrib. Europe, N. Asia, N. America; species about 30.—Etym. doubtful.

F. excel'sior, L.; leaflets oblong-lanceolate serrate, perianth 0.
Woods and hedges, N. to Shetland, but generally planted; ascends to 1,350 ft. in Yorkshire; Ireland, Channel Islands; fl. April-May.—Tree 50–80 ft.; bark pale; branchlets stout; buds large, black. **Leaflets** 1–3 in., 4–7 pair. **Flowers** small, polygamous, in dense small axillary panicles. **Stamens** purple-black. **Samaras** 1½ in., in large drooping panicles, pedicelled, linear oblong, notched at the tip, nucleus oblong ribbed. **Seed** ½ in.—**Distrib.** Europe, N. Africa.—Wood excellent.—**F. heterophylla**, Vahl, is a 1-foliolate state.

### Order XLVIII. **APOCYNACEÆ.**

Trees or shrubs, rarely herbs, often climbing; juice milky. **Leaves** opposite, rarely whorled, quite entire; stipules 0 or rudimentary. **Flowers** regular, solitary or cymose. **Calyx** 4–5-fid. **Corolla** hypogynous, funnel- or salver-shaped; throat naked or with scales; lobes usually oblique, contorted in bud. **Stamens** 4–5, on the tube or throat of the corolla, filaments very short; anthers basifixed, free, or connate and adhering to the stigma, cells sometimes obliterated below; pollen granular. **Disk** 0 or annular. **Ovary** of 2 free or connate carpels; style short, dilated, stigma entire or 2-fid often constricted in the middle; ovules many, placenta marginal. **Fruit** of 2 many-seeded follicles, or a berry or drupe. **Seeds** compressed, sometimes winged, hilum basilar or lateral, with often a pencil of silky hairs at the hilar (rarely at the other) end, albumen fleshy or hard or 0; embryo straight, cotyledons flat thin.—**Distrib.** Chiefly trop.; genera 103; species 900.—**Affinities.** With *Asclepiadeae*, and *Rubiaceae*.—**Properties.** Usually poisonous, drastic purgatives, or astringents.

1*. **VIN'CA, L.** **Periwinkle.**

Perennial herbs or slender decumbent undershrubs. **Leaves** evergreen. **Flowers** solitary, white blue or purple. **Calyx** 5-partite, lobes acuminate, glandular at the base inside. **Corolla** salver-shaped; tube hairy inside; throat thickened, angled; lobes 5, oblique. **Stamens** 5, filaments short; anthers inflexed, tipped with a bearded membrane; pollen glutinous. **Disk** of 2 glands alternating with the carpels. **Ovary** of 2 carpels; style terminated by a cup-shaped reflexed membrane, within which is the short conical entire or 2-lobed stigma. **Follicles** 2, slender, terete, many-seeded. **Seeds** subcylindric, testa black tuberculate, hilum lateral, albumen fleshy; embryo axile.—**Distrib.** Europe, Asia, Africa; species about 10.—**Etym.** *vincere*, from a use of the stems in binding.

**V. mi'nor, L.** ; flowerless-stems prostrate rooting, leaves elliptic-ovate margins glabrous, calyx-lobes glabrous ½ the length of the corolla-tube. Woods, copses, and hedgebanks, from Mull and Elgin southd.; (a denizen, *Wats.*); not indigenous in Scotland, Ireland, or the Channel Islands; fl. April–May.—**Stems** 1–2 ft. trailing, tough, flowering ones short erect. **Leaves** 1–1½ in., very shortly petioled. **Flowers** 1 in. diam.; peduncles not

V. MA'JOR, L.; flowerless-stems prostrate not rooting, leaves ovate or cordate at the base ciliate, calyx-lobes ciliate equalling the corolla-tube. Copses and hedges, naturalized; fl. April–May.—Much larger in all its parts than *V. mi'nor*; flower less-stems not tough, rooting at the tip only; flowering erect in flower, elongating afterwards.—Distrib. Mid. and S. Europe, N. Africa.

**Order XLIX. GENTIA'NEÆ.**

Annual or perennial herbs. *Leaves* opposite, quite entire, rarely whorled (alternate and 3-foliolate in *Menyanthes*, alternate and floating in *Limnanthemum*); exstipulate. *Flowers* regular, solitary, or in 2–3-chotomous cymes. *Calyx* inferior, 4–8-toothed or lobed; lobes twisted or valvate in bud. *Corolla* hypogynous, often persistent, rotate campanulate or funnel-shaped; throat naked fimbriate or scaly; lobes 4–8, usually contorted in bud. *Stamens* 4–8, inserted on the corolla-tube, filaments filiform; anthers intorse, often extrorse during flowering. *Ovary* 1–2-celled; style simple or 0, stigma 2-fid or 2-lamellar; ovules many, 1- or more-seriate on 2 opposite placentas, horizontal, anatropous. *Capsule* 1- or incompletely 2-celled, septicidally 2-valved, rarely indehiscent, many-seeded. *Seeds* minute, testa reticulate, albumen copious fleshy; embryo minute, cotyledons small.—Distrib. Cold and temp. regions; genera 50; species 520. —Affinities. Close with *Apocynaceæ*. —Properties. Bitter and tonic.


**Tribe III. MENYAN'THEÆ.** *Leaves* alternate. *Corolla* induplicate.


1. CHLO'RA, L. YELLOW-WORT, YELLOW CENTAURY.

C. perfoliata, L.; radical leaves obovate-spathulate, cauleine ovate.


2. MICROCALA, Link et Hoffm.

Small branched annuals. Leaves oblong or filiform. Flowers small, yellow or pink, in 3-chotomous cymes or fascicled. Calyx tubular, 4-lobed. Corolla salver-shaped, tube short, throat naked, lobes 4. Stamens 4, inserted on the corolla-tube. Ovary 1-celled; style deciduous, stigma capitellate; ovules many, on 2 parietal placentas. Capsule 1- or almost 2-celled, 2-valved, many-seeded. Seeds minute, immersed in the placenta. —Distrib. S. Europe, N. America; species 2.—Etym. μικρός and καλός, small and pretty.

M. filiformis, Link; leaves subulate, calyx campanulate, teeth deltoid acute, corolla-lobes obtuse equalling the tube. Exacum, Sm.; Cicen’dia, Reichb.

Sandy bays, rare, Pembroke and Cornwall to Sussex; Killarney and Cork in Ireland; fl. July-Oct.—Glabrous. Stem 4-8 in., angled, simple or sparingly branched above, very slender, branches suberect. Leaves 1/2-1 in. Flowers yellow; pedicels stout, very long, 2-2 1/2 in. Capsule ovoid, 1/2 in.—Distrib. From Denmark southd. (excl. Russia), Azores.

3. CICENDIA, Adans.


C. pusilla, Griseb.; calyx-lobes subulate, corolla-lobes mucronate 1/2 as long as the tube.

Sandy commons, Channel Islands; fl. July-Sept.—Smaller and more slender than Microcal’a filiformis. Stems several. Leaves 1/2 in. Flowers sometimes 5-merous, pink; peduncles slender. Calyx-lobes erect. Capsule fusiform.

4. ERYTHRÆA, Pers. CENTAURY.

Annuals. Stems erect, angular. Leaves connate. Flowers small, pink white or yellow, in terminal 3-chotomous cymes, not honeyed. Calyx 4-5-partite. Corolla funnel-shaped, persistent; tube cylindric, throat naked; lobes 4-5. Stamens 4-5, on the corolla-tube; anthers spirally
twisted, exserted. **Ovary** almost 2-celled; style deciduous, stigmas 2-lamellate; ovules many. **Capsule** linear 1- or almost 2-celled, 2-valved, many-seeded. **Seeds** minute.—**Distrib.** N. temp. regions; species 15. **Etym.** ἐφθότος, from the red flowers.

**E. Centauri'rum**, Pers.; radical leaves ovate or oblong-spathulate.

Dry pastures and sandy coasts, N. to Shetland; Ireland; Channel Islands; fl. June–Sept.—Erect, glabrous, 6–18 in., usually branched above. **Radical leaves** 11/2–2 in., upper sometimes linear. **Flowers** 6–9 in. diam., many, red or pink (heterostyled with dimorphic pollen, H. Müller). **Calyx**-lobes linear-subulate. **Corolla-lobes** oblong, obtuse or subacute. **Capsule** slender.—**Distrib.** From Gothland southd., N. Africa; introd. in N. America. I am quite unable to follow critical authors in their endeavours to limit the British forms of this variable plant. Of these Babington makes 5 and Nyman 7 species. Regarding those of the former author as sub-species, they are the following. (The comparative length of calyx and corolla-tube must be observed on the expansion of the flower.)

**E. Centauri'rum** proper; branched above, leaves 3–7-nerved, leaves oblong upper acute, cymes lax or compact, flowers subsessile, corolla-tube about twice as long as the calyx, lobes ovate.—**Var. capitata**, Koch (E. latifo'lia, Engl. Bot.), is a stunted var. with capitate flowers. **Pastures.**

Sub-sp. E. latifo'lia, Sm.; stem shorter subsimple, leaves broad lowest rounded 5–7-nerved, flowers in subcapitate cymes, corolla-tube about equalling the calyx, lobes lanceolate.—**Shores near Liverpool.**

Sub-sp. E. littora'lis, Fries; stem or stems simple, leaves ovate-oblong obtuse, radical crowded spathulate, cymes dense-fl., corolla-tube equalling the calyx, lobes oblong obtuse. **E. chlo'o'des**, Gen. and Godr.—**Sandy shores, N. to Shetland.**—This is referred to linarifolia, Pers., by Nyman, who further puts chlo'o'des with littora'lis, Sm., Engl. Fl., into confer'ta, Pers.

Sub-sp. E. pulche'lla, Fries; stem simple or branched tetraquetrous, leaves oblong-lanceolate radical few, cymes lax-fl., flowers all pedicelled, corolla-tube longer than the calyx, lobes oblong obtuse.—**Sandy ground, from Dumfries and Haddington southd.**—**Var. E. tenui'folia**, Link, from the I. of Wight, has a long corymbose inflorescence. It is referred to latifolia, Sm., by Nyman.

Sub-sp. E. capitata, Willd.; stem short, leaves oblong or subspathulate obtuse, radical rosulate 3–5-nerved, cymes dense-fl. sessile, corolla-tube equalling the calyx, top not constricted, not elongating, lobes oblong obtuse, stamens inserted at the base of the tube, capsule 1/2 protruded.—**Downs, I. of Wight and Eastbourne.**—The insertion of the stamens being anomalous in the Order, suggests this being a heteroclite form of E. Centauri'rum. It has been found in Norway and Prussia. It is omitted in Nyman.

**5. Gentia'na, L. Gentian.**

Herbs of various habit. **Leaves** opposite. **Flowers** solitary, or in terminal cymes. **Calyx** 4–5-fl. or -partite, or spathaceous. **Corolla** 4–5-lobed, angles sometimes folded and produced, throat naked bearded or with five scales. **Stamens** 4–5, inserted within the corolla-tube, included. **Disk** annular. **Ovary** 1-celled; stigmas 2, persistent, recurved; ovules many.
Capsule septicidally 2-valved, many-seeded. Seeds immersed in the broad membranous placentas.—Distrib. Temp. and alpine regions, rare in Arctic; species about 180.—Etym. The classical name.

1. **G. campes'tris**, L.; annual, calyx ebracteate 4-partite, lobes very unequal, corolla-tube subcylindric, throat ciliate.


Dry pastures, from Shetland southd.; ascends to 2,100 ft. in Yorkshire; Ireland; fl. July—Sept.—Habit and stature of *G. campes'tris*, but calyx less deeply divided, lobes 5, much smaller, subulate-lanceolate.—Distrib. Europe (Arctic), N. Asia.

G. *Amarel'la* proper; calyx-lobes subequal from half as long to as long as the corolla-tube.—Var. *pro'eox*, Raf. (*G. uliginosa*, Willd.), is an early flowering state with 4-merous flowers and unequal calyx-lobes.

Sub-sp. G. *German'ica*, Willd.; larger, stouter, flowers larger, calyx-lobes unequal, 2 broader and more acute, much shorter than the corolla-tube.—York, Pembroke, Herts, Berks, Surrey, Hants.

3. **G. Pneumonan'the**, L.; perennial, calyx 2-bracteate, lobes 5 equal, corolla narrow-campanulate, throat naked.

Moist heaths, from Cumberland to Dorset, and from York and Norfolk to Surrey and Anglesea, local; fl. Aug.—Sept.—Rootstock short. Stems 1—2 ft., few, slender, scaly below, simple or nearly so, leafy above. Leaves 1—1½ in., linear-oblong, obtuse, 1—3-nerved. Flowers 1—2 in., few, axillary and terminal, shortly pedicelled, proterandrous; bracts 2, long, linear. Calyx-tube obconic; lobes linear, obtuse. Corolla bright blue within. Capsule stipitate.—Distrib. Europe (excl. Turkey), N. Asia, N. America (a form).

4. **G. ver'na**, L.; perennial, calyx 2-bracteate, lobes 5 equal, corolla salver-shaped, throat with a 2-fid scale between each lobe.

Wet subalpine limestone rocks of Westmoreland, York, Durham; ascends to 2,400 ft.; Mayo, Galway, Clare; fl. May—June.—Tufted, stoloniferous. Radical leaves rosulate, ovate or ovate-oblong, obtuse or subacute, 1-nerved; cauline few, smaller, oblong. Stem 1—2 in., curved or ascending. Flowers 1 in. diam., solitary, sessile; bracts foliaceous. Calyx-tube large, 5-winged; lobes acute. Corolla bright blue; lobes ovate, obtuse. Capsule subsessile.—Distrib. Europe (excl. Turkey), N. and W. Asia.

5. **G. nival'is**, L.; annual, calyx 2-bracteate, lobes 5 equal, corolla funnel-shaped, throat with a 2-fid scale between each lobe.

Breadalbane and Clova Mts., from 2,400—3,300 ft., very rare; fl. Aug.—Sept.—Stem slender, 2—8 in., simple or branched. Radical leaves ½—¾ in., few,
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**M. trifolia'ta, L.**; leaflets subsessile oblong or obovate.

Marshy and spongy bogs, N. to Shetland; ascends to 1,800 ft. in the Lake district; Ireland; Channel Islands; fl. May–July.—Rootstocks stout, matted. Leaflets 1½–3 in., obtuse, quite entire, ultimate nerves with free tips within the larger areoles; petiole 3–7 in., sheath long narrow. Scape longer than the petioles, many-fl. Flowers ¾ in. diam., white or pink; pedicels ¼–½ in., stiff, spreading; bracts broad, short, obtuse. Sepals oblong, obtuse. Corolla-lobes recurved, subacute. Stamens reddish. Capsule apiculate.—Bitter, reputed tonic and febrifuge; used to add bitterness to beer; rootstock full of starch, hence eaten.

7. **LIMNANTHEMUM, S. P. Gmel.**

Perennial water-herbs. Leaves alternate or opposite, floating, peltate or cordate. Flowers yellow in sessile umbels that terminate short axillary branches, dimorphous. Calyx 5-partite. Corolla rotate, membranous, deciduous; segments 5–8, erose, with 5–8 fimbriate scales at the base, margins broadly inflexed in bud. Stamens 5–8, inserted on the corolla-tube. Disk of 5–8 hypogynous glands. Ovary 1-celled; style persistent, stigmas 2 simple or lobed; ovules many, placentas 2 parietal. Fruit bursting irregularly, few- or many-seeded. Seeds small, testa smooth or muricate.—Distrib. Temp. and trop. regions; species about 12.—Etym. ἀμυν, a pool, and ἄνθος, a flower.


Still waters, rare, from Norfolk and Oxford to Sussex; naturalized further north, and in Scotland and Ireland; fl. July–Aug.—Rootstock creeping, with alternate leaves. Flowering-stems floating; their branches short, in the axils of opposite leaves Leaves all petiolod, orbicular, base deeply cordate, quite entire, green, shining, purple-spotted above, opaque purplish and studded with glands beneath; petioles of radical leaves long, slender, not sheathing; of floating leaves shorter, stout, sheathing. Peduncles 1–3 in., crowded
**GENTIANÆÆ.**


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**ORDER L. POLEMONIACEÆ.**

Annual or perennial herbs (rarely shrubs). Leaves alternate, or the lower opposite, entire or divided, exstipulate. Flowers in terminal dichotomous cymes, usually blue or white. Calyx inferior, 5-lobed, imbricate in bud. Corolla subperigynous, regular or nearly so, 5-partite; lobes contorted in bud. Stamens 5, inserted on the corolla-tube, usually unequal; anthers 2-celled; pollen spongose, reticulate. Disk fleshy. Ovary 3-celled; style simple, stigmas 3 linear revolute; ovules 1 or more, attached to the inner angle of each cell, amphitropous. Capsule 3-celled, loculicidally 3-valved; valves separating from the persistent axis; cells 1- or many-seeded. Seeds angled or plano-convex, testa spongy sometimes winged, hilum ventral, albumen fleshy; embryo axile, cotyledons subfoliaceous.—**Distrib.** Chiefly Arctic and temp., especially W. American; genera 8; species about 150.—**Affinities.** With Convolvulaceæ.—**Properties** unimportant

**1. POLEMONIUM, L. Jacob's Ladder.**

Perennial herbs. Leaves alternate, pinnate. Flowers corymbose, usually ebracteate. Calyx campanulate, 5-lobed. Corolla rotate; lobes 5, obovate. Stamens declinate, inserted on the corolla-throat, filaments dilated and hairy at the base. Disk cup-shaped, crenate. Ovary ovoid; style filiform, stigma 3-fid; ovules many in each cell, 2-seriate. Capsule ovoid, 3-celled, many-seeded, loculicidally 3-valved. Seeds ovoid, angled, with a short wing or 0, testa thick, abounding in spiral vessels. **Distrib.** N. temp. and Arctic regions; species about 8.—**Etym.** obscure.

**P. caeruleum, L.;** leaflets 6–12 pairs subsessile. Greek Valerian.

Copes and streams, apparently indigenous from Stafford and Derby to the Cheviots, doubtfully elsewhere; an escape in Scotland and Ireland; fl. June–July.—**Rootstock** short, creeping. Stems 1–3 ft., glabrous or pubescent and glandular above, angular, fistular, leafy. Leaves 4–18 in.; petiole very slender, winged; leaflets ¼–1½ in., quite entire, ovate or oblong-lanceolate, acute. Flowers many, drooping, ½–1 in. diam., blue or white, proterandrous. Calyx campanulate; lobes oblong, acute. Corolla-lobes spreading, subacute. Capsule erect, included in the calyx. Seeds compressed, angular; testa ribbed and rugose, shortly winged.—**Distrib.** Europe (Arctic), N. of Alps to Russia, N. Asia, N.W. Himalaya, N. America.
Herbs, rarely shrubs, usually hispid scabrid or pilose. Stems terete. Leaves alternate, quite entire or sinuate; nerves usually strong, very prominent beneath; extispulate. Flowers regular or irregular, bracteate or not, in simple forked spiked or racemed often scorpoid cymes, rarely axillary. Calyx persistent, 5-lobed or -partite, valvate in bud. Corolla hypogynous, rotate tubular, campanulate or salver-shaped; throat often closed by hairs or hollow folds opposite the 5 lobes, imbricate in bud. Stamens 5, inserted on the corolla-tube or throat, filaments usually short; anthers 2-celled, often subulate. Disk 0, or confluent with a tumid receptacle. Ovary of 2 2-lobed 2-celled carpels connate at the very base; style simple, arising from the base of the carpels, stigma simple or 2-fid; ovaries solitary in each cell, suspended, anatropous or ½-anatropous. Fruit of 4 indehiscent 1-seeded nutlets, inserted on the receptacle, which is continuous with the base of the style. Seed straight or curved; hilum basal or ventral, often concave with thickened margins, testa membranous, albumen 0 or scanty and fleshy; embryo straight or curved, cotyledons foliaceous, radicle superior.—Distrib. All climates, abundant in S. Europe and E. Asia; genera 68; species 1,200.—Affinities. With Verbenaceae, Labiatae, and Convolvulaceae.—Properties. Mucilaginous and emollient; often abounding in alkalies. Roots yield purple or brown dyes.—The above character does not include the tropical sub-order Heliotropae, chiefly distinguished by the obscurely lobed ovary.

**Tribe I. Echieae.** Corolla irregular; throat usually naked. Nutlets inserted by flat bases on the flat receptacle. Stamens exerted...1. Echium.

**Tribe II. Anchusaee.** Corolla regular; throat closed with scales. Nutlets inserted by broad cup-shaped bases on the flat receptacle.

Corolla rotate. Anthers exerted, conniving in a cone..............1*. Borago.

**Tribe III. Lithospermeae.** Corolla regular; throat naked or closed by scales. Nutlets inserted by small flat bases to the flat receptacle.

6. Pulmonaria.

**Tribe IV. Cynoglossae.** Corolla regular; throat naked or closed with scales. Nutlets inserted by broad ventral surfaces on an elevated receptacle.


T 2
1. ECHIUM, Tournef. Bugloss.

Herbs, sometimes shrubby, usually large, stout, hispid or scabrous with tuberous-based hairs. Leaves entire. Flowers white red purple or blue, in spiked or paniced racemes, honeyed, proterandrous. Calyx 5-partite. Corolla-tube cylindric or funnel-shaped; throat dilated; limb unequally 5-lobed. Filaments unequal, adnate to the corolla below, exserted. Style filiform, stigma 2-lobed. Nutlets 4, ovoid or turbinicate, wrinkled, secrbid, bases flat, receptacle flat.—Distr. Chiefly S. Europe and Oriental; species 20.—Etym. εχύς, a viper, of disputed application.

1. E. vulgare, L.; cauline leaves lanceolate or oblong base rounded, cymes short, calyx exceeding the corolla-tube, 4 stamens protruded, 5th included. E. italicum, Huds. not L. Viper’s Bugloss.

Waste ground on light soils from Sutherland southd.; (an alien or colonist in Scotland, Wats.); S.E. Ireland; Channel Islands; fl. June–Aug.—Root fusiform, annual or biennial. Stem 1–3 ft., erect or ascending below, stout, leafy. Radical leaves petioled, 4–8 in.; cauline sessile, acute, rounded at the base. Cymes 1 in. or more, recurved, lengthening in fruit, paniced; bracts and sepals linear. Corolla ½ in., red-purple in bud, then bright blue, rarely white. Nutlets angular, rugose.—Distr. Europe, N. Africa, W. Siberia; introd. in N. America.


1*. BORAGO, Tournef. Borago.

Annual or perennial herbs, hispid with tuberous-based hairs. Flowers in lax forked cymes, bracteate, blue, honeyed, proterandrous. Calyx 5-partite. Corolla rotate, throat closed by notched scales, lobes acute. Stamens 5, on the throat of the corolla, filaments stout, concave, with an obtuse tooth; anthers elongate, mucronate, conniving, exserted. Style filiform, stigma capitate. Nutlets 4, rugose, base truncate concave, receptacle flat fleshy.—Distr. S. Europe, N. Africa; species 3.—Etym. doubtful.

B. officina’lis, L.; stem erect stout, sepals linear connivent. Waste ground, near habitations, England. Channel Islands; an alien or escape; fl. June–July.—Root annual or biennial. Stem 1–3 ft., stout, succulent, leafy, branched. Leaves waved or sinuate-toothed, subacute; radical 4–6 in., ovate-lanceolate, petiole broad, winged; cauline sessile or contracted towards the auricled base, upper oblong. Cymes axillary and terminal, few-
Borago.]  

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fld., branched; pedicel 1-1½ in., decurved; bracts linear or lanceolate. Sepals subulate-lanceolate. Corolla ¼ in. diam., bright blue; lobes triangular-ovate. Anthers purple-black, spurred at the back. Nutlets ½ in.—Distrib. Mid. and S. Europe, N. Africa; introd. in America.—Used as a cordial, but has no sensible properties.

2. SYMPHYTUM, Tournef. Comfrey.

Perennial coarse hispid herbs; roots tuberous or fascicled. Leaves, radical petioloed, cauleine sessile or decurrent, upper often opposite. Flowers in terminal forked cymes, drooping, bracteate, white blue purple or yellow, honeyed, proterandrous. Calyx 5-partite or -toothed. Corolla tubular, dilated above the middle, shortly 5-toothed, throat closed by elongate ciliate scales. Stamens 5, on the middle of the corolla, filaments slender; anthers long, included. Style slender, stigma capitate. Nutlets 4, ovoid, smooth, base broad excavated, receptacle flat.—Distrib. Europe, W. Asia; species 16.—Etym. doubtful.

1. S. officinale, L.; stem broadly winged above, leaves decurrent.

River-banks and watery places, from Caithness southd.; (a denizen in N. Britain, Wats.); Ireland; Channel Islands; fl. May–June.—Hispid and hairy. Rootstock branched; roots fleshy, fibrous. Stem 1-3 ft., stout, angular, branched. Leaves ovate-lanceolate, radical 4-8 in.; petiole long, winged; cauleine shortly petioloed. Cymes scorpioid; pedicels ¼-½ in. Sepals small, narrow-lanceolate. Corolla ⅓ in., yellow, red or purple. Nutlets ½ in., shining.—Distrib. Europe, W. Siberia; an escape in the U. States.—An old styptic; young leaves sometimes cooked and eaten.

S. officinale proper; corolla ochreous.—Var. S. patens, Sibth.; rougher, corolla purple.

2. S. tuberosum, L.; stem hardly winged, leaves scarcely decurrent.


3. ANCHUSA, L. Alkanet.

Annual or perennial herbs, usually villous and hispid. Flowers in scorpioid cymes, drooping, usually bracteate, blue or purple, rarely white or yellow, honeyed. Calyx 5-fid or -partite. Corolla-tube straight or curved, throat closed by hairs or scales; limb oblique or spreading, 5-partite. Stamens included. Nutlets 4, rugose or granulate, base broad deeply concave, receptacle flat.—Distrib. Europe, W. Asia; species 30.—Etym. doubtful.

Section 1. Lycopus, L. (gen.). Corolla-tube curved, equalling or exceeding the oblique limb. Nutlets with the ring equal at the base.

A. arvensis, Bieb.; hispid, with tuberous-based bristles. Bugloss.
Corn-fields and waste places in light soils, N. to Shetland; ascends to 1,000 ft. in the Highlands; Ireland; Channel Islands; fl. June-July.—Annual; root fusiform. Stem simple below, ½-1½ ft., angular, rather slender. Leaves, radical 1-4 in., petioled, obovate-lanceolate; cauline linear-oblong, sessile, acute, margin waved and toothed, upper ½-amplexicaul. Cymes 4-5 in., terminal, simple or forked, short, at length elongate, drooping, recurved; bracts leafy; flowers subsessile. Sepals ½ in., narrow. Corolla ½ in. diam., bright blue, scales white. Nutlets small, reticulate. —DISTRIB. Europe, N. and W. Asia to N.W. India; introd. in the U. States.—A. de Candolle regards it as indigenous only in S. Europe.

SECTION 2. Anchusa proper. Corolla-tube straight, equalling or exceeding the limb. Nutlets with the basal ring not produced.

A. officinalis, L. ; densely softly hispid, leaves narrow-lanceolate.


SECTION 3. Caryolopha, Fisch. et Traut. (gen.). Corolla-tube straight, shorter than the limb. Nutlets with the ring produced towards the style.

A. sempervirens, L. ; hispidly hairy, leaves ovate acute.

Hedges and waste places from Caithness southd., rare; Ireland; Channel Islands; (an alien, Wats.); fl. May-June.—Root stout, perennial. Stem 1-2 ft., simple. Leaves, radical 8-12 in., oblong-ovate, long-petioled; cauline ovate, shorter petioled. Cymes in axillary pairs, very hispid, subcapitate, long-peduncled, 2-bracteate, not lengthening much; peduncles 2-3 in., spreading, very slender; bracts ½-1 in., ovate-lanceolate; flowers shortly pedicelled. Sepals linear. Corolla ¾ in. diam., bright blue, scales white. Nutlets small, reticulate.—DISTRIB. From Belgium and Spain to Lombardy.


Annual or perennial herbs, or shrubs, hispid or hairy. Flowers in bracteate cymes. Calyx 5-partite. Corolla funnel- or salver-shaped, throat naked or with 5 tumid folds; lobes 5, spreading. Anthers oblong, included in the corolla-tube. Style simple, stigma capitate obscurely lobed. Nutlets bony or stony, smooth or rugose, base truncate, receptacle flat.—DISTRIB. Europe, temp. Asia and America; species about 40.—Etym. λθος and σπέρμα, from the stony nutlets.

1. L. officinalis, L. ; perennial, stems many all erect branched and flowering, leaves ½-amplexicaul narrow-lanceolate, nutlets smooth white.

Copse, hedge-banks, &c., from Ross southd.; Ireland; fl. June-July.—Rootstock stout, woody. Stem 1-3 ft., rough with the tuberous bases of the stiff hairs, very leafy. Leaves 2-4 in., pubescent above, strigose beneath.
Lithospermum.] **BORAGINEAE.**

2. **L. arven'se,** L.; annual, stems solitary erect branched, leaves sessile ½-amplexicaul linear-oblong, nutlets grey shining wrinkled.

3. **L. purpu'reo-cÆrœleum,** L.; perennial, barren stems creeping, flowering erect, leaves subsessile narrow-lanceolate, nutlets white smooth.

**5. MER'TEN'SIA,** Roth.

Perennial herbs. **Leaves** usually obovate, lower petioled, upper sessile. **Flowers** in terminal cymes, blue-purple, dimorphic. **Calyx** 5-fid or -partite. **Corolla-tube** cylindric, limb campanulate, 5-fid or -partite, throat naked or with 5 transverse folds. **Stamens** 5, towards the top of the corolla-tube. **Style** filiform, lengthened after flowering, stigma obtuse. **Nutlets** 4, rather fleshy, smooth or rough, base contracted, receptacle small 2-4-lobed.—**DISTRIB.** N. and Arctic Europe, Asia, and America; species 15.—**ETYM.** Prof. F. C. Mertens, a German botanist.

**M. marit'ima,** Don; glabrous, glaucous, leaves ovate or obovate.

Sea-shores, Wales and Berwick to Shetland; Ireland; fl. May–June.—**Succulent. Rootstock** fleshy, stoloniferous. **Stems** 1-2 ft., decumbent, leafy, much branched. **Leaves** 2-farious, 1-3 in., lower petioled, upper sessile, with prominent callous points when dry. **Cymes** dichotomous, with 2 opposite leafy bracts at the base; pedicels short, decurved in fruit. **Calyx** angular in fruit; lobes ovate. **Corolla** ½ in. diam., 5-lobed to the middle, pink then blue, throat with 5 folds. **Nutlets** flattened, large, fleshy, outer coat becoming inflated and papery, back rounded.—**DISTRIB.** Lapland to Denmark, N. and Arctic shores of Asia and America.

**6. PULMONA'R'IA,** Tournef. **LUNGWORT.**

Perennial herbs; rootstock creeping, usually terminating in sterile branches. **Flowering-stems** simple. **Cymes** terminal. **Flowers** often
polygamous or dimorphic, purple, white or pink in bud, honeyed. *Calyx* 5-angled at the base, 5-fid, after flowering campanulate, lobes erect. *Corolla* funnel-shaped, 5-cleft, with 5 pencils of hairs between the stamens. *Stamens* 5, included. *Stigma* subglobose, 2-lipped. *Nutlets* 4, turbinate, smooth, base truncate, receptacle flat.—**Distrib.** Europe, N. Asia; species 4.—**Etym. pulmo,** from its former use in lung complaints.

**P. angustifo'lia, L.** ; leaves narrow-lanceolate cauline sessile.


**P. officina'lis, L.** ; leaves ovate or ovate-lanceolate.

Woods and copses, S. Scotland and England, rare, naturalized.—**Habit,** &c. of **P. angustifo'lia,** but the leaves very different, and always blotched with pale green, and flowers pale purple.—**Distrib.** Europe.

**7. MYOSO'TIS, L.** Scorpion-grass.

Annual or perennial strigose herbs. *Radical leaves* petioled; cauline sessile, linear-oblong. *Cymes* terminal, scorpionid; flowers small, bracteate or not. *Calyx* 5-toothed or -cleft. *Corolla* salver- or funnel-shaped, throat closed by 5 short notched scales; limb 5-fid, lobes contorted in bud. *Anthers* included, connective slightly produced. *Style* short, stigma capitate. *Nutlets* 4, minute, usually highly polished, compressed or 3-gonous, base small, receptacle small.—**Distrib.** N. and S. temp. regions, most common in Europe and Australia; species about 30.—**Etym. μος** and οὖ, from the leaves resembling a mouse’s ear.

**Section 1.** Perennial. *Hairs* of stem appressed or spreading. *Pedicels* slender, longer than the calyx. *Calyx* campanulate, strigose with straight appressed hairs only.

1. **M. palus'tris, With.** ; hairs scanty spreading rarely appressed, corolla ¼–½ in. diam., style nearly equalling the calyx. *Forget-me-not.*


**M. palus'tris** proper; stolons subterranean, calyx-lobes triangular shorter than the corolla-tube. Lowlands, N. to Orkney, rarer Scotland.—**Var. M. strigulo'sa,**
Reich. ; more erect with more copious appressed hairs, leaves sessile, flowers smaller.

Sub-sp. M. repens, D. Don ; stolons above ground, calyx-lobes lanceolate exceeding the corolla tube.—More northern and upland, ascends to 2,200 ft. in Yorkshire, Channel Islands to Shetland.

2. M. caespitosa, Schultz ; hairs appressed, calyx-lobes triangular nearly as long as the tube, corolla $\frac{3}{4}$ in. diam., style much shorter than the calyx.—M. lingulata, Lehm.

Wet places, N. to Shetland ; ascends to 1,600 ft. in Yorkshire; Ireland; Channel Islands ; fl. May-Aug.—Light green, tufted, rather shining. Rootstock short, without stolons. Stem 6–18 in., much branched from the base, branches slender. Leaves, radical spatulate-oblong, polished; cauline 1–2$\frac{1}{2}$ in., linear-oblong, tip rounded, narrowed to the sessile base. Cymes usually long and slender, pedicels $\frac{1}{4}$–$\frac{1}{3}$ in. Sepals oblong-ovate, obtuse. Corolla sky-blue, disk yellow. Nutlets black, short, broad, bordered, not keeled in front.—DISTRIB. Europe (Arctic), N. Africa, N. and W. Asia, Himalaya, N. America.—This and the preceding are the only species with bright green shining foliage.

Section 2. Hairs of stem spreading. Calyx with spreading and hooked hairs.

* Lower leaves petioled. Pedicels usually much longer than the calyx.

3. M. sylvatica, Hoffm. ; perennial, stolons 0, calyx campanulate cleft $\frac{3}{4}$ of the way with few straight and many incurved or hooked hairs, closed in fruit, corolla $\frac{1}{4}$ in. diam. flat.

Dry woods, &c., from Forfar and Dumfries to Kent, Hants, and Wales; ascends to 1,200 ft. in Yorkshire; Channel Islands ; fl. May–Sept.—Biennial or perennial. Rootstock 0 or short. Stem $\frac{3}{4}$–2 ft., branched from the base, erect or the lateral branches ascending. Leaves $\frac{1}{2}$–2$\frac{1}{2}$ in., acute or apiculate, hairs spreading. Cymes very lax in fruit; pedicels about twice as long as the calyx. Flowers homomorphous, odorous in the evening; corolla bright blue, tube very short. Nutlets bordered, keeled at the tip in front.—DISTRIB. Europe (Arctic), Canaries, N. and W. Asia.

M. sylvatica proper ; leaves long-petioled subacute, calyx base rounded, tube with hooked hairs, nutlets brown.

Sub-sp. M. alpescbris, Schmidt ; leaves subsessile, calyx with many straight and few incurved or hooked hairs, open in fruit, base acute, corolla $\frac{3}{4}$ in. diam. flat, fruiting pedicels shorter, nutlets black. M. rupicola, Sm. —Moist rocks, Ben Lawers, alt. nearly 4,000 ft.; Teesdale, alt. 2,400 ft.; Westmoreland.

4. M. arvensis, Hoffm. ; annual or biennial, calyx shortly campanulate cleft $\frac{1}{2}$ way or lower with few appressed and many spreading hooked hairs, closed in fruit, corolla $\frac{3}{4}$ in. diam. usually concave. M. intermedia, Link. Fields and waste places, N. to Shetland; ascends to 1,200 ft. in Yorkshire; Ireland; Channel Islands; fl. June–Aug.—Closely allied to M. sylvatica, but pedicels usually much longer, slender, and flowers very small and paler blue. Nutlets brown, bordered, keeled in front.—DISTRIB. Europe (Arctic), N. Africa, N. and W. Asia to India, native of N. U. States.
**Lower leaves subsessile. Pedicels usually shorter than the calyx.**

5. *M. collina*, Hoffm.; annual, calyx shortly campanulate cleft ½ way with many spreading hooked and few straight hairs, open in fruit, corolla ½ in. diam. usually concave bright blue, tube short.

Field banks and waste grounds, N. to Shetland; ascends to 1,000 ft. in the Highlands; E. Ireland; Channel Islands; fl. May–July.—Stems 3–12 in., usually branched from the base. Leaves ½–1 in., linear-oblong, obtuse or apiculate, strigose. Cymes very long and slender in fruit, often exceeding the leafy part of the stem. Style not half as long as the calyx. Nutlets turgid, brown, scarcely bordered.—Distrib. Europe, N. Africa, W. Asia. *M. Mitte'ni* is a variety with the flowers pale, and the lower in the cyme bracteate.

6. *M. versic'olor*, Reichb.; annual, calyx shortly campanulate cleft ½ way with many spreading hooked and few straight hairs, closed in fruit, corolla ½ in. diam. usually concave yellow then dull blue, tube long.

Waste grounds, N. to Shetland; ascends to 1,500 ft. in Northumbd.; Ireland; Channel Islands; fl. April–June.—Stems 3–12 in., usually much branched from the base. Leaves ½–1 in., linear-oblong, subacute, strigose. Cymes elongate; flowers not secund, lowest sometimes bracteate. Flowers homogamous; corolla-tube elongating till the anthers reach the stigma. Style nearly as long as the calyx. Nutlets black, bordered.—Distrib. Europe, N. Africa, W. Asia; introd. in the U. States.

7*. *ASPERUGO*, Tournef. MADWORT (MADDERWORT).

An annual hispid procumbent herb. Radical leaves petioled; cauline alternate subopposite or whorled. Cymes axillary, 1–3-fld.; flowers on short recurved pedicels, small, blue. Calyx deeply 5-lobed, with alternating teeth; lobes leafy, spreading, veined, enlarged after flowering, and forming a compressed 2-lipped lacinate covering to the fruit. Corolla funnel-shaped, throat closed by scales; lobes 5, rounded. Stamens included. Stigma subcapitate. Nutlets laterally compressed, subacute, tubercled, attached by the edge to an elevated receptacle.—Distrib. Europe (Arctic), W. Asia to N.W. India.—Etym. asper, from the rough leaves.

A. PROCUM'BENS, L.; stem prickly, leaves linear-oblong.

Waste places, rare and casual, from Sutherland to Kent; fl. May–July.—Stem 1–2 ft., stout or slender, soft, simple or branched, sharply ridged, prickles scattered short hooked. Leaves 2–5 in., lower petioled, uppermost sessile, variable in form, obtuse or acute, thin, hispid. Corolla ½ in. diam., blue-purple. Fruiting-calyx ½ in. broad; lips unequal, fan-shaped, palmately lobed; pedicels very short, decurved. Receptacle of nutlets with 2 membranous scales formed of the detached cuticle of the calyx.
8. CYNOGLOSS'UM, Tournef. HOUND'S-TONGUE.

Coarse hispid villous or silky biennials. Flowers small, blue purple or white, in forked cymes, usually ebracteate. Calyx 5-partite. Corolla funnel-shaped, mouth closed by prominent scales; lobes obtuse. Stamens included. Style rigid, persistent, stigma entire or notched. Nutlets 4, depressed or convex, covered with hooked or barbed bristles, peltately attached to a thickened conical receptacle.—DISTRIB. Temp. and trop. regions, especially Asiatic; species about 60.—ETYM. κυών and γιλώσσα, dog's tongue, from the texture of the leaf surface.

1. C. officina'le, L.; hoary with soft rather appressed hairs, nutlets with a thickened border.

Fields and waste places, not common, E. Scotland, from Forfar to Kent and Cornwall; S.E. Ireland, rare; Channel Islands; fl. June-July.—Root fleshy, tapering. Stem 1-2 ft., stout, erect, branched, leafy. Leaves radical, 8-10 in., long-petioled, oblone or oblone-lanceolate; cauleine sessile, linear-oblone or lanceolate, obtuse, base rounded or cordate. Cymes lengthening to 6-10 in.; pedicels recurved, stout, lower often bracteate. Sepals oblone, obtuse, enlarged to ½ in. in fruit. Corolla ½ in. diam., dull red-purple. Nutlets ½ in., face flat ovate with short hooked spines; border thickened.—DISTRIB. Europe, N. Africa, N. and W. Asia; introd. in U. States.—Narcotic and astringent; smells like mice.

2. C. monta'nun, Lamk.; scabrid with short spreading hairs, nutlets without a thickened border. C. sylva'ticum, Hænke.

Copses and waste places in Mid. and E. England, rare, from Salop and Norfolk to Kent and Surrey; Dublin; fl. May-July.—Habit, &c., of C. officina'le, but greener, more slender, with linear sepals ½ in. long in fruit, bluer corollas, and the marginal spines of the nuts largest.—DISTRIB. From France and Germany southd. (excl. Greece).

Order LII. CONVOLVULACEÆ.

Herbs or shrubs, usually twining (rarely trees); juice often milky. Leaves alternate, 0 in Cuscuta, exstipulate. Flowers in axillary or terminal racemes, cymes, or heads, rarely solitary, often large, of all colours. Sepals 5, persistent. Corolla hypogynous, regular, tubular bell- or funnel-shaped; limb 5-lobed or -angled, plaited induplicate or imbricate in bud. Stamens 5, inserted on the corolla-tube, filaments often unequal and dilated at the base; anthers sagittate, basifixed, often twisted after flowering. Ovary 2-4- (rarely 1-) celled; style slender, 2-4-fid, stigmas capitate linear or lamellar; ovules 1 or 2 in each cell, erect from its base, 4 in the 1-celled ovaries. Capsule 1-4-celled, 2-4-valved, or bursting transversely at the base. Seeds basal, erect; testa coriaceous or membranous, often villous, albumen scanty mucilaginous (fleshy in Cuscuta); embryo curved, cotyledons broad thin folded, radicle short (embryo spiral
and undivided in *Cuscuta*).—*Dist* Chiefly trop.; genera 32; species about 800.—Affinities. With Boraginaceae and Hydrophyllaceae.—Properties. Often purgative; some (*Batatas*) yield esculent roots.


1. **CONVOLVULUS, L.** Bindweed.

Slender, often perennial twining herbs; juice milky. *Leaves* alternate, often cordate or sagittate. *Flowers* axillary, solitary or corymbose, white pink purple or blue, bracteate or ebracteate, honeyed. *Sepals* 5. *Corolla* funnel- or bell-shaped, limb 5-angled, plaited and twisted in bud. *Stamens* 5, inserted at the bottom of the corolla-tube, filaments dilated at the base. *Ovary* 2-celled; style filiform, stigmas 2 oblong or linear; ovules 2. *Capsule* 2-celled, the dissepiment sometimes imperfect. *Seeds* 2 in each cell, erect, testa hard.—*Distrib.* Temp. and trop. regions; species about 160.—*Etym.* convolvo, to entwine.


1. **C. arvensis, L.;** leaves hastate or sagittate entire or sinuate. *Small Bindweed.*


Sub-gen. 2. **Calystegia, Br.** (gen.). *Bracts* 2, large, enclosing the calyx. *Stigmas* broad.

2. **C. sepium, L.;** stem twining, leaves hastate or sagittate.

3. **C. Soldanel'ia, L.**; stem procumbent, leaves orbicular or reniform. Sandy sea-shores from Isla and Forfar southd.; Ireland; Channel Islands; fl. June–Aug.—Glabrous. *Rootstock* slender, running extensively. *Stems* 6–12 in., slender, rarely twining. *Leaves* $\frac{1}{2}$–1 in. diam., fleshy, usually much broader than long, lobes rounded; petiole 1–3 in., suddenly dilating at the tip. *Flowers* 1–1$\frac{1}{2}$ in. diam., pale purple or pink; peduncle solitary, 1-fld., 4-quetrous; bracts $\frac{1}{3}$–$\frac{3}{2}$ in., broadly oblong, obtuse, shorter than the similar or retuse unequal sepals. *Capsule* large, incompletely 2-celled. *Seeds* $\frac{1}{2}$ in. diam., obtusely 3-gonous, smooth, black.—**Distrib.** From Belgium southd., N. Africa, W. Asia, S. temp. regions.

2. **CUS'CUTA, Tournef.** Dodder.

Slender, twining, leafless, pink yellow or white, annual parasites. *Flowers* in bracteate heads (in British species), rarely spiked. *Calyx* 4–5-fld. *Corolla* urceolate, persistent; limb 4–5-fld; tube naked, or with a ring of scales below the stamens. *Stamens* 4–5, inserted on the corolla-tube. *Ovary* 2-celled; styles 2, free or connate, stigmas acute or capitate; ovules 2 in each cell, erect. *Capsule* 2-celled, circumsciss at the base, cells 2-seeded. *Seeds* angled; embryo filiform, undivided, spirally coiled round the fleshy albumen, radicle thickened.—**Distrib.** Temp. and trop. regions; species about 80.—**Etym.** doubtful.

1. **C. europæ'a, L.**; sepals erect obtuse, tips spreading, corolla twice as long ventricose above, scales short or 0, stamens included.

On nettles, vetches, &c., from York to Sussex and Devon, rare; fl. July–Sept. —*Stems* as thick as twine, reddish or yellow. *Flower-heads* $\frac{1}{2}$–$\frac{3}{2}$ in. diam., tinged with red. *Sepals* fleshy at the base only. *Corolla-lobes* about as long as the tube, obtuse, spreading. *Scales* appressed to the corolla-tube, remote, 2-fld. *Styles* included.—**Distrib.** Europe, N. Africa, Siberia.

2. **C. Epithy'mum, Murr.**; sepals suberect acute shorter than the cylindric corolla-tube, scales converging toothed, stamens exerted.

On furze, thyme, ling, &c., from Ayr southd.; Channel Islands; fl. July–Oct.—*Stems* filiform, very slender, reddish. *Heads* $\frac{4}{4}$–$\frac{8}{4}$ in. diam., variable in colour. *Corolla-lobes* spreading. *Scales* large, contiguous. *Styles* exerted.—**Distrib.** From Denmark southd., N. Africa, W. Asia.—**C. Trifo'lii, Bah.,** is a variety with shorter distant scales, found sporadically in clover fields.

C. **Epil'atinum, Weihe**; sepals acute appressed to the equally long inflated corolla-tube, scales small distant toothed, stamens included.

Order LIII. Solanaceae.

Herbs or shrubs (rarely trees). Leaves alternate, or in pairs, or sub-opposite, simple lobed or pinnatisect, exstipulate. Flowers regular, on 1- or more-fld. supra-axillary or axillary ebracteate cymes. Calyx inferior, 5-fld, usually persistent, often enlarged in fruit. Corolla hypogynous, rotate campanulate or salver-shaped; lobes 5, imbricate plicate or induplicate-valvate in bud. Stamens 5, rarely unequal, inserted on the corolla-tube, short; anthers connivent or cohering by their tips, opening inwards by slits or terminal pores. Disk annular. Ovary 2- or incompletely 4-celled; style simple, stigma simple or lobed; ovules many, amphitropous, placentas on the septum. Fruit a many-seeded capsule or berry. Seeds small, usually compressed, reniform, hilum ventral or lateral, testa thick, albumen fleshy; embryo terete, straight or curved, in- or out-side the albumen, radicle next the hilum.—Distrib. Chiefly tropical; genera 66; species about 1,250.—Affinities. With Convulvulaceae and Scrophulariaceae.—Properties. Narcotic and excitant, or tonic and bitter, pungent or stimulant.


1. HYOSCY'AMUS, Tournef. Henbane.

Annual or biennial, heavy-scented herbs, often viscid. Leaves toothed or sinuate-pinnatifid. Flowers axillary, or in bracteate scorpionioid cymes, honeyed. Calyx urceolate, 5-toothed. Corolla irregular, bell- or funnel-shaped; lobes 5, unequal, obtuse, plaited in bud. Stamens 5, inserted at the base of the corolla-tube, declinate; anthers with slits. Ovary 2-celled; style simple, stigma capitate; ovules many. Capsule hidden in the calyx-tube, constricted in the middle, 2-celled, membranous, circumsciss at the crown, many-seeded. Seeds reniform, punctate.—Distrib. Warm and temp. Europe, Africa, and Asia; species about 9.—Etym. obscure.

H. niger, L.; pubescent, leaves angled toothed or subpinnatifid.

2. SOLA'NUM, Tournef. Nightshade.

Herbs or shrubs (rarely trees). Leaves scattered or in pairs, entire or divided. Flowers solitary fascicled or cymose, white or blue, honeyless,

1. **S. Dulcamara**, L.; perennial, stem flexuous, leaves ovate-cordate or 3–5-partite, cymes panieled leaf-opposed or lateral. *Bitter-sweet.*


2. **S. ni'grum**, L.; annual, stem erect angled usually tubercled, leaves rhomboid-ovate narrowed into the petiole, cymes umbellate lateral.


3. **A'fropæa**, L. **Dwale.**


**A. Belladon'na**, L.; leaves ovate acuminate. *Deadly Nightshade.*

Waste places, probably indigenous on chalk and lime-stone; oftentimes naturalized near ruins, from Westmoreland southd.; near houses in Scotland; Ireland; Channel Islands; fl. June–Aug.—Glabrous or pubescent and glandular. *Rootstock* stout, fleshy, stoloniferous. *Stem* 2–3 ft., stout. *Leaves* usually in unequal pairs, larger 3–8 in., contracted into the petiole. *Flowers* axillary supra-axillary and from the forks, drooping; peduncles ½–1 in.,
slender. Sepals \( \frac{1}{2}-\frac{3}{4} \) in., broadly ovate. Corolla 1 in., greenish-purple; lobes subequal, spreading, obtuse. Filaments subequal, tip incurved; anthers pale, included. Berry spheroidal, obscurely 2-lobed.—A sedative, poisonous in overdoses.

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**Order LIV. PLANTAGINÆ.**

Annual or perennial scapigerous herbs. Leaves usually all radical with parallel ribs, rarely cauline and opposite or alternate. Scapes axillary. Flowers small, green, usually spiked, regular bisexual (1-sexual in Littorella). Sepals 4, persistent, imbricate in bud. Corolla hypogynous, salver-shaped, scarious; lobes 4, spreading, imbricate in bud. Stamens 4, inserted on the corolla-tube (hypogynous in Littorella), filaments capillary, flexed in bud, pendulous in flower, persistent; anthers large, versatile, deciduous. Ovary free, 2-4-celled (1-celled and 1-ovuled in Littorella); style filiform, with 2 lines of stigmatic hairs; ovules solitary and basal, or many peltately attached to the septum. Fruit a 1-4-celled, 1- or more-seeded, membranous circumsciss capsule (bony and indehiscent in Littorella), seed-bearing septum free. Seeds usually peltate, albumen fleshy; embryo transverse, cylindric, cotyledons oblong or linear, radicle inferior.—Distrib. All temp. regions; genera 3; species about 50.—Affinities. Doubtful; probably reduced form of Scrophulariinae.—Properties. Mucilaginous.


1. **PLANTA'GO, L. PLANTAIN, RIB-GRASS.**


1. **P. ma'jor, L.**; leaves petioled oblong or ovate-oblong toothed 3-7-ribbed, scape short not furrowed, spike very long, sepals free, capsule 2-celled 8-16-seeded, seeds flat in front.

Pastures and waste places, N. to Shetland; ascends to 2,000 ft. in Northumbd.; fl. May–Sept.—Glabrous or hairy. Rootstock stout, truncate. Leaves 2-5 in., petiole broad, short, teeth very irregular. Scape about as long as the leaves; spike slender, longer than the scape; bracts equalling the calyx, oblong-ovate, concave, obtuse, glabrous. Sepals \( \frac{1}{2} \) in., obtusely keeled, margins scarious. Corolla-tube glabrous. Filaments short; anthers purple. Seeds black, rough.—Distrib. Europe, N. Africa, N. and W. Asia, Himalaya; introd. in N. America.—Seeds used for feeding cage-birds.

**Var. P. interme'dia,** Gilib., is a dwarf very downy form with ascending scapes.
2. **P. me'dia, L.**; leaves subsessile elliptic-oblong toothed 5–9-ribbed, scape not furrowed, spike short, sepals free, capsule 2-celled 2-seeded, seeds flat in front.

Roadsides and waste places, usually on a dry soil, from Aberdeen and Ayr southd.; ascend to 1,600 ft. in Northumbd.; introduced? in Scotland and Ireland; Channel Islands; fl. June–Oct.—Pubescent. Rootstock tapering. **Leaves** 6–10 in., very variable. **Scape** 6–12 in.; spike 1–3 in.; bracts often purple, concave, obtuse, edges silvery, shorter than the glabrous unkeeled sepals. **Corolla-tube** glabrous. **Filaments** long; anthers whitish. **Seeds** brown, rough.—**Distrib.** Europe, N. Africa, N. and N.W. Asia, Himalaya. —Dimorphic: (1) scape long, corolla-lobes spreading acute, filaments white; (2) scape shorter, corolla-lobes rounded, filaments red, stigma shorter.

3. **P. lanceol'ata, L.**; leaves petioled lanceolate entire or toothed 3–6-ribbed, scape deeply furrowed, spike short, 2 anterior sepals often connate, capsule 2-celled 2-seeded, seeds concave in front. **Ribwort.**

Pastures and waste places, N. to Shetland; ascends to 2,200 ft. in the Highlands; Ireland; Channel Islands; fl. May–Oct.—Glabrous or pubescent. **Rootstock** tapering, crown woolly. **Leaves** 1–12 in., very variable. **Scape** as long; spiky 1/2–3 in., ovoid globose or cylindric; bracts acuminate. **Sepals** hairy at the tip, 2 dorsal keeled. **Corolla** longer than the calyx, glabrous. **Stamens** long, all white. **Seeds** black, shining.—**Distrib.** Europe, N. Africa, N. and W. Asia, Himalaya; introd. in N. America.—Leaves used for dressing sores in Scotland. Trimorphic, gynodioecious: (1) scape tall, anthers broad white (anemophilous); (2) scape shorter; (3) dwarf (entomophilous). **Delpino.**

**P. lanceol'ata** proper; bracts and sepals blackish at the tips.—**Var.** **P. Tim-bali**, Jord.; bracts and sepals with broad silvery margins. Fields of clover, &c., not indigenous.

4. **P. marit'ima, L.**; leaves narrow linear fleshy faintly 3–5-ribbed, scape not furrowed, spike short or long, 2 dorsal sepals connate, capsule 2-celled 2-seeded, seeds flat in front.

Salt marshes, N. to Shetland; mountain streams, in York and Perth; ascends to 1,800 ft.; fl. June–Sept.—Glabrous or hairy (b. hirsu'ta, Lond Cat.). **Rootstock** woody, branched, crown woolly. **Leaves** 1–12 in., 1/3–1 in. diam., very variable, sometimes narrowly lanceolate, quite entire or remotely toothed. **Scapes** as long as or longer than the leaves; spikes 1/2–3 in.; bracts ovate-lanceolate. **Flowers** homomorphous. **Sepals** nearly glabrous, 2 dorsal with a toothed keel, margins narrowly scarious. **Corolla-tube** pubescent. **Stamens** pale yellow. **Seeds** brown, faintly winged at one or both ends.—**Distrib.** Europe (Arctic), N. Africa, N. and W. Asia, Himalaya, N. America.

5. **P. Coro'nopus, L.**; leaves narrow linear 1-ribbed toothed or 1–2-pinnatifid, scape not furrowed, spike short or long, 2 dorsal sepals with a winged scarious keel, capsule 3–4-celled 3–4-seeded, seeds flat in front.

Sandy and gravelly places, N. to Shetland; Ireland; Channel Islands; most common near the sea; fl. June–Aug.—Annual or biennial, usually pubescent with long hairs. **Leaves** 1–12 in., very variable. **Scapes** usually ascending
equalling or exceeding the leaves; spikes ¹⁄₂-6 in.; bracts ovate, long acuminate, much exceeding the obtuse sepals. **Corolla-tube** pubescent. **Stamens** pale yellow. **Seeds** pale brown.—**Distrib.** Europe, N. Africa, W. Asia.

### 2. LITTORELL’I'A, L. SHORE-WEED.

A creeping aquatic perennial herb. **Leaves** all radical, ½-cylindric. **Scapes** short, few-flld.; flowers monoecious. **Male** fl. solitary. **Sepals** 4. **Corolla-tube** cylindric, lobes 4. **Stamens** 4, hypogynous. **Ovary** rudimentary. **Female** fl. usually 2 at the base of the male scape. **Sepals** 3–4, unequal. **Corolla** urceolate, mouth 3–4-toothed. **Stamens** 0. **Ovary** flagon-shaped, 1-celled; style very long, rigid; ovule 1 rarely 2, erect, campylotropous, flanked by a column of placental tissue. **Fruit** bony. **Seed** erect, testa membranous.—**Distrib.** Europe (Arctic) (excl. Turkey, Greece), Azores.—**Etym.** *littus*, from growing near shores.

**L. lacus’tiris, L.** ; leaves fleshy lacunose internally.

Sandy or gravelly edges of lakes and ponds, N. to Shetland; ascends to 1,600 ft. in the Highlands; Ireland; Channel Islands; fl. Aug.—Glabrous or puberulous, often forming a submerged matted turf. **Rootstock** creeping, white, stoloniferous. **Leaves** 1–4 in., linear-subulate, sheathing at the base. **Male** fl. **Scape** axillary, much shorter than the leaves, 1–2-bracteate below the middle, papillose. **Sepals** ½ in., obtuse, green, edges scarious. **Stamens** long; **anthers** very large, pale. **Female** fl. subsessile, enclosed in lanceolate bracts.

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**Order LV. SCROPHULARI’NEÆ.**

Herbs or shrubs. **Leaves**, lower opposite or whorled, upper alternate, rarely all opposite or alternate and stipulate. **Inflorescence** various, flowers usually irregular, peduncles 2-bracteate at the forks. **Calyx** inferior, usually persistent, 5-merous. **Corolla** hypogynous; lobes 4–5, imbricate or subvalvate in bud. **Stamens** 4, rarely 2 or 5, inserted on the corolla-tube, with or without a rudimentary fifth; **anthers** 1- or 2-celled. **Disk** annular glandular or cup-shaped. **Ovary** 2-celled; style simple, stigma capitate or 2-lobed; ovules many, very rarely 2 in each cell, anatropous or amphitropous, placentas axile. **Fruit** a many-seeded capsule, rarely a berry, dehiscence various. **Seeds** small, testa various, hilum lateral or ventral, albumen fleshy; embryo straight, rarely curved, radicle next the hilum or lateral.—**Distrib.** All climates; genera 157; species about 1,900. **Affinities.** With *Orobancheae* and *Solanæae.*—**Properties.** A few are purgative, or emetic, or intensely bitter, or very poisonous.

**Sub-order I. Antirrh’i’nideæ.** **Corolla** with the posticous (upper) lobes external in bud.

**Tribe I. VERBAS’CEÆ.** **Leaves** alternate. **Inflorescence** centripetal. **Corolla** rotate. **Stamens** 5, declinate, unequal...........1. **Verbascum.**

Corolla spurred at the base..................................................2. Linaria. Corolla saccate at the base..................................................3. Antirrhinum.


4. Scrophularia.


SUB-ORDER II. RHINANTHIDEÆ. Corolla with the posticous (upper) lobes never exterior in bud.


8. Veronica.


Leaves opposite. Seeds many, small, not winged.

Upper corolla-lip entire or notched........................................9. Bartsia.

Upper corolla-lip with 2 spreading or reflexed lobes......10. Euphrasia.


1. VERBASCUM, L. MULLEIN.

Tall, erect, usually biennial, tomentose or woolly herbs. Leaves alternate. Flowers in simple or compound racemes, red, yellow, or purple, rarely white, honey scanty. Calyx 5-partite. Corolla rotate; segments 5, nearly equal. Stamens 5, 3 posterior or all the filaments bearded; anther-cells confluent. Stigma undivided or 2-lamellate. Capsule septicidally 2-valved, many-seeded. Seeds pitted.—DISTRIB. Chiefly Europe and W. Asia; species about 100.—ETYM. A corruption of Barbascum, the Latin name. The following hybrids occur; their names indicate their parentage: Thapsos-Lychnitis, Thapso-nigrum, nigro-pulverulentum, nigro-Lychnitis.

1. V. Thapsus, L.; densely woolly, eglandular, stem terete simple, leaves very decurrent, flowers in a dense simple woolly spike.
Waste dry places, local, from Argyll and Elgin southd.; Ireland; Channel Islands; often an escape; a denizen in Scotland; fl. June–Aug.—Stem 2–3 ft., stout. Radical leaves 6–18 in., obovate-lanceolate, entire or crenate; cauline oblong, acute, upper acuminate. Spike 6–10 in.; bracts longer than the flowers. Corolla ½–1 in. diam., woolly externally. Filaments with white hairs; anthers of long stamens slightly decurrent. Seeds ribbed.—DISTRIB. Europe, N. and W. Asia, Himalaya; introd. in N. America.—Wool formerly used for lamp-wicks.

2. **V. Lychni’tis, L.**; stem angled, leaves stellately-pubescent, racemes panicked narrow, flowers small whitish, hairs of filaments white.


3. **V. pulverulent’um, Vill.**; mealy, stem terete, leaves stellately-pubescent, racemes panicked pyramidal, flowers yellow, hairs of filaments white.

Waste places Norfolk and Suffolk; (native? Wats.); fl. July.—Habit of *V. Lychni’tis*, but leaves much broader, sessile, with small crenatures and more matted with woolly hairs; cauline cordate. Flowers ½–¾ in. diam., several to each bract, bright yellow. Sepals small, lanceolate. Anthers not decurrent. Capsule small, ovoid.—DISTRIB. From Belgium southd. (excl. Greece, Russia).

4. **V. ni’grum, L.**; stem angular, leaves stellately pubescent, racemes nearly simple, flowers yellow, hairs of filaments purple.

Waste places, fields, &c., from Notts, Derby, and Carnarvon southd., but often an escape; fl. June–Oct.—Stem 2–3 ft., whole plant covered with long hairs, not so matted as in the former species. Radical leaves petioled, sometimes 1 ft., ovate-oblong or oblong-lanceolate, often cordate, crenate; cauline, except the upper, petioled, ovate-cordate, hardly white beneath. Raceme 1–1½ ft. slender, erect. Flowers ½–¾ in. diam., many to each bract, pedicelled. Sepals small, lanceolate, tomentose. Anthers not decurrent.—DISTRIB. Europe, Siberia.—An Alderney var. (tomentosum, Bab.), has more woolly leaves beneath, and smaller flowers.

5. **V. Blatta’ria, L.**; nearly glabrous, stem subangular, branches of panicle slender glandular, flowers yellow, hairs of filaments purple.

Waste places, rare, from Norfolk and Stafford southd.; S. and W. Ireland; Channel Islands; a denizen or alien; fl. June–Oct.—Stem 8 in. to 4 ft., rather slender, simple or branched. Radical leaves 4–10 in., oblong-lanceolate, obtuse, crenate lobulate or subpinnatifid; cauline small, sessile, ovate, or oblong, acute or acuminate, sometimes cordate, irregularly toothed or subcrenate. Flowers ¾–1½ in. diam., bright yellow, rarely cream-coloured, lax or dense; lower bracts leafy; peduncles ¾–1 in. Sepals oblong, often
large. Anthers of long stamens decurrent. Capsule nearly globose.—
Distrib. From Holland southd., N. Africa, N. and W. Asia, Himalaya; introd. in N. America.
V. Blatta'ria proper; upper leaves not decurrent, racemes lax-fld., pedicels solitary slender longer (often much) than the calyx.—Native (?) of S.W. England, probably introd. elsewhere.
Sup-sp. V. Virga'tum, With.; more glandular, upper leaves shortly decurrent, racemes dense-fld., pedicels more fascicled shorter than the calyx.

2. Lina'ria, Tourner. Toad-flax.

Herbs, rarely shrubby. Lower leaves opposite whorled or alternate. Flowers in bracteate racemes or spikes, or axillary and solitary. Calyx 5-partite. Corolla personate, tube spurred; upper lip erect, mid-lobe of lower smallest; palate sometimes closing the throat. Stamens 4 fertile, 5th or rudimentary; anthers oblong. Stigma notched or 2-lobed. Capsule ovoid or globose; cells subequal, dehiscing by simple or toothed pores. Seeds angled or rugose, sometimes discoid and winged.—Distrib. Europe, W. Asia; species 130.—ETYM. linum, flax, which some species resemble.


L. Cymbala'ria, Mill.; glabrous, leaves petioled subsucculent broadly reniform irregularly 3-7-angled or -lobed. Ivy-leaved Toad-flax.


Section 2. Elatinoi'des, Chav. Diffuse. Peduncles axillary, 1-fld. Spur as long as the corolla; palate projecting. Capsule dehiscing by pores which are furnished with deciduous valves.

1. L. spu'ria, Mill.; hairy or villous and glandular, leaves shortly petioled ovate or orbicular entire or obtusely toothed. Male Fluellen.


2. L. Elat'i ne, Mill.; hairy or villous and slightly glandular, leaves shortly petioled, cauleine alternate broadly hastate acute.
Sandy and gravelly cornfields, from N. Wales and York southd.; Ireland, rare; Channel Islands; (a native or colonist, Wats.); fl. July–Oct.—Annual. Branches 6–30 in., many from a very short stem, prostrate, very slender. Leaves, radical and lower opposite, ovate; cauline 2–1 in., sometimes toothed towards the very acute basal lobes. Peduncles capillary, longer than the leaves, curved at the top. Sepals oblong-lanceolate. Corolla 1/4–1/3 in., yellow; upper lip purple within. Capsule globose. Seeds much as in *L. spuri'ria*.—

**SECTION 3. Linarias'trum, Chav.** Flowers racemed. Spur long or short; palate prominent. Capsule 4–10-valved at the top.

3. *L. vulga'ris*, Mill.; perennial, erect, almost glabrous, glaucous, leaves linear or lanceolate, sepals ovate or lanceolate shorter than the spur or capsule, corolla yellow.

Waste ground, from Elgin and the Clyde southd., rare in Scotland and Ireland; Channel Islands; fl. July–Oct.—Rootstock creeping. Stem 1–2 ft., stout or slender, leafy. Leaves 1–3 in., often whorled. Raceme dense-fld.; pedicels variable; bracts short; spur parallel to and as long as the tube, acute. Capsule broadly oblong. Seeds scabrous, winged. —**DISTRIB.** Europe (Arctic), N. Asia; introd. in N. America.—A reputed purgative and diuretic.—A Peloria form occurs with regular flowers, 5 spurs and corolla-lobes, and 5 stamens.

*L. vulga'ris* proper; leaves obscurely 3-nerved, raceme glandular-pubescent, sepals ovate-lanceolate.—**VAR. latifo'lia**, Bab. (*L. speci'dsa*, Ten.); leaves 3-nerved, raceme glabrous, bracts foliaceous, sepals lanceolate, corolla 1/2 in. —Isle of Wight, Kent.

4. *L. Pelisseria'na*, Mill.; annual, erect, glabrous, leaves linear, sepals subulate shorter than the slender spur longer than the capsule, corolla purple.


5. *L. re'pens*, Ait.; perennial, creeping, glabrous, sepals lanceolate as long as the spur shorter than the capsule, corolla violet. *L. stria'ta*, DC. Waste places, from Westmoreland and Mid. Wales southd., rare; naturalized north of this; Ireland, very rare; Channel Islands; fl. July–Sept.—Rootstock slender, creeping. Stems 1–3 ft., many, very slender, branched, leafy. Leaves 2–1/3 in., whorled or scattered, linear-lanceolate. Racemes elongating; bracts very small. Corolla 1/3 in.; spur almost parallel to the tube, obtuse. Capsule broad, compressed. Seeds angled, wrinkled transversely.—**DISTRIB.** W. Europe.—*L. se'pium*, Allman, is a hybrid with *L. vulga'ris*.

**SECTION 4.** Chænorrh'i'num, DC. Flowers axillary or racemed. Spur short; palate depressed; upper lip horizontal.

### 3. **ANTIRRHI'NUM**, Tournef. **SNAPDRAGON.**

Annual or perennial herbs. *Leaves* entire, rarely lobed, lower opposite, upper alternate. *Flowers* solitary and axillary, or racemose and bracteate. *Calyx* 5-partite. *Corolla* personate, tube saccate, compressed; upper lip erect; lower spreading, mid-lobe smallest; palate broad, bearded, closing the throat. *Stamens* 4 fertile, 5th rudimentary or 0; anther-cells oblong. *Stigma* shortly 2-lobed. *Capsule* 2-celled, upper cell bursting by one pore, lower by 2 many-toothed pores, rarely globe with 1 pore to each cell. *Seeds* minute, oblong, truncate, rugose or pitted.—**DISTRIB.** Europe, W. Asia; species 25.—**ETYM.** *avrtl* and *plv*, from the *snout*-like flower.

**A. Oront'ium**, *L.*; low, annual or biennial, leaves linear-lanceolate, raceme leafy or flowers axillary, sepals longer than the corolla.


**A. Ma'jus**, *L.*; tall, perennial, leaves lanceolate oblong or linear, raceme bracteate glandular-pubescent, sepals short.


### 4. **SCROPHULA'RIA**, Tournef. **FIG-WORT.**

Herbs, often foetid. *Leaves* opposite, or the upper alternate, entire or divided, often with pellucid thrysid cymes, greenish-purple or yellow; peduncles glandular-pubescent. *Calyx* 5-partite. *Corolla-tube* oblong or ventricose; lobes short, 4 upper erect, lowest spreading. *Stamens* 4, declinate, 5th usually a scale; anther-cells adnate to

Section 1. Scrophularia proper. Sepals obtuse. Corolla purplish, throat not contracted, upper lobes longer than the lateral. Stamens 4, included, 5th reduced to a scale on the upper lip.

1. S. noda'sa, L.; glabrous below, stem acutely 4-angled, leaves ovate or triangular-cordate acutely doubly-serrate, border of sepals narrow.

Shady places, from Caithness southd.; ascends to 1,500 ft. in Yorkshire; Ireland; Channel Islands; fl. July–Oct.—Rootstock tuberous, nodose. Stem 1–3 ft., simple. Leaves 2–4 in., shortly petioled, acute or acuminate, nerves strong, basal teeth largest. Cymes lax; bracts linear, acute, lower leafy; pedicels erect, slender, glandular at the base. Flowers ¼ in., green or brownish, proterogynous; scale notched. Capsule broadly ovoid, acuminate. Seeds rugose, brown.—Distr. Europe, N. and W. Asia, N. America.

2. S. aquatica, L.; glabrous below, stem 4-winged, leaves oblong-lanceolate obtuse or acutely crenate-toothed, petiole winged, border of sepals broad.

Ditches, edges of ponds, &c., from Berwick southd.; Ireland; Channel Islands; fl. July–Sept.—Rootstock stout, creeping. Stems 2–4 ft. Leaves 3–8 in., petiole winged and lobed or leaves pinnatisect below, lower cordate at the base, glabrous or pubescent, teeth largest upwards. Panicles large, erect; cymes opposite, dichotomous; lower bracts small, linear. Flowers proterogynous. Corolla ¼–½ in., greenish below, brown above, rarely white; upper lip 2-fid, scale broad. Capsule small, ovoid or subglobose pointed.—Distr. From Denmark southd., N. Africa, N. and W. Asia, Himalaya. Sub-sp. S. aquatica proper; cymes lax, many-fld., leaves crenate, scale reniform. S. Balbis’ii, Hornem.—Var. S. cinerea, Dum., has an entire scale.

Sub-sp. S. umbrosa, Dum.; cymes contracted few-fld., leaves more toothed, scale 2-lobed. S. Ehrhar’ti, Stevens.

3. S. Scorodo’nia, L.; glandular-pubescent, stem obscurely 4-angled, leaves ovate or triangular-ovate doubly crenate, petiole not winged, border of sepals broad.


Section 2. Ceraman’the, Reichb. Sepals linear-oblong, subacute. Corolla yellow, throat contracted; lobes nearly equal. Stamens 4, exserted; 5th absent.

4*. *MIM'ULUS*, L.


5. *LIMOSEL'LA*, L. *Mudwort*.


6. *SIBTHOR'PIA*, L.

as the corolla-lobes or one fewer; anthers sagittate, cells contiguous at the top, not confluent. **Stigma** capitate. **Capsule** membranous, compressed, loculicidally 2-valved. **Seeds** dorsally convex, ventral face flat or concave, hilum ventral.—**Distrib.** Europe, N. and W. trop. Africa, Andes; species 6.—**Etym.** Dr. Sibthorp, an Oxford Professor of Botany.

**S. europæa**, L.; leaves 7–9-lobed, calyx 5-lobed, stamens 4.

Moist shady banks, rare; S. Wales, Sussex to Cornwall; Channel and Scilly Islands; Kerry; fl. July–Oct. **Hairs** flaccid, jointed. **Stem** 6–14 in., filiform, creeping. **Leaves** ¼–¾ in. diam., membranous; lobes broad, rounded, or retuse. **Flowers** minute; peduncle short. **Calyx-lobes** lanceolate. **Corolla** pink, 5-lobed, two smaller lobes yellowish. **Capsule** very small.—**Distrib.** W. France, Spain, Portugal.

**7. DIGITALIS**, Tourn. **Foxglove.**

Tall, biennial or perennial herbs. **Lower leaves** crowded, petioled; upper alternate. **Flowers** in terminal racemes, purple orange yellow or white, spotted inside, honeyed, proterandrous; throat bearded. **Calyx** 5-partite. **Corolla** declinate, tube campanulate or ventricose, constricted above the base; upper lobe short, spreading, notched or 2-fid; lower longer, horizontal. **Stamens** 4, ascending; anthers in pairs, cells at first parallel contiguous, then divaricate. **Stigma** 2-lobed. **Capsule** septicidally 2-valved, valves entire with inflexed margins, separating from the seed-bearing column. **Seeds** minute, oblong, angled.—**Distrib.** Europe, N. Africa, W. Asia; species 18.—**Etym.** digitus, a finger.

**D. purpœrea**, L.; leaves ovate-oblong or lanceolate crenate.

Copses, banks, &c., ascends to near 2,000 ft. in the Highlands; Ireland; Channel Islands; fl. July–Sept.—Glandular-pubescent and hoary. **Stems** 2–4 ft., stout, erect, rarely branched. **Leaves** 6–12 in., rugose above, radical petioled; upper cauleine sessile. **Raceme** 1–2 ft., elongate, secund, dense-fid.; bracts leafy; pedicels short. **Flowers** pendulous. **Calyx-lobes** oblong-lanceolate. **Corolla** 1½–2½ in., speckled with purple ocellated rarely white spots; lobes ciliate. **Capsule** ovoid, exceeding the calyx. **Seeds** alveolate.—**Distrib.** W. Europe.—A well-known sedative drug.

**8. VERONICA**, Tourn. **Speedwell.**

Herbs or shrubs. **Leaves** lower or all opposite, rarely whorled. **Flowers** in axillary or terminal racemes, rarely solitary, usually blue, never yellow. **Calyx** 4-, rarely 5-partite. **Corolla** rotate or subcampanulate; limb 4-, rarely 5-fid, spreading, lateral lobes usually narrower. **Stamens** 2, inserted on the corolla-tube at the sides of the upper lobe, exserted; anther-cells diverging or parallel, tips confluent. **Stigma** subcapitate. **Capsule** compressed or turgid, septi- or loculicidal. **Seeds** ovoid or orbicular, peltate smooth or rugulose.—**Distrib.** North temp. regions, Australia, New Zealand, Chili; species about 160.—**Etym.** obscure.
Section 1. **Omphalo'spora.** Annual. Peduncles 1-fld., solitary, axillary in alternate leaf-like bracts. Seeds cup-shaped, or deeply grooved on one side.

1. **V. agrestis**, L.; prostrate, slightly hairy and glandular, leaves petioled ovate-cordate coarsely serrate, sepals ovate or oblong, cells of the capsule compressed 2-lobed 4-10 seeded.

Waste places, N. to Shetland; ascends to 1,200 ft. in Northumbd.; Ireland; Channel Islands; fl. April–Sept.—Branches 4-8 in., slender. Leaves \( \frac{3}{4} - \frac{5}{2} \) in., obtuse; floral similar, about as long as the decurved pedicels. Flowers honeyed, homogamous. Sepals \( \frac{1}{2} \) in., ciliate, 3-nerved, when in fruit \( \frac{1}{2} \) in. and unequal. Corolla \( \frac{1}{4} - \frac{1}{2} \) in. diam., shorter or longer than the sepals. Capsule \( \frac{1}{2} \) in. diam., hairy or ciliate.—Distr. Europe, N. Africa, N. and W. Asia, Himalaya; introd. in N. America.

V. agrestis proper; leaves \( \frac{1}{3} - \frac{2}{3} \) in., serratures regular not deep, sepals linear-oblong, corolla pale-blue or white, seeds 4-5 in each cell.

Sub-sp. V. polita, Fries; leaves \( \frac{1}{4} - \frac{3}{4} \) in. broader, serratures deeper and rather irregular, sepals ovate subacute, corolla bright blue, seeds 8-10 in each cell.

2. **V. Buxbaumii**, Ten.; prostrate, hairy, eglandular, leaves shortly petioled oblong or ovate-cordate coarsely serrate, sepals lanceolate subacute spreading in fruit, cells of the capsule diverging compressed 2-lobed 5-8-seeded. **V. persica**, Poir. (the oldest name).

Fields from Caithness and the Clyde southd.; ascends to 1,000 ft. in Northumbd.; Ireland; (a colonist since 1825, Wats.); fl. April–Sept.—Branches 6-12 in., tips often ascending. Leaves \( \frac{1}{4} - \frac{1}{2} \) in., obtuse, petiole variable; floral similar, shorter than the decurved pedicels. Sepals usually large, ciliate, 5-7-ribbed and reticulate in fruit. Corolla \( \frac{1}{3} \) in. diam., bright blue. Capsule \( \frac{1}{2} \) in. diam., reticulate, glandular-pubescent.—Distr. From Belgium southd., N. Africa, W. Asia, Himalaya; introd. in N. America.

3. **V. hederæfolia**, L.; prostrate, pubescent, leaves petioled very broadly-ovate 5-7-lobed, sepals cordate ciliate exceeding the corolla, cells of the biglobose capsule 1-2-seeded.

Cultivated ground, N. to Shetland; Ireland; Channel Islands; fl. March–Aug.—Branches 6-18 in. Leaves \( \frac{1}{4} - \frac{3}{4} \) in. broad, lobes rounded, petiole dilated upwards; floral similar, about equalling the decurved or straight peduncles. Flowers appearing in succession as the branch lengthens, homogamous. Sepals acuminate, membranous. Corolla \( \frac{1}{2} \) in. diam., pale blue. Seeds large, rugose, with a small deep pit on the inner face.—Distr. Europe, N. Africa, W. Asia, Himalaya; introd. in N. America.

Section 2. **Veronicascarum.** Leaves all opposite, or floral alternate. Flowers in terminal racemes. Capsules flat, valves adhering to the axis. Seeds plano-convex, biconvex, or flattened.

4. **V. triphylllos**, L.; annual, suberect, glandular-pubescent, leaves small, upper incised, lower petioled, sepals linear-oblong, cells of the obcordate capsule many-seeded.
Sandy fields, Norfolk and Suffolk, York; fl. May–June.—Stem 3–8 in., rigid, branches few. Leaves \(\frac{1}{4}-\frac{3}{2}\) in., long and broad, palmately 3–7-lobed; lobes entire, obtuse, oblong or linear; floral subdigitate. Flowers few, subrace-mose; bracts 3–5-partite; peduncles slender, ascending. Sepals subequal, obtuse. Corolla \(\frac{3}{4}\) in. diam., dark blue. Capsule \(\frac{1}{4}\) in. diam., as broad as long, deeply-lobed, glandular. Seeds rugose.—Distrb. From Gothland southd., N. Africa, N. and W. Asia, N.W. India.

5. V. arvensis, L.; annual, erect or ascending, pubescent, leaves ovate-cordate irregularly crenate-serrate, bracts alternate, pedicels short, capsule obcordate, seeds 6–7 in each cell nearly flat.

Dry sandy, &c., places, N. to Shetland; ascends to near 2,000 ft. in Yorkshire; Ireland; Channel Islands; fl. May–Oct.—Branches 4–18 in., stiff, 2-fariously pubescent, often very long and simple. Leaves \(\frac{3}{4}-\frac{3}{4}\) in., lower petioled, serratures few obtuse. Bracts often in dense leafy cylindric racemes, linear or oblong-lanceolate, obtuse, entire or obscurely lobed, exceeding the flowers. Sepals narrow, obtuse, ciliate. Corolla minute, pale blue with a white eye. Style very short. Capsule \(\frac{1}{4}-\frac{1}{2}\) in. broad, glandular, shorter than the sepals.—Distrb. Europe, N. Africa, N. and W. Asia, Himalaya; introd in N. America.

Var. eximia, Towns. (? var. perpusilla, Bromf.), from Hants, is prostrate, tufted, with shorter leaves bracts and sepals.

6. V. verna, L.; annual, erect, glandular-pubescent, leaves lobed or pinnatifid, bracts lanceolate entire, pedicels short, capsule deeply obcordate, seeds 6–7 in each cell flat.

Sandy fields, Norfolk and Suffolk; fl. May–June.—Habit of V. arvensis, but always small, 2–4 in., densely leafy and more glandular-pubescent; flowers always much crowded; capsule and seeds much the same in both.—Distrb. Europe, N. America, W. Asia, N.W. India.

7. V. serpylinfolia, L.; perennial, ascending, stem glandular-pubescent, leaves subentire, racemes many-flowered, pedicels short erect, style as long as the didymous flat capsule, seeds plano-convex minute.

Fields, moist waste places, &c., N. to Shetland; ascends to 2,500 ft. in the Highlands; Ireland; Channel Islands; fl. May–June.—Much branched from the base; branches 3–10 in. Leaves \(\frac{1}{4}-\frac{3}{4}\) in., sessile, ovate-rotundate or oblong, obtuse, subcoriaceous. Raceme 1–4 in.; bracts alternate, quite entire, lower leaf-like, upper narrow. Flowers proterogynous or homogamous. Sepals oblong-obovate, obtuse, ciliate, shorter than the corolla. Corolla \(\frac{1}{4}\) in. diam., white or lilac. Capsule shorter than the sepals, glabrous.—Distrb. Europe (Arctic), N. Africa, N. and W. Asia, Himalaya, N. America.—V. humifusa, Dicks., is an alpine variety, decumbent, rooting at the nodes, with leaves entire, flowers few, corolla blue, capsule glandular-pubescent. Ascends to 3,700 ft. in the Highlands.

8. V. alpina, L.; perennial, erect, glandular-pubescent above, leaves ovate entire or serrulate, raceme corymbose few-fld., bracts alternate, pedicels short erect, capsule obovate notched, seeds plano-convex.
Springs and rills, highest Scotch Alps, rare, from 1,600 to 3,700 ft.; fl. July-Aug.—Resembles V. serpyllifolia, but more erect; leaves rather larger; flowers fewer, in a denser raceme; sepals narrower, subacute, half as long as the obscurely notched capsule; corolla dark blue; style short, and seeds larger.—DISTRIB. Arctic and Alpine Europe, Asia, America.

9. **V. saxatilis**, L.; perennial, decumbent, subglabrous, lower leaves obovate, upper oblong, raceme subcorymbose few-fld., bracts subopposite, pedicel long erect, style long, capsule oblong, seeds nearly flat.

Highest Scotch Alps, alt. 1,600-3,000 ft., rare; fl. July-Sept.—Stem woody; branches many 2-4 in., ascending, with leafy barren shoots. **Leaves** 4-1/2 in., coriaceous, teeth very few or 0. **Sepals** linear-oblong, obtuse, shorter than the capsule. **Flowers** 1/2 in. diam., bright blue, very beautiful, honeyed, homogamous; pedicels 1/2-1 in., stiff. **Style** short, slender. **Capsule** 1/2 in., exceeding the sepals.—DISTRIB. Arctic, N. and Alpine Europe, Greenland.

**SECTION 3. Chamaedrys.** Perennial. **Branches** diffuse, ascending. **Leaves** all opposite. **Racemes** axillary. **Capsule** flat, notched or 2-lobed, valves adhering to the axis. **Seeds** plano-convex or turgid.

10. **V. officinalis**, L.; glandular-pubescent or subglabrous, stem hairy all round, leaves shortly petioled obovate-oblong or orbicular serrate, pedicels very short, capsule triangular or obcordate truncate or retuse.

Banks and pastures, N. to Shetland; ascends to near 3,000 ft. in the Highlands; Ireland; Channel Islands; fl. May-July.—Decumbent; branches 2-18 in., ascending. **Leaves** 1/2-1 in., contracted into the petiole, sharply or obtusely serrate. **Racemes** slender, many-fld.; pedicels erect; bracts lanceolate or subspathulate, obtuse. **Sepals** linear-oblong. **Corolla** 1/2 in. diam., pale blue or lilac. **Style** very long. **Capsule** 1/2 in., much longer than the sepals. **Seeds** nearly flat.—DISTRIB. Europe, N. and W. Asia, Himalaya N. U. States.—Leaves bitter and astringent.

**V. hirsuta**, Hopkirk (V. salig’na, D. Don.), is a very hairy small variety with leaves narrower smaller, capsule seedless entire at the tip. Ayrshire.

11. **V. Chamaedrys**, L.; hairy, stem pubescent on opposite sides, leaves subsessile ovate-cordate deeply serrate, pedicels slender, raceme long lax, capsule obcordate shorter than the calyx.

Copses, pastures, banks, &c., N. to Shetland; ascends to 2,700 ft. in the Highlands; Ireland; Channel Islands; fl. May-June.—Branches 8-24 in., slender, ascending. **Leaves** 1/2-1 1/2 in. **Raceme** with its slender peduncle 2-5 in.; bracts linear, much shorter than the pedicels. **Flowers** honeyed, homogamous. **Sepals** linear-lanceolate, acute. **Corolla** 1/2-1 1/2 in. diam., bright blue. **Capsule** broader than long, pubescent and ciliate.—DISTRIB. Europe (Arctic), Siberia; introd. in N. America.

12. **V. montana**, L.; hairy, stem pubescent all round, leaves petioled ovate-cordate serrate, pedicels slender, racemes short lax, capsule orbicular longer than the calyx glabrous, margin subcrenulate ciliate.

Moist woods from Skye and Banff southd.; ascends to 1,000 ft. in Yorkshire; Ireland; fl. June-Sept.—Habit of **V. Chamaedrys**, but sepals much broader.
corolla not \( \frac{1}{4} \) in. diam., paler blue; capsule glabrous except the margins; and foliage darker (though not black) in drying.—Distrib. From Gothland southd. (excl. Greece, Turkey), N. Africa, W. Siberia.

13. V. scutella'\( \wedge \)ta, L.; suberect, leaves sessile linear-lanceolate faintly toothed, racemes subopposite, pedicels slender deflexed in fruit. Bogs, edges of ditches, &c., N. to Shetland, not very common; ascends to 2,200 ft. in Yorkshire; Ireland; Channel Islands; fl. July–Aug.—Glabrous, rarely hairy (var. pubesc'\( \wedge \)ens), stoloniferous. Stem*6–24 in., slender, brittle, decumbent and rooting below, sparingly branched. Leaves 1–2 in., \( \frac{1}{2} \)-amplexicaul. Racemes many; peduncles filiform, usually as long as the leaves; pedicels secund, spreading; bracts small. Sepals ovate-oblong, acute. Corolla \( \frac{1}{4} \) in. diam., white or pinkish. Capsule \( \frac{1}{4} \) in. diam., broader than long, deeply 2-lobed, margins ciliate.—Distrib. Europe (Arctic), N. Africa, N. and W. Asia, N. America.

Section 4.—Beccabun'\( \wedge \)ga. Perennial. Leaves opposite, serrate. Racemes axillary, opposite, many-fld. Capsule flat, loculicidal; valves 2-fld, falling away from the seed-bearing axis.

14. V. Beccabun'\( \wedge \)ga, L.; procumbent, glabrous, succulent, leaves petioled oblong obtuse serrate, capsule orbicular notched. Brooklime. Margins of brooks, ditches, &c., N. to Shetland; ascends to 2,800 ft. in the Highlands; Ireland; Channel Islands; fl. May–Sept.—Stem hollow, rooting below; branches 1–2 ft., spreading. Leaves 1–2 in., sometimes obovate. Racemes 2–4 in.; bracts narrow, usually shorter than the pedicels. Flowers honeyed. Sepals small, ovate-oblong, subacute, glabrous. Corolla \( \frac{1}{8} \) in. diam., bright blue or pink. Capsule turgid, a little exceeding the sepals. Seeds minute, biconvex.—Distrib. Europe, N. Africa, N. and W. Asia, Himalaya.—A reputed antiscorbutic.

15. V. Anagal'\( \wedge \)lis, L.; erect, glabrous, stout, succulent, stoloniferous, leaves sessile \( \frac{1}{2} \)-amplexicaul ovate- or oblong-lanceolate serrate, capsule orbicular notched. Watery places, N. to Shetland; ascends to 1,050 ft. in Derby; Ireland; Channel Islands; fl. July–Aug.—Stoloniferous. Stem 1–3 ft., simple or sparingly branched. Leaves 2–5 in., subacute, sometimes auricled at the base, teeth small. Racemes ascending, 4–10 in., elongating in fruit; bracts lanceolate, about equaling the pedicels. Sepals ovate-lanceolate, subacute, glabrous or glandular. Corolla \( \frac{1}{5} \)–\( \frac{1}{3} \) in. diam., pale lilac or white. Style moderate. Capsule shorter than sepals, rather turgid. Seeds as in V. Beccabun'\( \wedge \)ga.—Distrib. Europe, N. Africa, N. and W. Asia, Himalaya, N. America.


*V. spicata* proper; leaves subsessile narrow-oblong or oblong-lanceolate serrated above the middle. E. counties, very rare.—*Var.* *V. hybrida*, L.; larger, stouter, leaves petioled broader serrate throughout. W. counties, from Wales and Westmoreland to Bristol.

### 9. BART'SIA, L.

Erect herbs, parasitic on roots. *Leaves* opposite or upper alternate, crenate or serrate. *Flowers* in bracteate spikes; bracts leafy. *Calyx* tubular or campanulate, 4-fid. *Corolla* tubular, 2-lipped; upper lip arched, entire or notched, its sides not reflexed; lower as long or shorter, tip 3-fid. *Stamens* 4, didynamous, hidden by the upper lip; anther-cells mucronate. *Stigma* obtuse, or 2-lobed, posticus lobe very small. *Capsule* ovoid or oblong, compressed, loculicidally 2-valved, sepa and placentas persistent. *Seeds* transversely ovoid.—*Distrib.* N. temp. regions; species 60.—*Etym.* John Bartsch, a Prussian botanist.

#### Section 1. BART'SIA proper. *Capsule* ovoid, acuminate. *Seeds* many, large, ribbed or winged on the back; hilum lateral.


#### Section 2. EUFRA'GIA, Griseb. (gen.). *Capsule* oblong, acute. *Seeds* very minute, faintly granulate; hilum basal.

2. **B. visco'sa**, L.; annual, viscid, leaves sessile ovate or oblong-lanceolate coarsely serrate.

Meadows, &c., S. England, Sussex to Cornwall; Wales; Chester to Argyll; W. Ireland; Channel Islands; fl. June-Oct.—*Stem* 6-18 in., terete, usually simple, often flowering throughout much of its length. *Leaves* ¼-1½ in., rather scabrid, nerves prominent beneath. *Calyx-tube* curved; lobes triangular-lanceolate, acuminate. *Corolla* ¼ in., yellow, glandular; lower lip

SECTION 3. Odontites, Persoon (gen.) Capsule ovate or oblong, compressed, obtuse. Seeds strongly ribbed, pendulous; hilum basal.


Fields and waste places, N. to Orkney; ascends to 1,200 ft. in the Highlands; Ireland; Channel Islands; fl. June–Aug.—Stem 6–18 in., erect or ascending, wiry, 4-gonous, panicularly branched; branches opposite, terminating in slender leafy racemes. Leaves ¼–2 in., sessile, very variable. Spikes sub-secund; lower bracts leafy, upper narrower. Flowers protogynous, honeyed. Calyx campanulate; lobes ovate, acute, as long as the tube. Corolla ¼ in., pink, pubescent; upper lip long, entire. Anthers usually exserted, yellow, almost glabrous. Style moderate. Capsule ¼ in., rather exceeding the calyx. Seeds narrow-oblong.—Distrib. Europe, N. Asia, N. Africa, Himalaya.—Often placed in Euphrasia, and with reason.

Var. O. veru'ma, Reichb.; branches ascending, leaves rounded at the base bracts longer than the flowers, calyx-teeth equalling the tube.—Var. O. seroti'na, Reichb. (Euphrasia rotunda'ta, Ball); branches flexuous upcurved, leaves narrow at the base, bracts shorter than the flowers, calyx-teeth equalling the tube.—Var. O. diver'gens, Jord.; much branched, branches widely spreading.

10. EUPHRASIA, Tournef. Eyebright.

Annual or perennial herbs, parasitic on roots. Leaves opposite, toothed or cut. Flowers in dense secund or interrupted bracteate spikes, white yellow or purple. Calyx tubular or campanulate, 4-fid. Corolla tubular, 2-lipped; upper lip concave, lobes 2, broad spreading; lower spreading 3-fid. Stamens hidden by the upper lip; anthers-cohering by hairs, cells mucronate. Stigma dilated, obtuse. Capsule oblong compressed, loculicidally 2-valved. Seeds few or many, pendulous, oblong or fusiform, furrowed.—Distrib. Temp. regions; species 20.—Etym. εὐφραίνω, to gladden, in allusion to its former use as an eye-medicine.

E. officinalis, L.; annual, lower leaves crenate, upper cut.

Meadows, heaths, &c., N. to Shetland; ascends to 3,600 ft. in the Highlands; Ireland; Channel Islands; fl. May–Sept.—Glabrous or glandular-pubescent. Stem 1–10 in., erect, wiry, usually with many opposite branches. Leaves ¼–½ in., sessile, ovate or lanceolate. Spikes terminal; bracts leafy; flowers minute. Flowers dimorphous, larger protogynous, smaller proterandrous. Calyx about equalling the bracts, tube ribbed; lobes acute. Corolla ¼–½ in., white or lilac, purple veined; mid-lobe of lower lip yellow. Anthers brown, pubescent, one cell spurred. Capsule included or exserted. Seeds very variable in form and colour.—Distrib. Europe (Arctic), N. and W. Asia, Himalaya, N. America.—Of this plant there are a multitude of forms.

E. officinalis proper; bracts triangular-ovate base broad, lower corolla-clip equalling or exceeding the tube.—Var. E. gracilis, Fries; more slender, bracts broader, base narrowed, lower corolla-clip shorter than the tube.—
VAR. marit’ima; capsule much longer than the calyx. Shores of Shetland.

11. RHINANTHUS, L. YELLOW-RATTLE.

Annual erect herbs, black when dry, parasitic on roots. Leaves opposite, narrow, serrate. Flowers in secund spikes, yellow spotted with violet, honeyed; bracts broad, cuspidate-toothed. Calyx ventricose, compressed, 4-toothed. Corolla 2-lipped, tube subcylindric; upper lip obtuse, compressed, entire, with a toothed appendage on each side the tip; lower shorter, lobes 3 spreading. Stamens 4, hidden by the upper lip; anthers cohering by hairs, not spurred. Style filiform, tip inflexed, stigma subcapitate. Capsule orbicular, compressed, loculicidally 2-valved; valves membranous, entire, bearing the placentas in the middle. Seeds suborbicular, compressed, hilum lateral; embryo small.—DISTRIB. Europe (Arctic), N. Asia, N. America; species 2–3.—ETYM. pbr, the nose, and āvðos, flower, in allusion to the form of the corolla.

R. Crista-gal’li, L.; erect, leaves deeply crenate-serrate. Damp pastures and wet places, N. to Shetland; ascends to 2,500 ft. in the Highlands; Ireland; Channel Islands; fl. May–July.—Glabrous or glandular pubescent. Stem 6–18 in., simple or with opposite branches, 4-gonous. Leaves distant, 1–2 in., oblong-lanceolate or linear-oblong, obtuse or acute. Bracts longer than the calyx, ovate, taper-pointed. Flowers dimorphic as in Euphrasia. Calyx 1/4–1 in., mouth small, teeth triangular. Corolla 1/4–1 in., yellow; lobes of upper lip blue. Anthers bluish. Capsule included in the bladdery calyx-tube. Seeds with a broad or narrow wing.—DISTRIB. Of the genus.

R. Crista-gal’li proper; stem subsimple, bracts green, spikes few- and lax-fld., corolla-tube hardly exceeding the calyx, lobes of upper lip short roundish. R. mîn’or, Ehrh. Meadows and pastures.

Sub-sp. R. măj’or, Ehrh.; taller, much branched, bracts yellowish, spikes many and dense-fld., corolla larger tube exceeding the calyx, lobes of upper lip oblong, seed-wing broad (var. platyp’tera, Fr.) or narrow (stenop’tera, Fr.), or 0 and seed ribbed (ap’tera, Fr., R. Reichenbach’ii, Drej.). Fields, sporadic, not in Ireland or Channel Islands.

12. PEDICULA’RIS, Tournef. LOUSEWORT.

Herbs, black when dry; parasitic on roots. Leaves alternate whorled or opposite, toothed or pinnatisect. Flowers in bracteate spikes or racemes, white red purple or yellow, honeyed. Calyx tubular or campanulate, split anteriorly; teeth 2–5, unequal, entire lobed or crested. Corolla 2-lipped, tube cylindric or throat dilated; upper lip compressed, entire or notched, or with 2 teeth below the tip; lower 3-lobed. Stamens 4, concealed by the upper lip, filaments or the 2 posterior only hairy; anthers cohering by hairs, cells obtuse. Capsule compressed, loculicidally 2-valved, seeds few, in its lower part. Seeds ovoid, testa firm or lax rugose or smooth; embryo short or long.—DISTRIB. N. temp. regions; species 120.—ETYM. pediculus, being supposed to encourage lice in sheep.
1. *P. palustris*, L.; stem erect branched above, calyx ovoid compressed hairy ribbed, lobes subequal crenate. 

Bogs and marshes, N. to Shetland; ascends to 1,800 ft. in the Highlands; Ireland; Channel Islands; fl. May–Sept.—Annual, glabrous or sparingly hairy. **Stem 6–18 in., stout. Leaves 1–3 in., linear-oblong, pinnate; segments oblong, obtuse, crenate or pinnatifid, ultimate rounded. Bracts leafy. Calyx 1/2 in., reddish green, ventricose in fruit. Corolla 1 in., dull pink; upper lip 3-toothed, lower broad. Capsule exceeding the calyx, curved.**—**DISTRIB. Europe (Arctic) (excl. Spain, Greece), N. Asia.**

2. *P. sylvatica*, L.; stem branched at the base, branches spreading, calyx oblong angled glabrous, lobes unequal foliaceous crenate. 

Copses, heaths, and damp meadows, N. to Shetland; ascends to 2,000 ft. in the Highlands; Ireland; Channel Islands; fl. April–July.—Perennial, glabrous. **Stems many, 3–10 in., decumbent and ascending from a very short rootstock, leafy. Leaves and bracts much as in *P. palustris*, but segments acute. Spike lax-fld. Calyx 1/2 in., 5-lobed, upper lobe entire, the rest foliaceous. Corolla 1 in., rose-cold., tube slender, upper lip 2-toothed. Capsule longer than the calyx, obliquely truncate.**—**DISTRIB. Europe (excl. Greece, Turkey).**


Erect, branched, annual herbs, black when dry, parasitic on roots. Leaves opposite, cauline narrow entire. Flowers axillary and solitary or in leafy spikes, honeyed. Calyx tubular or campanulate; teeth 4, acuminate. Corolla 2-lipped, tube cylindric, dilated above; upper lip short, compressed, truncate, margins recurved; lower shorter, 3-lobed, palate prominent. Stamens 4, under the upper lip, anthers oblong, cohering by hairs, cells mucronate. Disk hypogynous, anticus. Stigma small, obtuse; ovules 2, collateral near the base of each cell, one subsessile erect, the other stalked fixed laterally. Capsule compressed, ovate, oblique or falcate, loculicidally 2-valved, 1–4-seeded. Seeds oblong, testa smooth, hilum thickened; embryo small.**—**DISTRIB. Europe, temp. Asia; species 6.—**ΕΤΥΜ. μελας and πυς, black wheat.**

1. *M. pratense*, L.; flowers axillary secund, bracts entire or toothed, corolla much longer than the calyx, lips closed, lower straight. 

Copses, heaths, and pastures, N. to Orkney; ascending to 3,000 ft. in the Highlands; Ireland; fl. June–Sept.—Glabrous or pubescent, very variable. **Stem 6–24 in., terete, wiry; branches spreading. Leaves 1/2–3 in., ciliate, linear-or ovate-lanceolate, sessile or very shortly petioled, quite entire. Bracts ciliate, often toothed laciniate or pinnatifid, sometimes hastate. Calyx-teeth lanceolate ascending. Corolla pale yellow, horizontal, tube straight. Capsule ovoid, deflexed.**—**DISTRIB. Europe (Arctic) (excl. Spain, Italy, Greece Turkey), Siberia.**

*M. pratense* proper; leaves linear-lanceolate acute, bracts toothed or pinnatifid tips slender.—**VAR. latifolia;** leaves ovate-lanceolate from a broad base, bracts deeply toothed, the upper with short tips. Chalk, &c. districts, Oxford, Monmouth, I. of Wight.—**VAR. M. montanum, Johnst.**
leaves linear-lanceolate, bracts entire tips long slender.—Var. ericetorum, D. Oliv.; hispid, leaves linear-lanceolate, bracts toothed.

2. M. sylvaticum, L.; flowers axillary second, bracts quite entire, corolla not much exceeding the calyx, lips not closed, lower deflexed. Subalpine woods, rare, from York to Caithness; ascends to 1,000 ft. in the Highlands; N.E. Ireland, rare; fl. July-Aug.—Similar in habit and foliage to M. pratense, but flowers suberect; calyx-teeth spreading; corolla smaller, shorter, deep yellow rarely pale (var. pallidijlo'ra), its tube curved, and capsule not deflexed.—Distrib. Europe (Arctic) (excl. Greece), Siberia.


14. LATHRÆ'A, L. TOOTHWORT.


L. squama'ria, L.; raceme decurved in bud, flowers subsessile. On roots chiefly of hazel in shady places, from Perth and Inverness southd.; Ireland; fl. April–May.—Perennial, white or purplish, glabrous or pilose, fleshy, black when dry. Rootstock branched, scaly, rootlets attached by tubercular bases to the rootlets of the plant it preys upon. Stems 4–10 in., stout, scaly. Raceme 4–6 in.; bracts like the scales, broadly oblong.

x 2
SCROPHULARINEAE. [Lathrea.]

_flowers_ \( \frac{1}{2} \) in. Calyx 2-lipped, lobes broad subacute, shorter than the dull purple arched corolla, which has small erect lobes. Anthers coherent, pubescent. Style exserted, decurved, stigma purple. Capsule ovoid.—Distrib. Europe, N. and W. Asia, Himalaya.

Order LVI. OROBAN'CHEÆ.

Leafless brownish root-parasites. Rootstock often tuberous, naked or scaly. Stem usually stout, solitary, scaly. Flowers in lax or dense spikes or racemes. Sepals 4–5, inferior, free or connate. Corolla hypogynous, irregular, tube curved; limb 2-lipped; upper lip arched, lower 3-fid; throat with 2 villous folds. Stamens 4, didynamous, inserted on the corolla-tube; anthers 2-celled, cells spurred at the base, opening by lateral slits or basal pores. Disk unilateral, or 0. Ovary 1-celled, of 2 carpels; style simple, curved at the tip, stigma capitate 2-lobed; ovules many, rarely few, anatropous, placentas 2 pairs free or confluent parietal. Capsule 1-celled, 2-valved, few- or many-seeded. Seeds minute, testa thick pitted or tubercled, albumen fleshy; embryo ovoid, undivided or 2-fid.—Distrib. Temp. and trop.; chiefly S. Europe and E. Asia; genera 11; species 150.—Affinities. With Scrophularinace and Cyrtandraceae, and possibly parasitic forms of these.—Properties. Astringent and bitter.

See Lathrea in Scrophularinæ.

1. OROBAN'CHE, L. Broom-rape.

_Flowers_ usually glandular-pubescent, 1–3-bracteate. Sepals 4, usually connate in pairs, with sometimes a small 5th. Corolla gaping; upper lip erect, 2-lobed; lower spreading, 3-lobed. Stamens included, filaments flattened below; anther-cells spreading. Disk glandular or 0. Ovary ovoid; style usually glandular, stigma 2-lobed. Capsule imperfectly 2-valved, many-seeded; valves cohering at the base and usually at the top also.—Distrib. Of the Order; species about 100.—Etym. ῶποθός, a vetch, and ἀγχέων, to strangle, from its parasitic habit.

Section 1. Ospro'leon proper. Stem usually quite simple. Flowers 1-bracteate, ebracteolate. Calyx-segments 2, 2-fid, rarely entire. Capsule with the valves coherent above.

1. _O. ma'jor_, L. ; brown, sepals 1–3-nerved nearly as long as the corolla-tube, upper lip entire, mid-lobe of lower lip longer than the lateral, filaments glabrous below glandular above, stigma yellow. _O. Ra'pum_, Thuill. On roots of shrubby Papilionaceae, from Dumfries southd.; Ireland; Channel Islands; fl. June–Aug.—Stem stout, 1–2 ft. Spike rather dense-fld.; bracts equaling or exceeding the corolla. Sepals entire or 2-fid. Corolla 1 in., yellow and purplish, subcampanulate, curved, lobes small, waved, scarcely
toothed; upper lip arched, scarcely notched.—Distrib. From Holland southd. (excl. Greece, Turkey), N. Africa.—Reichenbach figures the lobes of lower lip as small and equal, and flower as red-brown. I take this to be O. major of Linnens, who states that it is parasitic especially on *Leguminosae*, and quotes for it the *Rapum genistae* of Lobel. There are no specimens in *Linn. Herb.*

2. **O. elatior**, Sutt.; yellow, sepals 2-fid 2–3-nerved as long as the corolla-tube, lobes of lip subequal acute, filaments glandular below glabrous above, stigma yellow.

Parasitic on *Centaurea Scabiosa*, chiefly in the E. counties from York and Durham to Sussex and Somerset, rare; S. Wales; fl. June–Aug.—Habit of *O. major*, of which it is probably a sub-species; but bracts shorter than the corolla, which is narrower, more compressed above, the lobes more toothed, and the upper lip deeply notched, with inflexed margins.—Distrib. From Denmark southd., Caucasus, Siberia.

3. **O. caryophylla'cea**, Sm.; brown, sepals 2-fid several-nerved shorter than the corolla-tube, lobes of lower lip subequal waved and toothed, filaments hairy below glandular above, stigma purple. *O. Galii*, Duby.


4. **O. ru'bra**, Sm.; red, sepals entire 1-nerved subulate longer than the corolla-tube, lips toothed crisped, of mid-lobe lower longest, filaments subpilose below, glandular above, stigma pale red. *O. Epithy'mum*, DC.


5. **O. mi'nor**, Sutt.; yellow-brown or purplish, slender, sepals 1- or more-nerved with long slender points, corolla-tube contracted in the middle, filaments more or less hairy below, stigma subglobose.


O. mi'nor proper; bracts equalling or exceeding the corolla whose tube is gently curved, limb white or yellowish, lobes of upper lip spreading, of lower nearly equal toothed and waved, stigmas purple.—On clover.

Sub-sp. O. amethyst'aea, Thuill.; corolla much curved in the lower third, upper two-thirds nearly straight, mid-lobe of lower lip much the largest. *O. Eryngii*, Duby.—Cornwall to Kent; Channel Islands.

Sub-sp. O. pi'cridis, F. Schultz; very pale, bracts about equalling the flowers, sepals entire or 2-cleft exceeding the slightly-curved corolla-tube 1-nerved,
upper lip retuse, tip inflexed, lobes of lower lip toothed nearly equal, stigma purple.—On Picris, Cambridge, Kent, Surrey, Hants, Tenby.

Sub-sp. O. hederacea, Duby; spike more lax, sepals 1-nerved, stigma yellowish.

O. barbata, Eng. Bot. Suppl., not Poir.—On Ivy, Wales, Gloster, Kent to Cornwall; Ireland; Channel Islands.


6. O. caerulea, Vill.; blue-purple, stem simple, calyx-lobes 4 lanceolate, corolla-tube curved, lobes of both lips acute, filaments almost glabrous, suture of anthers glabrous, stigma white.

Herts and Norfolk, and Hants to Cornwall, local; Channel Islands; fl. June–Oct.—Stem 6–12 in., slender, tough, not tumid below. Spikes usually dense; bracts lanceolate. Corolla-tube $\frac{1}{2}$–1 in., curved, upper lip 2-lobed, lobes pale blue with darker veins.—Distrib. From Holland southd., W. Asia.

Sub-sp. O. arena'ria, Bork., found in Alderney, is distinguishable from O. caerulea by the hairy anthers.

Order I.VII. LENTIBULARI'NEAE.

Scapigerous herbs, chiefly aquatic or marsh. Leaves radical, crowded or whorled, undivided or multifid, exstipulate. Flowers solitary racemose or corymbose, irregular, bracteate. Calyx free, persistent, 2-labiate or 5-partite. Corolla hypogynous, deciduous, personate or 2-lipped, tube short; upper lip short 2-fid, lower entire or 3-fid; palate convex. Stamens 2, opposite the lateral sepals, hypogynous or inserted on the corolla-tube, filaments short arching; anthers adnate, 1-celled, transversely 2-valved. Disk 0. Ovary free, 1-celled; style short, thick, stigma 2-lipped, upper lip short, lower dilated; ovules many, anatropous, placenta free basal globose. Capsule 2-valved or bursting irregularly, many-seeded. Seeds minute, oblong or peltate, placenta spongy, testa striate or pitted sometimes hairy, albumen 0; embryo straight, sometimes undivided.—Distrib. Chiefly temp. and cold regions; genera 4; species about 180.—Affinities. With Scrophularinæ.—Properties unimportant.


Aquatic. Stamens on the base of the lip of the corolla ......2. Utricularia.

1. PINGUI'CULA, Tournef. BUTTERWORT.


—**ETYM. pinguis,** from the greasy texture.

### 1. P. vulga'ris, *L.*; calyx-lobes ovate-oblong obtuse, corolla violet, lips very unequal, spur slender about equalling the lower lip.

Wet bogs, &c., Shetland to Hants and Devon; rare in S. England; ascends to near 3,000 ft. in the Highlands; Ireland; Channel Islands; fl. May–July. Glabrous, except the glandular top of the scape and calyx. **Leaves** 1–3 in., appressed to the ground, oblong, obtuse, succulent; petiole broad, very short. **Scapes** several, 4–6 in., purplish. **Calyx-lobes** very variable. **Corolla** 3–1 in.; lower lip much longer and broader than the upper; segments broad, obtuse; spur straight or incurved, variable in length. **Stamens** 2 anterior, and sometimes 2 imperfect lateral. **Capsule** ovoid or subglobose. **Cotyledon solitary.**—**DISTRIBUT.** Europe (Arctic), N. Asia, N. America.—Leaves insectivorous, used to curdle milk in Lapland.

**P. vulga'ris** proper; calyx-lobes ovate sometimes subacute, corolla 3/ in., lobes of lower lip not overlapping, spur entire at the tip, capsule ovoid subacute.

**Sub-sp. P. grandiflo'ra, Lamk.**; larger, leaves broader, calyx-lobes more oblong, tip rounded, corolla 1 in., lobes of lower lip very broad overlapping, spur often 2-fid, capsule subglobose.—**Bogs, Cork and Kerry; (Penzance, introduced).**—**DISTRIBUT.** W. France, Alps, Pyrenees, Spain, Portugal.—The Irish is an extreme form; Alpine and Pyrenean intermediates are numerous.


**Bogs, S.W. England, local, from Hants to Cornwall; W. Scotland, Orkney to Wigton; Ireland, ascending to 1,500 ft. in Mayo; fl. June–Oct.** Glabrous. **Leaves** 1/–2 in., oblong, shortly petioled, thin, succulent, obtuse. **Scapes** very slender. **Corolla** 3/ in.; lips nearly equal, lower pouched from without, lobes short broad; spur very broad, obtuse. **Capsule** globose. **Cotyledons** 2.—**DISTRIBUT.** W. France, Spain, Portugal.

### 3. P. alpi'na, *L.*; calyx-lobes broadly ovate obtuse, corolla white, lips unequal, throat yellow, spur very short conical.

**Bogs, Skye, Ross; fl. May–June.**—Similar to **P. lusitanica,** but larger, scapes shorter; corolla 1/ in., throat hairy; lower lip longer than the upper; spur broader and more obtuse; capsule ovoid, acute.—**DISTRIBUT.** Europe, N. of the Alps (Arctic), N. Asia, Himalaya, Greenland, Fuegia.

### 2. UTRICULA'RIA, *L.*

Aquatic or terrestrial herbs, often floating and propagated by hybernacula. **Leaves** (of Brit. species) floating, multifid; segments very slender, furnished with minute pitchers, which entrap animalcules. **Flowers** solitary spiked or racemded, naked or bracteate. **Calyx** 2-partite, lobes subequal. **Corolla** personate, palate protruded. **Stamens** inserted on the upper lip of the corolla, filaments incurved; anthers subterminal, free or coherent, simple or constricted in the middle. **Style** short, stigma unequally 2-lobed. **Capsule** globose, bursting irregularly. **Seeds** oblong or peltate, striate,
pitted or with capitate or glochidiate hairs.—**Distr.** Widely dispersed; species 150.—**Etym.** *utriculus*, from the bladder-like pitchers.

1. **U. vulgaris**, *L.*; leaves spreading pinnately multifid, pitchers at the bases of and upon the leaf-segments, upper corolla-lip exceeding the palate or not, spur conic.

Pools and ditches, N. to Shetland, not common; ascends to 1,500 ft. in the Highlands; Ireland; Channel Islands; fl. July–Aug.—**Stems** 6–18 in., leafy. *Leaves* 3–1 in., broadly ovate; segments very slender, obtuse, remotely toothed with tufts of cilia at the sinus; pitchers 1–2 in., shortly stalked. *Scape* 4–8 in., 2–8-fld.; pedicels 2–3 times as long as the calyx, reflexed after flowering. *Corolla* 6–8 in., yellow, upper lip broad short, palate prominent; spur appressed to the under lip, honeyed. *Anthers* cohering. *Stigma* irritable.—**Distr.** Europe, N. Africa, Siberia, N. America.

**U. vulgaris** proper; stem and scapes stout, upper corolla-lip about equalling the palate, spur obtuse.


2. **U. intermedia**, *Hayne*; leaves distichous dichotomously multifid, pitchers on leafless branches, upper corolla-lip far exceeding the palate, spur conic acute.

Pools and ditches, rare, Dorset, Hants, Norfolk, Westmoreland to Sutherland; Ireland; fl. July–Sept.—**Stems** slender, 4–8 in. *Leaves* close-set, 3–4 in. broad, orbicular; segments subulate, distantly ciliate; pitchers 1–2 in. long, on slender stalks. *Scape* rather stout, 3–4-fld.; pedicels equalling or much exceeding the calyx. *Corolla* 6–8 in., pale yellow; upper lip twice as long as the prominent palate; lower broad, flat; spur appressed to the under lip. *Anthers* free.—**Distr.** Europe N. of the Alps, N. Asia, N. America.

3. **U. minor**, *L.*; leaves dichotomously multifid, pitchers on the leaf-axils, spur minute obtuse.


Flowerless specimens of **U. Bremii**, Heer, have been found in Nairn and Moray. It differs from **U. minor** in its more robust habit and orbicular lip.
ORDER LVIII. VERBENACEÆ.

Herbs, shrubs, or trees. 

Leaves opposite or whorled, exstipulate. 

*Flowers* cymose, irregular, bracteate. 

*Calyx* inferior, tubular, cleft or toothed, persistent, imbricate in bud. 

*Corolla* hypogynous, tubular, usually 2-lipped, imbricate in bud. 

*Stamens* usually 4, didynamous, inserted on the corolla-tube; anthers 2-celled. 

*Ovary* 2-4-celled; style simple, terminal, stigma simple or 2-fid; ovules solitary or 2 collateral in each cell, erect and anatropous or ascending and ½-anatropous. 

*Fruit* a 2- or 4-celled berry, or a drupe with 2-4 1-2-celled stones, or of 4 nutlets. 

*Seeds* ascending, exalbuminous; cotyledons foliaceous, radicle inferior. 

DISTRIB. Chiefly tropical; genera 59; species 700.—AFFINITIES. With Boragineæ and Labiateæ.—Properties unimportant.

1. VERBE'NA, L. VERVAIN.

Herbs or undershrubs. 

*Stem* 4-gonous. 

Leaves opposite or 3-nate, simple pinnatifid or 3-partite. 

*Flowers* bracteate, in terminal spikes or racemes. 

*Calyx* tubular, 5-ribbed, unequally 5-toothed. 

*Corolla* salver-shaped; tube straight or curved, villous within; limb oblique, 2-lipped, 5-fid. 

*Stamens* 4, 2 or all perfect, included. 

*Disk* annular. 

*Ovary* 4-celled; style slender, 2-lobed, one lobe stigmatic; ovules solitary in each cell, erect. 

*Fruit* of 4 ribbed nutlets.—DISTRIB. Almost wholly American; species 80.—ETYM. Classical, obscure.

*V. officin'alis, L.*; leaves opposite, flowers spiked. 

Dry waste ground, local, from Northumbd. southd.; Ireland, local; Channel Islands; fl. July–Sept.—Perennial, hispidly pubescent. 

*Rootstock* woody. 

*Stems* 1-2 ft., rigid, branched above. 

*Leaves* oblong, pinnatifid or 3-partite, lobes acute or obtuse, upper narrower. 

*Spikes* dense-fld., afterwards elongating; bracts ovate, acute, ½ as long as the calyx, which is ½ as long as the corolla-tube. 

*Corolla* lilac, limb ½ in. diam. 

*Nutlets* truncate, granulate.—DISTRIB. From Denmark southd., N. Africa, W. Asia, Himalaya; introd. in N. America.—An object of much superstition amongst the ancients.

ORDER LIX. LABIA'TÆ.

Glandular herbs or shrubs; branches 4-angled, opposite or whorled. 

*Leaves* opposite or whorled, entire or divided, exstipulate. 

*Flowers* solitary or in axillary opposite centrifugal often crowded (falsely whorled) cymes, irregular, 2-bracteate and bracteolate, proterandrous. 

*Calyx* inferior, persistent, 5-cleft, ribbed. 

*Corolla* hypogynous, deciduous, 5-merous, 2-lipped, imbricate in bud, upper lip outermost. 

*Stamens* inserted on the corolla-tube, perfect usually 4, 5th and sometimes 2 lateral imperfect or 0, anthers polymorphous. 

*Disk* annular. 

*Ovary* of 2 connate deeply 2-lobed carpels, hence 4-partite, 4-celled; style from between the lobes,
slender; stigma simple or 2-fid; ovules solitary in each cell, erect, anatropous. Fruit of 1-4 1-seeded nutlets. Seed erect or ascending, testa thin, albumen 0; embryo straight, rarely curved, cotyledons fleshy, radicle next the hilum.—Distrib. All warm and temp. regions, rare in Arctic and alpine; genera 136; species about 2,600.—Affinities. With Boraginaceae and Verbenaceae.—Properties. Stimulant, fragrant, aromatic.

Tribe I. Satureineæ. Corolla-lobes flat or margins recurved. Stamens 2-4, remote, spreading or conniving under the upper lip, 2 upper shorter or 0; anther-cells contiguous or confluent. Nutlets free, smooth, or nearly so.

* Corolla subregular. Stamens spreading; anthers 2-celled.
Perfect stamens 4 .................................................. 1. Mentha.
Perfect stamens 2 .................................................. 2. Lycopus.

** Corolla 2-lipped. Stamens 4, distant.
Erect, leaves broad. Calyx equally 5-toothed .................. 3. Origanum.

*** Corolla 2-lipped. Stamens 4, conniving under the upper lip.
Corolla-tube straight; upper lip flat .......................... 5. Calamintha.
Corolla-tube curved, ascending; upper lip concave .................. 5*. Melissa.

Tribe II. Monardeæ. Stamens 2, erect or ascending; anthers 1-celled, or if 2-celled cells remote. Nutlets free, smooth, or nearly so.

Calyx 2-lipped .................................................. 6. Salvia.

Tribe III. Nepeteæ. Stamens 4, 2 upper longer, ascending or diverging; anther-cells 2, parallel or nearly so. Nutlets smooth or tubercled.

Tribe IV. Stachydeæ. Stamens 4, parallel, 2 upper shorter, ascending under the concave upper lip or included in the tube. Nutlets free, smooth or tubercled.

* Calyx 2-lipped, not inflated, lips closing over the fruit.
Filaments 2-fid, anthers all 2-celled .................................. 8. Brunella.

**Calyx inflated or 2-lipped. Anthers exserted .................. 10. Melittis.


**** Calyx 5-toothed, subcampanulate, equal or oblique.


Mentha.]

**LABIATAE.**

**Tribe V. Ajugoideæ.** *Stamens 4, parallel, ascending, exserted, 2 upper shorter. Nutlets connate, base oblique, reticulate and rugose.*


**1. Mentha, L. Mint.**

Strong-scented perennial herbs; rootstock stoloniferous, creeping. Whorls many-fl., axillary, or forming terminal spikes; bracts subulate or foliaceous; bracteoles small or 0; flowers small. Calyx campanulate or tubular, 5-toothed; throat naked or villous. Corolla-tube short, limb campanulate 4-lobed; lobes subequal, upper broader. Stamens 4, equal, erect, distant, glabrous; anther-cells parallel. Style shortly 2-fid. Nutlets dry, smooth.—DISTRIB. N. temp. regions; species about 25.—ETYM. The old Greek name.—Species often variable, hybridizing and difficult to discriminate.

* Whorls in terminal spikes; bracts minute. Throat of calyx glabrous.

† Leaves all sessile, or the lower only petioled.

1. **M. sylvestris**, L.; leaves broadly or narrowly oblong-ovate or lanceolate subacute serrate smooth above hoary beneath, spike continuous, calyx-teeth lanceolate, corolla hairy glabrous within. *Horse-mint.*

Moist waste places, rare, from Forfar and the Clyde southd.; Ireland ? native; fl. Aug.—Sept.—Stem 2-3 ft., robust, tomentose with white hairs. Leaves 1-3 in., 3/2-2 in. broad, rounded or cordate at the base. Spikes 1-3 in., 1/2 in. broad, dense; bracts lanceolate; bracteoles subulate; pedicels hairy. Corolla lilac, about 1/2 in. diam.—DISTRIB. Europe, N. Africa, N. and W. Asia, N.W. India.

*M. sylvestris* proper; leaves oblong-lanceolate acute, base rounded, slightly hairy above hoary beneath, spikes slender.—VAR. *M. nemorosa*, Willd.; leaves broadly oblong acute, base rounded, slightly hairy above tomentose beneath, spike stouter.—VAR. *M. mollisima*, Bock., leaves broadly ovate acute, base subcordate, finely serrate hoary above felted beneath, spikes stout. Rare.—VAR. *M. alopecuroides*, Hull (velutina, Bab.); leaves broad large coarsely serrate, base subcordate, somewhat wrinkled above very hairy beneath, spikes short stout, bracts broader. Kent, Essex, Norfolk, Perth, rare; (an escape? *Wats.*) The transition to *M. rotundifolia*.

2. **M. rotundifolia**, L.; leaves broadly ovate-oblong very obtuse crenate much wrinkled above shaggy or deeply tomentose beneath, spikes interrupted, calyx hairy teeth subulate, corolla hairy glabrous within.


M. viridis, L.; glabrous or nearly so, leaves oblong-lanceolate subacute serrate smooth above, spikes slender, corolla wholly glabrous. *Spear-mint.*
Wet places, naturalized in England and Scotland, rare; possibly indigenous in W. York; fl. Aug.–Sept.—Probably a cultivated form of *M. sylvestris*, easily distinguished by its pungent smell.—**Distrib.** Cultivated for culinary purposes.—**Var. crispa** is a garden form with crisped foliage.

†† Leaves petioled.

3. *M. piperita*, Huds.; glabrous, leaves ovate or obleng-lanceolate acute serrate upper smaller, spikes cylindric interrupted below, pedicels and flowers glabrous or very sparingly hispid. *Peppermint.*

Damp places, from the Clyde and Forfar to Sussex and Cornwall; Ireland; (a doubtful native, *Wats.*); fl. Aug.–Sept.—Usually smaller and more slender than the preceding. **Leaves** 1–4 in., acute or obtuse at the base, coarsely serrate, smooth above, rarely sparingly hairy on the nerves beneath uppermost sometimes bracteiform. **Calyx** often red.—**Distrib.** Europe; introd. in America. Nowhere indigenous, *Nyman.*—Probably a garden form of *M. aquatica*, Bentham.

Two forms occur: *M. officinalis*, Hull; leaves acute or rounded at the base, spikes elongate, and *M. vulgaria*, Sole; leaves rounded or subcordate at the base, spikes shorter.

4. *M. aquatica*, L.; usually softly hairy, leaves ovate-oblong or cordate, upper bracteiform, spikes oblong continuous or interrupted below, pedicels and flowers usually hairy or villous.

River-sides, marshes, N. to Orkney, &c., ascends to 1,500 ft. in Yorkshire; Ireland; Channel Islands; fl. Aug.–Sept.—Very common and variable; some forms are with difficulty distinguished from *M. sativa*. **Stem** 1–5 ft. **Leaves** 1–3 in. **Spikes** ¾–1 in. diam., long or short, usually stout. **Flowers** lilac or purplish. **Bracts** and **bracteoles** lanceolate-subulate. **Calyx-teeth** slender.—**Distrib.** Europe, N. Africa, N. and W. Asia; introd. in America. *M. aquatica* proper; leaves ovate rounded or subcordate at the base serrate more or less hairy on both surfaces, spikes axillary and terminal ovoid or subglobose, calyx-teeth ½–¾ the length of the tube. *M. hirsuta*, L. Common.—*M. hirsuta* proper; leaves tomentose on both surfaces, calyx pedicels and corolla hairy. **Var. M. subglaabra**, Baker; leaves narrower glabrous except on the nerves beneath, calyx pedicels and corolla hairy.—**Var. M. citrata**, Ehrh. (*Bergamot Mint*); leaves glabrous on both surfaces, calyx pedicels and corolla glabrous. Staffordshire, Wales, &c., rare.

Sub-sp. *M. pubescens*, Willd.; leaves ovate-oblong or lanceolate pubescent above tomentose or woolly beneath sharply serrate, spikes cylindric stout dense, calyx-teeth ¾ the length of the tube. Mid. and S. England only.—**Var. M. palustris**, Sole; leaves ovate-oblong tomentose above woolly beneath.—**Var. M. hircina**, Hull; leaves ovate-oblong green and sub-glabrous above hairy beneath.

**Whorls** in axillary clusters, shorter than the leaves; bracts foliaceous.

**Throat of calyx** glabrous.

5. *M. sativa*, L.; leaves petioled ovate- or obleng-lanceolate acutely serrate, upper smaller, bracteoles usually shorter than the flowers acuminate calyx-teeth lanceolate acuminate ½–¾ the length of the tube.

Wet waste places, from Argyll and Elgin southd.; Ireland; fl. July–Sept.—Probably a form of *M. aquatica*, distinguished by the inflorescence alone.—
DISTRIB. Europe, Canaries; introd. in N. America.—The forms here enumerated are not constant; I have taken their diagnosis from Baker’s and Syme’s works.

M. sativa proper (b. rivalis, Lond. Cat.); green, 2–3 ft., leaves hairy on both surfaces, pedicels calyx and corolla hairy. Common in England, rare in Scotland and Ireland.—VAR. 1, hairy, whorls all separate, bracts all foliaceous, upper sometimes flowerless.—VAR. M. paludosa, Sole; hairy, upper whorls collected into a spike with smaller bracts. The passage to M. aquatica.

—VAR. subgla'dabra, Baker; almost glabrous, whorls all separate, bracts all foliaceous.

Sub-sp. M. ru'bra, Sm.; stem 3–5 ft., and nerves of leaves purple, leaves glabrous or sparingly hairy, calyx hairy, pedicels and corolla glabrous. Not uncommon in England, rare in Scotland and Ireland.

Sub-sp. M. grac'ilis, Sm.; slender, green, leaves oblong-lanceolate glabrous or sparingly hairy, whorls all separate, bracts all smaller and narrower than the leaves, bracteoles equalling and exceeding the flowers, calyx ciliate, pedicels and corolla glabrous.—VAR. grac'ilis proper, stem hairy below, lower bracts shortly petioled 5–6 times as long as the rather remote whorls. Wiltshire (gathered by Sole only).—VAR. card'i'aca, Baker; nearly glabrous, bracts sessile 2–4 times as long as the crowded whorls. From Middlesex N. to the Tyne; often cultivated; smells of Basil.

Sub-sp. M. praten'sis, Sole; leaves drooping rounded at both ends finely serrate hairy above, glabrous except on the close-set nerves beneath, whorls in the upper leaves only all separate, calyx-teeth ciliate, pedicels and corolla glabrous. New Forest, gathered by Sole only in 1789.

Sub-sp. M. gentil'is, L.; leaves spreading ovate acute serrate slightly hairy above and on the (few) nerves especially beneath, bracts all leaf-like uppermost flowerless, pedicels and corolla glabrous, calyx-teeth ciliate. Common in England, rare in Scotland.—VAR. gentil'is proper; stem hairy, leaves rather coriaceous most hairy beneath, calyx-teeth densely hairy.—VAR. M. Wir'tgenia'na, F. Schultz (a hybrid, Nyman); stem subglabrous, leaves slightly hairy above, but on the nerves only beneath, calyx-teeth sparingly hairy.—VAR. M. Paulia'na, F. Schultz; stem subglabrous, leaves as in Wir'tgenia'na, calyx-teeth densely hairy (a var. of arven'sis, Nyman).

6. M. arven'sis, L.; leaves petioled ovate- or oblong-lanceolate obtusely serrate, upper smaller, bracteoles shorter than the flowers acute, calyx hairy, teeth triangular, corolla hairy without and within.

Cultivated fields and waste places, N. to Orkney; ascends to 1,000 ft. in the Highlands; Ireland; Channel Islands; fl. Aug.–Sept.—Usually a low branched plant, 1–2 ft., very variable, chiefly distinguished from M. sativa by the short calyx-teeth. Flowers honeyed, dimorphous, larger 2-sexual, smaller males.—DISTRIB. Europe (Arctic), N. and W. Asia, Himalaya; introd. in N. America.—The following are inconstant varieties.

M. arven'sis proper; stem short, hairs dense reflexed, leaves smooth hairy all over, calyx very hairy.—M. nummul'a'ria, Schreb.; stem long, hairs few, leaves and calyx sparingly hairy.—M. agrest'is, Sole; stem long hairy, leaves coarsely serrate broad often cordate wrinkled and calyx very hairy, bracts smaller upwards.—M. pre'cox, Sole; stem stout erect slightly hairy, leaves smooth sparingly hairy, bracts much smaller upwards, calyx-teeth longer. Approaches M. sativa.—M. Allio'nii, Bor.; stem tall slightly hairy
above nearly glabrous below, leaves smooth thinly hairy, bracts uniform, calyx-teeth very short.—*M. parietariaefolia*, Beck.; subglabrous, stem long, leaves smooth serrated towards the tip, bracts smaller upwards, calyx-teeth short.

*** Whorls axillary, distant, none towards the ends of the branches. Calyx 2-lipped; throat closed with hairs.

7. **M. Pulegium**, L. ; leaves small shortly petioled ovate or oblong subserate, calyx-teeth ciliate, corolla hairy without glabrous within. *Penny-royal.*

Pools, wet heaths, &c., from Ayr and Berwick southd.; Ireland; Channel Islands; fl. Aug.—Sept.—Glabrous or more or less tomentose. Stems 4—10 in., prostrate or erect (var. erecta), much branched, very leafy. Leaves 1⁄4—3⁄4 in., spreading and recurved, base acute. Whorls all separate; bracts foliaceous, upper sessile flowerless; bracteoles 0, or obovate and shorter than the flowers. Flowers proterogynous. Calyx and pedicels pubescent or hispid.—Distrib. Europe, N. Africa, N. and W. Asia.—Formerly much used medicinally.

2. **LYC'OPUS, Tournef.** GIPSY-WORT.


*L. europæus*, L. ; stem acutely 4-angled, calyx-teeth 5 subulate.

Ditches and river-banks from Ross southd.; rarer in Scotland; Ireland; Channel Islands; fl. June—Sept.—Glabrous or slightly pubescent. Rootstock creeping or stoloniferous. Stem 1—3 ft., tough. Leaves subsessile, elliptic-oblong, coarsely serrate or pinnatifid. Whorls many; bracts smaller upwards; flowers sessile. Corolla 1⁄2 in., bluish-white, dotted with purple, hairy within.—Distrib. Europe, N. Africa, N. and W. Asia, India, N. America, Australia.

3. **ORIG'ANUM, Tournef.** MARJORAM.

Aromatic herbs or undershrubs. Leaves entire or toothed. Flowers crowded, in corymbose cymes, honeyed; bracts large, imbricating. Calyx subcampanulate, 10—13-nerved, 5-toothed or 2-lipped, upper lip entire or 3-toothed, lower 2-toothed truncate or 0. Corolla obscurely 2-lipped; upper lip notched or 2-fd; lower spreading, 3-fd. Stamens 4, ascending, distant; anther-cells distinct, spreading. Style-lobes acute. Nutlets dry, smooth.—Distrib. Temp. N. regions; species about 20.—Etym. ὄψος and γάνος, from affecting hilly localities.
O. vulgare, L.; erect, corymbose-branching, leaves broadly ovate.

Dry copes and hedgebanks, &c., from Caithness southward; Scotland, rare; ascends to 1,300 ft. in Yorkshire; Ireland, local; Channel Islands; fl. July-Sept.—More or less pubescent, bifariously on the branches. Rootstock short, stoloniferous. Stems many, 1–3 ft., stout. Leaves ½–1 in., shortly petiolate, rhombic-ovate, lower early withering, entire or obtusely serrate. Cymes 3–4 in., ovoid, 4-gonous; bracts ½ in., green or purple, ovate, acute, longer than the calyx. Flowers proterandrous, dimorphic, larger 2-sexual, purple, stamens long, smaller female paler. Calyx yellow-dotted, teeth short; throat closed with hairs.—Distrib. Europe (Arctic), N. Africa, N. and W. Asia, Himalaya; introd. in N. America.—Aromatic, bitter, and balsamic.—O. megastachyum, Link, is a large state with 4-gonous spikes.

4. THYME, L. Thyme.

Small shrubs, often hairy, much branched, very aromatic. Leaves small, quite entire; margins often revolute. Whorls few-fld., in lax or dense spikes; bracts minute; flowers purple, rarely white, honeyed, proterandrous. Calyx ovoid, 10–13-nerved, 2-lipped, upper lip 3-toothed, lower 2-fld.; throat villous. Corolla-tube naked within, obscurely 2-lipped; upper lip straight, flattish, notched; lower 3-fld. Stamens 4, usually exserted, straight, distant, the lower longer; anther-cells parallel or diverging. Style-lobes subequal, subulate. Nutlets nearly smooth.—Distrib. Temp. Old World; species 40.—Etym. The Greek name.

T. Serpyllum, L.; prostrate, leaves green flat quite entire.

Hills and dry grassy places, N. to Shetland; ascends to 3,500 ft. in the Highlands; Ireland; Channel Islands; fl. June-Aug.—Glabrous or hairy, hairs often reflexed and in lines on the stems. Rootstock woody. Stems decumbent. Leaves ½–1 in., shortly petiolate, ovate or obovate-lanceolate, obtuse. Whorls capitate; bracts foliaceous; pedicels very short; flowers dimorphic, males large, bisexual smaller. Calyx purplish, teeth ciliate. Corolla ½–¾ in., rose-purple.—Distrib. Europe (Arctic), N. and W. Asia, Himalaya, Greenland; introd. in N. America.

T. Serpyllum proper; flowering-branches ascending from trailing shoots that are barren at the tip, leaves often obovate, whorls in one head, upper lip of corolla oblong.—Commonest form in mountain districts.

Sub-sp. T. Chamædrys, Fries; flowering- and barren-branches ascending from the crown of the rootstock, leaves usually ovate, whorls in many axillary heads, upper lip of corolla short and broad.

5. CALAMIN'THA, Mäch.

Herbs or shrubs. Whorls dense and axillary or loose and panicled; flowers purple white or yellow. Calyx tubular, 13-nerved, 2-lipped, upper lip 3-toothed, lower 2-fld.; throat naked or villous. Corolla-tube straight; throat naked, often inflated; upper lip erect, flattish, lower spreading, 3-lobed. Stamens 4, ascending under the upper lip, upper sometimes imperfect; anther-cells parallel or diverging. Style-lobes equal, or the
lower larger. Nutlets smooth.—Distrib. Temp. N. hemisphere; species about 40.—Etym. kalos and μινθα, beautiful mint.


1. C. officinalis, Mœch; perennial, leaves ovate, cymes secund. Calamint.
Waste places in dry soil from Westmoreland southd.; Ireland; Channel Islands; fl. July–Sept.—Hairy. Rootstock more or less creeping, stoloniferous. Stem 1–3 ft., erect or decumbent below; branches usually long, straggling and ascending. Leaves crenate-toothed, very variable in size and depth of serratures but pretty uniform in shape, almost glabrous or downy or nearly woolly. Cymes more or less unilateral, peduncles and pedicels variable.—Distrib. From Belgium southd., N. Africa, W. Asia; introd. in N. America.
C. officinalis proper; branches long ascending, leaves 1–1½ in. crenate-serrate green beneath, cymes few-fld., calyx bent on the pedicel 2-lipped, teeth with long bristles, upper triangular, lower subulate much longer, hairs of throat included, corolla ½ in., mid-lobe of lower lip longest. C. menthaefolia, Host.—Var. Briggsii, Syme; larger, more hispid, peduncles of lower whorls equaling or exceeding the pedicel of the central flower.—Devonshire.
Sub-sp. C. Neve’ta, Clairv.; branches short erect, leaves usually ½–1 in., subentire pale beneath, cymes about 10-fld., calyx erect on the pedicel, teeth nearly equal, upper triangular recurved, lower subulate, hairs of throat prominent, corolla ½ in., mid-lobe of lower lip broad truncate.—York to Kent.
Sub-sp. C. Sylvat’ica, Bromf.; branches 0 or long ascending, leaves 1–3 in., deeply crenate-serrate, cymes loose, flowers large, calyx bent on the pedicel 2-lipped ciliate, 3 upper teeth abruptly recurved, 2 lower twice as long incurved, hairs of throat concealed in the tube, corolla ¾–1 in., mid-lobe of lower lip about equalling the lateral.—Chalk banks, I. of Wight, Hants, Devon.—This is the true C. officinalis, Mœch, according to Nyman.


Sub-gen. 3. A’cinos, Mœch (gen.). Whorls many, simple, lower 5–6-fld.; bracteoles few, minute. Calyx-tube curved. Corolla with the mid-lobe of the lower lip almost entire.

Banks and fields, on dry soil, from Elgin and Inverness southd.; rare, indigenuous? in Scotland; N.E. Ireland, very rare; Channel Islands; fl. July-Aug.—More or less pubescent. Stem 3-6 in., ascending, slender, leafy. Leaves \( \frac{1}{2} - \frac{3}{4} \) in., narrowed into the petiole, variable in breadth, entire or slightly serrate. Bracts leafy; bracteoles shorter than the pedicels. Calyx bent on the pedicel; tube much enlarged below in fruit; throat closed with hairs; 3 upper teeth recurved. Corolla \( \frac{3}{4} \) in., blue-purple, spotted white and darker purple.—Distrib. Europe, N. Africa.


Herbs, sometimes shrubby. Whorls few-fl., axillary, secund; bracts few, subfoliaceous; flowers white or yellowish. Calyx coriaceous, curved, subcampanulate, ribs 15, 5 very strong, 2-lipped; upper lip flattish, 3-toothed, lower 2-fl.; Corolla-tube ascending, more or less recurved; throat dilated, naked; upper lip concave, notched; lower 3-fl., lobes flat. Stamens 4, converging under the upper lip; anther-cells at length spreading. Style-lobes subequal, subulate. Nutlets smooth.—Distrib. Europe, W. Asia, Himalaya; species 4.—Etym. μέλις, from bees affecting the plant.—Genus hardly differing from Calamintha.


Herbs or shrubs. Whorls usually racemed or spiked; bracts leafy or small. Calyx tubular or campanulate, 2-lipped, upper lip entire or 3-toothed, lower 2-fl.; throat naked. Corolla-tube naked or with a ring of hairs or smooth processes inside; upper lip erect, entire or notched; lower 3-lobed, mid-lobe entire or notched, lateral spreading. Stamens 2, filaments short jointed on the long slender arched connective which bears at one end a perfect anther-cell, at the other a rudimentary one. Disk forming a large gland anteriorly. Style ascending, 2-fl., lobes subulate or dilated. Nutlets 3-quetrous, usually shining.—Distrib. All temp. and trop. regions; species about 450.—Etym. salvo, from the healing properties of Sage.

1. **S. Verbena'ca**, L.; stem leafy, corolla \( \frac{1}{2} \) in. glabrous inside. Clary.

Dry pastures and waste places, E. Scotland from Ross southd.; all England; Ireland; Channel Islands; fl. June-Sept.—Subglabrous below, glandular-

*S. clandestina*, L., is a smaller more slender variety, with leaves narrower, upper calyx-teeth less spiny, corolla longer more purple, upper lip longer arched.—Channel Islands.

2. *S. pratensis*, L.; stem-leaves few, corolla 1 in. lip viscid.

Dry fields, very rare, Cornwall, Kent, Oxford; (a denizen, *Wats*); fl. June–Aug.—Glandular-hairy, especially above. Habit of *S. Verbenæca*, but larger. Leaves wrinkled, 3–6 in., radical oblong or ovate-cordate, long-petioled, obtuse, sometimes 2-lobed at the base, crenatures large irregular; cauline similar or more oblong, smaller, shorter petioled. Whorls about 4-fl.d., in spikes 1–1 ½ ft.; bracts small, ovate-cordate, long acuminate and calyx coloured. Flowers dimorphous, honeyed, larger 2-sexual, proterandrous, smaller female. *Corolla* bright blue, glabrous inside; upper lip long, compressed, much arched; lower broad. Connective dilated.—DISTRIB. From Belgium southd., W. Asia.

7. NEP'ETA, L.

Erect or prostrate herbs. Whorls axillary or terminal; flowers blue yellow or white. *Calyx* tubular, 15-ribbed, 5-toothed, teeth equal or unequal. *Corolla-tube* slender below, throat dilated, naked; upper lip straight, notched or 2-fl.d.; lower 3-fl.d., mid-lobe large. *Stamens* 4, ascending under the upper lip, upper pair longest; anther-cells diverging. *Style-lobes* subulate. *Nutlets* smooth.—DISTRIB. Temp. Europe, N. Africa and Asia; species about 120.—ETYM. The Latin name.


1. N. Cata'ria, L.; erect, leaves ovate-cordate inciso-serrate white and pubescent beneath, flowers white. *Cat-Mint*.

Sub-gen. 2. **Glecho'ma**, L. (gen.). Whorls axillary; bracts all large and leaf-like. Corolla-tube long; mid-lobe of lower lip obcordate, flat. Anthers conniving and forming a cross; cells each with a slit.


Hedges and copses, from Caithness southd.; ascends to 1,350 ft. in Derby; Ireland; Channel Islands; fl. March–June.—Perennial, more or less pubescent. Stems 6–18 in., rooting at the base, slender, branched. Leaves \( \frac{3}{4}–1 \frac{1}{4} \) in. diam., petiole \( \frac{1}{2}–2 \) in. Whorls 3–6-fld.; bracteoles subulate, equalling the short pedicels. Flowers dimorphic, larger 2-sexual, smaller female. Calyx-teeth short, recurved. Corolla \( \frac{1}{2}–1 \) in., tube very variable in length. Nutlets granulate.—Distrib. Europe (Arctic), N. and W. Asia; introd. in U. States.—Bitter and aromatic, formerly used for beer, occasionally for tea.

8. **BRUNEL'LA**, L. SELF-HEAL.


**B. vul'garis**, L.; leaves ovate-oblong, corolla not twice as long as the purplish calyx. *Prunel'la vulgaris*, L.

Pastures and waste places, N. to Shetland; ascends to 2,400 ft. in Yorkshire; Ireland; Channel Islands; fl. July–Sept.—More or less hairy. Rootstock creeping. Stems 4–12 in., erect or ascending, branches often abbreviated. Leaves 1–2 in., petioled, uppermost sessile, ovate-oblong or oblong-lanceolate, entire toothed or subpinnatifid. Whorls in cylindric 1–3 in. spikes; bracts broadly ovate-cordate, ciliate, green with purple edges; bracteoles 0; pedicels very short. Flowers dimorphic, larger 2-sexual, proterandrous, smaller female. Calyx-teeth minute, mucronate. Corolla \( \frac{1}{2}–\frac{3}{4} \) in., purple, rarely rosy or white.—Distrib. Europe (Arctic), N. Africa, temp. Asia, America, Australia.

9. **SCUTELLA'RIA**, L. SKULL-CAP.

Slender herbs, rarely shrubs. Flowers solitary or in pairs, axillary or in terminal spikes or racemes. Calyx campanulate, 2-lipped, tube dilated opposite to the posterior lip into a broad flattened hollow pouch, lip and pouch deciduous in fruit, mouth closed after flowering, persistent. Corolla-tube long, naked inside, throat dilated; upper lip entire or notched; lower dilated, lateral lobes free spreading. Stamens 4; anthers
conniving in pairs, ciliate, lower 1- upper 2-celled. Disk elongate, curved. Ovary oblique. Style with the upper lobe very short. Nutlets smooth or tubercled.—Distr. N. temp. and subtrop. regions, abundant in America; species about 90.—etym. scutella, from the dish-like pouch of the calyx.


2. S. minor, L. ; leaves with 1–2 crenatures near the base, flowers 1∕4 in. Swampy heaths and sides of ditches, &c., from Inverness and W. Scotland southd.; ascends to 1,000 ft. in Devon; Ireland; Channel Islands; fl. July–Oct.—Habit of S. galericulata, but only 4–6 in., more slender, often much branched; leaves shorter-petioled or sessile, 3∕4–1 in., obtuse, upper quite entire; flowers much smaller, 1∕3 in., pale pink-purple.—Distr. W. Europe, W. Asia, N.W. Himalaya.

10. melittis, L. Bastard-balm.


M. Melissophyllum, L. ; leaves ovate or oblong crenate-serrate. M. grandiflora, Sm.

Copses, Worcester, Wales, Cornwall to Sussex; fl. May–June.—Sparingly hairy. Rootstock long, creeping. Stem 1–2 ft., erect, simple or branched. Leaves subsessile or petioled, nerves hairy beneath. Bracts leaf-like; bracteoles 0; pedicels short, stout. Calyx very open, lobes all short broad. Corolla 1–1∕4 in., cream-white, spotted pink or purple, tube nearly straight, mouth oblique, lips diverging.—Distr. From France southd.


Perennial, tomentose or woolly herbs. Whorls axillary; bracts leaf-like; flowers small. Calyx tubular, 5–10-nerved; teeth 5–10, subspinous, erect
or spreading. Corolla short; tube naked or with a ring of hairs inside; upper lip erect; lower spreading, 3-fid, mid-lobe broadest. Stamens 4, included; anthers glandular, cells diverging, subconfluent. Style-lobes short, obtuse. Nutlets obtuse.—Distrib. Temp. and warm regions of the Old World; species 30.—Etym. The old Latin name.

M. vulgare, L.; leaves broadly ovate crenate, whorls dense-fld.

Waste places, Elgin and E. Scotland, rare; all England; not native except in I. of Wight; Ireland, rare; Channel Islands; fl. July-Nov.—Hoary, almost woolly. Rootstock short, stout. Stem 1-1½ ft., stout, branched, leafy. Leaves ½-1½ in., base cordate or cuneate, nerves stout usually diverging from the broad rather long petiole, much wrinkled, leathery. Whorls of innumerable partial ones, depressed, axillary, villous. Calyx oblong; teeth 10, short, spinous, hooked at the tip. Corolla ½ in., white; tube slender; upper lip long, 2-fid.—Distrib. Europe, N. Africa, W. Asia, N.W. India; introd. in N. America.—Aromatic and bitter.—Much used as a cough medicine.

12. STA'CHYS, L. Woundwort.

Herbs, rarely shrubs. Leaves crenate or serrate. Whorls 2- or more-fld., usually in terminal racemes; flowers honeyed, proterandrous. Calyx subcampanulate, 5-10-nerved, 5-toothed, teeth usually equal. Corolla-tube cylindric, with usually a ring of hairs inside, often incurved above; throat not dilated; upper lip erect or spreading; lower spreading, 3-lobed, mid-lobe largest, lateral often reflexed. Stamens 4, ascending, 2 lower longest; anthers conniving, cells parallel or diverging. Style-lobes nearly equal, subulate. Nutlets obtuse.—Distrib. Chiefly N. temp. and Oriental regions; species about 160.—Etym. στάχυς, from the spiked inflorescence.

Section 1. Sta'chys proper. Whorls in elongate interrupted spikes or racemes; lower or all the bracts foliaceous. Anther-cells diverging.

1. S. sylvatica, L.; perennial, hispid, cauline leaves long-petioled ovate broadly cordate coarsely serrate, whorls 6-12-fld.

Shady places, N. to Shetland; ascends to 1,500 ft. in Northumbd.; Ireland; Channel Islands; fl. July-Aug.—Foetid when bruised; softly hispid. Rootstock creeping, stoloniferous. Stem 1-3 ft., rather slender, solid, simple or branched. Leaves 2-4 in., petiole often longer, radical withering early. Spikes 4-8 in., hairy and glandular; lower bracts serrate, upper lanceolate quite entire; bracteoles minute; pedicels short. Calyx-teeth triangular-subulate, spinous. Corolla ½-¾ in., red-purple; tube equalling or exceeding the calyx; lower lip variegated with white.—Distrib. Europe (Arctic), Siberia, N.W. Himalaya.

2. S. palustris, L.; perennial, hairy, cauline leaves shortly petioled or sessile ovate- or oblong-lanceolate, whorls 8-10-fld.

River-banks and moist places, N. to Shetland; ascends to 1,500 ft. in Northumbd.; Ireland; Channel Islands; fl. July-Sept.—Habit of S. sylvatica, but leaves much narrower, stem stouter hollow, hairs less coarse,
odour less, flowers paler.—Distrib. Europe (Arctic), N. and W. Asia, Himalaya, N. America.

*S. ambig'ua, Sm., is a hybrid nearer *sylva'tica than *palus'tris, with leaves shortly petioled, fruit never maturing. Cultivated ground, not uncommon. Other hybrids nearer to *palus'tris are more common.

3. **S. german'ica, L.;** biennial, shaggy with white silky hairs, cauline leaves shortly petioled ovate-oblong or lanceolate, spikes stout, whorls very dense-fld. lower remote.


4. **S. arven'sis, L.;** annual, sparingly hairy, leaves ovate or oblong obtuse crenate, whorls 4–6-fld., corolla very small.

Fields and waste places, N. to Sutherland; rare in Scotland; Ireland; Channel Islands; fl. April–Nov.—Branched from the base; branches 6–18 in., weak, ascending, often rooting below. *Leaves* small, ½–1 in., base cordate or cuneate, upper sessile; petiole very variable. *Whorls* ½–2 in. diam.; bracts sessile, subacute; bracteoles 0; pedicels short. *Calyx-teeth* longer than the tube, lanceolate-subulate, spinous-tipped. *Corolla* equaling the calyx, ½ in., pale pink variegated with white.—Distrib. Europe, N. Africa, N. and W. Asia, N.W. India; introd. in N. America.

**Section 2. Beton'ica, L.** (gen.). *Whorls* in short dense terminal spikes; lowest bracts leafy, upper minute. *Anther-cells* parallel.

5. **S. Beton'ica, Benth.**; hairs deflexed, leaves petioled oblong-cordate obtuse deeply crenate, whorls all close or the lower only separate, calyx-lobes triangular spinous. *Betton'ica officinal'is, L.* Wood Betony.

Copses, woods, roadsides, &c., from Perth southd.; rare in Scotland and Ireland; ascends to 1,200 ft. in Northumbd.; Channel Islands; fl. June–Aug.—Rootstock woody. *Stems* 6–24 in., ascending or erect, simple or sparingly branched from the base. *Leaves* 1–4 in., coriaceous, radical tufted on slender petioles, crenatures large round; cauline few, much narrower, more toothed or serrate. *Whorls* in an oblong, obtuse, long-peduncled spike, 1–3 in.; bracteoles as long as the calyx, oblong-lanceolate, awned; pedicels short. *Calyx-teeth* as long as the tube. *Corolla* ½ in., red-purple, hairy, tube exserted; upper lip erect, lower 3-lobed.—Distrib. Europe, N. Africa, W. Siberia.—Formerly much used medicinally.


Annual herbs; branches diverging. *Leaves* toothed. *Whorls* many-fld., dense, axillary and terminal; bracts foliaceous; flowers red orange or variegated, honeyed, proterandrous. *Calyx* subcampanulate, subregular,
5-nerved; teeth 5, spinescent. *Corolla-tube* straight, naked inside, throat dilated; upper lip ovate, arched; lower 3-fid, mid-lobe obcordate or 2-fid; palate with erect teeth at the union of the lobes. *Stamens* 4, exserted; anther-cells transversely 2-valved, inner valve rounded ciliate, outer larger naked. *Nutlets* rounded, compressed, obscurely reticulate.—**Distr.** Temp. Europe, W. Asia; species 3.—**Etym.** γαλέη and ὑσις, from the resemblance of the corolla to a weasel’s head.

1. **G. Lad’anum**, L.; softy pubescent, nodes not thickened, calyx-teeth not exceeding the tube, corolla red.


**G. Lad’anum** proper (*L. Herb.*); leaves ovate or ovate-lanceolate serrate throughout, whorls all separate, tube of corolla equalling the calyx. *G. intermedia*, Vill.—Denbigh, Moray.

Sub-sp. **G. Angustifol’ia**, *Ehrh.*; leaves narrower connate at the base interruptedly serrate or subentire, upper whorls approximate, tube of corolla much longer than the calyx. *G. canes’cens*, Schultz.


Sandy cornfields, rare, Durham, York, Lincoln, Carnarvon, Notts, Essex; (a colonist, *Wats.*); fl. July–Aug.—Habit of *G. Lad’anum*, but glandular, leaves broader, more deeply serrate; whorls dense, almost silky; bracteoles much smaller; calyx-teeth less spinescent; corolla 1–1½ in., pale yellow, rarely white or purple.—**Distr.** From Denmark southd.

3. **G. Tet’rahit**, L.; hispid, nodes thickened, calyx-teeth as long as or longer than the tube, corolla yellow and purple or white.

Cornfields and waste places, N. to Sutherland; ascends to 1,300 ft. in Northumbd.; Ireland; Channel Islands; (colonist? *Wats.*); fl. July–Sept.—Usually much larger and stouter than the two preceding, with spreading and deflexed hairs. **Stem** ½–3 ft., succulent, nodes very hispid. *Leaves* 1–4 in., rather long-petioled, ovate or ovate-lanceolate, acute or acuminate, very coarsely serrate. *Whorls* dense-fld.; bracts leafy; bracteoles shorter than the calyx. *Calyx* ½–3 in.; teeth very long, straight, subulate. *Corolla* ¾–1½ in.—**Distr.** Europe (Arctic), N. and W. Asia, N.W. India; introd. in N. America.

**G. Tet’rahit** proper; corolla ¾ in., rosy or white, upper lip flattish longer than broad, lower flat, nutlets slightly convex above ventrally.—*G. bif’ida*, Boenn., is a slender var. with the mid-lobe of the lower lip notched, margins at length reflexed.

Sub-sp. **G. Specio’sa**, *Miller*; corolla larger broader 1–1½ in. yellow and purple, tube much exceeding the calyx, upper lip arched as broad as long, nutlets very convex above ventrally. *G. versic’olor*, Curt.
13*. LEONURUS, L. MOTHER-WORT.

Erect herbs. Leaves lobed. Whorls axillary, dense-fld., scattered; bracteoles subulate: flowers small, pink or white. Calyx 5-nerved, turbinate, truncate, with 5 subsinnescent spreading teeth. Corolla-tube naked, or with an oblique ring within; upper lip entire, erect; lower 3-fid, mid-lobe obcordate. Stamens 4; anthers conniving in pairs, cells transverse. Style-lobes subulate or obtuse. Nutlets smooth, 3-quetrous, truncate.—DISTRIB. Europe, Asia, America; species 10.—ETYM. λέων and οὐρά, lion’s tail.

L. CARDI'ACA, L.; pubescent, leaves palmately lobed, bracts subtrifid, corolla-tube with a ring of hairs inside.

Hedges and waste places, England, Scotland, Ireland, Channel Islands, rare, not indigenous; fl. July–Sept.—Rootstock stout. Stem 2–4 ft., stout, erect, angles prominent, very leafy. Leaves very close, radical with slender long petioles, ovate or orbicular-cordate, lobed and toothed; cauline 2–3 in., petioled, cuneate or obovate-oblong, lower multifid, upper 3-fid palmately 3–many-nerved, lobes acute. Whorls very many; bracts large, leaf-like, petioled; bracteoles small, subulate, pungent; flowers sessile. Calyx ½ in.; teeth broadly triangular. Corolla ½ in., woolly, pale rose, upper lip nearly straight. Nutlets villous-tipped.—DISTRIB. Europe, N. and W. Asia, Himalaya; introd. in N. America.

14. LA'MIUM, L. DEADNETTLE.

Annual or perennial hairy herbs. Whorls many-fld., axillary, or in leafy bracteate heads; bracteoles 0 or subulate; flowers red purple white or yellow, honeyed, homogamous. Calyx tubular or subcandpanulate; teeth 5, equal, or the upper longer. Corolla-tube naked, or with a ring of hairs within, throat dilated; upper lip arched; lower 3-fid spreading, lateral lobes sometimes toothed at the base; mid-lobe broad, base contracted. Stamens 4; anthers conniving in pairs, cells diverging. Style-lobes subulate. Nutlets 3-quetrous, truncate, smooth scaly or tubercled.—DISTRIB. Temp. Europe, Asia, N. Africa; species 40.—ETYM. λαμίος, from the throat-like corolla.

SECTION 1. Lamiop'sis. Annual (the British sp.). Corolla-tube nearly straight, naked or with a ring of hairs, not constricted below the ring; throat very wide. Anthers hairy. Nutlets with white scales.

1. L. purpu'reum, L.; leaves petioled cordate crenate, whorls sub-terminal crowded, calyx slightly hairy, teeth spreading in fruit about as long as the tube.

Fields and waste places, N. to Shetland; ascends to near 2,000 ft. in Northumbd.; Ireland; Channel Islands; fl. April–Oct.—Silkily hairy, or subglabrous. Stem 6–18 in., decumbent below, branched from the base, often purplish. Leaves ½–2 in., obtuse, petiole as long or longer. Bracts crowded, bases not overlapping, upper subsessile, together forming a flat-topped head. Calyx about ½ in.; teeth triangular, tips spinous. Corolla ½–⅓ in.,
purple, rarely white; lateral lobes generally 1-2-toothed at the base. —DISTRIB. Europe, Canaries, N. and W. Asia; introd. in N. America.
L. purpureum proper; corolla-tube longer than the calyx-teeth, with a ring of hairs within.—VAR. decipiens, Sonder; has leaves and bracts deeply crenate.
Sub-sp. L. hybridum, Vill.; leaves more deeply crenate, floral with cuneate bases, calyx-teeth erect; corolla-tube shorter, ring of hairs within obscure. L. dissectum, With.; L. incisum, Willd.

2. L. intermedium, Fries; leaves petioled orbicular-cordate deeply crenate, whorls crowded, calyx slightly hairy, teeth spreading in fruit much longer than the tube.
Cultivated ground, Scotland, N. England; Ireland, rare; fl. June–Sept.—Intermediate between purpureum and L. amplexicaule, of which it has the habit, overlapping upper bracts, and foliage; stouter and more succulent than either; the long calyx-teeth distinguish it from both. The tube of the corolla slightly exceeds the calyx and has a very obscure ring of hairs; lateral lobes toothed.—DISTRIB. N.W. Europe.

3. L. amplexicaule, L.; leaves petioled orbicular inciso-crenate, whorls distant, calyx small densely pubescent, teeth converging in fruit about equalling the tube, corolla-tube long slender. Henbit Deadnettle.
Waste sandy places, N. to Orkney; Ireland; Channel Islands; fl. May–Aug.—Hairy or almost glabrous. Stem 4–10 in., branched from the base. Leaves small, ½–3 in., lower long-petioled, almost lobulate, base rounded or cordate. Bracts sessile, broader than long, many-lobed, bases overlapping. Corolla sometimes imperfect, often ½ in., very slender, rosy, pubescent.—DISTRIB. Europe, N. Africa, N. and W. Asia, N.W. India; introd. in N. America.


4. L. album, L.; leaves all petioled cordate crenate or serrate, calyx-teeth narrow straight longer than the straight tube, corolla white, tube gibbous at the base below, ring of hairs oblique.
Fields and waste places, N. to Orkney; rare and local in Scotland and Ireland; Channel Islands; fl. May–Dec.—More or less hairy. Rootstock creeping, branched, stoloniferous. Stem 6–18 in., rooting and branched from the base, then erect. Leaves 3–3 in., sometimes blotched with white, lower long-petioled, subacute or acuminate, rarely deeply incised. Whorls 6–10-fl., upper crowded, lower remote; bracts shortly petioled. Calyx glabrous or hairy; teeth triangular-subulate, points long slender. Corolla ½–1 in., throat gradually dilated; upper lip vaulted, villous; lateral lobes variable. Stamens, sometimes outer, at others inner pair longest.—DISTRIB. Europe, N. Africa, N. Asia; introd. in N. America.

L. macula'tum, L.; leaves all petioled cordate crenate or serrate, calyx-teeth broad recurved as long as the oblique tube, corolla usually purple, tube equal at the base below, ring of hairs transverse. L. laviga'tum, Engl. Bot.
Waste places England, Scotland, not indigenous; fl. June–Sept.—Very closely allied to L. al'bum, but the calyx and corolla are different; flowers fewer, rarely white; leaves more wrinkled, and almost always with a median white stripe, and corolla-throat suddenly dilated.—Distrib. Europe, N. Africa, N. and W. Asia.


5. L. Galeob'dolon, Crantz; leaves petioled ovate acuminate doubly-crenate or -serrate, calyx-teeth shorter than the oblique tube, corolla yellow, ring of hairs oblique. Galeob'dolon luteum, Huds. Yellow Archangel.


15. BALLO' TA, L. Black Horehound.

Perennial, hairy or woolly herbs or undershrubs. Whorls axillary, dense-fld.; bracts subulate; flowers small, proterandrous. Calyx tubular or funnel-shaped, 10-nerved; teeth 5–10, dilated at the base or conuate into a spreading limb. Corolla-tube with a ring of hairs inside; upper lip erect, concave; lower as long, 3-lobed, spreading. Stamens 4, ascending under the upper lip; anthers conniving in pairs, cells at length diverging. Style-lobes subulate. Nutlets obtuse.—Distrib. Europe, N. and S. Africa, temp. Asia; species 25.—Etym. The Greek name.

B. ni'gra, L.; erect, hairy, calyx-teeth exceeding the corolla-tube.

16. **TEUCRIUM, L. GERMANDER.**

Herbs. *Whorls* with leafy bracts or in leafy unilateral racemes or spikes; flowers protandrous, honeyed. *Calyx* tubular or campanulate; teeth 5, equal or the upper broader and reflexed. *Corolla-tube* short, naked within; limb obliquely 5-lobed; 2 upper lobes very small, 2 lateral larger, lowest largest, rounded or oblong, often concave. *Stamens* 4, 2 lower longest, protruded between the upper corolla-lobes; anther-cells confluent. *Style-lobes* subequal. *Nutlets* subglobose, smooth reticulate or pitted, base obliquely truncate.—**Distrib.** Temp. and warm regions; species 100.—**Etym.** The ancient name.


Stony copses, heaths, hedges, and soils, N. to Orkney; ascends to 1,500 ft. in Northumberland; Ireland; Channel Islands; fl. July—Sept.—**Perennial,** finely pubescent or hairy. *Rootstock* woody, stoloniferous. *Stems* 8-24 in., tufted, usually ascending, rigid. *Leaves* 1-1 1/2 in., in distant pairs, rarely laciniate. *Racemes* 3-6 in., branched at the base; bracts petioloed, green; bracteoles 0; pedicels short. *Calyx* broadly campanulate, reticulate in fruit; lobes cuspidate, 4 lower small incurved subulate. *Corolla* 1/2 in., ochreous. *Stamens* purplish, 2 longer deflexed after dehiscence. *Nutlets* subglobose, smooth.—**Distrib.** Europe, except Russia, N. Africa.—Bitter, aromatic, tonic; a substitute for hops.

**Section 2. Scor'dium, Benth.** *Whorls* 2-6-fld.; bracts leaf-like. *Upper lip* of calyx equal to or rather larger than the lower.


3. **T. Bo'trys, L.**; leaves all petioloed triangular-ovate pinnatifid, calyx saccate at the base, teeth equal.

Chalky fields, Surrey, very rare; (a colonist? Baker); fl. Aug.—**Annual,** pubescent and glandular with long hairs. *Stem* 4-8 in., erect, much branched from the base, leafy. *Leaves* 1/4-1 in., segments 3-5 pair, linear, obtuse, lower again lobed; nerves prominent beneath. *Bracts* leaf-like. *Calyx* large, glandular, inflated and reticulate in fruit; lobes triangular,
mucronate. Corolla \( \frac{3}{4} \) in., rose-purple, lower lip spotted white and red, Nutlets deeply pitted.—Distrib. From Belgium southd. (excl. Greece), N. Africa.

**SECTION 3. CHAMAEDRYS, Benth.** Whorls 2-6-fld., all or the upper only in lax terminal racemes. Calyx-teeth subequal.

T. CHAMAEDRYS, L.; leaves petioled ovate incised-crenate, bracts sessile leaf-like, calyx nearly equal at the base, teeth nearly equal.

Old walls in England, Scotland, and sandy fields in Ireland, rare; a garden escape; fl. July–Sept.—Perennial, almost hispidly hairy. Rootstock creeping, stoloniferous. Stem 6-18 in., ascending, much branched, leafy. Leaves \( \frac{1}{2} \)-1\( \frac{1}{2} \) in., gradually narrowed into the petiole, nerves prominent beneath. Whorls about 6-fld., in the axis of leafy bracts, or subsecond in leafy terminal spikes; bracts exceeding the calyx, quite entire, acuminate, often purple, upper smaller; pedicels very short. Calyx-teeth straight, triangular, spinescent. Corolla \( \frac{3}{4} \) in., rosy, lower lip spotted white and red. Nutlets nearly smooth.—Distrib. From Holland southd.; W. Asia.—A reputed tonic and famous old gout medicine.

**17. A'JUGA, L. Bugle.**

Annual or perennial herbs. Whorls few- or many-fld.; bracts leaf-like; flowers blue purplish or yellow, proterandrous. Calyx subcampanulate, 5-fld. or 5-toothed. Corolla-tube usually with a ring of hairs within, straight or twisted; upper lip short, notched; lower longer, spreading, 3-fld, lateral lobes oblong, middle broader notched or 2-fld. Stamens 4, ascending, protruded beyond the upper lip, 2 lower longer; anther-cells diverging, at length confluent. Style-lobes subequal. Nutlets reticulate or rugose.—Distrib. Temp. regions of the Old World, from Europe to Australia; species 30.—Etym. doubtful.

1. A. rep'tans, L.; almost glabrous, stoloniferous, leaves repand-crenate, whorls in a loose spike with spreading bracts, flowers blue.

Copse, woods, and pastures, N. to Shetland; ascends to 2,000 ft. in the Highlands; Ireland; Channel Islands; fl. May–July.—Perennial, subglabrous or pilose, lines of hairs bifarious on the stem. Rootstock short, stout; stolons slender, leafy, tips ascending. Flowering-stem 6-12 in. Leaves, radical 2-3 in., long-petioled, narrowly obovate, obtuse; those on the stolons small, obovate-spathulate; cauline few, sessile, oblong, obtuse. Spike 3-8 in.; bracts subentire, obtuse, much shorter than the upper flowers, upper often purplish; whorls 6-10-fld.; pedicels very short. Calyx small, teeth triangular acute ciliate. Corolla \( \frac{3}{4} \), rarely white or rosy, mid-lobe of lower lip broadly obcordate.—Distrib. Europe.—A form without stolons (var. pseudo-alpi'na) has been mistaken for A. alpina, an exotic species.


Mountain woods and streams, very rare, Westmoreland, Argyll to Orkney and Hebrides; W. Ireland; fl. May–July.—Similar to A. rep'tans, but stolons
produced late only; radical leaves shortly petioled; calyx woolly with longer teeth; lower corolla-lip smaller, mid-lobe less cordate.—Distr. Europe (excl. Greece).


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**Order LX. Illecebra’ceae.**

Annual or perennial generally small, often tufted herbs. *Leaves* opposite or alternate, quite entire (serrulate and exstipulate in *Scleranthus*); stipules scarios. *Flowers* very small, cymose, 2-sexual. *Sepals* 4–5, distinct or connate, persistent, closing over the fruit. *Petals* small or 0. *Stamens* hypogynous or perigynous, filaments short distinct or connate anthers small. *Disk* 0 or annular. *Ovary* free, ovoid, 1-celled; style 2-rarely 3-fld, stigmas deciduous; ovule 1, erect, or pendulous from a basal funicle. *Utricle* enclosed in the perianth, 1-seeded. *Seed* globose reniform or lenticular, testa smooth, hilum ventral or lateral, albumen floury; embryo straight curved or annular.—Distr. Chiefly warm and dry regions; genera 17; species 60.—Affinities. Close to Caryophyllaceae and Amaranthaceae.—Properties unimportant.


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**1. Corrigi’ola, L. Strapwort.**


**C. littor’alis, L.;** leaves linear-lanceolate, stipules ½-sagittate.

Sandy places, very rare, Cornwall, Devon; fl. July–Sept.—Annual. *Stems* many from the root, 4–8 in., slender, prostrate or ascending. *Leaves* ½–
nde., narrowed into an obscure petiole; stipules small. **Flowers** in crowded terminal cymes. **Petals** as long as the sepals.—**Distrib.** From Denmark southd.

### 2. Hernia'ria, L. Rupture-wort.

Annual or perennial prostrate herbs. **Leaves** opposite and alternate, narrow. **Flowers** minute, green, crowded, axillary, 1–2-sexual. **Sepals** 4–5, connate at the base, obtuse, equal or unequal. **Petals** 4–5, setaceous, minute or 0. **Stamens** 3–5, inserted on an annular disk. **Style** 2-fid or -partite; ovule erect. **Utricle** indehiscent. **Seed** subglobose or reniform, testa crustaceous shining; embryo annular.—**Distrib.** Europe, N. and S. Africa, W. Asia; species 8 or 10.—**Etym.** The classical name.

1. **H. gla'bra, L.** ; leaves oblong glabrous or ciliate.

Sandy soils, rare, Lincoln, Norfolk, Suffolk, Cambridge; Channel Islands; fl. July–Aug.—**Root** woody, often perennial. **Stems** many, 4–6 in., tufted, glabrous or slightly pubescent. **Leaves** $\frac{1}{2}$–$\frac{3}{4}$ in.—**Distrib.** Europe, N. and W. Asia.—Probably a var. of **H. hirsuta, L.**, a more southern plant. **Var. H. cilia'ta, Bab.** ; perennial, stouter, forming larger tufts, leaves broader, stipules larger whiter.—Lizard Point; Guernsey.—Syme remarks that this keeps its green colour during the winter of Middlesex, which **H. gla'bra** proper does not.

2. **H. hirsu'ta, L.** ; leaves elliptic-oblong hirsute.

Sandy soil, Christchurch, Hants; fl. July–Aug.—Very near **H. gla'bra**, but hirsute all over.—**Distrib.** From Belgium southd., and eastd. to W. Asia.

### 3. Illece'brum, L.

A small diffuse glabrous annual herb. **Leaves** opposite. **Flowers** minute, white, crowded in all the leaf-axils, 1–2-sexual. **Sepals** 5, white, corky, compressed laterally, keeled, tips awned. **Petals** 5, setaceous, very minute. **Stamens** 5, hypogynous. **Style** very short, stigmas 2 capitulate; ovule erect. **Utricle** fissured at the base, included in the hardened calyx. **Seed** oblong; embryo curved, lateral.—**Distrib.** W. Europe from Denmark southd., N. Africa.—**Etym.** doubtful.

1. **Verticilla'tum, L.** ; leaves ovate-oblong or spathulate.

Moist sandy places, Devon, Cornwall; Channel Islands; fl. July–Aug.—Branched from the root, very slender, prostrate; branches 4–8 in., ascending, covered throughout with leaves and tufts of white flowers. **Leaves** $\frac{1}{2}$–$\frac{3}{4}$ in. **Flowers** subsessile, shorter than the leaves. **Sepals** opaque.

### 4. Scleran'thus, L. Knawel.

Low, tufted, annual or perennial herbs. **Leaves** opposite, connate, subulate, pungent, often serrulate; stipules 0. **Flowers** minute, green, in axillary and terminal cymes or fascicles, honeyed. **Calyx-tube** funnel-shaped or urceolate, hardening over the fruit; lobes 4–5, short, erect. **Petals** 0. **Stamens** 1, 2, 5, or 10, inserted on the calyx-mouth. **Styles**
Scleranthus.] Illeccebraceæ. 335

2, filiform, stigmas capitate; ovule pendulous from a filiform basal funicle. Utricle indehiscent. Seed lenticular, testa smooth; embryo annular.—Distrib. Europe, E. Asia, Africa, Australia, N. Zealand; species 10.—Etym. ἐκληρός, from the indurated perianth.

1. S. an'nuus, L.; calyx-lobes suberect in fruit acute with narrow membranous margins.

Fields and waste places, N. to Caithness; ascends above 1,000 ft. in the Highlands; Ireland; Channel Islands; fl. June–Sept.—Annual, rarely biennial (S. bien'nis, Reut.). Stem 2–8 in., slender, green, sometimes puberulous. Leaves ¼–½ in., recurved, base often ciliate. Flowers solitary in the lower axils, and fascicled in terminal dichotomous cymes. Calyx-tube 10-grooved in fruit.—Distrib. Europe to the Caucasus, N. Africa, N. and W. Asia; introd. in U. States.

2. S. peren'nis, L.; calyx-lobes incurved obtuse with broad scarious margins.

Sandy fields, from Radnor, Warwick, and Norfolk to Cornwall and Dorset; fl. June–Aug.—Very similar to S. an'nuus, but more glaucous, with shorter bracts and pubescent calyx-tube.—Distrib. Europe to the Caucasus Siberia.

Order LXI. Chenopodia'ceæ

Herbs or shrubs. Leaves simple, alternate, exstipulate. Flowers 1–2-sexual, small, regular, often dimorphic; bracts 1–3 or 0. Calyx inferior, of 3–5 free or connate sepals, imbricate in bud. Petals 0. Stamens usually 5, opposite the sepals, perigynous or hypogynous; anthers 2-celled. Ovary ovoid globose or depressed, 1-celled; ovule solitary, basal or lateral, campylotropous. Fruit usually a utricle, enclosed in the often enlarged or fleshy calyx. Seed horizontal or vertical, testa crustaceous, inner coat membranous, albumen floury fleshy or 0; embryo curved annular or spiral.—Distrib. All climates; genera 70; species about 450.—Affinities. With Amaranthaceæ, Caryophyl'lææ, and Illeccebræ.—Properties. Chiefly known as pot-herbs.

A. Cyclolobeæ. Embryo annular.

Tribe i. Euchenopodiææ. Stem leafy. Flowers bisexual, or if unisexual perianths of males and females similar


B. SPYROLOBEÆ. Embryo spiral.

TRIBE IV. SÜÆDEÆ. Stem leafy. Sepals 4–5, not winged at the back ................................. 5. Süeda.


1. CHENOPÓDIUM, Tournef. Goose-foot.

Erect or prostrate, very variable herbs, usually littoral or on made soil. Stem angled, often striped white or red and green. Leaves entire lobed or toothed. Flowers minute, 2-sexual, ebracteolate; clusters axillary, or in simple or panicked cymes. Sepals 3–5. Stamens 2–5, perigynous, filaments subulate. Disk 0. Ovary free, depressed or compressed; styles 2–3. Utricle membranous, often enclosed by the calyx. Seed horizontal or vertical, testa crustaceous, albumen floury; embryo annular.—DISTRIB. All climates; species about 50.—ETYM. χῦν and πῦς, goose-foot.


* Leaves quite entire.

1. C. Vulvária, L.; mealy, diffuse, leaves deltoid-ovate, sepals not keeled covering the utricle. C. ol'ídum, Curtis.

Roadsides and waste places, Edinburgh, and from Northumbd. southd.; S. and E. Ireland (? extinct); Channel Islands; fl. Aug.–Oct.—Annual, foetid. Branches 6–18 in., opposite, divaricate. Leaves 1/2–1 in., greasy to the touch, acute, grey-green; petiole as long or shorter. Spikes small, 1/2–1 1/2 in., dense, axillary and terminal. Seeds black, punctulate.—DISTRIB. From Denmark southd., N. Africa.—Odour of stale salt fish.

2. C. polysper'mum, L.; glabrous, erect or ascending, leaves ovate, sepals not keeled shorter than the utricle. C. acutifo'lium, Sm.

Cultivated ground, manure-heaps, &c., from Berwick southd.; Channel Islands; fl. Aug.–Oct.—Annual. Stem 6–18 in.; branches many, spreading, leafy. Leaves 1/2–1 1/2 in., shortly petioled, membranous, obtuse or acute. Cymes 1/2–1 in., axillary and terminal, simple or panicked; branches very slender, spreading; flowers very minute. Seeds minute, dark brown, rough.—DISTRIB. Europe, N. Asia; introd. in N. America.

** Leaves more or less toothed or lobed.

3. C. álbum, L.; erect, mealy, leaves rhombic or deltoid-ovate sub-entire or irregularly toothed, upper oblong entire, sepals keeled covering the utricle narrowly scariosus or all green, seed smooth keeled.

Waste, especially cultivated ground, N. to Shetland; ascends to 1,000 ft. in Yorkshire; Ireland; Channel Islands; fl. July–Sept.—Very variable. Stem 1–3 ft.; branches erect or ascending. Leaves 1–3 in., tip acute obtuse or rounded, base cuneate often 3-nerved; petiole usually long and slender. Spikes terminal and axillary, simple or panicked, leafy below. Seed almost black, hardly dotted.—DISTRIB. Europe (Arctic), temp. Asia; introd. in N. America.
C. album proper (C. can'dicans, Lamk.); leaves usually much toothed mealy, spikes simple shorter than the leaves in a slender terminal panicle, calyx very mealy.—Var. C. vir'ide, L.; leaves subentire sparingly or hardly mealy, spikes lax axillary subcorymbose, branches recurved, calyx almost glabrous.—Var. C. pagá'num, Reichb. (vi'rens, Lond. Cat.); lower leaves obtusely serrate glabrous or sparingly mealy below only, spikes lax erect axillary simple or in terminal panicles, calyx sparingly mealy.

4. C. ficifo'lium, Sm.; erect, mealy, flaccid, leaves oblong-hastate sinuate-toothed upper entire, basal lobes ascending, sepals covering the utricle, seed dotted not keeled.

Waste places, usually in rich soil, chiefly in the E. and S. of England, York to Kent and Sussex; Ireland rare; Channel Islands; fl. Aug.–Sept.—Very near C. al'bum, but more flaccid, flowers later, with more oblong-hastate leaves whose basal lobes spread more, and above which the leaf is often contracted, inflorescence almost leafless, seeds smaller.—Distr. Europe.

5. C. ur'bicum, L.; erect, sparingly mealy, leaves triangular acute deeply toothed or subentire, spikes erect leafless simple axillary or in a terminal erect panicle, sepals not keeled nor covering the utricle broadly scarious, seed large punctate not keeled.


C. ur' bicum proper (C. delto'ideum, Lamk.); leaves deltoid shortly toothed or subentire, spikes erect longer than the leaves, panicle leafless above.—Var. C. intermé'dium, Mert. and Koch; leaves rhombic-triangular deeply sinuate-toothed, spikes shorter than the leaves, panicle leafy almost to the top.

6. C. hy'bridum, L.; erect, almost glabrous, leaves large long-acuminate with 2–4 broad lobes on each side, spikes in lax axillary almost leafless corymbs, sepals obtusely keeled not covering the utricle broadly scarious, seed large opaque coarsely pitted not keeled.


7. C. mura'le, L.; nearly glabrous, leaves bright green rhombic- or deltoid-ovate acute entire at the cuneate base, upper narrower serrate, spikes short densely panicled, sepals slightly keeled almost covering the utricle narrowly scarious, seed sharply keeled.

Waste places, near houses, from Northumbd. southd., rare in England; Ireland, very rare; Channel Islands; fl. Aug.–Sept.—Rather tetrid. Stem 6–18 in., erect or ascending; branches decumbent. Leaves ½–3 in. broad, rather shining, teeth sharp; petiole shorter than the blade. Spikes ½–2 in. Seed
rather opaque, dotted.—Distrib. Europe, N. Africa, W. Asia, N.W. India; introd. in N. America.

Section 2. Annual. *Lateral flowers* of each cluster usually 2-4-merous, seed vertical; terminal 5-merous, seed horizontal or vertical. Styles short.

8. *C. ru'brum*, L.; glabrous, shining, leaves deltoid or rhombic-ovate, spikes leafy panicled, sepalts not keeled covering the utricle narrowly scarious, seed mostly vertical minute brown shining obscurely keeled.

Waste places, ditches, salt marshes, &c., from Aberdeen and Clyde southd.; Ireland, very rare; Channel Islands; fl. Aug.–Sept. —Stem 1–3 ft., erect or ascending. *Leaves* excessively variable, entire irregularly toothed or serrate, obtuse or acute, base 3-nerved. Spikes very short in terminal and axillary panicles.—Distrib. Europe, N. and W. Asia.

*C. ru'brum* proper; leaves sinuate-serrate not fleshy, panicle leafy to the top, spikes short compact dense-fl. often almost capitate.—VAR. *pseudo-botryo'des*, Wats., is smaller, often reddish, stem slender prostrate, leaves rhomboid almost entire, panicles much reduced.—VAR. *C. botryo'des*, Sm.; leaves subentire more triangular fleshy, panicle leafless above.

9. *C. glau'cum*, L.; prostrate, leaves mealy beneath oblong or ovate-oblong sinuate-lobed, spikes short dense leafless, sepalts keeled nearly covering the utricle narrowly scarious, seed acutely keeled.


Section 3. Perennial, glabrous, or nearly so. Flowers all 5-merous, or lateral 2–3-androus. Seeds nearly all vertical. Styles very long.

10. *C. Bo'rus-Henri'cus*, L.; leaves triangular-hastate subacute, spikes mostly in a compound leafless panicle, sepalts not keeled toothed at the tip broadly scarious, seed large tumid black not keeled. All-good.

Waste places, often near houses, from Caithness southd.; ascends to 1,200 ft. in N. England; common in Ireland; Channel Islands; (a native? Wats.); fl. May–Aug. —*Rootstock* stout, fleshy, branched. Stem stout, erect or ascending, 1–3 ft., papilllose. *Leaves* 2–4 in., succulent, papillose beneath, variable in shape, entire or sinuate-toothed, petiole of lower long, basal lobes often large acute and spreading. *Spikes* 1–2 in., dense-fl. Sepalts shorter than the utricle. Stamen 2–5, rarely 0. Seed punctulate.—Distrib. Europe, Siberia; introd. in N. America.—Cultivated as a pot-herb in Lincolnshire, and called "Mercury."


Herbs. Leaves almost entire. Flowers 2-sexual, in axillary spiked or cymose fascicles, cohering in fruit by the enlarged hardened bases of the


## 3. *Atriplex*, Tournef. ORACHE.

Herbs or shrubs, mealy or scaly. Leaves alternate or opposite, petioled, often hastate, entire or sinuate-toothed. Flowers small, 1-sexual, ebracteate; clusters usually in branched cymes.—Male. Sepals 3-5. Stamens 3-5, hypogynous, filaments filiform. Ovary rudimentary.—Female. Sepals 2, free or connate. Stamens 0. Styles 2, filiform, connate at the base. Utricle compressed, enclosed in the enlarged calyx. Seed compressed, vertical or horizontal, albumen floury; embryo annular.—Distrib. Shores and waste places; species 100.—Etym. The old Latin name.


1. **A. patula**, L.; mealy, stem erect or ascending stripped, branches spreading, leaves deltoid hastate or rhombic, floral usually broad, fem. sepals rhombic or deltoid usually toothed and tubercled or rarely hardened. Waste places, manure-heaps, &c., N. to Shetland; Ireland; Channel Islands; fl. June-Oct.—Very variable, 6 in.-3 ft., rarely prostrate, less mealy than *A. laciniata*. Female fl. mostly mixed with males, but axillary ones occur separately. Fruiting sepals usually ½-3 in. diam., except in sub-sp. Babington-Donnii, excessively variable in form, length of free portion, toothing and sculpture; base hastate truncate or deltoid. Seeds of two forms, largest ½-1 in. diam., dark brown, much compressed; smallest ½-½, smooth, shining.—Distrib. Most cool (Arctic) parts of the globe, native or naturalized. A. Patula proper; erect or ascending, deep green, sparingly mealy, lower leaves opposite rhombic or rhombic-hastate with ascending cuspae acute entire or serrate, spikes dense simple leafy below, sepals united at the base only deltoid entire or serrate (var. erecta, E. B.), smooth or muricate, seeds all vertical. A. erecta, Huds.—Common, extending to India; ascends to
1,000 ft. in N. England.— *A. angustifolia*, Sm.; is a weak procumbent state with branches divaricate, leaves subentire, spikes long lax paniced, sepals usually smooth.

Sub-sp. *A. hastata*, L.; erect or decumbent, dark green, mealy, lower leaves opposite hastate-deltoid with horizontal cusps subacute entire or toothed, upper lanceolate, spikes simple or paniced interrupted leafy at the base, sepals deltoid united at the base only, seeds dimorphic, larger brown rough, smaller black smooth. *A. patula*, Sm.; *A. Smithii*, Syme. Common, extending to India; ascends to 1,300 ft. in N. England.— *A. triangularis*, Willd. (*A. prostrata* and *A. deltoidea*, Bab.), is a var. with upper leaves hastate, spikes dense, terminal of the panicle short, sepals truncate but little longer than the utricle, seeds mostly small.

Sub-sp. *A. Babingtonii*, Woods; usually pale and very mealy, branches spreading ascending, leaves mostly opposite deltoid or rhombic-obovate entire or sinuate-toothed, upper usually similar, clusters of flowers remote, spikes simple lax leafy, sepals connate at the often hardened base or united nearly to the middle, seeds all vertical large pale rather rough. *A. rosea*, Bab., not L. Sea-shores, abundant.—Very variable; as green as sub-sp. *hastata*, or almost as white as *A. lacinia*, from which the striped stems distinguish it.—N. to Shetland; Ireland; Channel Islands.

2. *A. littoralis*, L.; mealy, stem erect striped, branches ascending, leaves linear- or elliptic-oblong usually quite entire upper very narrow, fem. sepals rhombic or deltoid toothed tubercled not hardened.

Salt and brackish marshes, banks, &c., from Perth to Dorset and Kent (excl. W. Scotland); Ireland; Channel Islands; fl. July–Sept.—Best distinguished from *A. patula* by the narrower usually quite entire leaves, which are never hastate and hardly ever rhombic. *Clusters of flowers* in slender terminal spikes. *Seeds* nearly smooth, shining, all vertical.—**Distrib.** Of *A. patula*.

*A. marina*, L. (*A. serrata*, Huds.), is a var. with leaves serrate or lobed, tips of fruiting sepals appressed.


Sandy sea-coasts, from Sutherland southd.; Ireland; Channel Islands; fl. July–Oct.—Silvery-white all over. *Stem* angled, branched from the base; branches 4–10 in., diffuse, stout or slender. *Leaves* 1–1 ½ in., petiole short, acute or obtuse, base cuneate, subentire or irregularly acutely or obtusely lobed toothed or serrate. *Male flowers* in short dense subapanicled spikes, female axillary with a few males intermixed. *Fruiting sepals* ½–1¼ in. diam., united to the middle, often broader than long, rhombic, acute or acuminate, entire lobed or toothed; disk often prominently veined or wrinkled, rarely tubercled. *Seed* large, ½ in. diam., much compressed, rough, red-brown.—**Distrib.** W. Europe, Norway to France.

**Sub-gen. 2. Obi'one**, Gærtn. (gen.). Annual or perennial. *Flowers* monoecious or dioecious. *Pericarp* adherent to the cup-shaped perianth. *Testa* coriaceous or crustaceous; *radicle* superior. *Halimus*, Wallroth.
4. *Atriplex.* L.; shrubby, mealy, leaves obovate- or spatulate-lanceolate quite entire, fem. perianth sessile compressed 2-4-lobed.


5. *Atriplex.* L.; herbaceous, mealy, leaves narrowly obovate-oblong quite entire, fem. perianth pedicelled, lobes 2 recurved.

Muddy maritime marshes, rare, Lincoln, Norfolk, Suffolk, Kent; fl. Aug.—Oct.—Annual, mealy like *Atriplex.* *Stem* 3-8 in., flexuous, slender, terete, simple or sparingly branched. *Leaves* ½-1½ in., tip rounded, shortly petiolate. *Spikes* terminal and reduced to axillary fascicles; flowers sub-sessile, one or few fruiting in each fascicle, when the pedicel elongates to ⅓-½ in., and is very spreading. *Fruiting perianth* ⅓ in. diam., campanulate with 2 lateral lobes and 2 intervening small teeth. *Seed* as in *Atriplex.*—*Distrib.* From Gothland southd., N. Africa, Siberia.

4. **Salicornia**, Tournef. **Marsh Samphire.**

Annual or perennial leafless herbs. *Stems* cylindric, very succulent, jointed; branches opposite. *Flowers* 2-sexual, minute, 2 together sunk in pits at the nodes. *Perianth* turbinate, compressed, fleshy, 3-4-lobed or truncate, mouth contracted. *Stamens* 1-2, perigynous. *Styles* 2. *Utricles* compressed, included in the swollen perianth. *Seed* vertical, testa membranous hairy, albumen scanty fleshy or 0; embryo conduplicate green, radicle inferior incumbent, cotyledons ½-terete thick.—*Distrib.* Salt districts; species 8.—*Etym.* sal and *cornu*, from the horn-like branches.

1. **Salicornia herba'cea,** L.; annual, root slender, stem ascending, branches more or less fusiform all flowering.

Salt marshes, N. to Shetland; Ireland; Channel Islands; fl. Aug.—Sept.—*Stem* 6-18 in., ¾-½ in. diam. at the thickest part, which is above the base; internodes ¾ in., usually contracted above and below, 2-lobed at the top when dry, lower woody slender, upper fleshy slightly compressed; branches spreading or ascending; flowering internodes in short spikes. *Flowers* bearing cavities 2 at each node, opposite. *Stamens* inserted at various heights, if 2 successively protruded. *Styles* exserted. *Fruiting perianth* narrowly winged at the top. *Seed* ovoid or oblong, greenish, covered with curled hairs.—*Distrib.* Europe, N. Africa, N. and W. Asia, India, N. America.—Formerly burnt for Barilla, and sometimes pickled.

**Salicornia herba'cea** proper; green, glaucous, ascending, branches suberect, spikes many-flowered.——*Var.* **S. procumb'bens,** Sm.; red, decumbent, branches cruciate, spikes few-flowered.——*Var.* **S. ramosis'sima,** Woods; grass-green, erect, much-
branched, spikes few-fld. Hayling Island.—Var. pusill'a, Woods; very small, spikes about ½ in. few-fld.

2. **S. radic'ans**, Sm. ; rootstock perennial woody creeping sending up herbaceous terete barren and flowering branches.

Salt marshes, from York southd. to Devon; fl. Sept–Oct.—Much more branched and tufted than *S. herba'cea*, colour browner.—Stems $\frac{1}{2}$–2 ft., 4–5 in. diam., spikes thicker and more obtuse.—Distrib. W. Europe from Denmark southd.—Erroneously referred to *Arthrocnemum fruticos'um* by Moquin Tandon (in DC. Prodr.).

Imperfectly known species are *S. ligno'sa*, Woods (Linn. Soc. Proceed., 1851, p. 111), with the growth, &c., of *S. radic'ans*, but stem shorter thicker more woody below; and *S. megasta'chya*, Woods, with tubercled hairless seeds, which is possibly an *Arthrocnemum*.


Saline herbs or shrubs. Leaves fleshy, alternate, terete or ½-terete. Flowers 1–2-sexual, small, green, axillary, minutely 3-bracteolate. Calyx 5-partite; segments obtuse, not keeled or winged. Stamens 5, hypogynous. Styles 3–5, compressed. Utricle enclosed in the fleshy or dry calyx. Seed horizontal or vertical, testa crustaceous, inner coat thin, albumen 0 or fleshy and scanty; embryo in a flat spiral, radicle inferior.—Distrib. Salt marshes and shores; species about 40.—Etym. unknown.

1. **S. marit'ima**, Dumort. ; annual, stem procumbent or ascending branched, leaves subacute tapering at the base, styles 2, seed horizontal. *Schobe'ria*, C. A. Meyer; *Chenopodi'na*, Moq. Tand.


Sandy and pebbly beaches, Norfolk, Suffolk, Essex, Dorset, rare and local; fl. July–Oct.—Glabrous, rather glaucous. Stem 1–3 ft., $\frac{1}{2}$ in. diam. at the base; branches erect or ascending. Leaves ½–$\frac{3}{4}$ in., crowded, fleshy, dotted with white. Flowers solitary or 2–3 together, subsessile. Seed shining, black.—Distrib. From Spain eastd., N. Africa, W. Asia, India.


Herbs or shrubs. Leaves alternate or opposite, sessile, subcylindric or subulate, fleshy rigid or spinescent. Flowers small, axillary, sessile, dichogamous, 2-bracteate. Sepals 5, rarely 4, with a broad transverse dorsal wing that forms after flowering. Stamens 5, rarely 3, hypogynous; filaments linear free or connate below. Ovary subglobose; style elongate,
stigmas 2–3 compressed or subulate. Utricle depressed, enclosed in the stellately 5-winged much enlarged calyx. Seed horizontal, testa membranous, albumen 0; embryo forming a conical helix.—Distrib. Saline districts; species about 40.—Etym. sal, from yielding alkalies.

S. Ka'li, L.; herbaceous, rigid, leaves spinous-pointed. Sandy sea-shores from Caithness southd.; Ireland; Channel Islands; fl. July–Aug.—Annual, pubescent or scabrid, glaucous. Stem 6–18 in., erect or procumbent, striped; branches many, spreading, flexuous. Leaves |-1| in., spreading and recurved, fleshy, ovate-subulate, \( \frac{1}{2} \)-amplexicaul. Flowers 1–3; bracts spinescent. Wings of fruiting perianth very variable, broad or narrow, scarious, often rose-coloured. Seed brown, adherent to the pericarp.—Distrib. Europe, N. and S. Africa. N. and W. Asia, India, N. and S. America, Australia.—Formerly burnt for Barilla.

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Order LXII. Polygonaceae.

Herbs, rarely shrubby. Leaves alternate, simple, quite entire or serrulate; margins revolute in bud; petiole dilated; stipules sheathing, scarious. Flowers usually 2-sexual, pedicels jointed. Sepals 3–6, petaloid or herbaceous, free or connate, persistent, imbricate in bud. Stamens 5–8, rarely more or less, perigynous or hypogynous, opposite the sepals; anthers 2-celled. Disk glandular annular or 0. Ovary free, ovoid, 3-gonous or compressed; styles 1–3, stigmas capitate or penicillate; ovule 1, basilar, orthotropous. Fruit indehiscent, hard, usually enveloped in the perianth. Seed erect, testa membranous, albumen floury; embryo straight and axile, or lateral and curved, cotyledons various, radicle superior.—Distrib. Chiefly temp. regions; genera 30; species about 600.—Affinities. With Amaranthaceae and Chenopodiaceae.—Properties. Root often astringent or purgative; some yield oxalic and malic acids; the leaves or seeds of others are alimentary.


1. Polygonum, L.

Herbs. Leaves alternate; stipules tubular. Flowers 2-sexual, in panicked racemed or spiked clusters; bracts ochreate. Sepals 5, 3 outer sometimes enlarging in fruit. Disk usually glandular. Stamens 5–8; anthers versatile. Ovary compressed or 3-gonous; styles 2–3, stigmas capitate. Fruit 3-quetrous or compressed. Embryo axile or lateral.—Distrib. All climates; species 150.—Etym. \( \pi \alpha \lambda \upsilon \) and \( \gamma \omega \nu \), from the many nodes.


Wet meadows, wild from Renfrew and Edinburgh southd., often introduced N. of it; ascends to 1,050 ft. in Derby; Ireland, rare, native?; fl. June–Sept.—Glabrous, except the leaf-nerves beneath. Rootstock woody, twisted, creeping; roots tuberous. Stem 1–2 ft., strict, slender. Leaves, radical 3–6 in., oblong-ovate, obtuse, glaucous beneath; petiole 6–12 in., broadly winged above; cauline subsessile, broader at the base; stipules \( \frac{1}{2} – 3 \) in. Raceme 1\( \frac{1}{2} \)–2 in.; bracts cuspidate. Flowers \( \frac{1}{2} \) in. long, white or pink, honeyed, proterandrous. Stamens exserted. Fruit brown, shining.—Distrib. Europe (Arctic), N. and W. Asia, Himalaya.—Rootstock astringent; used as food in famine-times, and formerly medicinally.

2. P. viviparum, L.; leaves narrowed at the base, petiole not winged, raceme spike-like bulbiferous below.

Mountain pastures and wet alpine rocks; from Carnarvon and York to Shetland; ascends to 4,000 ft.; W. Ireland; fl. June–Aug.—Glabrous. Rootstock slender. Stem 4–16 in., slender. Leaves 1–2\( \frac{1}{2} \) in., \( \frac{1}{6} – \frac{1}{3} \) in. broad, radical narrow linear-oblong, petiole as long or shorter, subacute, glaucous beneath, margins revolute; cauline few, shorter petioled; stipules \( \frac{1}{2} – 1\frac{1}{2} \) in. Racemes 1–3 in., slender, obtuse. Flowers white or pink, polygamous; bulbils purple. Fruit rarely ripening.—Distrib. Alps of N. temp. and Arctic regions.


* Spikes short, usually dense, not or rarely interrupted, not leafy at the base.

3. P. amphibia, L.; perennial, creeping or floating, leaves oblong or lanceolate, racemes subsolitary dense-flld., peduncles hairy, sepals eglandular, stamens 5, styles 2 united half way, fruit ovoid, faces convex.

Damp and watery places, N. to Shetland; Ireland; Channel Islands; fl. July–Aug.—Rootstock creeping, slender, woody, branched. Stem very variable in length. Leaves floating and long-petioled or aerial and subsessile, obtuse or acute, serrulate or ciliate, eglandular; stipules large, appressed, glabrous or hispid, mouth entire, Racemes 1–3, \( \frac{1}{2} – 2 \) in.; peduncle stout; pedicels short; bracts obtuse acute or cuspidate. Sepals \( \frac{1}{2} \) in., not nerved, pale or bright rose-red, much longer than the shining fruit.—Distrib. N. temp. and Arctic regions.

4. P. lapathifolium, L.; annual, leaves ovate or oblong-lanceolate, racemes subcyllindric, peduncle rough and sepals glandular, stamens 5–6, styles 2 free, fruit orbicular, faces concave.
Fields and waste places, N. to Shetland; ascends to near 1,000 ft. in York; Ireland; Channel Islands; fl. July—Aug.—Stem 1—4 ft., decumbent and rooting below, much branched, green red or spotted; nodes stout, swollen. Leaves 4—6 in., shortly petioled, acuminate, ciliate, glabrous pubescent scaberulous or cottony above and beneath, sometimes glansceous beneath, or with a black blotch above, punctate and sparingly glandular; stipules loose, often ciliate. Racemes 1—3, ½—1½ in., often panicked, obtuse, stout; bracts broad, obtuse or cuspitate. Sepals nerves, equaling the obtuse dark fruit.—Distrib. Europe, N. Africa, N. and W. Asia, India; introd. in America.

P. Lapatthropium proper; racemes remote, sepals shorter than the fruit. Common.

Sub-sp. P. maculatum, Dyer and Trimen; racemes crowded, sepals larger than the smaller fruit. P. nudosum, Reichb.; P. laxum, Bab.

5. P. Persicaria, L.; annual, racemes usually short dense, leaves ovate or lanceolate, peduncle glabrous, sepals subeglandular, stamens 5—8, styles 2—3 united half way, fruit plano-convex or 3-gonous. Persicaria. Waste moist places, N. to Shetland; ascends to 1,300 ft. in N. England; Ireland; Channel Islands; fl. July—Oct.—Stem 6—18 in., branched, erect or ascending, nodes usually swollen. Leaves subsessile, subacute, ciliolate, often with a black blotch, pubescent and punctate below, eglandular; stipules ciliate. Racemes ½—1½ in., with sometimes a leaf at the base, erect or suberect, peduncled, lateral, sessile. Flowers homogamous; anthers, outer intorse, inner extorse. Sepals red or white, equaling the fruit.—Distrib. Europe (Arctic), N. Africa, N. and W. Asia, India.

P. Persicaria proper; branches divaricate, racemes remote short stout, or slender (P. bifor’mé, Wahlb.) obtuse cylindric.—Var. P. nudosum, Pers.? branches erect, racemes slender rather lax attenuated upwards, young crowded. P. bifor’mé, Bab.

**Spikes long, lax, slender, interrupted and leafy below.

6. P. mite, Schrank; annual, suberect, racemes slender erect, sepals eglandular, stamens 5—6, styles 2—3 united half way, fruit roughish plano-convex or 3-gonous as long as the sepals.


7. P. Hydrodropiper, L.; annual, suberect, racemes very slender tips drooping, sepals with few very large glands, stamens 6 (rarely 8), styles 2—3 free, fruit plano-convex or 3-gonous as long as the sepals. Water-pepper.

Watery places from Skye southd.; ascends to 1,300 ft. in the Lake district; Ireland; Channel Islands; fl. Aug.—Sept.—Stem 1—3 ft., creeping and rooting at the base, much branched. Leaves 2—4 in., shortly petioloed, lanceolate or elliptic-lanceolate, subacute, ciliolate, minutely glandular beneath; stipules short, inflated, ciliate or not. Racemes 3—8 in., curved, lax. Sepals green
and rose. Fruit black, punctulate.—Distrib. N. temp. hemisphere.—Very acrid, and a reputed diuretic.

8. P. minus, Huds.; annual, racemes very slender straight, sepals usually 5 with minute glands at the base only, styles 2-3 united half way, fruit smooth plano-convex or 3-gonous as long as the sepals.

Marshy places, local from Perth and Renfrew southd.; Ireland, rare; fl. Aug.-Sept.—Stem 6-24 in., usually very slender, much branched, erect or ascending. Leaves 1-3 in., narrow-lanceolate, ciliolate, eglandular; stipules not inflated, short, ciliate. Racemes 1-3 in., solitary or panicked, usually on slender peduncles. Sepals 1/10-1/3 in., very small. Fruit pitchy-black, shining, acute.—Distrib. Europe, N. and W. Asia, India.

Section 3. Avicularia, Meissn. Annual or biennial. Leaves narrow; stipules silvery, at length lacerate. Flowers axillary, solitary or fascicled; pedicels jointed at the top. Stamens usually 8. Styles usually 3. Fruit 3-quetrous; embryo lateral, cotyledons thin flat.


Fields and waste places, N. to Shetland; ascends to 1,800 ft. in Northumbd.; Ireland; Channel Islands; fl. May-Oct.—Annual, glabrous, eglandular, branched from the base; branches 1/4-3 ft., straggling, grooved, angular above, leafing and flowering throughout. Leaves 1/8-1/3 in., 1/10-1/3 in. broad, sessile or short petioled, linear-lanceolate or -oblong, narrowed at both ends, rarely broadly elliptic or almost filiform, acute or obtuse, margins flat or recurved; stipules 1/8-1/4 in., white, red at the base, lacerate. Flowers 1/10-1/3 in., white, pink, crimson, or green, clustered in the axils, homogamous. Fruit brown, minutely striate and punctate.—Distrib. Europe (Arctic), N. and W. Asia; introd. in N. America.

P. Avicula're proper; leaves rather thin, fruit dull included.—Var. P. littoral'le, Link; leaves rather fleshy, fruit more shining, tip exerted. Littoral. The passage to P. marit'imum.—Var. agresti'num, Jord., is the common robust field form, arenastrum, Boreau, a sand-loving prostrate one; micro-sper'mum, Jord., a small fruited one; and ruriva'yum, Jord., a wayside one with narrow very acute leaves.

Sub-sp. P. Robert'ti, Loisel; fruit longer than the sepals. P. Rai'i, Bab. in part.—Sandy shores.

10. P. marit'imum, L.; prostrate, nerves of the leaves reticulate beneath, of the stipules few or many, sepals shorter than the fruit.

Sea-shores, Hants, Devon, Cornwall; Channel Islands; fl. July-Sept.—Similar to P. avicula're, but perennial, much stouter, more rigid and woody, darker when dry; leaves thicker, often glaucous beneath; stipules larger more scarios and nerved; flowers and fruit much larger.—Distrib. France, Spain, Mediterranean, W. Asia, N. America.

Section 4. Tina'ria, Meissn. Annual (the British species), usually twining. Leaves cordate or sagittate; stipules truncate, mouth entire.

11. **P. Convol'vulus, L.**; leaves cordate-sagittate, 3 outer sepals obtusely keeled rarely winged, pedicels short jointed above the middle, fruit dull striate granulate. *Black Bindweed.*

Fields and waste places, from Caithness southd.; ascends to 1,350 ft. in Derby; Ireland; Channel Islands; fl. July–Sept.—Root fibrous. Stem 1–4 ft., angular, twining climbing or prostrate, slender, angles puberulous. Leaves 1½–4 in., petiole shorter, slender, gradually acuminate, lateral angles obtuse or acute, eglandular, puberulous beneath; stipules short. Racemes erect, terminal and axillary, slender, pedicels recurved. Sepals 5, obtuse, green, margins white, 3 outer rough at the back, at length ½ in., and covering the fruit.—Distr. N. temp. and Arctic regions; introd. in America.

**P. Convol'vulus proper**; clusters 4–6-fld., outer sepals obtusely keeled in fruit. —**Var. pseudo-dumeto'rum, Wats.**; clusters 5–10-fld., outer sepals broadly winged in fruit.

12. **P. dumeto'rum, L.**; leaves cordate-sagittate, 3 outer sepals with broad membranous wings, pedicels very slender jointed below the middle, fruit smooth highly polished.

Hedges and thickets, Monmouth and Essex to Kent and Devon, rare, soon disappearing; fl. July–Aug.—Habit of *P. Convol'vulus*, but pedicels capillary (often ¾ in.) and seed polished. The stems are described as terete, but I find them as much angled as in *P. Convol'vulus.*—**Distr.** Europe, N. and W. Asia, N.W. India.

### 2. **RU'MEX, L.** Dock.

Biennial or perennial herbs. Rootstock stout, tapering into the root. Stems usually grooved. Leaves alternate; stipules tubular. Flowers 1–2-sexual, in panicked or racemed whorls, anemophilous. Sepals 6, 3 inner enlarging. Stamens 6; anthers basifixed. Ovary 3-quetrous; styles 3, filiform, stigmas penicillate. Fruit 3-quetrous. *Embryo* lateral.—**Distr.** All temp. climates; species about 100.—**Etym.** The old Latin name.

Hybrids are common in this genus; those most known to cross are said to be pulcher, crispus, and conglomeratus.

**Section 1. Lap'athum, Meissn.** Leaves not hastate. Flowers 2-sexual (monœcious in *R. alpinus*). Inner sepals coriaceous in fruit.

* Inner fruiting sepals usually strongly toothed.

1. **R. obtusifo'lius, L.**; radical leaves oblong-ovate cordate obtuse, panicle leafy below, inner fruiting sepals elongate triangular obtuse usually strongly toothed at the base, upper or all with an ovoid tubercle.

Fields, waste grounds, N. to Shetland; ascends to 1,600 ft. in N. England; Ireland; Channel Islands; fl. Aug.–Sept.—Perennial, 2–3 ft., stem stout and leaves beneath puberulous. Leaves 6–12 in., subacute or obtuse, margin crenulate waved, upper oblong-lanceolate; petiole rather slender. *Panicle* narrow; pedicels ½–twice as long as the reticulate fruiting sepals, ½–¾ in.;
tubercle red or brown.—**Distrib.** Europe, N. Africa, N. and W. Asia, N.W. India; introd. in N. America.

*R. obtusifo'lius* proper (*R. Fries'ii*, Gren. and Godr.); inner sepals with spreading subulate teeth, oblong one tubercled, apex entire.—**Var.** *R. sylvest'ris*, Wallr.; all the inner sepals tubercled nearly entire in fruit. Thames at Putney.

2. **R. acu'tus**, *L.*; radical leaves linear or oblong-lanceolate waved, panicle leafy below, inner fruiting sepals unequal triangular or cordate with short broad teeth near the top, upper with an ovoid or lanceolate tubercle. *R. praten'sis*, Mert. and Koch.

Roadsides, &c., from Orkney southd.; ascends to 1,200 feet in N. England; fl. June–July.—Similar to *R. obtusifo'lius*, but leaves narrower, and fruiting inner sepals much broader, with more and shorter teeth.—Syme and Koch regard it as a hybrid between *R. cris'pus* and *obtusifo'lius*; Watson as a medley of intermediate forms.—**Distrib.** Europe from the Alps northd., Spain.

*R. conser'pus*, Hartm., found in a few Scotch counties from Orkney to Berwick, differs only in the more crisped leaves and equal inner fruiting sepals.

3. **R. pul'cher**, *L.*; leaves oblong-cordate or fiddle-shaped obtuse, upper acute, panicle leafy to the top, inner fruiting sepals oblong deeply-toothed to above the middle, tubercle oblong often muricate. *Fiddle Dock.*

Waste places in dry soil from N. Wales and Notts southd.; Ireland; Channel Islands; fl. June–Oct.—Biennial or perennial, glabrous or nearly so. **Stem** 6–24 in., flexuous; branches slender, spreading, tips often decurved. **Leaves** 3–6 in., soon withering, always contracted above the base, crenulate; petiole slender. **Panicle** with spreading branches, whorls remote; pedicels stout, shorter than the fruiting sepals, jointed below the middle. **Fruiting sepals** ½ in., pale, obtuse truncate or cuneate at the base, deeply pitted and reticulate; teeth short, straight. **Fruit** ½ in.—**Distrib.** From Belgium southd. N. Africa, W. Asia.

4. **R. marit'imus**, *L.*; leaves linear- or oblong-lanceolate, panicle leafy to the top, inner fruiting sepals triangular or rhomboid acuminate, teeth 2–4 very long, tubercle linear-oblong very tumid. *Golden Dock.*

Marshes, &c., rare, from Northumbd. to Kent and Somerset; Ireland; Channel Islands; fl. July–Aug.—Biennial, puberulous, yellow-green. **Stem** 1–2 ft.; branches ascending. **Leaves** 3–10 in., base acute obtuse or cuneate, shortly petioled, margins slightly waved. **Panicle** with spreading densely flowering branches, whorls often confluent; pedicels jointed at the base, variable in length, rarely twice as long as the fruiting sepals, which are reticulate, ½ in., orange-yellow, spines as long; tubercle often almost concealing the sepal. **Fruit** small, pale chestnut.—**Distrib.** Europe, N. and W. Asia, N.W. India, N. America.—*R. Knaf'í*, Celak, is a hybrid with *conglomer'atus* of which only a single specimen has been seen; it was first figured as *R. marit'imus*, *L.* (forma hybrid a?) *Warren'i* ii, by Trimen in Journ. Bot. iii. 161, t. 146.

*R. marit'imus* proper; whorls confluent, inner fruiting sepals triangular, teeth often longer than the sepal.
Sub-sp. R. palustris, Sm.; whorls laxer usually distinct fewer-fld., inner fruiting sepals oblong triangular or rhomboid, teeth shorter usually fewer, fruit much larger. R. Steinii, Becker.

** Inner fruiting sepals quite entire or minutely toothed.

† One or all the inner sepals with a prominent tubercle on the midrib.

5. R. crispus, L.; leaves lanceolate or oblong-lanceolate subacute much waved and crisped, panicle leafy below, inner fruiting sepals oblong-ovate or cordate obtuse subentire, upper with a broad smooth tubercle.

Waste places, N. to Shetland; ascends to 2,000 ft. in Northumbd.; Ireland; Channel Islands; fl. June–Oct.—Perennial, glabrous or puberulous. Stem 1–3 ft., branched. Leaves 6–10 in., base obtuse rounded or acute; petiole moderate. Panicle with erect branches; whorls crowded; pedicels jointed at the base, twice as long as the fruiting sepal or shorter. Fruit sepals ½–1 in., green or reddish, reticulate; inner entire or crenulate; tubercle small, smooth. Fruit brown.—Distrib. Europe, N. Africa, temp. Asia; introd. in N. America.

Var. trigranulata, Syme, has the panicle very dense, branches short appressed, inner fruiting sepals all tubercled. Orkney, Annn, Fife.—Var. subcordata, Warren, has a lax panicle, and inner fruiting sepals larger and more triangular. Lewes.

R. elongatus, Guss., is a var. with flat leaves and laxer panicles from wet places by the Thames and Wye; it attains 6 ft.

6. R. sanguineus, L.; leaves oblong-lanceolate fiddle-shaped sparingly waved, base of panicle leafy, inner fruiting sepals oblong obtuse base rounded entire, upper (or all) with a large smooth tubercle.

Roadsides and hedges from Isla and Elgin southd.; ascend to 1,200 ft. in York; Ireland; Channel Islands; fl. July–Aug.—Perennial, glabrous. Stem 1–4 ft., slender, simple or sparingly branched. Leaves 6–10 in., base usually cordate, nerves red or green (R. viridis, Sibth.; R. nemorosus, Schrad.); petiole shorter. Panicle lax, usually leafless; whors distant, many-fld.; pedicels usually equaling the fruiting sepals, rarely twice as long, jointed at the base. Fruit sepals oblong or oblong-lanceolate; tubercle on the outer larger, subglobose, on the others small or 0. Fruit brown, shining.—Distrib. Europe, W. Asia; introd. in N. America.

7. R. conglomeratus, Murray; leaves oblong-lanceolate base rounded or cordate, panicle leafy almost to the top, inner fruiting sepals linear-oblong subacute rounded at the base quite entire, all with oblong tubercles. R. acutus, Sm. and L. Herb.

Wet meadows and waste places, from Skye and Aberdeen southd.; Ireland; Channel Islands; fl. June–Oct.—Closely allied to R. sanguineus, differing in the leaves never contracted above the base, pedicels jointed below the middle, longer tubercles, and in the characters given above.—Distrib. Europe, N. Africa, W. Asia; introd. in N. America.

R. rupestris, Le Gall, is a more upright var. with panicle tapering, root-leaves narrower, bracts few and narrow, fruiting sepals larger more obtuse. —Sea coasts, Sussex to Cornwall; Channel Islands.
8. **R. Hydrolap’athum, Huds.**; leaves broadly oblone-lanceolate, panicle almost leafless, inner fruiting sepals deltoid-ovate acute or obtuse quite entire or faintly toothed, all with oblong tubercles.

Ditches and river-sides from Perth and Isla southd.; Ireland; Channel Islands; fl. July–Aug.—Perennial, glabrous. **Stem** 3–6 ft., erect, branched. **Leaves** 1–2 ft., acute, base rounded coriaceous or acute, margins flat crenulate; petiole 6–10 in., flat above, not winged. **Panicle** very large; whorls rather crowded; fruiting pedicels as long or twice as long as the sepals, jointed near base. **Fruiting sepals** ¼–½ in., reticulate, base truncate or cuneate. **Fruit** pale chestnut.—**Distrib.** Europe.—The largest British species. Root astringent.

**R. Hydrolap’athum** proper; petioles flat, base of inner fruiting sepals narrowed.—**Var. latifolia, Borr.** (? R. max’imus, Schreb.); margins of petioles raised, base of inner fruiting sepals truncate or cordate. Essex, Hants, Sussex, Cornwall, Scilly Is.

†† **Fruiting sepals without tubercles on the midrib.**

9. **R. aquat’icus, L.**; lower leaves oblone-lanceolate crisped and waved, panicle leafy at the base only, inner fruiting sepals coriaceous waved membranous reticulate. **R. longifo’lius, DC.**

Wet meadows and ditches, from York to Shetland; ascends to 1,600 ft. in the Highlands; fl. July–Aug.—Perennial, glabrous. **Stem** 1–3 ft., very stout. **Leaves** 3–4 in. diam. **Panicle** with erect branches; whorls confluent; pedicels usually the length of the sepals, jointed below the middle. **Fruiting sepals** ¼–½ in. diam., obtuse, green, strongly reticulate; midrib slightly thickened. **Fruit** broad, small, pale brown.—**Distrib.** Scandinavia (Arctic), France, Germany, N. and W. Asia, Himalaya, N. America.

**R. alpi’nus, L.**; leaves broadly ovate-cordate obtuse, panicle leafy at the base only, inner fruiting sepals triangular-ovate obtuse faintly reticulate. Monk’s Rhubarb.

Roadsides, near cottages, &c., N. England and Scotland, rare, naturalized; fl. July–Aug.—Perennial, puberulous with cellular hairs. **Rootstock** very stout. **Stem** 2–4 ft., stout. **Leaves** 6–24 in., not so broad, margins waved; petiole long, stout. **Panicle** with very many erect branches; whorls very many, not confluent; flowers monoeious; fruiting sepals, ⅔–⅓ in.; pedicels twice as long, jointed below the middle. **Fruit** grey.—**Distrib.** N. and Alpine districts of S. Europe, excluding Russia.—Root formerly used medicinally, and leaves as a pot-herb.

**Section 2. Aceto’sa, Tournef.** **Leaves** hastate or sagittate. **Flowers** monoeious or dioecious.

10. **R. Aceto’sa, L.**; dioecious, lower leaves sagittate, upper sessile, outer fruiting sepals reflexed, inner enlarged orbicular entire scarious tubercled at the base. **Sorrel**

Meadows and pastures, N. to Shetland, ascends to 4,000 ft.; Ireland; Channel Islands; fl. May–Aug.—Perennial, glabrous, acid, rather succulent. **Rootstock** tufted, slender. **Stem** 1–2 ft., simple, slender. **Leaves**, radical 3–6 in., very long-petioled, basal sinus rounded or angled, glaucous beneath; stipules
brown. *Panicle* with erect branches, leafless; male whorls densely 4-8-fld.; pedicels jointed below the middle. *Sepals* of male fl. herbaceous, margins white or pink, scarious; of female, $\frac{1}{2}$ in. when in fruit, pink or crimson. *Fruit* brown, shining.—*Distr.* N. temp. and Arctic zones.—A salad and pot-herb; abounds in binoxalate of potash.


Dry pastures, N. to Shetland, ascends to 2,500 ft. in York; Ireland; Channel Islands; fl. May–Aug.—Perennial, acid, glabrous, often bright red in autumn. *Rootstock* creeping, much branched. *Stems* 3-20 in., often many and tufted, decumbent at the base, slender. *Leaves* $\frac{1}{2}$-2 in., long-petioled, variable in breadth, often 3-lobed; stipules silvery, torn. *Panicle* leafless, branches erect; male flowers largest; pedicels as long as the fruiting sepals, jointed at the top, length variable. *Fruiting sepals* $\frac{1}{8}$ in., obtuse, closely investing the yellow-brown fruit.—*Distr.* N. temp. and Arctic zones; introd. into the S.

3. **Oxyria**, Hill. **Mountain Sorrel**.

Characters of *Rumex*, but sepals 4; anthers versatile; ovary compressed; stigmas 2; fruit lenticular, broadly winged, and embryo axile.—*Distr.* Arctic regions and Alps of the N. temp. zone; species 1.—*Etym.* δίξιος, from the acidity of the leaves.

**O. digyna**, Hill; leaves cordate or reniform. *O. renifolium*, Hk.

Mountain rocks and streams, from N. Wales and Westmoreland to Orkney; ascends to near 4,000 ft.; S.W. Ireland; fl. July–Aug.—Perennial, glabrous, rather fleshy, acid. *Rootstock* tufted. *Stem* 6-18 in., stout, subsimple. *Leaves*, radical many, $\frac{1}{2}$-2 in. broad, long-petioled, rounded or retuse, rarely 3-lobed or subhastate; cauline solitary. *Panicle* slender, leafless, lax-fld.; pedicels slender, jointed at the middle, top thickened. *Outer sepals* spreading or reflexed; inner $\frac{1}{10}$ in., spatulate, 3-5-nerved. *Fruit* $\frac{1}{8}$ in. diam.; wing orbicular-cordate, membranous, veined, top notched.—An excellent pot-herb and antiscorbutic.

**Order LXIII. Aristolochiae.**
basilar, cotyledons short, radicle usually next the hilum.—DISTRIB. Chiefly trop.; genera 5; species 200.—AFFINITIES. With Nepenthaceae and Rafflesiaaceae.—PROPERTIES. Bitter, acrid, sometimes aromatic.


1. AS'ARUM, Tournef. Asarabacca.

Perennial herbs. Rootstock stout, branched, woody. Leaves radical. Flower solitary, peduncled, terminal, lurid purple, proterogynous. Perianth campanulate, regular, persistent, 3-lobed. Stamens 12; anthers bursting outwards, connective produced. Ovary inferior or ½-inferior, 6-celled; styles 6, tubular, grooved or 2-fid. Fruit coriaceous, bursting irregularly. Seeds boat-shaped, wrinkled on the convex face, with a median winged or fleshy raphe on the other.—DISTRIB. Europe, N. Asia, Himalaya, N. America; species 13.—ETYM. doubtful.


1*. ARISTOLO'CHIA, Tournef. Birthwort.

Shrubs or perennial herbs, often twining. Leaves cauline; petioles with dilated bases, having in their axils solitary or racemose proterogynous flowers and often the stipule-like leaf of an undeveloped bud. Perianth coloured, tube inflated at the base, then contracted, hairy inside; limb dilated, obliquely 1–2-lipped. Anthers 6, rarely 5 or more, adnate in a whorl to the very stout short 6-lobed style. Capsule septicidally 6-valved.—DISTRIB. Chiefly trop.; species 160.—ETYM. The old Greek name.

Order LXIV. **Thymelaeaceae.**

Herbs, shrubs, or trees; juice acrid; inner bark tenacious. **Leaves** alternate or opposite, quite entire, exstipulate. **Flowers** 2-sexual (rarely polygamous), solitary fascicled cymose or capitate. **Perianth** inferior, throat naked or bearing scales glands or staminodes; lobes 4–5, imbricate in bud. **Stamens** 2, 4, 8, or 10, adnate in 1–2 series to and included within the perianth-tube, when equalling its lobes alternate with them. **Disk** 0 or of 4–8 hypogynous scales or glands. **Ovary** free, 1–rarely 2-celled; style terminal or lateral, stigma capitate; ovules 1–3, pendulous, anatropous. **Fruit** a drupe or berry (rarely capsular). **Seed** pendulous, testa thin or crustaceous, albumen scanty; embryo straight, cotyledons plano-convex, radicle short superior.—**Distrib.** Temp. and trop. regions; genera 40; species about 300.—**Affinities.** With Elaeagnaceae, Proteaceae, and Santalaceae.—**Properties** acrid.

1. **Daphne, L.**

Shrubs, rarely tall. **Leaves** usually alternate and persistent. **Flowers** odorous, honeyed. **Perianth** tubular; lobes 4, spreading; throat naked. **Stamens** 8, subsessile, 2-seriate; anthers fixed by the back. **Style** subterminal, short or 0. **Fruit** coriaceous or fleshy. **Testa** crustaceous. **Distrib.** Europe, N. Africa, temp. Asia; species about 50.—**Etym.** doubtful.

1. **D. Laureola, L.;** leaves evergreen, flowers fascicled in the upper leaf-axils green glabrous. **Spurge Laurel.**

Copses and hedgebanks in stiff soils, from Durham to Devon and Kent; Channel Islands; fl. Jan.–April.—Shrub 1–3 ft., leafless below, branches few. **Leaves** 2–5 in., very coriaceous, obovate-lanceolate, acute, subsessile. **Cymes** few-fld.; bracts oblong, deciduous; flowers ½ in., inclined, males and 2-sexual intermixed. **Calyx-lobes** ½ the length of the tube. **Fruit** ½ in., ovoid, black.—**Distrib.** From Belgium southd. (excl. Russia and Greece), N. Africa, W. Asia.—Berry very poisonous.

2. **D. Mezereum, L.;** leaves deciduous, flowers appearing before the leaves clustered on the branches pink silky. **Mezereon.**

Copses and woods, perhaps native in the S.; (an alien or denizen, Wats.); fl. Feb.–April.—Shrub 2–4 ft.; branches few, erect. **Leaves** 2–3 in., obovate- or spatulate-lanceolate, acute, membranous, petioled. **Flowers** usually 3-nate, subsessile in the axils of the last year’s leaves, very fragrant, rarely white; bracts small. **Perianth** ½ in. diam., tube as long as the lobes. **Fruit** ½ in., bright red, ovoid.—**Distrib.** Europe (excl. Greece), Siberia.—Acrid and poisonous; leaves used as a vesicant; berries cathartic.
Order LXV. **ELÆAGNACEÆ.**

Shrubs or trees, with copious silvery or brown scales; buds naked. **Leaves** alternate or opposite, quite entire, exstipulate. **Flowers** small, regular, 1–2-sexual, axillary, fascicled or cymose, white or yellow. **Perianth** in the 2-sexual and female fl. tubular, 2–6-cleft, lobes imbricate or valvate in bud; in male fl. of 2 or 4 sepals free or connate below. **Disk** 0, or lining the calyx-tube. **Stamens** adnate to the calyx-tube, in the male fl. twice as many as the lobes, in the 2-sexual as many as and opposite the lobes; anthers fixed by the back or base. **Ovary** free, sessile, enclosed in the thickened calyx-base, 1-celled; style filiform, stigma lateral; ovule 1, basal, erect, anatropous. **Fruit** indehiscent, enclosed in the calyx-tube. **Seed** oblong, testa thick or thin, albumen 0 or scanty; embryo straight axile, cotyledons thick, radicle inferior.—**Distrib.** N. temp. and trop. zones; genera 3; species 16.—**Affinities.** With *Thymelaeaceae.*—**Properties** unimportant.

1. **HIPPOPH'AE, L.** SEa BuCKTHORN.

A shining silvery willow-like dioecious shrub. **Leaves** alternate. **Male** fl. in axillary clusters. **Sepals** 2. **Stamens** 4. **Fem.** fl. solitary. **Calyx** tubular, minutely 2-lobed. **Fruit** a membranous utricle enclosed in the succulent calyx-tube. **Seed** oblong, grooved on one side, testa crustaceous shining, albumen a thin fleshy layer; embryo amygdaloid.—**Distrib.** Europe, N. and Central Asia, Himalaya.—**Etym.** doubtful.

**H. rhamnoi'des, L.**; leaves obovate at length lanceolate.

Sandy sea-shores, York to Kent and Sussex, not common; naturalized in Scotland and Ireland.—Shrub 1–8 ft.; branches slender and subpendulous, or short and spinescent. **Leaves** 1/2–2 in., lengthening after flowering to 3 in., dull green above, silvery beneath. **Flowers** on the old wood; male minute; sepals broadly oblong; filaments short; anthers yellow. **Fruit** 1/3 in. diam., globose or oblong, orange-yellow.

Order LXVI. **LORANTHACEÆ.**

Evergreen parasitic shrubs. **Stem** often jointed. **Leaves** usually opposite, coriaceous, exstipulate. **Flowers** 1–2-sexual. **Sepals** thick, 4, 6, or 8, superior, free or united into a tubular calyx, lobes valvate in bud. **Stamens**, one adnate to each calyx-lobe; anther 1–2 celled opening by slits, or many-celled and opening by many pores. **Disk** annular, epigynous or 0. **Ovary** inferior, 1-celled; style simple or 0, stigma simple; ovule 1, reduced to a nucleus or to an embryo sac, adnate to the substance of the ovary. **Berry** 1-seeded. **Seed** erect, testa thin, albumen copious fleshy; embryos 1 or more, cotyledons thin or plano-convex, radicle superior.—**Distrib.** Trop., temp.; genera 13; species 500.—**Affinities.** Very near *Santalaceae.*—**Properties** unimportant.
LORANTHACEÆ.

1. VIS'CUM, L. Mistletoe.

Leaves opposite whorled or 0. Flowers dioecious, small, green, spiked or clustered in the forks or internodes of the branches. Sepals 4, triangular. Anthers sessile, cells many, opening by pores. Stigma sessile.—Distrib. Of the Order; species about 30.—Etym. ἴδνυς, or βισκός, of the Greeks.

V. album, L.; leaves obovate-lanceolate obtuse 5-7-nerved.

On various trees, most rare on the oak, from York and Denbigh to Devon and Kent; fl. March–May.—Shrub 1-4 ft., yellow green, glabrous; branches terete, dichotomous, knotted. Leaves 1-3 in., opposite or in whorls of 3. Flowers 3-nate, inconspicuous, green, 2-bracteate rarely monoeious. Berry white, nearly ½ in. diam., ovoid or globose, viscid. Embryos 1-3, green; when 2, often united by the cotyledons.—Distrib. Europe, N. Asia.

Order LXVII. SANTALA'CEÆ.

Herbs, shrubs, or trees, usually parasitic on roots. Leaves mostly alternate, quite entire, exstipulate. Flowers 1-2-sexual, small or minute, solitary or cymose, 2-bracteolate. Calyx inferior or becoming adherent to the ovary; lobes 3–5, valvate in bud, often with a tuft of hairs on their face. Stamens opposite and adnate to the calyx-lobes, filaments short; anthers fixed by the base or back. Disk epigynous, often dilated and lobed. Ovary 1-celled; style short, stigmas 1–5; ovules 2–5, reduced to a naked nucleus pendulous from a basal erect column. Fruit indehiscent, 1-celled, 1-seeded. Seeds adhering to the placenta, and often to the pericarp, albumen fleshy; embryo straight axile, cotyledons plano-convex, radicle superior.—Distrib. All regions; genera 28; species 220.—Affinities. With Loranthaceæ, Olacineæ, and Cornoæ.—Properties unimportant, except the fragrant wood of Santalum.

1. THE'SIUM, L. Bastard Toad-Flax.

Slender, herbaceous, perennial root-parasites. Leaves alternate, narrow, decurrent 1-3-nerved. Flowers minute, green, solitary and axillary or in 2-chotomous cymes, 2-sexual. Calyx-tube short or long, limb 5–rarely 4-lobed, persistent; lobes with a tuft of hairs on the face. Ovary inferior; style short, stigma capitate; ovules 3. Fruit ribbed.—Distrib. Europe, Asia, and Africa; species about 100.—Etym. obscure.

T. linophyllum, L.; stems diffuse, leaves 1-nerved, pedicels scabrid. T. humifusum, DC.; T. divaricatum, var. anglicum, A.DC.

Dry chalky pastures, from Norfolk and Gloster to Cornwall and Sussex; Channel Islands; fl. May–July.—Rootstock woody, yellow; roots fibrous, attached to those of various plants. Stems many, 6-18 in., leafy, prostrate. Leaves ½-1½ in., linear-lanceolate, acute or obtuse. Flowers ½ in. diam., racemted or.
fascicled, pedicelled, white inside. Calyx funnel-shaped, lobes incurved in fruit toothed. Fruit $\frac{1}{2}$ in., green, ovoid, contracted into the short stout pedicel.—Distrib. From Belgium southd., N. Africa, W Asia.

Order LXVIII. EUPHORBIA'CEÆ.

Herbs, shrubs, or trees, juice often milky. Leaves usually alternate, simple, often stipulate. Flowers small or minute, usually 1-sexual, bracteate or involucrate. Perianth 0, or sepals 2 or more.—Male. Stamens 1 or more; anthers didymous. Ovary rudimentary or 0.—Female. Ovary 2-3-lobed, 2-3-celled; styles 2-3, stigmas entire or lobed. Ovules 1-2, collateral, pendulous from the top of each cell, funicle dilated over the micropyle. Capsule 2-3-lobed and -celled, cells 1-2-seeded. Seeds pendulous, testa usually crustaceous, funicle often swollen at the top (seeds carunculate), albumen copious fleshy; embryo axile, radicle superior.—Distrib. All climates except Arctic; genera 197; species about 3,000.—Affinities. Close with Malvacem and Urticaceæ.

Properties. Usually acrid, but too numerous to specify.—The above diagnosis applies to the British genera.

Tribe I. EUPHORBIEÆ. Involucre calyciform with many male monandrous flowers surrounding one female. Perianth minute or 0..1. Euphorbia.

Tribe II. BUXEÆ. Flowers distinct. Stamens opposite the sepals. Ovules 2 in each cell .................................2. Buxus.

Tribe III. CROTONÆ. Flowers distinct. Stamens, outer or all opposite the sepals. Ovules solitary in each cell .................3. Mercurialis.

1. EUPHOR'BIA, L. SPURGE.

Herbs (the British species). Inflorescence of many male and one female flower in a 4-5-lobed involucre (perianth of some); lobes with thick glands at the sinuses.—Male fl. a pedicelled stamen; anther didymous. —Female fl. Ovary on a lengthening pedicel, inclined or pendulous; stigmas 2-fid. Capsule 3-lobed, 3-valved, valves with a coriaceous exocarp separable from a hard 2-valved endocarp. Distrib. Of the Order; species 600.—Etym. The old Greek name.

Section 1. Leaves exstipulate. Branches (or stem, if simple) terminated by umbels of forked branchlets (rays) subtended by a whorl of leaves; rays 2-bracteate at the forks.

* Leaves alternate. Umbels 5- rarely 3-6-rayed. Glands of involucre transversely oblong reniform or orbicular, not cuspidate.

1. E. Heliosco'pia, L.; annual, glabrous, rarely hairy, leaves narrowly obovate serrate above the middle, upper bracts broadly ovate-cordate, capsule smooth, seeds deeply pitted. Sun Spurge.
Euphorbia.]

EUPHORBIACEAE.

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Fields and waste places, N. to Shetland; ascends to 1,000 ft. in the High-14
lands; Ireland; Channel Islands; fl. June-Oct._Subglaucous. Stem 6-18
in., simple or 3-fid below. Leaves 1-2 in., subpetioled, sometimes cuneate,
tip rounded, membranous, lower smaller. Involucral glands orbicular,
yellow. Capsule ½ in. Seeds brown.—Distrib. From Belgium southd.,
N. Africa, N. and W. Asia, India; introd. in N. America.

2. **E. platyphyll**os, L.; annual, glabrous or hairy, leaves linear-
oblong or obovate-lanceolate acute serrulate above the middle, bracts
cordate, capsule warted, seeds smooth.

Fields and waste places, rare, from York and Glover southd.; fl. July-Oct._
**Stem** ½-3 ft., usually simple, stout, erect; branches numerous, alternate,
slender, ascending. **Leaves** ½-1½ in., sessile, spreading or reflexed. **Bracts**
short, broad, apiculate. Involucral glands suborbicular.—Distrib. From
Belgium southd., N. Africa, W. Asia; introd. in N. America.

E. **platyphyll**os proper; bracts ½-½ in., capsule ½ in. long, warts hemispheri-
cal, seeds olive-brown. **E. stric'ta**, Sm., not L.

Sub-sp. E. **stric'ta**, L.; bracts ¼-½ in., capsule ½ in., warts conical, seeds
oblong smaller red-brown.—Woods on limestone in Glover and Monmouth.

3. **E. hiber'na**, L.; perennial, pubescent, leaves elliptic- or lanceolate-
oblong quite entire, upper cordate, bracts ovate-cordate, capsule furrowed
and warted, seeds smooth.

Copses and hedges, N. Devon; S. and W. Ireland, rare; fl. May-June.—**Root-
stock** stout. **Stems** 1-2 ft., several, subsimple, leafy. **Leaves** 2-4 in., 1-1½
in. broad, sessile, obtuse or notched at the tip, thin. **Bracts** broad, upper
rounded at the base. Involucral glands reniform. **Capsule** ½ in., subglobose,
valves not keeled, warts cylindric. **Seeds** broad, pale brown.—Distrib.
W. France, N. Spain.—Used in Ireland to poison fish.

4. **E. pilo'sa**, L.; perennial, hairy, leaves oblong-lanceolate tips serru-
late, bracts elliptic obtuse, capsule glabrous or hairy smooth or minutely
warted, seeds smooth. **E. palus'tris**, Forst., not L.

Near Bath, in shaded places; (alien or denizen, *Wats.)*; fl. May-June. **Root-
stock** stout. **Stems** tall, leafy, branched above. **Leaves** 3-4 in., membranous.
**Bracts** yellow. **Rays** of umbel 4-6, 3-fid, then 2-fid. **Involucral glands**
hairy, or hairy, glands transversely oblong. **Seeds** obovoid.—Distrib. Mid. and S.
Europe to W. Siberia and the Caucasus.

** Leaves alternate. Umbels 3- or many-rayed. Glands of involucre
reniform or lunate with cuspidate tips.
† Bracts connate at the base.

5. **E. amygdalo'ides**, L.; perennial, hairy, leaves obovate-lanceolate
quite entire, capsules glabrous minutely dotted, seeds smooth grey.

Woods, copses, &c., from Northumbd. southd., local; Bandon and Donegal in
Ireland; Channel Islands; fl. March-May.—**Rootstock** woody. **Stems** 6-12
in., erect, very stout, leafy, barren the first year, elongating the following
to 2 ft., then throwing out slender branches. **Leaves** 2-3 in., obtuse or
acute, lower petioled, upper sessile often oblong. **Rays** 5-10; bracts
connate into an orbicular limb $\frac{3}{4}$-1 in. diam., yellow. Involucres broad, pedicels slender, cusps of glands converging. Capsule with rounded valves. Seed subglobose, acute.—Distrib. From Holland southd., W. Asia.

†† Bracts free at the base. All glabrous.

6. E. Peplus, L.; annual, leaves orbicular-ovate quite entire, bracts ovate, capsules small, valves keeled, seeds pitted whitish.

Waste places, N. to Orkney; ascends to 1,200 ft. in Derby; Ireland; Channel Islands; fl. July-Nov.—Stems 6-10 in., simple or 3-chotomous below. Leaves $\frac{1}{2}$-$\frac{3}{4}$ in., thin, petiole short slender. Rays 3, repeatedly forked. Involucres small; cusps of glands slender, curved. Capsule-valves with 2 keels on the back. Seeds 3-gonous, dorsally deeply pitted and keeled, ventrally 2-sulcate.—Distrib. Europe, N. Africa, N. and W. Asia, N.W. India; introd. in N. America.

7. E. exigua, L.; annual, leaves linear-lanceolate quite entire obtuse or acute, bracts cordate at the base, capsules rough on the back of the valves, seeds pale deeply pitted.

Fields, &c., from Banff and the Clyde southd.; Scotland, rare; Ireland, local; Channel Islands; (a colonist, Wats.); fl. July—Oct.—Very variable. Usually excessively branched from the base; branches 6-15 in., erect and strict, or prostrate and ascending. Leaves $\frac{1}{2}$-1 in., broadest above or below the middle, sometimes truncate and apiculate. Rays 3-5, often forked; bracts often toothed at the base. Involucres small, subsessile; tips of glands obtuse. Capsules small. Seeds obtusely 3-gonous, keeled, grey.—Distrib. Europe, N. Africa, W. Asia, N.W. India.

8. E. Portlandica, L.; perennial, leaves coriaceous obovate or oblong-ovate quite entire, bracts deltoid- or reniform-cordate, capsules slightly rough on the back of the valves, seeds opaque brown pitted.

Sea-shore, from Wigton southd. to Hants, rare (absent on the E. coast); Ireland; Channel Islands; fl. May—Aug.—Rootstock cylindric, woody, tortuous. Stems 6-18 in., very many, tufted, erect or ascending, naked and scarred below, branched, leafy above. Leaves $\frac{1}{2}$-$\frac{3}{4}$ in., spreading, acute or apiculate. Rays 3-5; bracts $\frac{3}{4}$-$\frac{5}{8}$ in. diam., broader than long, often keeled and cuspidate. Capsule-valves faintly keeled, granulate. Seeds with shallow pits, cuticle brown, caruncle large.—Distrib. W. France, Spain, Portugal.

9. E. Paraflas, L.; perennial, leaves imbricate coriaceous quite entire, lower linear-ovate or oblong, upper ovate, bracts broadly cordate, capsules leathery wrinkled, seeds minutely dotted whitish.

Sandy shores, from Cumberland and Suffolk southd.; local in Ireland; Channel Islands; fl. July—Oct.—Bushy, glaucous, often reddish. Rootstock woody. Stems 6-18 in., many, stout, erect or ascending, naked and tubercled below. Leaves $\frac{1}{2}$-1 in., very thick, sessile, obtuse, concave, nerveless. Rays 5-8, short, stout, forked once or twice; bracts variable, $\frac{3}{4}$-$\frac{5}{8}$ in. diam., sometimes broader than long. Involucres sessile or pedicelled, cusps of glands short. Capsules deeply lobed, valves very rugose, with a dorsal furrow. Seeds ovoid, caruncle minute.—Distrib. From Belgium southd. and eastd.
10. **E. E'sula, L.**; perennial, leaves linear or oblong-lanceolate, bracts broadly cordate mucronate, capsule granulate, seeds smooth ovoid brown. Woods and fields, native in Jersey; naturalized in Forfar, Edinburgh, and Alnwick; fl. July.—Rootstock creeping. **Stem** 1–2 ft., erect, slender, naked below, simple or with flowerless side-branches. **Leaves** 1-1½ in., sessile, spreading, acute or obtuse, sometimes denticulate, thin, 1-nerved. **Rays** 10–20, long, slender, forked only at the tips; bracts ½-3 in. diam., reniform-cordate, acute or obtuse. **Involucres** small, long-pedicelled; glands with short straight cusps. **Capsule** small, valves with a dorsal furrow. **Seeds** with a small caruncle.—**Distrib.** Europe, N. and W. Asia; introd. in N. America.

E. **Cyparissias, L.**; perennial, leaves narrow-linear quite entire, bracts cordate obtuse, capsule granulate, seeds smooth globose pale. Woods and plantations, from Cumberland southd.; fl. June–July.—Habit of **E. E'sula**, but rather glaucous; rootstock creeping and stoloniferous; more leafy; leaves narrower; bracts smaller; and seeds almost white.—**Distrib.** Europe; introd. in N. America.

*** Leaves opposite. **Umbels** 3–4-rayed. **Glands of involucre** lunate, cuspidate.

11. **E. Lathyrus, L.**; biennial, leaves decussate linear-oblong broader at the base obtuse, bracts cordate at the base, capsule smooth, seeds ridged and wrinkled dusky brown. **Caper Spurge.**

Copses and woods, native ? in Somerset and Sussex, naturalized elsewhere and in the Channel Islands; (an alien, Wats.); fl. June–July.—Glabrous, glaucous. **Stem** stout, erect, short, leafy the first year, during the next elongating to 3–4 ft., and flowering. **Leaves** 2–8 in., sessile, spreading, 1-nerved, tip rounded apiculate. **Rays** stout, unequal, irregularly forked; bracts 1–3 in., ovate-lanceolate, acute. **Involucres** large, sessile, cusps of glands suberect. **Capsule** ½ in. diam. **Seed** ½ in., broadly oblong, obliquely truncate, caruncle large.—**Distrib.** S. Europe; introd. in N. America.

**Section 2.** **Stems** prostrate, dichotomously branched. **Leaves** opposite, stipulate. **Involucres** axillary or in the forks, solitary.

12. **E. Pep'lis, L.**; annual, glabrous, leaves dimidiate-cordate subentire. Sandy shores, S. Wales and Cornwall to Hants, very rare; Waterford; Channel Islands; fl. July–Sept.—Procumbent, glaucous, purplish. **Stems** many, 6–12 in., spreading from the root. **Leaves** ½ in., coriaceous, shortly petioled, obtuse or retuse, base auricled on one side truncate on the other; stipules ovate, 2-fid. **Involucres** shortly pedicelled, glands oblong. **Capsule** ½ in., valves smooth, keeled, glabrous. **Seeds** white, not caruncled.—**Distrib.** Atlantic and Mediterranean shores, from France southd.; salt tracts of Asia.

2. **BUX'US, Tournef.** **Box.**

Evergreen shrubs. **Leaves** opposite, exstipulate. **Flowers** monoecious, in axillary fascicles or spikes, green, 4-bracteolate, uppermost female. —**Male.** **Sepals** 4, 2 outer imbricate in bud. **Stamens** 4, hypogynous, opposite the sepals, filaments stout fleshy; anthers introrse. **Ovary**
rudimentary.—Female. Sepals 4–12, often imbricate in threes. Ovary 3-celled, top 3-lobed; styles 3, excentric, spreading, persistent, grooved and stigmatic on the inner face; ovules suspended in pairs in each cell, anatropous, raphe dorsal. Capsule coriaceous, 3-celled, loculicidally 3-valved; cells 1–2-seeded. Seeds pendulous, testa crustaceous shining, base thickened, albumen fleshy; embryo axile, curved, radicle superior.—Distrib. Europe, Africa, Madagascar, Asia, W. Indies; species 17.—Etym. πῦς of the Greeks.

B. sempervirens, L.; leaves oblong, flowers crowded sessile.

Chalk hills, Kent, Surrey, Bucks, Gloster, (indigenous), naturalized elsewhere; fl. April–May.—A shrub or small tree, 8–12 ft., branches erect or drooping, young pubescent, wood close-grained. Leaves ½–1 in., obtuse or retuse. Spikes small; bracts and sepals obtuse; flowers whitish. Stamens much exserted; anthers didymous. Ovary globose. Capsule ½ in., ovoid, 3-horned, wrinkled. Seeds black.—Distrib. From Belgium southd., N. Africa, N. and W. Asia, W. Himalaya.—Bitter and poisonous; wood used for engraving upon.


Erect herbs. Leaves opposite, petioled, serrate, stipulate. Flowers mon- dioecious, minute; males in interrupted axillary spikes or racemes; females clustered, spiked or racemose. Sepals 3, valvate. Disk in the female of 2 elongate glands, alternating with the carpels. Stamens 8–20, on a central disk, filaments slender erect; anther-cells pendulous from a sub-globose connective, extrorse. Ovary 2-celled; styles long, subulate; ovule solitary, pendulous. Capsule didymous, outer coat separating from the cartilaginous 2-valved inner. Seeds pitted or wrinkled, funicle thickened; cotyledons broad.—Distrib. Europe, N. Africa, N. Asia; species 6.—Etym. unknown.


Shady places, N. to Orkney; ascends to 1,700 ft. in the Highlands; Ireland; Channel Islands; fl. March–April.—Rootstock slender, creeping. Stem 6–18 in., solitary, erect, terminal. Leaves larger upwards, upper 2–3 in., shortly petioled, ovate or elliptic-lanceolate, broader and subsessile in M. ova’ta, Steud., crenate-serrate, green, often blue when dry; stipules minute. Male racemes very slender, long-pediculed; flowers pedicelled; sepals acute. Female spikes or racemes shorter, 1–3-fl.; styles long, recurved, stigmatic all over the front. Capsule ½ in. diam., hispid. Seeds grey, cuticle white.—Distrib. Europe, N. Africa.

2. M. an’nua, L.; annual, nearly glabrous, stem branched.

Fields, gardens, in England, a casual in Scotland; rare in Ireland; (a colonist? Wats.); fl. July–Oct.—Dioecious, or monoeious (M. ambigua, L. fil.). Stem 6–18 in. Leaves membranous, shortly petioled, ovate or lanceolate, narrowest in the female, acute, base rounded or cordate, shining, crenate-serrate, ciliate. Female clusters with sometimes male flowers intermixed; styles

Order LXIX. Euphorbiaceæ.

Herbs, shrubs, or trees. Leaves opposite or alternate usually stipulate. Flowers 1- rarely 2-sexual, small, green. Perianth of male 3–8-lobed or 3–5-partite, of female tubular or 3–5-cleft, or of a scale-like sepal. Stamens as many and opposite the perianth-lobes, filaments straight with erect anthers, or inflexed in bud with reversed anthers. Ovary sessile, 1- rarely 2-celled; style 1 or 0 with a capitate stigma, or styles 2 papillose; ovules solitary in the cells, erect and orthotropous, or pendulous and anatropous. Fruit indehiscent. Seed pendulous or erect, albumen 0 or fleshy, radicle superior.—Distrib. All climates; genera 108; species over 1,500.—Affinities. With Malva'ceæ and Euphorbiaceæ.—Properties. Very various.


Tribe II. Urticeæ. Flowers 1-sexual. Perianth of male 4–5-partite, of female tubular or 4–5-cleft. Filaments inflexed in bud with reversed anthers. Ovary 1-celled; style simple or 0; ovule erect, orthotropous. Albumen fleshy or 0; embryo straight.—Herbs or shrubs.


Stem twining. Embryo spiral ..................................................4. Humulus.

1. Ulmus, L. Elm.

Trees or shrubs; juice watery. Leaves alternate, simple, distichous, oblique, scabrid; stipules caducous. Flowers 2-sexual, fascicled, lateral. Perianth campanulate, 5- rarely 4- 8- or 9-fid, imbricate in bud, persistent. Stamens usually 5, filaments adnate to the perianth-tube; anthers extrorse. Ovary free, 1–2-celled; styles 2, subulate, stigmatic on the inner face; ovule 1 in each cell, pendulous, anatropous. Fruit a 1-seeded samara. Seed pendulous, testa thin, albumen 0; embryo straight, cotyledons large flat or folded, radicle superior.—Distrib. N. temp. zone; species 16. —Properties. Bitter, mucilaginous, astringent.
U. montana, Sm.; seed in the centre of the oblong or suborbicular samara. U. campestris, L. herb.; U. majus, Sm. Scotch, Wych, or Mountain Elm.

Woods, N. to Sutherland, indigenous and naturalized; Ireland; Channel Islands; ascends to 1,300 ft. in Yorkshire; fl. March–April.—A large tree, 80–120 ft., trunk attaining 50 ft. in girth; branches long, spreading, bark corky or not; twigs pubescent. Root sending up suckers, chiefly when cut. Leaves 3–6 in., often 3 in. diam., ovate-oblong, cuspidate, doubly and trebly serrate, base unequally rounded or cordate. Perianth ⅓ in., ciliate, lobes obtuse. Stamens 4–6; anthers purple. Samara ⅔–1⅔ in., very variable in breadth and the depth of the notch.—Distrib. Europe, Siberia.

U. campestris, Sm.; seed above the centre of the obovate or oblong samara. U. carpinifolia, Lindl. Common Elm.

Woods and hedgerows, rarer in Scotland; ascends to 1,500 ft. in Derby; Ireland; Channel Islands; a denizen, never seeding; fl. March–May.—A very large tree, 125 ft., trunk attaining 20 ft. in girth; bark rugged. Root sending up abundant suckers. Branches spreading (suberect in U. stricta, Lindl.); twigs often corky. Leaves smaller than in U. montana, 2–3 in., less cuspidate, often narrow at the base (scabrid above and pubescent beneath in U. suberoides, Ehrh., nearly glabrous in U. glabra, Mill.). Perianth smaller. Stamens often 4. Samara ⅓–⅔ in., usually obovate.—Distrib. Mid. and S. Europe, N. Africa, Siberia.—Many vars. of this and the preceding are described, differing in habit and foliage, but they offer no constant characters.

2. URTICA, Tournef. Nettle.

Herbs, rarely shrubs, with stinging hairs and tenacious inner bark. Leaves opposite; stipules 2 on each side. Flowers mon- dioecious in bracteate clusters, ebracteolate; pedicel of male jointed. Perianth 4-partite; segments imbricate in bud, persistent, of male concave, of female flat unequal. Stamens 4; anthers reniform. Stigma sub sessile, penicillate. Fruit minute, compressed.—Distrib. Temp. and trop. regions; species 30.—Etym. uro, from the burning pain of its stings.

1. U. urens, L.; annual, glabrous except for the stinging hairs, leaves ovate-oblong coarsely serrate, panicles 2-sexual.

Fields and waste places, N. to Shetland; ascends to 1,600 ft. in Northumbd.; Ireland; Channel Islands; fl. June–Sept.—Stem 1–2 ft., erect, branched. Leaves 1–2 in., petiolo, teeth few, terminal oblong. Spikes ¼–1 in., in pairs. Flowers few in a cluster; pedicels long or short.—Distrib. Europe (Arctic), N. Africa, N. and W. Asia, Himalaya; introd. in N. America, &c.

2. U. dioica, L.; perennial, pubescent, leaves ovate-cordate or lanceolate, deeply serrate, panicles usually 1-sexual.

Hedgebanks, &c., N. to Shetland; ascends to 2,500 ft. in the Highlands; fl. June–Sept.—Rootstock creeping, stoloniferous. Stem 2–4 ft., simple or branched. Leaves 2–4 in., petiole long or short, nerves impressed; stipules
linear-oblong. *Panicles* 1–3 in., in pairs, males lax- females dense-fld., recurved.—Distr. N. temp. regions (Arctic), S. Africa, Andes.—The young leaves are a good pot-herb, and yield a green dye.


**U. pilulifera** proper; leaves deeply serrate.—Var. **U. Dodartii**, *L.*; leaves entire or nearly so.

3. **Parietaria**, Tournef. **Pellitory**.


4. **Hu'mulus**, *L.* **Hop**.

Perennial, twining herbs; juice watery. *Leaves* opposite, lobed; stipules connate. *Flowers* minute, dioecious.—Male panicked. *Sepals* 5, free, imbricate in bud. *Stamens* 5, adnate to the base of the sepals; anthers oblong, basifixed, slits subterminal.—Females in pairs in the axils of the bracts of a dense spike which forms a catkin-like head in fruit, bracteate and bracteolate. *Sepal* 1, membranous, bract-like. *Ovary* free, compressed; styles 2, subulate, stigmatic all over; ovule 1, pendulous, campylotropous, micropyle superior. *Fruit* dry, indehiscent, enclosed in the sepal. *Seed* pendulous, testa coriaceous, albumen 0; embryo a flat helix. —Distr. N. temp. and trop. regions; species 2.—Etym. doubtful.

**H. Lu'pulus**, *L.*; bracts of fruit much enlarged scarious.  
Hedges and copse, from York southd.; Channel Islands; naturalized N. to Renfrew and Elgin, and in Ireland; ascends to 1,000 ft. in the Highlands fl. July–Aug.—*Rootstock* stout, branched. *Stems* tall, scabrid, almost prickly
very tough; branchlets glabrate. *Leaves* 3–4 in. diam., cordate, petioled, uppermost ovate, the rest palmately 3–5-lobed to the middle; lobes ovate, acutely toothed. *Male* fl. ½ in. diam., in panicles 3–5 in.; *female heads* ½ in. diam., on curved peduncles ½–1 in.; stigmas purple. *Fruiting heads* 1½ in., broadly ovoid or subglobose, yellow; scales orbicular, covered with resinous glands at the base, as are the bracteoles and fruit.—*Distrib.* Temp. Europe, Asia, N. America.—Heads of fruit used in brewing; the young blanched foliage is a good pot-herb.

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**Order LXX. *Myrica'ceæ.***

Shrubs or trees, often with a glandular wax-secreting pubescence; buds scaly. *Leaves* alternate, simple, exstipulate (with one exception). *Flowers* in simple or compound spikes, usually bracteate, 1-sexual, perianth 0.—*Male* fl. *Stamens* 2–16, filaments adnate to the base of the bract, free or connate; anthers basifixed, extrorse. *Female* fl. 2–4-nate and usually 2–4-bracteolate. *Ovary* sessile, 1-celled; styles 2, lateral, filiform, stigmatic all over; ovule 1, basal, orthotropous. *Drupe* papillose, sometimes 2-winged from being adnate to the enlarged bracteoles, stone 1-seeded. *Seed* erect, testa thin, albumen 0; cotyledons plano-convex, radicle superior.—*Distrib.* Temp. and trop. Asia, S. Africa, N. America; genus 1; species 35.—*Affinites.* Close with *Juglandaceae*.—*Properties.* Yield wax, resin, benzoic acid, and tannin.

1. *Myri'ca, L.* **Sweet-Gale, Bog-Myrtle.**

Character of the Order.—*Etym.* The Greek name.

*M. Ga'le, L.*; leaves narrowly cuneate-obovate or lanceolate serrate towards the tip, stipiams usually 4, ovary 2-bracteolate.

Bogs and moors, Caithness to Cornwall and Sussex, ascends to 1,800 ft. in the Highlands; Ireland; fl. May–July.—*Shrub* 2–3 ft., twiggy, suberect, resinous, fragrant, flowering before leafing. *Leaves* 2–3 in., rarely quite entire, obtuse or acute, very shortly petioled, often pubescent beneath. *Male spikes* ½–1 in., racemose, crowded, erect; bracts broadly ovate, concave, anthers red; female ½ in., styles red. *Drupe* minute, lenticular, adnate to the persistent bracts.—*Distrib.* W. and N.W. Europe, N. Asia, N. America.—Much used in cottage-practice and for tea-making.

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**Order LXXI. *Cupulif'ereæ.***

Trees or shrubs. *Leaves* alternate, stipulate. *Flowers* monoecious, anemophilous.—*Male* fl. solitary, crowded, or in spikes, bracteate. *Sepals* 1–5 or more, unequal, or 0. *Stamens* 2–20, on a disk or adnate to the bases of the sepals; filaments free or connate; anthers introrse, 2-celled.—*Female* fl.
Calyx adnate to the ovary, or 0. Ovary inferior, after fertilization more or less completely 2-3- (rarely 4-6-) celled; styles as many, stigmatose above and within; ovules 1, or 2 collateral, erect or pendulous, anatropous. Fruit indehiscent, 1- rarely 2-seeded, seated on or enclosed in the hardened or accrescent bracts. Seed large, testa thin often adherent to the pericarp, albumen 0; cotyledons thick, fleshy or farinaceous, often grooved or folded; radicle short, superior.—Distrib. N. hemisphere, from N. Africa, N. India, the Malay Is. and Darien northwards, Mts. of South Australia, N. Zealand, Chili; genera 10; species about 400.—Affinities. With Juglandeæ.—Properties. Yield tannin, many good woods, and esculent embryos.


 Tribe II. Quercineæ. Male fl. Calyx 4-10-lobed or -partite. Filaments simple; anther-cells connate. Female fl. 1-3 in an involucre of many bracteoles which enlarges in fruit. Ovary 3-7-celled; ovules 2 in each cell. Fruit seated in a cupular involucre.


 Tribe III. Coryleæ. Male fl. Catkins pendulous. Perianth 0. Stamens included between 2 bracteoles; anther-cells separate or connate, hairy at the tip. Female fl. in pairs; bracts enlarging in fruit. Ovary imperfectly 2-celled; ovules 2, pendulous from one placenta only. Fruit enclosed in the coriaceous bracts.

Female spike minute, with few brown scales..........................5. Corylus. Female spike large, with many leafy scales......................6. Carpinus.


Trees or shrubs. Flowers monoecious.—Male catkin. Scales peltate, with 3-bibracteolate flowers. Sepals 1-4. Stamens 2, filaments forked, separating the anther-cells.—Female. Bracts imbricate, usually 3-lobed, 2-3-fld.; bracteoles 0. Perianth 0. Ovary compressed, 2-celled; styles 2, slender, stigmas terminal. Ovules 1 in each cell. Fruit lenticular, winged or margined, 1-seeded. Cotyledons flat.—Distrib. N. temp. and Arctic regions, Mexico to Peru; species about 25.—Etym. The Latin name.

1. B. alba, L.; a tree, leaves long-petioled deltoid rhomboid or ovate acute doubly serrate, fruit broadly winged. Woods and copes, N. to Orkney; ascends to 2,500 ft. in the Highlands; Ireland; Channel Islands; fl. April-May.—A short-lived tree, 40-50 rarely
80 ft., trunk 8-10 in. diam.; bark flaking, silvery white; branches often weeping (B. pen'd'ula, Wahlb.). Leaves 1-3 in., sometimes pubescent, rather coriaceous, resinous or glandular when young; petiole slender; stipules broad. Male catkins ½-2 in., pendulous; sepal 1; female spike solitary, shorter, suberect. Scales of fruit cuneate, brown, 3-lobed to the middle. Fruit orbicular, wing notched.—Distr. Europe (Arctic), N. Asia, N. America (a variety).—Bark used in tanning, and yields a fragrant oil; juice sugary in spring, and a wine is made from it; wood durable.

B. alba proper; leaves truncate at the base, lateral lobes of fruiting bracts spreading. B. verruco'sa, Ehrh.

Sub-sp. B. glutino'sa, Fries; sometimes bushy, leaves rhomboid-ovate, lateral lobes of fruiting bracts erect.—Var. denud'da, leaves glabrous resinous.—Var. pubes'cens, leaves and twigs pubescent.

2. B. na'nà, L.; a bush, leaves short-petioled orbicular crenate, fruit very narrowly winged.

Mts. of Northumbd., Peebles, and from Perth to Sutherland, local; ascends to 2,700 ft.; fl. May.—Bush 1-3 ft. Leaves ¼-½ in., glabrous, dark green. Catkins ½ the size of those of B. alba. Bracts of fruiting catkins broadly obcuneate, with 3 rounded lobes.—Distr. Arctic and Alpine N.W. and W. Europe, N. Asia, N. America.


Trees or shrubs.—Male fl. in catkins. Scales peltate, 3-fld. Sepals and stamens 3-5; anthers 2-celled.—Female fl. in broadly ovoid spikes; scales fleshy, 2-3-fld., each with 2-3 bracteoles or sepals adnate to the bract. Fruiting spike woody; fruit compressed, winged or not, 1-celled, 1-seeded. Cotyledons flat.—Distr. Europe, Asia from the Himalaya northd., N. America, Andes; species 14.—Etym. The Latin name.

A. glutino'sa, Gaertn.; leaves obovate- or orbicular-cuneate green on both sides, female spikes racemose. River-banks, marshes, &c., N. to Caithness; ascends to 1,600 ft. in the Highlands; Ireland; Channel Islands; fl. March–April.—A bush or tree, 20-40 very rarely 70 ft.; trunk 1-2 ft. diam.; bark black; wood white when alive, red when cut, then pale pink. Leaves 2-4 in., shortly petioled, glutinous and hairy when young, sinuate and serrulate, laciniate in var. inci'sa; stipules ovate. Catkins appearing before the leaves; male 2-4 in., bracts orbicular red; female spikes ½-1 in., terminal, racemose, obtuse, bracts red-brown, woody. Fruit ¼ in., pale, hardly winged.—Distr. Europe, N. Africa, W. and N. Asia.—Wood soft, durable.

3. Querc'u'sus, Tournef. Oak.

Trees; buds scaly; hairs often stellate. Leaves evergreen or deciduous; stipules deciduous.—Male fl. in catkins, with usually a caduceous bract at the base. Calyx 4-7-lobed. Stamens indefinite (10 in the British sp.), filaments slender exserted.—Female fl. spicate, enclos'd in imbricating bracts. Calyx-limb 3-8-lobed. Ovary 3-celled; styles 3; ovules 2 in
each cell. **Fruit** terete, 1-seeded, seated in a cupule of imbricating scales. **Seed** with the remains of the septa and undeveloped ovules attached to its upper or lower part; cotyledons included in the pericarp in germination. —**Distrib.** Of the Order, excl. the S. temp. hemisphere; species about 300.—**Etym.** The Latin name.

**Q. Ro'bur, L.**; leaves deciduous oblong-obovate sinuate-lobed.

Woods, &c., from Sutherland southd.; ascends to 1,350 ft. in the Highlands; Ireland; Channel Islands; fl. April–May.—**Trunk** 60 to 100 ft., 70 ft. in girth (Cowthorpe oak, Yorkshire); bark rugged; branches tortuous. **Leaves** 3–6 in., base narrowed rounded or cordate, young pubescent beneath, plaited in bud. **Male catkins** 1–3 in., appearing with the leaves, pendulous; bracts linear; flowers small, in distant clusters; sepals hairy. **Acorns** ½–1 in., 2–3 together; cupule with many appressed triangular obtuse imbricating scales.—**Distrib.** From the Atlas, Taurus, and Syria, almost to the Arctic circle. —The following varieties are very inconstant.


### 4. **PÆ'GUS, Tournef.** Beech.

**Trees.** **Leaves** deciduous or evergreen; stipules caducous.—**Male fl.** in long-peduncled heads; bracts small or 0. **Calyx** 4–7-lobed. **Stamens** 8–40, filaments slender, exserted; anthers oblong.—**Female fl.** 2–4, in a 4-partite involucre of imbricating bracts. **Calyx-limb** 4–5-toothed. **Ovary** 3-gonous, 3-celled; styles 3, linear; ovules 2 in each cell, pendulous from the top. **Fruits** usually 2 together, 1- rarely 2–3-seeded, compressed 3-gonous or 2–3-winged, enclosed in the hardened or coriaceous scaly involucre. **Seed** pendulous, crowned with the undeveloped ovules; cotyledons thin, plaited, leafy after germination.—**Distrib.** Temp. Europe, N. Asia (excl. the Himalaya), N. and S. America, S. Australia, New Zealand; species 15.—**Etym.** from φάγω, from the eatable seeds.

**F. sylva'tica, L.**; leaves deciduous oblong-ovate obscurely toothed.

Woods in England, especially on chalk and limestone; ascends to 1,200 ft. in Derby; planted in Scotland and Ireland; fl. April–May.—**Trunk** 118 ft. (King’s beech, Ashridge), and 29 ft. girth (Bicton, Devon); head 352 ft. diam. (Knowle beech); bark smooth, white; branches horizontal; buds acute. **Leaves** 2–3 in., shortly pietioled, acuminate, silky when young; plaited parallel to the nerves in bud; stipules scarious. **Male fl.** capitate, pendulous; peduncle 1–2 in.; anthers yellow; female on shorter peduncles. **Cupule** ½ in., 4-cleft, segments bristly. **Fruit** 3-quetrous, smooth.—**Distrib.** A triangular area between Norway, Asia Minor, and Spain; Japan.—Wood used for tools, carpentry, and fuel; fruit yields oil.

### 5. **COR'YLUS, Tournef.** Hazel.

**Shrubs or trees.** **Leaves** deciduous, plaited in bud. **Male catkins** slender, pendulous; bracts cuneate, with 2 bracteoles above their inner
base. **Perianth** 0. **Stamens** 4-8, filaments short; anther-cells separate, tips hairy. **Female** fl. sessile in pairs in the upper bracts of a minute head, each enclosed in a 3-partite bracteole which enlarges after flowering. **Calyx-limb** unequally toothed. **Ovary** 2-celled; styles filiform; ovules 1 in each cell, pendulous. **Fruit** woody, 1-celled, 1-seeded, enclosed in the greatly enlarged coriaceous more or less cut bract and bracteoles. **Cotyledons** thick, plano-convex, included in the nut in germination.—**Distrib.** Temp. N. hemisphere; species 7.—**Etym.** *kopus*, from the cap-like form of the involucre.

**C. Avella'na**, *L.*; leaves orbicular-cordate doubly serrate cuspidate.

Copse and hedges, N. to Orkney; ascends to nearly 1,900 ft. in the Highlands; Ireland; Channel Islands; fl. Feb.-March.—A glandular, hispid and pubescent shrub; rarely a tree 30 ft., with trunk 3 ft. girth at the ground (Eastwell Park, Kent). **Leaves** 2-4 in., distichous, base unequal, plaited parallel to the midrib in bud; petiole short; stipules oblong, obtuse. **Male catkins** 1-2 in., 2-4 in a raceme, female heads subsessile. **Fruit** on an elongated branch, 1 1/2-3 in., clustered, woody; involucre palmately lobed and cut, unarmed.—**Distrib.** Europe, N. Africa, temp. Asia.—Wood very elastic. Nuts yield abundance of bland oil.

**6. CARPI'NUS**, Linn. **Hornbeam.**

Trees. **Leaves** deciduous.—**Male.** Catkins lateral; bracts ovate, acute. **Stamens** 3-12 in the axil of the bract, filaments slender forked; anther-cells separate, stipitate, tips hairy.—**Female.** **Spikes** terminal, erect in flower, pendulous in fruit; bracts ovate-lanceolate, caducous; flowers in pairs, each in a lobed bracteole which enlarges after flowering. **Calyx-limb** toothed. **Ovary** strongly nerved, 2-celled; styles 2, filiform; ovules 1 in each cell, pendulous. **Fruit** almost woody, nervet, 1-celled, 1-seeded, enclosed in the large leafy lobed bracteole. **Cotyledons** fleshy.—**Distrib.** N. temp. zone; species 9.—**Etym.** The Latin name.

**C. Bet'ulus**, *L.*; leaves elliptic-ovate doubly serrate hairy beneath, female bracts 3-lobed 3-nerved mid-lobes much the longest.

From N. Wales, Stafford and Norfolk to Devon and Kent; planted N. of this and in Ireland; Channel Islands; fl. May.—A small tree, sometimes 70 ft.; with the trunk (usually flattened) 10 ft. in girth; bark smooth, light-grey, wood close, white, heavy. **Leaves** 2-3 in., distichous, acute or acuminate, shortly petioled, plaited parallel to the nerves in bud; stipules large, linear-oblong. **Male catkins** 1-2 in., pendulous; bracts ovate-lanceolate, acute. **Female** 2-4 in., pendulous in fruit, cylindric; bracteole 1-1 1/2 in., entire or toothed. **Fruit** 1/4 in., green, 7-11-nerved.—**Distrib.** From Gothland southd., W. Asia.—Wood the best fuel, very tough and difficult to work.
Order LXXII. Salicinae.

Trees or shrubs. Leaves alternate, simple, deciduous, stipulate. Flowers dioecious, in catkins which usually precede the leaves. Perianth 0. Disk annular urceolate or glandular.—Male. Stamens 2 or more, inserted under the disk, filaments free or connate; anthers basifixed, introrse.—Female. Ovary sessile or pedicelled, 1-celled; styles 2, short, stigmas 2 entire or 2–4-lobed; ovules many on 2 parietal placentas, ascending, anatropous, raphe dorsal. Capsule 1-celled, loculicidal; valves 2, rolling back, many-seeded. Seeds minute, testa membranous, funicle short, with a pencil of silky hairs that conceals the seed, albumen 0; embryo straight, cotyledons plano-convex, radicle inferior.—Distrib. Arctic and N. temp. zones, rare in the tropics and S.; absent from Australia and the Pacific; genera 2; species about 180.—Affinities. Very obscure.—Properties. Bitter, astringent, febrifuge, aromatic.

Leaves broad. Catkins drooping, scales cut.

Leaves usually narrow. Catkins usually erect, scales entire.

1. Po'pulus, Tournef. Poplar.

Catkins drooping; scales crenate lobed or cut. Disk oblique, cupular Stamens 4–30, filaments free. Stigmas slender, 2–4-cleft.—Distrib. N. temp. regions; species 18.—Etym. The Latin name.


1. P. al'ba, L.; buds not viscid, leaves of shoots more or less lobed, of branches broadly ovate cordate sinuate white and cottony beneath. Moist woods, river-banks, &c., from Elgin and the Clyde south.; Ireland Channel Islands; fl. March–April.—A large tree, 60–100 ft.; bark grey, smooth; wood white; branches spreading, buds cottony; suckers many, with large deltoid-ovate lobed and toothed leaves 2–4 in. diam. Leaves on the branches 1–3 in., glabrous in age; petiole very long, slender, compressed Catkins 2–4 in., cylindric; female shorter. Stamens 6–10; anthers purple. Capsules ½ in., narrow ovoid.—Distrib. From Gothland southd., N. Africa, N. and W. Asia, N.W. Himalaya.—Wood light, does not burn easily.

P. AL'BA proper; leaves of the suckers lobed, of the branches white and cottony beneath, stigmas usually 2–4 linear. White Poplar, Abele.—A doubtful native, cultivated as far N. as Forfar, but does not flower in Scotland?

Sub-sp. P. canes'cens, Sm.; leaves of the suckers angled and toothed, of the branches hoary beneath or glabrous, stigmas 2–4 rarely 2 each 4-cleft Grey Poplar.—A supposed hybrid with tremula, indigenous in S.E. England. Wood said to be superior to that of P. alba proper. I have never seen stigmas like those figured in Engl. Bot. (? copied from Reichenbach).

2. P. trem'ula, L.; buds not viscid, leaves of shoots cordate acute entire, of branches suborbicular-ovate sinuate-serrate with incurved teeth glabrous or silky beneath. Aspen.
Copses, &c., N. to Orkney, indigenous, more often planted; ascends to 1,600 ft. in Yorkshire; Ireland; Channel Islands; fl. March–April.—Erect, 40–80 ft., short-lived. Bark gray, wood white; suckers many, pubescent; branches spreading; buds pubescent. Leaves 1–4 in., old obtuse, young acute, cottony beneath; petiole very long, slender, glabrous, compressed. Catkins 2–3 in., cylindric; scales lanceolate. Vars. villosa and glabra, have respectively villous and subglabrous foliage.—Distr. Europe (Arctic), N. Africa, N. Asia.—Wood indifferent.


P. nigra, L.; buds viscid, leaves rhombic deltoid or suborbicular finely crenate-serrate at length glabrous. Black Poplar.


2. Salix, Tournef. Willow.

Trees or shrubs. Leaves quite entire or serrate; stipules persistent or deciduous. Stamens 2 or more, filaments free or connate. Catkins usually erect; scales entire. Disk of 1–2 distinct glands. Stigmas entire or 2-fid.—Distr. Of the Order; species 160.—Etym. The Latin name.—For the species of this troublesome genus I have followed Andersson (in D.C. Prodr. XVI. part 2), and for the vars., principally Syme.

Section 1. Catkins on short peduncles that bear fully developed leaves; scales pale, persistent or deciduous. Filaments hairy below, all free. Capsule glabrous in the British species.

* Stamens 3 or more, free. Petiole glandular at the top. Capsule pedicelled.

1. S. trian'dra, L.; leaves linear- or oblong-lanceolate acuminate glandular-serrate glabrous paler or glaucous beneath, disk of the male flower 2-glandular, stamens 3. Almond-leaved or French Willow.

River-banks and osier-grounds from Perth southd.; doubtfully native of Scotland and Ireland; fl. April–June.—A tree, 20 ft., bark flaking. Leaves 2–4 in., base broad or narrow; stipules large, ½-cordate. Catkins 1–2 in., appearing with the leaves, slender, female narrower; scales nearly glabrous. Capsule small, terete or furrowed, glabrous; style thick, short.—Distr. Europe (Arctic), N. Asia.

S. trian'dra proper (S. amygdalina, L.); leaves more linear narrow glaucous beneath.—Var. S. Hoffmannid'na, Sm.; leaves broader at the base green beneath.—S. contorta, Crowe, is a var. cultivated in Sussex.—S. undulata, Ehrh. (S. lanceolata, Sm.), distinguished from S. trian'dra by its shaggy scales and distinctly developed style, is commonly cultivated for basket-
work, but is not indigenous. Andersson supposes it to be a smooth-fruit ed hybrid between triandra or alba, and viminalis.—S. Trevirâni, Spr., is another hybrid with viminalis, found in Staffordshire.

2. S. pentan'dra, L.; leaves elliptic or ovate- or obovate-lanceolate acuminate glandular-serrulate viscid shining paler beneath, disk of male and female flowers 2-glandular, stamens 5 (4–12). Bay-leaved Willow.

River-banks and wet places, from N. Wales, Worcester, and York to Argyll and Banff; planted S. of this; ascends to 1,300 ft. in Northumbd.; rare in Ireland; fl. May–June.—A glabrous shrub, 6–8 ft., or tree, 20 ft.; dark brown. Leaves 1–4 in., fragrant, reticulate beneath; stipules ovate oblong or 0. Catkins, male 1–2 in., erect then pendulous, scales oblong; female shorter. Capsule glabrous; style short.—Distr. Europe (Arctic), excl. Greece and Turkey, W. and N. Asia. —The latest-flowering willow.—S. cus-pida'ta, Schultz (Meyeria'na, Willd.), found in Shropshire, is probably a hybrid with fragilis.

**Stamens 2, rarely more, free. Petiole glandular or not at the top.**


Marshy ground, from Ross southd.; ascends to 1,300 ft. in Northumbd.; ? native in Scotland or Ireland; Channel Islands; fl. April–May.—A tree, 80–90 ft., trunk sometimes 20 ft. in girth; branches spreading obliquely from the trunk; twigs easily detached, smooth, polished. Leaves 3–6 in., petiole often glandular at the top. Catkins usually spreading, stout, male 1–2 in., female slender, often longer; scales linear-lanceolate; disk 2-glandular. Stamens 2, rarely 3–5. Capsule glabrous; style short.—Distr. Europe, N. and W. Asia; introd. in America.—Andersson doubts this being indigenous except in S.W. Asia.

S. frag'ilis proper; twigs yellow-brown, leaves elliptic-lanceolate.—Var. S. decipi'ens, Hoffm.; twigs orange or crimson, leaves smaller, style longer.

S. Russelli'a'na, Sm. (Bedford Willow), a tree, 50 ft., trunk 12 ft. in girth, is considered a hybrid between fragilis and alba, and referred to S. vir'idis, Fries. Mr. Baker says it is a synonym of S. fragilis; and that Fries' S. viridis is not a British plant.

4. S. al'ba, L.; leaves narrowly lanceolate long-acuminate silky on both surfaces (except when old) glandular-serrate, stipules ovate-lanceolate deciduous, capsule subsessile. White Willow.

Marshy ground, always? planted, from Sutherland southd.; Ireland; Channel Islands; fl. May.—A large tree, 80 ft., trunk 20 ft. in girth; bark fissured: twigs not easily detached, silky. Leaves 2–4 in., glabrous when old, petiole eglandular. Catkins slender, lax, erect, scales linear. Capsule glabrous, style very short.—Distr. Europe, N. Africa, N. and W. Asia, N.W. India.—Timber most useful for carpentry and fuel; bark for tanning.

S. al'ba proper; twigs olive, old leaves silky on both surfaces.—Var. S. ævr'lea, Sm.; twigs olive, old leaves glabrous glaucous beneath.—Var. S. vitelli'na
L.; twigs yellow or reddish, old leaves glabrous above, scales of catkins longer. *Golden Willow.*

**Section 2. Catkins** on leafy or bracteate peduncles; scales persistent, discoloured at the tip (except *S. reticulata*). **Stamens 2,** filaments free. **Disk** 1-glandular. **Capsule** tomentose or silky, rarely glabrous.

*Capsule with a slender pedicel; style very short or 0.*

5. **S. Capre'a**, *L.*; leaves elliptic or oblong-obovate or lanceolate acute or acuminate crenate reticulate on both surfaces tomentose beneath, stipules 1/3-reniform, catkins silky, male ovoid-oblong, female elongate at length nodding, scales hairy, tip black. *Common Sallow, Goat Willow.*

Copes, pastures, &c., by streams, from Argyll and Inverness southd.; ascends to 2,000 ft. in the Highlands; Ireland; Channel Islands; fl. April-May.—A grey tree or large shrub. **Leaves** 2-4 in., dark green above, cuspidate, margins narrowly recurved. **Catkins** short, preceding the leaves, sessile, bracteate; male 1 in., very stout, female lengthening to 3 in. **Capsule** 1 in., silky; pedicel very slender.—**Distrib.** Europe, N. and W. Asia, Himalaya.—The earliest-flowering British willow. The twigs with catkins gathered at Easter, are called Palm-branches. Andersson points out the impossibility of distinguishing this from *S. cine'rea,* *L.*

*S. Capre'a* proper; buds and twigs glabrous or puberulous, leaves usually broad glabrous and dull green above undulate crenate-serrate or subentire, stipules long or 0.—*S. sphecælata,* Sm., is a subalpine form, without stipules and with subentire leaves.

Sub-sp. *S. cine'rea*, *L.*; buds and twigs tomentose, leaves smaller narrower from elliptic-oblong to oblanceolate margins undulate pubescent above, male catkins less stout opening later, anthers pale yellow, capsule smaller (filaments hairy at the base, *Syme*).—*S. aquatica,* Sm., with leaves more obovate glaucous, hairs beneath white, stipules large, and *S. oleifolia,* Sm., with leaves narrow rigid glaucous, hairs beneath red-brown, stipules small, are slight varieties.—Andersson correctly refers *S. cine'rea,* Sm., in *Engl. Bot.,* t. 1897, to this; but also quotes that plate and name under *daphnoi'des,* Vill., a very different plant.


Moist copses, heaths, &c., N. to Shetland; ascends to 2,000 ft. in the Highlands; Ireland; Channel Islands; fl. April-May.—A small bush, 2-4 ft., with straggling branches; probably a form of *S. Capre'a,* being so closely allied to sub-sp. *cine'rea* that it is chiefly distinguishable by its smaller size, reddish twigs, leaves rarely 2 in., very much wrinkled, young reddish and crisped, often petioled, large stipules, shorter catkins, 1/3—1/2 in., and narrower more tomentose capsule.—**Distrib.** Europe, N. and W. Asia.

7. **S. rep'ens**, *L.*; leaves small oblong- or linear-lanceolate obtuse or acute, margins recurved entire or serrulate shining and reticulate above, silky or glaucous beneath, stipules 0 or lanceolate, catkins cylindric-oblong, scales spathulate, anthers at length black. *S. fæ'fida,* Sm.
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Heaths, commons, &c., from Shetland southd.; ascends to 2,500 ft. in the
Highlands; Ireland; Channel Islands; fl. April–May.—A small, straggling
bush; branches slender, elongate, erect or decumbent; buds silky. Leaves
excessively variable, %1/2 to 1%1/2 in., young always silvery silky. Catkins preceding
or appearing with the leaves, erect, short, sessile, rarely on lengthening
leafy peduncles %1/2 to 1 in.; bracts leafy; scales yellow-green or purple, silky,
always dark at the tip; anthers yellow till the pollen is shed. Capsule
pedicelled, glabrous or silky.—Distr. Europe, Siberia.—The following
are the chief British forms.

S. repens proper; stem decumbent below, flowering branches erect or ascend-
ing, leaves appearing with the flowers elliptic-oblong quite entire silky
beneath tip straight, stipules 0, capsule glabrous.—S. fuscæ, L.; stem sub-
erect, branches spreading, leaves elliptic-oblong faintly serrate tip straight;
the rest as in repens.—S. prostrata, Sm.; prostrate, branches many slender,
leaves appearing after the flowers faintly serrate puberulous above glaucous
and silky beneath, stipules minute or 0, capsule silky.—S. ascendens, Sm.;
stem decumbent, branches ascending, leaves as in prostrata but appearing
with the flowers more silky beneath and tips recurved, stipules ovate or
lanceolate or 0, capsule silky at length glabrous.—S. parvifolia, Sm.; stem
as in prostrata, leaves and capsules as in ascendens, stipules small ovate or 0.
—S. argentea, Sm. (arena'ria, L. partly); stem and simple slender branches
erect, leaves appearing with the flowers elliptic-ovate quite entire densely
silky and silvery especially beneath, tip recurved, capsule silky. A large
form, growing in sandy places.—S. rosinarininfolia, L.; leaves 2-3 in. linear
or linear-lanceolate faintly glandular-serrate or entire glabrous or silky be-
neath, stipules ovate or lanceolate, catkins short sessile dense, scales black,
capsule tomentose. Said to have been found in the last century by Sherard
in bogs in Scotland.

S. incuba'cea, L. (? S. ambigu'a, Ehrh.; S. repens, var. incuba'cea, Syme), is
referred to repens by Wimmer, and to a hybrid between this and aurita
by Andersson; it has reticulate leaves with recurved margins and large sti-
pules.—S. spathula'ta, Willd., is referred by Andersson to a hairy form of it.

** Capsule with a slender pedicel; style distinct.

3. S. nigricans, Sm.; leaves thin ovate-oblong cordate or lanceolate
subacute reticulate above, stipules 0 or 1-cordate, catkins sessile or on short
leafy peduncles ovoid or cylindric, scales linear-oblong hairy.

Rocks and banks of streams, from York to Argyll and Aberdeen; ascends to
2,300 ft. in the Highlands; rare in Ireland; fl. May–June.—A procumbent
shrub or tree, 10 ft. Leaves entire or serrate, black when dry. Catkins %1/2
in., appearing before or after the leaves, scales acute or obtuse. Filaments
hairy at the base. Capsule narrowly conical, glabrous or tomentose;
pedicel and styles slender.—Distr. Alps of N. and Mid. Europe.
Andersson describes this as the most variable of the genus. It is perhaps
a form of S. phyllicifol'ia, which presents a parallel series of variations.
Syme sums its differences in the thinner more reticulate darker leaves, more
or less glaucous beneath, blackening more when dry, and more permanently
hairy; more pubescent twigs; large stipules; more glabrous capsule; shorter
style and longer pedicel.

Mr. Baker's experience is:—phyllicifol'ia, twigs bright chestnut, rarely hairy;
leaves firmer brighter coloured above, glaucous (very rarely not), quite
glabrous beneath; stipules of the leaf-shoots smaller and more deciduous; plant drying without turning black.—*nigricans*, twigs much shorter, dull-coloured, pubescent (like *cinerea*); leaves softer usually grey-pubescent and much less if at all glaucous beneath; stipules of barren shoots larger, more persistent; style and pedicel the same in both, and ovary similarly variable in silkiness; plant turning black when dried. Both, when growing with *Caprea* and *cinerea*, flower a little later (through May into June), and are mostly plants of subalpine valleys.

The erect varieties with broad leaves 1–4 in., more or less glaucous beneath, and silky capsules are:—True *nigricans*; cotinifolia, Sm.; and *Forsteria*na, Sm.—*S. rupestris*, Sm., is a trailing variety with small broad leaves.—*S. Andersoniana*, Sm.; *damascena*, Forbes, and petrae*a*, G. Anders., are erect shrubs with glabrous capsules.—*S. hirta*, Sm., is a subarborescent form (male only) with silky twigs and leaves densely pubescent beneath.—*S. floribunda*, Forbes (*tenuifolia*, Sm.; *biicolor*, Hook.), is a doubtful plant.

9. *S. phylicifolia*, L.; leaves ovate-oblong or elliptic-lanceolate quite glabrous shining above glaucous beneath, stipules 0 or very small, catkins sessile bracteate, scales linear-oblong black acute. *Tea-leaved Willow*.

Rocks and mountain streams, from York and Lancashire to Orkney; ascends to 2,000 ft. in Yorks. and Perth; rare in Ireland; fl. April–May.—A handsome large bush or small tree (10 ft.). When fully developed conspicuous from its spreading shining chestnut or reddish branches, and glistening green and glaucous foliage. Andersson distinguishes it from *S. nigricans* by the less unequal thicker leaves, which blacken less in drying, and have no minute white dots; capsule larger, with longer beaks; he adds that it is the earliest flowerer of the genus (in England *S. Capre'a* flowers first); (Syme it is among the latest).—Distr. Almost the same as *S. nigricans*.

The British forms are, 1st, the erect with silky capsules, *S. Davallia*na, Sm.; *Weigelia*na, Willd. (*Wulfenia*na, Sm.); *nitens*, G. Anders.; *Crowea*na, Sm.; *Dicksonia*na, Sm. (*mytrilloides*, Sm., not L.); and *tenuior*, Borr.—2d, erect with glabrous or nearly glabrous capsules, *laxiflora*, G. Anders.; *propinqua*, Borr.; *tetrapila*, Walker; *Borneria*na, Sm.; *phillyreafolia*, Borr.; *tenuiifolia*, Borr.—3d, a more or less decumbent rooting form, with silky capsules, *S. radiicans*, Sm. (*phylicifolia*, Sm.).

*S. laurina*, Sm. (*laxiflora*, Borr.; *bicolor*, Sm.), a small handsome tree, 20–30 ft., found in various parts of England and Ireland, is a hybrid between *S. phylicifolia* and *Capre'a*.

*** Capsule with a short pedicel or 0. Style slender.***

*S. Daphnoides*, Vill.; arboreous, buds large, leaves narrow oblong or linear-lanceolate acuminate acutely serrate shining above glaucous beneath, stipules ½-cordate acute, catkins stout sessile, scales black acute very villous, capsules glabrous. *S. acutifolia*, Willd. *Violet Willow*.

Great Ayton, Yorkshire, not indigenous; fl. April.—A small tree, 10–12 ft., twigs violet. *Leaves* 3–6 in., very acuminate, with persistent glaucous bloom. Catkins clothed with silky hairs, appearing before the leaves; scales black-pointed; anthers yellow.—Distr. S. Scandinavia across Europe and Asia to the Amur.
10. **S. viminalis**, L. ; leaves linear-lanceolate acuminate reticulate above silvery silky beneath, margin revolute quite entire, stipules linear-lanceolate, catkins sessile, bracts small or 0, capsules tomentose. *Osier.*

Wet places and osier-beds, from Elgin and Argyll southd.; Ireland, native?; fl. April–June.—A shrub or small tree, 30 ft.; branches long, straight, young silky, old polished, leafy. *Leaves* 4–10 in., narrowed into the petiole, margins waved. *Catkins* ¼–1 in., mature long before the leaves, golden-yellow; scales oblong, brown; gland slender. *Capsule* shortly pedicelled, base broad, white; stigmas rarely 2-fid.—*Distr.* Russia, N. Asia, Soon-garia; cult. throughout Europe; introd. in N. America.

*S. stipul'aris*, Sm., is a supposed hybrid, probably with *Caprea* or *cinerea*, cultivated in Essex and Suffolk; Channel Islands; it has broader more undulating leaves, large stipules, and a shortly pedicelled capsule.—In Britain this and *Smithia’na* shade off into *viminalis*, and keep quite distinct from *cinerea* (Baker).

*S. Smithia’na*, Willd. (*S. mollis’sima*, Sm.); this Anderson regards as an undoubted and excessively variable hybrid between *viminalis* and *Caprea*; it is very common in osier-grounds of England and Ireland, and found in Scotland; the leaves are not so silvery beneath, usually dull and hoary; capsule long pedicelled.—*S. acuminata*, Sm., *ferrugin’ea*, G. Anders., *S. holoseric’ea*, Willd., and *rugosa*, Leefe (*holoseric’ea*, Hook. and Arn.), are varieties or hybrids with *S. cinerea*.

11. **S. lan’ata**, L. ; leaves broadly ovate or oblong-lanceolate acute woolly entire cottony beneath with raised reticulate veins, stipules large ¼-cordate glandular-serrate, catkins terminal sessile, scales obtuse clothed with long golden hairs, capsules glabrous.

Alpine cliffs and rills, Perth, Fcl’tar, Inverness, and Sutherland; alt. 2,000–2,500 ft.; fl. May–June.—A small shrub, 2–3 ft., branches tortuous, twigs tomentose; buds large, black, hirsute. *Leaves* 1–3 in., coriaceous, petiole very short. *Catkins* appearing with the leaves, crowded, stout, sometimes ashy white as in *S. Lappo’num*, especially in age; male 1–2 in., female 2–4 in.; scales black, oblong. *Stamens* glabrous. *Capsule* shortly pedicelled; style very slender, stigmas filiform notched or 2-fid.—*Distr.* Arctic and Alpine Scandinavia, Arctic Asia, Altai Mts., Greenland.

12. **S. Lappo’num**, L. ; dwarf, leaves elliptic or obovate-lanceolate acuminate reticulate silky and villous above cottony beneath with straight raised veins, margins recurved, stipules 0 or small, catkins subsessile bracteate, scales acute clothed with long white hairs, capsules tomentose.

Alpine rocks, Edinburgh and Argyll to Sutherland; alt. 2,000–2,700 ft.; fl. June–July.—Shrubby, 2–3 ft., erect or decumbent; branches stout, brown, buds woolly. *Leaves* 1–2 in., very variable, quite entire or sinuate-serrate, dull green above; petiole rather long, base dilated. *Catkins* preceding the leaves; male ovoid, scales black, anthers yellow; female longer, 1–3 in. *Capsule* conical, subsessile; style very long, stigmas filiform cleft.—*Distr.* Scandinavia to the Arctic circle, Mts. of France and N. Italy, Siberia, N. America.—The Edinburgh specimens seen by me are flowerless; this locality is anomalous for so alpine a plant.
The following are slight varieties:—S. aren'aria, L. (partly); leaves downy above woolly beneath, style equalling the capsule. —S. Stuartid'na, Sm.; leaves woolly above silky and cottony beneath, style equalling the capsule. —S. glau'ca, Sm. (not L.); leaves snow-white and woolly beneath, style much shorter than the capsule. (I should doubt this being the same species.)

13. **S. Myrsi'nites**, L.; dwarf, leaves small rigid ovate obovate or lanceolate glandular-serrate shining and reticulate on both surfaces, stipules 0 or lanceolate, catkins on leafy peduncles, scales spatulate blackish, capsules hairy. **S. retu'sa**, Dickson (Andersson).

Alpine rocks and rivulets in Mid. Scotland; alt. 1,000-2,700 ft.; fl. June-July.—A small rigid suberect or creeping shrub, young parts clothed with silky deciduous hairs. *Leaves* usually ½-1 in., very variable, dark green and glossy; petiole very short; stipules ovate-lanceolate, serrate. *Catkins* ½-1 in., appearing with or after the leaves, on stout peduncles often as long, oblong, male ovoid; scales pilose; disk large; anthers at length black. *Capsule* hairy or pubescent, distinctly pedicelled; style long, stigmas thick. —**Distrib.** Alps of Scandinavia (Arctic), Mid. Europe, Siberia, N. America. The following are British varieties: *S. procum'bens*, Forbes *S. le'veis*, Hook.); leaves broad subacute faintly serrate.—**Var. arbuti'fola**, Syme; leaves narrow acute or acuminate very faintly serrate.—**Var. serr'ata**, Syme; leaves ovate acute serrate.

*S. Graha'mi*, Borr. MS. (Baker in *Seem. Journ. Bot.* 1867, 157, t. 66), is only known from female specimens cultivated in the Edinburgh Bot. Garden, said to have been brought by Prof. Graham from Frouvyn in Sutherland. It appears to me to be a form of *S. Myrsi'nites*, with smaller catkins, paler scales, and a perfectly glabrous capsule with a rather long very silky pedicel; and not allied to *S. pola'ris or herba'cea*, Syme suspects it to be a hybrid between *herbacea* and *nigricans* or *phylicifolia*; and Nyman, a sub-sp. of *S. retu'sa*, L. The *Engl. Bot.* figures of the ovary and scale are very incorrect. A similar plant occurs in Muckish Mt., Donegal.

14. **S. Sadle'ri**, Syme; dwarf, leaves small short-petioled broadly ovate or ovo-cordate subacute quite entire smooth and cottony above reticulated and glabrous beneath, stipules 0, catkins terminating leafy branches, scales oblong obtuse, capsule glabrous.

Rocky ledges of Glen Callater, alt. 2,500 ft.; frt. Aug.—Prostrate branches few, tortuous; bark shining, red-brown; shoots woolly. *Leaves* few, ½-1 in., firm, dark green, young cottony beneath; petiole ½ in. *Catkins* ½-2 in., cylindric, many-fid.; peduncle woolly, ½-1 in., leafless; scales woolly at length dark brown, shorter than the capsules which are ½ in., glabrous, conical-ovoid; pedicels and persistent styles slender.—Only two plants hitherto seen, both in ripe fruit. I am indebted to Dr. Balfour for the loan of one here described. Nyman regards it as a sub-sp. of *S. lana'ta*, or hybrid with this and *re'ticul'ata*.

15. **S. Arbus'cula**, L.; leaves ovate-lanceolate or obovate acuminate serrulate shining above pale or glaucous beneath, catkins lateral on bracteate peduncles, scales obtuse hirsute, capsules sessile tomentose.
Rocks, Dumfries, Argyll, Perth, Forfar, Aberdeen, alt. 1,000-2,400 ft.; fl. June-July.—A small, rigid, decumbent, rooting shrub; twigs yellow, pubescent, then brown. Leaves ½-1½ in., very variable, at first silky beneath. Catkins ½-1 in., females often long-peduncled; scales obovate or rounded, reddish, very pubescent. Capsules conical, reddish, base embraced by the scale; style long, deeply cleft, stigmas thick notched.—Distrib. Alps of Mid. and N. Europe (Arctic), N. and Central Asia, Greenland.—Intermediate between S. phyllicifolia and Myrsini'tes.

British forms are: S. carina'ta, Sm.; suberect, leaves folded and recurved.—S. fæ'tida, Schl. (prunifo'lia, Sm.); decumbent or ascending, leaves flat.—S. venulo'sa, Sm.; decumbent, leaves reticulate on both surfaces.—S. vacciniifo'lia, Walker (liv'ida, Sm., not Wahl); decumbent, leaves silky beneath.

**** Capsule sessile or sub sessile. Style short or 0.

16. S. herba'cea, L.; very dwarf, branches buried, leaves oblong or orbicular obtuse or retuse shining reticulate serrat, catkins on 2-leaved peduncles oblong few-fld., scales concave glabrous or pubescent.

Loftiest Welsh, N. English, Scotch and Irish Alps, ascending to 4,300 ft.; fl. June.—Stem and branches spreading under the turf, sending up short flowering few-leaved twigs; bud-scales persistent, brown. Leaves ¼-½ in., shortly petioled, curled; stipules minute ovate or 0. Catkins ¼-½ in., flowering after the leaves, subterminal, shortly peduncled, 4-10-fld.; scales obovate, obtuse; anthers yellow-brown or purple. Capsule rarely pubescent, sub sessile; style rather short.—Distrib. Arctic and Alpine Europe, N. Asia, N. America.—The smallest British shrub.

17. S. reticul'a'ta, L.; dwarf, branches buried, leaves orbicular-oblong or obovate strongly reticulate on both surfaces green above glaucous beneath, catkins on very long leafy peduncles, style very short.

Lofty Mts. of Perth, Forfar, Aberdeen, Inverness, and Sutherland; alt. 2,000-3,200 ft.; fl. July-Aug.—Stem 1-2 ft., procumbent, short, woody; branches tortuous, sparingly leafy. Leaves sometimes cuneate, obtuse or retuse, margin entire or waved, young hairy, older glabrous and rugose above, usually hoary beneath, stipules 0. Catkins ½-1 in., subterminal, flowering after the leaves, oblong, many-fld.; scales obovate, purplish or yellow, of one colour; anthers purplish; disk a laciniate cup. Capsule sessile, hoary, obtuse; stigmas notched.—Distrib. As S. herba'cea, reaching the limits of Arctic vegetation.

Section 3. Syn'andræ, Anderss. Catkins appearing before the leaves, on short bracteate or leafy peduncles; scales tipped with dark colour. Stamens 2, filaments more or less combined.

18. S. purpu'rea, L.; shrubby, leaves often subopposite thin linear lanceolate serrulate glabrous, stipules ¼-ovate or 0, catkins sub sessile, scales small, capsule sub sessile, styles very short. Purple Osier.

River-banks and osier-beds, from Banff and Isla to Devon and Kent; native? in Ireland; fl. March-April.—An erect or decumbent shrub, 5-10 ft.; twigs slender, tough; bark red or purple. Leaves 3-6 in., sparingly hairy when young, shortly petioled, broadest about or beyond the middle, glaucous but
most so beneath, black in drying. *Catkins* 2½ in., opposite or alternate, erect, then spreading or recurved, cylindric; scales purple-black above, hairy or woolly; filaments hairy at the base; anthers red, then black. Capsule broadly ovoid, obtuse; stigmas entire or cleft.—Distrib. Europe, N. Africa, N. and W. Asia, India; introd. in N. America.—Bark very bitter; used for basket-making, but not so commonly as *S. viminalis*.—The best-marked British varieties are:—*S. Woolgaria* Borr., and *ramulosa*, Borr.; erect, branches yellowish, stigmas notched. *S. Lambertia* Sm.; erect, leaves broader above, branches purplish glaucous, stigmas subsessile short thick.

*S. ru'bra*, Huds., a common osier-bed shrub, or tree 10 ft., is a hybrid with *viminalis*; the leaves are silky beneath, filaments usually more or less free, and style longer; it is very variable, and includes:—*S. ru'bra* proper; filaments connate at the base only; *S. Forbyana* Sm.; filaments united to the top; *S. Hel'ix*, L.; leaves often subopposite filaments united to the top (bears fascicles of diseased leaves, owing to the puncture of a Cynips, hence called *Rose Willow*).

*S. Donia* Sm., a native of dry places in Mid. and S. Germany, is intermediate between *repens* and *purpurea* (Andersson), was stated by G. Don. to be a native of Forfarshire, no doubt erroneously; it may be known from *purpurea* by its yellow anthers, pedicelled capsule, and filaments more or less connate at the base only.

*S. Pontedera* Schleich., gathered by the Rev. J. E. Leefe near Rothbury, Northumbd., is probably a hybrid with *cinerea* (Baker).

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**Order LXXIII. Ceratophyl'leæ.**

A submerged, branched, slender, fragile herb; stems cylindric. Leaves whorled, sessile, exstipulate, 2-chotomously cut into linear-toothed lobes. Flowers solitary, axillary, minute, monoecious, enclosed in an 8–12-partite persistent involucre with subulate lobes. Perianth 0.—Male. Anthers many, crowded, sessile, oblong; cells linear, sunk in a fleshy 2-cuspidate connective, bursting irregularly.—Female. Ovary oblong, 1-celled; style terminal, subulate, persistent, stigmas unilaterial papillose; ovule 1, pendulous from the top of the cell, orthotropous. Fruit coriaceous, indehiscent, base tubercled winged or spurred. Seed pendulous, testa membranous, hilum thickened, albumen 0; cotyledons 2-fid ovoid thick, plumule large many-leaved, radicle very short.—Distrib. Europe, Asia, Africa, N. America (Arctic).—Affinities doubtful.—Properties unknown.—Etym. képas and φύλλον, from the horn-like leaf-lobes.

1. *Ceratophyl'ium*, L. Hornwort.

*C. demer'sum*, L.; leaves remotely serrate.

Ponds and ditches from Forfar southd.; E. Scotland only; rare in Ireland; Channel Islands; fl. July–Sept.—Stems 8 in.–3 ft., densely leafy. Leaves 1 in., segments spreading, subulate, dark green. Flowers found in shallow water
only, very inconspicuous. *Fruit* \(\frac{1}{4}\) in., tipped with the slender curved style, very variable.


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**SUB-CLASS II. GYMNOSPERMAE.**

**ORDER LXXIV. CONIFERAE.**

Trees or shrubs; wood without ducts (except in the first year); wood-cells studded with disks. *Leaves* usually alternate, rigid, linear or subulate, solitary, or fascicled in membranous sheaths. *Flowers* monoecious or dioecious, anemophilous; males in deciduous catkins; females in cones or solitary; perianth 0.—**MALE** of many 1- or more-celled anthers seated on the scales of the catkin, filaments 0 or connate.—**FEMALE** of 1 or more sessile naked orthotropous or anatropous ovules seated on an open carpellary leaf (bracts of some), which is free or adnate to the scale of the cone. *Seeds* often winged, testa thin or thick, albumen densely fleshy; embryo axile, straight, cotyledons 2 or more, radicle terete often attached to a crumpled thread (suspensor).—**DISTRIB.** Especially cold regions; very rare in trop. Africa and America; genera 33; species about 300.—**AFFINITIES.** With Cycadeae and Gnetaceae.—**PROPERTIES.** Yield terebinthine, succinic acid, pitch, tar, turpentine, valuable woods, and a few edible seeds.

**TRIBE I. ABIETINAE.** *Flowers* monoecious. *Cones* usually large, conical; scales more or less woody. *Pollen* curved.

Cone woody, scales persistent.................................1. *Pinus*.

**TRIBE II. CUPRESSINAE.** *Flowers* mono- di-ecious. *Cones* usually globose or short; scales woody or fleshy, persistent. *Pollen* globose.

Cone fleshy, globose; scales at length connate..................2. *Juniperus*.

**TRIBE III. TAXIINAE.** *Flowers* dioecious. Cones much reduced; scales small, thin or coriaceous, the upper with 1 ovule. *Seed* hard, with a fleshy coat, or seated in a fleshy cup. *Pollen* globose.

Seed solitary, seated in a fleshy cup..............................3. *Taxus*.

1. **PINUS**, L. **PINE.**

Trees; branches more or less whorled. *Leaves* evergreen, in clusters of 2, 3, or 5. *Male catkins* spicate, ovoid or oblong of many 2-celled anthers spirally arranged; pollen-grains curved, 2-globose. *Fruit*, a cone, usually ripening in the second year; scales woody. *Ovules* 2, inverted, adnate to the scale; cotyledons 3 or more, linear; radicle inferior.—**DISTRIB.** N. hemisphere, from Mexico and Borneo to the Arctic circle; species about 70.—**ETYM.** The classical name.
**P. sylvestris**, *L.*; leaves in pairs, cones ovoid young recurved, seeds winged. *Scotch Fir.*

In a few spots, York to Sutherland; ascends to 2,200 ft.; Ireland; once native of many parts of Britain; planted elsewhere; fl. May–June.—A tree, 50–100 ft., trunk attaining 12 ft. girth; wood red or white; bark red-brown, rough. Leaves 2–3 in., falling in the 3d year, acicular, acute, grooved above, convex and glaucous beneath, minutely serrulate, sheath fimbriate. *Male catkins* $\frac{3}{4}$ in., yellow; connective produced. *Cones* 1–2 in., 1–3 together, acute; scales few, ends rhomboid with a transverse keel and deciduous point. *Seed* $\frac{1}{2}$ in., wing cuneate, much exceeding the nucleus.—**Distrib.** Europe, N. Asia.—Yields tar, pitch, rosin, turpentine, and deals.

2. **JUNIP'ERUS, *L.* Juniper.**

Trees or bushes; heart-wood red, odorous. *Leaves* opposite or whorled in threes, all subulate, or on the young shoots subulate, on the old scale-like and appressed. *Male catkins* solitary or crowded, of many 2–6-celled anthers. *Cone* ripening the 2d year, small, globose, baccate, of 4–6 decussate or whorled confluent fleshy scales, the upper and lower flowerless. *Ovules* 1–2 under each scale, erect. *Seeds* 1–8, enclosed in the fleshy confluent scales, free or connate, testa various; cotyledons 2–5, oblong, radicle superior.—**Distrib.** Temp. and cold N. hemisphere; species 27.—**Etym.** The classical name.

**J. commu'nis, *L.*;** leaves whorled in threes subulate pungent glaucous above, margins and midrib thickened.

Open hill-sides, N. to Shetland; ascends to 2,400 ft.; Ireland; fl. May–June.—Shrubby, 1–5 ft., rarely subarboreous (10–20 ft., with trunk 5 ft. in girth). *Bark* flaking, fibrous, red-brown. *Leaves* $\frac{3}{4}$–1 in., crowded; lower shorter, oblong-lanceolate, concave. *Cone* $\frac{1}{2}$–$\frac{3}{4}$ in. diam., very fleshy, blue-black, glaucous, with scarcely empty scales at its base.—**Distrib.** Europe, N. Africa, N. and M. Asia, N. America, Arctic regions.—A diuretic. **J. commu'nis** proper; leaves spreading straight subulate.—**Var.** J. na'na, Willd.; leaves shorter broader imbricate incurved. Mountains from N. Wales and Westmoreland to Shetland, ascends to 2,700 ft.

3. **TAX'US, Tournef.** Yew.

A tree or shrub; wood very tough, heart-wood red; wood-cells with a spiral thickening within. *Leaves* linear, 2-farious; petiole very short, with a half twist. *Male catkin* peltate, subglobose with 5–8 anthers surrounded at the base by imbricate scarious empty scales.—**Female** of a few minute scales, and 1 terminal erect ovule seated on a fleshy disk, which enlarges into a red fleshy cup containing the seed. *Seed* ovoid, subcompressed, testa bony; cotyledons 2, short, radicle superior.—**Distrib.** N. temp. regions to the Arctic circle.—**Etym.** possibly τόξον, from the wood being used for bows.

**T. baca'ta, *L.*;** leaves linear more or less falcate acute.
Hill-sides and woods, from Perth and Argyll to Somerset and Kent; ascends to 1,500 ft. in Northumbd.; Ireland; fl. March.—Tree 15-50 ft., in England; loftier in India; sometimes 27 ft. in girth, channelled; bark thin, flaking; branches spreading. Leaves ½–1½ in., coriaceous, shining above, paler beneath. Male catkins ½ in., yellow; female minute; scales green. Fruit ¼ in.; cup red, mucilaginous; seed olive-green, punctulate.—I believe also the 6 supposed species of this genus to be forms of one. T. fastigiat'a, Lindl. (Irish or Florence-court yew), is a fastigiate variety.

Class II. Monocotyledones.

Order LXXV. Hydrochari'dæ.

Aquatic herbs. Leaves aerial floating or submerged, opposite or whorled, convolute in bud. Flowers usually dioecious, buds inclosed in one or more spathaceous bracts.—Mäle. Perianth of 6 segments in 2 series (rarely 0), 3 inner often petaloid, imbricate or valvate in bud. Stamens on the base of the segments, 3 and opposite the sepals, or more and in 2 or more series, filaments free or connate below; anthers adnate. Ovary rudimentary.—Female. Perianth superior, 6-partite. Staminodes various, sometimes antheriferous. Ovary 1- or 3-6-celled; styles 3 or 6, 2-fid, free or connate below, stigmas decurrent; ovules many, ascending. Fruit usually baccate, submerged, 1-6-celled. Seeds many or few, on projecting placen-tas, testa firm, albumen; embryo straight, plumule lateral, radicle next the hilum.—Distrib. All climates; genera 14; species about 40.—Affinities. None.—Properties unimportant.

Leaves orbicular, floating ........................................... 1. Hydrocharis.
Leaves ensiform, serrate, submerged ................................ 2. Stratiotes.
Leaves linear opposite or whorled, submerged ...................... 2*. Elodea.


A floating herb. Leaves orbicular, quite entire.—Male fl. 2-3, sub-umbelled; spathe peduncled, 2-leaved. Sepals 3, herbaceous. Petals 3, white membranous. Stamens 12, 3-6 without anthers, filaments connate below, forked, fleshy; anthers basifix'd, cells separate, both on one fork. Pistillodes 3.—Female solitary, long-peduncled; spathe 1, radical. Sepals of the male. Petals with a fleshy gland at the base. Staminodes 6, filiform, in pairs opposite the sepals. Ovary ovoid, 6-celled; styles 6, short, connate at the base; ovules many, inserted on the septa, orthotropous. Fruit fleshy, indehiscent. Seeds few, ovoid, immersed in mucus, testa lax papillose; embryo ovoid.—Distrib. Europe, N. Asia.—Etym. ὕδωρ, water, and χάρις, elegance.

H. Mor'sus-Ra'næ, L.; leaves orbicular-reniform, flowers white.
Ponds and ditches, from Durham to Devon and Kent; local in Ireland; fl. July–Aug.—Stoloniferous, roots fibrous and bulbiferous. Leaves 1-1½ in. diam., deep green above, reddish beneath. Flowers erect, ⅛-1 in. diam.; sepals small, oblong; petals broadly obovate, crumpled. Fruit I have not seen.—The cells of the testa swell in water and emit a spiral thread.

2. STRATIO'TES, L. Water Soldier.

A stoloniferous submerged herb. Leaves all radical. Flowers subdicious, submerged before flowering and when fruiting, floating when in flower, honeyed. Inflorescence and perianth of Hydrocharis, but female flower sessile on a 2-spathed peduncle.—Male fl. Stamens many, filaments subulate, 12 antheriferous; anthers linear.—Female. Staminodes many, a few antheriferous. Ovary compressed with a narrow neck, and fruit as in Hydrocharis; ovules anatropous.—Distrib. Europe (excl. Greece), Siberia.—Etym. στρατιώτης, a soldier, from the sword-like foliage.

S. aloides, leaves tapering spinous-serrate.


2*. ELO'DEA, Michx. Water-thyme.

Stem slender, submerged, elongate, branched. Leaves in whorls of 3 (rarely 4), lower opposite. Flowers subdicious, axillary, solitary, sessile; spathe tubular, slender, 2-lipped. Sepals and petals 3 each, small, green.—Male. Stamens 3-9, filaments short or 0; anthers oblong.—Female. Tube of perianth long, slender. Staminodes 3 or 6, sometimes antheriferous. Ovary 1-celled; style slender, adnate to the perianth-tube, stigmas 3; ovules few, orthotropous, placentas 3 parietal. Berry oblong, 1-celled, few-seeded.—Distrib. Temp. and trop. climates: species 8.—Etym. ἐλοδός, growing in watery places.

E. CANADEN'SIS, Michx.; leaves linear- or lanceolate-oblong serrulate. Anach'aris Alsinastrum, Bab.; Udo'ra canaden'sis, Nutt.

ORDER LXXVI. ORCHIDÆ.

Terrestrial herbs, roots fascicled or tuberous (many exotics are epiphytes, with pseudo-bulbs). Leaves sheathing at the base, or scales. Flowers solitary, spiked, racemose or panicled. Perianth superior, irregular, of 6 coloured segments; 3 outer (sepals) nearly similar; inner lateral similar (petals); third inner (inferior by torsion of the pedicel) (lip) dissimilar, usually larger, often spurred. Stamens confluent with the style into an unsymmetrical column; anthers 1 superposed to the outer sepal (in Cypripedium 2 opposite the petals), 2-celled, persistent or deciduous; pollen in 2, 4, or 8 pyriform usually pedicelled masses (pollinia), pedicels (audicles) terminating in a gland; glands exposed or in 1 or 2 pouches. Ovary usually long and twisted, 3-gonous, 1-celled; style often terminating in a beak (rostellum) at the base of the anther or between its cells; stigma a viscid surface (of three confluent stigmas) facing the lip, beneath the rostellum; ovules very many, anatropous, placentas 3 parietal. Capsule 3-valved, valves separating from a framework that bears the placentas. Seeds innumerable, very minute, fusiform, testa very lax reticulate, albumen 0; embryo fleshy.—Distrib. All climates and situations except the very cold maritime, and aquatic; genera 334; species 5,000.—Affinities. With Irideae.—Properties. A few are aromatic (Vanilla); the tubers of Orchis are nutritive, and yield starch and salep.

TRIBE I. EPIDENDREÆ. Anther a 2-celled cap, hinged upon the column; pollen-masses 4, waxy, free or connate, not attached to the rostellum.


TRIBE II. NEOTTIEÆ. Anther a 2-celled deciduous cap, hinged on to the top, or back of the column; pollen-masses 2 or 4, granular or powdery, grains free or united by an elastic web.

* Anther hinged on the back of the column; rostellum beaked.

A leafless brown saprophyte. Pollen powdery .........................4 Neottia.
Leaves several. Lip adnate to the base of the column. Pollen powdery. 7. Spiranthæ.

** Anther hinged on the top of the column; rostellum very short.


TRIBE III. PHRYDEÆ. Anther 1, confluent with the column, 2-celled, erect; pollen-masses 2, granular, grains united by an elastic web.
* Glands of stalks of pollen masses in pouches of the rostellum.

Spur long; both glands in one pouch ............................11. Orchis.
Spur 0; both glands in one pouch ................................12. Aceras.
Spur 0; glands in separate pouches...............................13. Ophrys.

** Glands of stalks of pollen masses naked, not in pouches of the rostellum.

Spur 0 ............................................................14. Herminium.
Spur long or short ................................................15. Habenaria.

Tribe IV. Cypripedieæ. Anthers 2; rostellum prolonged into a
shield between the anthers; pollen powdery.
Lip large, saccate ...............................................16. Cypripedium.

1. Malaxis, Sw.

A small green subsucculent herb. Leaves few, broad, short. Flowers
minute, racemose, green. Sepals and very small petals spreading. Lip
superior, minute, entire, concave. Anther hinged on to the top of the
minute column, persistent; pollen-masses 4, waxy, attached to one gland.
Stigma depressed; rostellum minute.—Distr. Europe (Arctic) N. of
the Alps, N. Asia.—Etym. μαλακός, in allusion to its softness.

M. paludo'sa, Sw.; leaves obovate obtuse. Bog Orchis.

Sphagnum swamps and bogs, from Devon and Kent to Sutherland, rare,
and easily overlooked; ascends to 1,500 ft. in N. England; local in
Ireland; fl. July–Sept.—Stem 1–4 in., swollen and sheathed with white
scales at the base, forming a new plant at the side of the old, angled above.
Leaves few, fringed with cellular bulbils that develop new plants. Raceme
elongate, many-fl.; bracts minute; pedicel twisted. Flowers ½ in., yellow-
green; sepals ovate; petals linear-oblong, recurved; lip about equalling
the petals, erect, acute, embracing the column at its base.

2. Liparis, Rich.

Habit of Malaxis, but usually 2-leaved. Sepals and petals spreading,
linear. Lip inferior or superior, broader than the sepals, entire. Anther
terminal on the slender column, deciduous; pollen-masses 4, waxy, glands
evanescent. Stigma small, depressed; rostellum minute.—Distr. Temp. and trop. regions; species 100.—Etym. ἄπαρος, from its greasy
texture.

L. Loesel'tii, Rich.; leaves elliptic-lanceolate acute keeled petioled, lip

Spongy bogs, Norfolk, Suffolk, Hunts, Cambridge; fl. July.—Stem 4–8 in.,
swollen and sheathed with white scales at the base, 3-gonous and leafless
above. Leaves 1–3 in. Flowers few, ½ in., ascending, pale yellow-green;
bracts mostly small.—Distr. Europe N. of the Alps, Italy, Turkey.


C. inna'ta, Br. ; sepals linear-lanceolate, lip oblong.

Boggy or sandy woods and copes in E. Scotland, from Ross to Berwick, very rare; fl. July-Aug.—Stem 6-10 in., slender; sheaths lax, red-brown. Raceme 4-8-fld., pedicels very short; bracts minute. Flowers horizontal; perianth ½ in.; sepals ovate-lanceolate, olive-green, lateral deflexed, and petals narrower; lip whitish with small purple tubercles.—Distrib. Arctic, N. and Mid. Europe, N. Asia, N. America.

4. NEOT'TIA, L. Birds'-nest Orchis.

Leafless brown saprophytes, stem with sheathing scales. Flowers racemed. Sepals and petals incurved. Lip decurved, base saccate, apex with two straight or spreading lobes. Anther hinged on to the back of the slender free column, 2-celled; pollen-masses 2, powdery, glands connate. Stigma prominent; rostellum tongue-shaped.—Distrib. N. temp. Europe and Asia; species 3.—Etym. νεωττία, a bird's nest, in allusion to the curious roots.

N. Ni'dus-avis, L. ; glabrous, lobes of lip spreading.


5. LIST'ERA, Br.

Root of fleshy fibres. Leaves 2, subopposite. Flowers racemmed, green. Sepals and petals spreading. Lip deflexed, entire, lateral lobes 0 or minute; spur 0. Anther hinged on to the back of the column, 2-celled; pollen-masses 2, powdery, glands connate. Stigma prominent; rostellum tongue-shaped.—Distrib. N. temp. and cold regions; species 10.—Etym. Dr. Martin Lister, a British naturalist.

1. L. ov'a, Br. ; stem tall terete pubescent above, leaves broadly elliptic, lip 2-fid without lateral lobes. Tway-blade.

Woods and pastures, N. to Sutherland; ascends to near 1,900 ft. in N. England; Ireland; Channel Islands; fl. May-July.—Stem 1-2 ft., solitary, stout. Leaves 3-8 in., ribbed. Raceme elongate; bracts minute. Flowers ½ in.; sepals deep green, ovate, subacute; petals yellow-green; lip the same, base slightly saccate, apiculate between the terminal lobes. Rostellum
emitting when touched a viscid fluid that attaches the pollen to foreign bodies.—DISTRIB. Europe (Arctic), Siberia.


Mountain woods and moors, especially under heather, from Hants and Devon to Shetland; ascends to 2,700 ft. in the Highlands; rare in Ireland; fl. July–Sept.—*Stem 4–8 in., brownish-green. Leaves ½–1 in., sessile, membranous, acute. Raceme lax, few-fld.; bracts minute. Flowers ⅝ in.; sepals and petals olive-brown, obtuse; lip dirty yellow-green, terminal lobes linear.—DISTRIB. Arctic and Alpine Europe, N. Asia, N. America.


G. *repens*, Br.; leaves ovate acute, nerves reticulate.

*Fir* woods in E. Scotland, from Cumberland, Berwick, and Ayr to Ross, rare; fl. July–Aug.—*Rootstock* slender, matted, widely creeping. *Stem* 4–8 in., slender, and spike glandular-pubescent. *Leaves* ½–1 in., acute, dark green, pubescent beneath. *Spike* slender; bracts subulate-lanceolate, longer than the ovary. *Flowers* cream-white; perianth ⅝ in.—DISTRIB. Mid and N. Europe (Arctic), Siberia, Himalaya, N. America.


*Root* of tubers or stout fibres. *Stem* leafy. *Spike* of small flowers in 1–3 spirally-twisted rows. *Sepals* and *petals* similar, suberect; sepals gibbous at the base; upper adnate to the petals, forming a tube round the lip. *Lip* embracing and adnate to the base of the column, tip entire, disk 2-tubercled. *Anther* hinged on to the back of the column, 2-celled; pollen masses 4, powdery, sessile on one linear gland. *Stigma* discoid; rostellum beaked, finally 2-fid.—DISTRIB. Trop. and temp. regions; species 80.—ETYM. σπιρα and ἀνθός, from the twisted inflorescence.


Dry pastures from Westmoreland and York southd.; S. and Mid. Ireland; Channel Islands; fl. Aug.–Sept.—*Stem* 4–8 in., slender, upper part and spike pubescent. *Leaves* 1 in., in lateral rosettes, ovate, acute, appearing after the flowers. *Flowers* ½ in., sheathed by the cuculate cuspidate bracts, fragrant, white; lip channelled at the base, tip exserted crenate.—DISTRIB. From Denmark southd., N. Africa.
2. S. æstivalis, Rich.; tubers several cylindric, radical leaves on the
flowering stem linear, spike slender many-fl., flowers in 1 series.

Bogs; Wyre Forest, Worcester, and New Forest, Hants; Channel Islands;
Spike slightly pubescent. Flowers and bracts as in S. autumnalis, but
rather larger.—DISTRIB. W. Europe from Belgium southd., N. Africa.

3. S. Romanzovia'na, Cham.; tubers several cylindric, radical leaves
on the flowering stem narrow obovate-lanceolate, spike stout, flowers in
Meadows, Bantry Bay, Co. Cork; fl. Aug.–Sept.—Stem 6–10 in., stout, gla-
brous, leafy throughout. Leaves, lowest 3–6 in. Spike 2–3 in., glandular-
pubescent; bracts sheathing the base of the ovary, subulate-lanceolate.
Flowers white, much larger and broader than in the preceding species; lip
tongue-shaped, contracted below the crenate recurved tip, tubercles at the
base smooth and shining.—DISTRIB. Kamtschatka.—A. Gray correctly
refers S. gemmip'ara to Romanzovia'na.

8. EPIPO'GUM, Gmelin.

Sepals and petals rather spreading. Lip superior, ovate, 3-lobed, disk
with rows of glands; spur short, stout. Anther terminal, deciduous;
pollen-masses 2, in cavities of the cylindric column, stalked, glands
conname. Stigma prominent, horseshoe like; rostellum 0. Ovary not
twisted.—DISTRIB. Europe N. of the Alps, N. Italy, N. Asia, Himalaya;
species 2.—ETYM. ἐπιπόγωμον, from the lip being uppermost.

E. Gmeli'ni, Rich.; flowers pale yellow. E. aphyl' lum, Sw.
Amongst decayed leaves, Herefordshire, most rare; fl. Aug.—Stem 4–8 in., tumid
above the base, pale yellow-brown, with 1 or 2 appressed sheaths. Bracts
as long as the pedicels. Flowers 2–6, shortly pedicelled, 1 in.; ovary broad,
short; sepals and petals narrow-lanceolate, subequal, margins involute; lip
recurved, lateral lobes small, middle whitish with red glands; spur obtuse.

9. EPIPACTIS, Rich. HELLEBORINE.

Rootstock creeping. Stem leafy. Flowers racemed; ovary straight;
pedicel twisted. Sepals and petals conniving or spreading. Lip much
contracted in the middle, basal lobe concave, terminal entire with 2 basal
tubercles. Anther sessile, hinged on the top of the column; pollen-
masses 2, powdery, glands connate. Stigma prominent; rostellum short,
erect. Capsule pendulous.—DISTRIB. Europe, N. Asia, Himalaya; species
about 8.—ETYM. The classical name for this or another plant.

1. E. latifo'lia, Sw.; leaves orbicular ovate-lanceolate or oblong, bracts
mostly exceeding the flowers, basal lobe of lip with rounded margins,
terminal broadly ovate, ovary broadly pyriform. E. Hel'leborine, Crantz.
Woods, from Ross southd.; Ireland; fl. July–Aug.—Stem 1–3 ft., pubescent
above. Leaves variable, ribbed. Raceme many-fl., bracts green. Flowers

cc 2
subsecund, $\frac{1}{2}-\frac{3}{4}$ in. diam., green, variously marked with yellow white or purple; sepal broadly ovate; petals ovate-lanceolate; lip variable in form and colour, as long as the sepals or shorter, terminal lobe with thickened ridges on the disk.—Distr. Europe (Arctic), N. Africa, Siberia, Himalaya.—I am indebted to Mr. Baker for the diagnoses of the following subspecies, which coincide with Syme’s, and appear to embrace the prevalent forms; they do not however precisely accord with those of other countries, nor do materials from different parts of England give quite the same results.

Sub-sp. latifolia proper; stems 2-3 ft. not tufted, lower leaves 4-5 by 2-3 in., sepals $\frac{1}{4}-\frac{1}{3}$ in. ovate-oblong, tip of lip broader than long obscurely pointed. E. viridiﬂora, Hoffm.; E. Helleborine, var. varians, Crantz.—Common. (Also found in one spot in E. U. States.)

Sub-sp. E. purpurata, Sm.; stems 2-3 ft. often tufted, lower leaves 3-4 by 1$\frac{1}{2}-2$ in., sepals oblong-lanceolate $\frac{1}{8}$-in. more pointed, tip of lip as broad as long subdeltoid. Flowers usually tinted violet-purple, except var. E. media, Fries, which is also less robust. E. violacea, Bor.—S. of England rare.

Sub-sp. E. atro-rubens, Hoffm.; dwarfer, lower leaves 1$\frac{1}{2}-2$ by 1 in. ovate acute, tip of lip broader than long rounded obscurely cuspidate. Flowers a month earlier, reddish brown. E. ovalis, Bab.; E. rubiginosa, Crantz.—Limestone cliffs, Orme’s Head, Yorkshire (ascends to 1,200 ft.), Sutherland, &c.

2 E. palustris, Sw.; leaves lanceolate, bracts mostly short, basal lobe of lip angular terminal obtuse crenate, ovary narrowly pyriform.

Marshy places, from Fife and Perth southd., local; rare in Ireland; Channel Islands; fl. July.—Stem 8-18 in., slender, wiry, pubescent above. Leaves acute, upper acuminate. Flowers few, $\frac{1}{2}-\frac{2}{3}$ in. broad; sepal and petals ovate, subacute, green striped with purple; lip white, streaked with red, terminal lobe tubercled towards the base.—Distr. Europe, Siberia.


Woods and copses chiefly in chalky districts, from Cumberland to Somerset and Kent, rare; fl. May—June.—Stems tufted, 1-2 ft. Leaves 3-6 in., upper narrower. Flowers $\frac{3}{4}$ in. distant, suberect, cream-white; sepal and petals ovate-oblong, obtuse; terminal lobe of lip orbicular, erect, yellow.—Distr. From Denmark southd.

2. C. ensifolia, Rich.; leaves ovate or lanceolate, bracts of upper flowers much smaller than the almost glabrous ovaries, flowers white.
Woods and copses from Mull and Perth to Dorset and Sussex, local; rare in Ireland; fl. May–June.—Stems 1–2 ft., subsolitary, slender. Upper bracts minute. Leaves usually longer than in C. grandiflora, flowers whiter and narrower, sepals more acute.—Distrib. Europe, W. Asia.


Woods and copses on limestone, Gloster and Somerset, very rare; fl. June–July.—Stem 6–18 in., slender. Flowers few or many; sepals and petals acuminate; lip white, terminal lobe ovate-lanceolate. Column slender.—Distrib. From Gothland southd., W. Siberia.

11. ORCHIS, L.

Tubers globose ovoid or palmate. Leaves chiefly radical, sheathing. Flowers spiked. Sepals and petals ascending, connivent or the lateral sepals spreading. Lip spurred, decurved or deflexed, spur not honeyed. Anther confluent with the column, cells diverging at the base; pollen-masses decurving after removal, glands in one 2-lobed pouch; rostellum projecting between the lobes of the pouch.—Distrib. Europe, N. and W. Asia, Himalaya, rare in N. America; species about 80.—Etym. The old Greek name.

Section 1. Or'chis proper. Lobes of lip not spirally coiled. Pollen-glands not connate.

* Lateral sepals spreading or reflexed.

1. O. mas'cula, L.; tubers ovoid, leaves usually spotted, spike lax, bracts 1-nerved coloured, lip 3-lobed, spur longer than the ovary. Purple Orchis.

Copes and pastures, N. to Shetland; ascends to 1,500 ft. in the Lake district; Ireland; Channel Islands; fl. April–June.—Stem 6–18 in. Leaves narrow-oblong, obtuse, spots purple-black. Bracts equalling the ovary. Flower red-purple, rarely white; sepals ⅓ in., acute or obtuse; lip as broad as long, margin recurved, spotted with purple, mid-lobe longest crenate, tip notched; spur stout, obtuse, variable in direction.—Distrib. Europe, N. Africa, W. Siberia.—Yields salep.

2. O. laxiflo'ra, Lamk.; tubers globose, leaves lanceolate, spike lax, bracts 3–5-nerved coloured, lip 2–3-lobed, spur ⅓ as long as the ovary.

Wet meadows, Channel Islands; ballast heaps, Hartlepool; fl. May–June.—Stem 1–3 ft., grooved. Leaves cauline and radical, acuminate, not spotted. Bracts as long as the slender ovary. Flowers 1 in. from dorsal sepal to tip of lip, bright red-purple; sepals and petals obtuse; lip as broad as long, sides reflexed, spotted, lateral lobes very large, crenulate, mid-lobes shorter or 0; spur stout, obtuse, variable in direction.—Distrib. From Belgium southd.

3. O. latifo'lia, L.; tubers palmate, leaves usually spotted, spike dense, bracts 3-nerved green, lip obscurely 3-lobed, spur usually shorter than the ovary. O. palma'ta, Syme. Marsh Orchis.
Moist meadows, &c., N. to Shetland; ascends to near 1,600 ft. in Northumbd.; Ireland; Channel Islands; fl. May–July.—Stem 1–3 ft., usually tubular, leafy upwards. Leaves oblong or lanceolate. Bracts mostly exceeding the flowers. Flowers ¾ in. from dorsal sepal to tip of lip, dull purple; sepals and petals obtuse or acute; lip spotted with purple, margins recurved, mid-lobe narrowest; spur nearly straight or decurved.—DISTRIB. Europe, N. Africa? N. Asia, Himalaya.


4. O. macula'ta, L.; tubers palmate, leaves usually spotted, spike oblong-pyramidal dense, bracts 3-nerved green, lip deeply 3-lobed, spur equaling the ovary or shorter. Spotted Orchis.

Moist places, N. to Shetland; ascends to 3,000 ft. in the Highlands; Ireland; Channel Islands; fl. May–July.—Stem 6–18 in., slender, leafy upwards. Leaves narrow, oblong-lanceolate, acute or obtuse. Bracts subulate, about equaling the ovary. Flowers ½ in. from the dorsal sepal to the tip of the lip, very pale purple or white, spotted, rarely white; lip as broad as long, margins recurved, mid-lobe narrower and about as long as the lateral, which are toothed; spur straight.—DISTRIB. Europe (Arctic) (excl. Greece), N. and W. Asia.

** Lateral sepals arching and forming a hood with the dorsal and the petals.


Meadows, &c., from Northumbd. southd.; Ireland; fl. May–June.—Stem 6–12 in. Leaves rather small and narrow, unspotted. Bracts about equaling the ovary. Flowers ¾ in. from the dorsal sepal to tip of lip, dingy purple; sepals obtuse, veins green; lip spotted, lateral lobes broad crenate, middle about as long; spur nearly straight, obtuse.—DISTRIB. From Gothland southd., N. and W. Asia.

6. O. ustula'ta, L.; short, tubers ovoid, spike dense, bracts 1-nerved green, sepals and petals very dark white-spotted, lip 3-lobed, spur ¼ as long as the ovary. Dark-winged or Dwarf Orchis.

Dry pastures, from Northumbd. to Devon and Kent, local; fl. May–June.—Stem 3–10 in. Leaves narrow-oblong, acute, unspotted. Bracts variable, scarious. Flowers ¼ in. from the dorsal sepal to tip of lip, eventually white; sepals and petals dark-purple and green; lip with raised purple spots, lateral and segments of 2-fid mid-lobe nearly equal; spur decurved, obtuse.—DISTRIB. From Gothland southd. (excl. Greece), W. Siberia.

7. O. purpu'rea, Huds.; tall, stout, tubers ovoid, spike dense, bracts 1-nerved, sepals obtuse green and purple, lip 3-lobed, lateral lobes narrow, mid-lobe obcordate crenate, segments broad flat crenulate, spur ½ as long as the ovary. O. milita'ris, Sm.; O. fus'ca, Jacq.
Downs and copses in chalk soils, Kent and Sussex; fl. May.—Stem 1-3 ft., stout. Leaves oblong, 3-5 in., obtuse. Flowers usually large, many-fld. Flowers ¾ in. from the dorsal sepal to tip of lip; sepals and petals hardly acute, green and purple outside, paler inside, spotted; lip pale rosy, spotted with purple, with a notch in the sinus of the mid-lobe; spur decurved.—Distr. From Denmark southd. (excl. Greece).

8. O. militaris, L.; tubers ovoid, spike oblong dense, bracts 1-nerved, sepals acuminate and petals pale purple or white, lip 3-lobed, lateral lobes narrow, middle 2-fid with narrow upcurved segments and a tooth in the sinus, spur ¼ as long as the ovary.

Woods and chalk downs, Oxford, Berks, Herts, Bucks, Kent; fl. May–June.—Stem 1-1½ ft. Leaves large, oblong, obtuse, concave, unspotted. Bracts very short. Flowers about 1 in. from dorsal sepal to tip of lip, bright or pale purple; lip pale, dotted with raised rough points, lateral lobes linear, segments of mid-lobe rather broader; spur decurved, obtuse.—Distr. From Gothland southd. (excl. Greece), N. Africa (?), N. Asia. O. militaris proper; lateral lobes of pale purple lip narrow veined, mid-lobe deeply 2-fld, segments broader than the lateral lobes.

Sub-sp. O. Simia, Lamk.; more slender, lobes of crimson lip and segments of the mid-lobe very narrow. O. tephrosanthes, Vill.


9. O. pyramidalis, L.; tubers globose, leaves acuminate, spike pyramidal, bracts 1-3-nerved coloured, lateral sepals spreading, lip 3-lobed 2-tubercled at the base, spur longer than the ovary.

Pastures, &c., from Wigton and Berwick southd.; Mid. Ireland; fl. June–Aug.—Stem 6-24 in., slender. Leaves chiefly radical, lanceolate. Spike pyramidal, then oblong. Bracts as long as the ovary. Flowers rosy, rarely white; sepals and petals obtuse; lip broader than long, lobes subentire, variable in shape and relative size.—Distr. From the Baltic southd., N. Africa.—Scent of flowers peculiar.


Copse in E. Suffolk and Kent, extremely rare; fl. July–Aug.—Stem 1-5 ft. Leaves chiefly radical, oblong, obtuse. Spike 6-17 in. Bracts 1-2 in., much exceeding the flowers. Flowers large; sepals and petals forming a green hood ¾ in. long; lip 1½ in., white, purple-spotted at the base, lateral lobes slender, mid-lobe about 1 in. by ½ broad, green.—Distr. From Belgium southd., N. Africa.—Odour detestable, hircine.

Tubers ovoid. Sepals and petals forming a hood. Lip elongate, 4-lobed; spur 0. Anther confluent with the column; cells parallel; pollen-masses 2, decuring after removal; glands connate in one pouch. Stigma depressed; rostellum obsolete.—Distrib. Europe, N. Asia, Himalaya; species 11.—Etym.  κέρας, privative, and ἑριξα, spur.

A. anthropoph'ora, Br.; perianth green, lobes of lip linear.

Pastures and copses in chalky soil in E. England, from York to Kent and Sussex, scarce; fl. June–July.—Stem 8–16 in. Leaves oblong-lanceolate, lower obtuse, upper acute. Spike lax-flód, narrow; bracts small. Flowers 3/4-1 in.; sepals and petals often edged with red; lip perpendicular, yellow, edges red, narrow, with 2 lateral and 2 terminal lobes, all similar and linear.—Distrib. From Belgium southd., N. Africa.

13. O'phrys, L.

Tubers ovoid. Perianth spreading. Petals small. Lip perpendicular, usually convex, velvety; spur 0. Anther capping the column, arched forwards, often beaked, cells parallel; pollen-masses 2, glands in separate pouches. Stigma a depressed disk; rostellum 0. Ovary not twisted.—Distrib. Europe, N. Africa, W. Asia; species about 30.—Etym. ὀψρη's, an eyebrow, from the markings of the lip.

1. O. apif'era, Huds.; sepal pink or white inside, lip broad convex 3-lobed with a terminal appendage, anther-beak hooked. Bee Orchis.

Copses and fields in chalk and limestone districts, from Durham and Lancaster southd.; ascends to 1,000 ft. in W. England; S. and Mid. Ireland; Channel Islands; fl. June–July.—Stem 6-18 in. Leaves short, oblong. Spike 3-6-flód.; bracts large, leafy. Flowers 1-1½ in.; sepals ovate; petals small, downy, linear-oblong, obtuse; lip brown-purple, lateral lobes tubercled at the base, disk spotted with orange yellow. Pollen-gland persistent on the column, head falling over on the stigma, and fertilizing the ovules.—Distrib. From Belgium southd., N. Africa.

O. apif'era proper; petals linear, lip equalling the sepals deeply 3-lobed, appendage recurved, or acute and triangular in O. Trol'lii, Heg.

Sub-sp. O. arachnit'es, Hoffm.; petals subteltoid-ovate, lip longer than the sepals, appendage straight or incurved.—Kent, Surrey.—Pollen said to be stiff and not falling over the stigma.

2. O. aranif'era, Huds.; sepals yellow-green inside, petals oblong, lip broad convex without an appendage, anther-beak not hooked. Spider Orchis.

Copses and downs in chalk and limestone, rare, from Northampton and Suffolk to Dorset andKent; fl. April–May.—Habit of O. apif'era. Lip brown with various glabrous markings.—Distrib. From France southd.

O. aranif'era proper; petals almost glabrous, lip usually lobed at the margin.—Var. O. fucif'era, Smith; petals downy within, lip rarely lobed, its tubercles less prominent.

Copses and downs on chalk and limestone, from Durham and Westmoreland to Kent and Somerset; Mid. Ireland, very rare; fl. May–July.—Stem slender, 10–18 in. Leaves few, linear-oblong. Flowers distant, 3/4 in.; petals and lip bright red-brown; lip with a blue patch, sometimes edged with yellow, lateral lobes reflexed, terminal 2-fid.—Distrib. From Norway southd. (excl. Greece).


Tubers ovoid. Leaves 2 or few. Perianth-segments incurved. Lip 3-lobed; spur 0. Column with short lateral arms. Anther confluent with the column; cells diverging below; pollen-masses 2, subsessile, glands large exposed. Stigma discoid; rostellum 0.—Distrib. Europe, temp. Asia; species 4.—Etym. &pulv, the foot of a bed-post, from the shape of the tubers.

H. Monorchis, Br.; flowers minute subsecund green.

Chalk downs, from Norfolk, Cambridge, and Ghestor to Somerset and Kent; fl. June–July.—Tubers at the end of fleshy fibres. Stem 4–10 in., slender. Leaves, radical 2, narrow-oblong, acute; cauline solitary. Spike slender, rather lax; bracts green, as long as the ovary. Flowers 3/4 in., not honeyed, musky at night; sepals broad; petals narrower, longer, obscurely lobed at the side; lip narrow, 3-lobed, base saccate, mid-lobe entire narrow.—Distrib. Europe (Arctic) (excl. Spain, Greece), Siberia, Himalaya.

15. HABENARIA, Br.

Habit of Orchis. Tubers 2, ovoid, entire or lobed, or of several fleshy fibres. Lip spurred, decurved or deflexed. Anther confluent with the column; cells parallel or diverging; pollen-masses decuring after removal; glands exposed (or partially concealed in H. viridis and intacta); rostellum produced or not; stigma 2-lobed or depressed.—Distrib. N. temp. and trop. regions; species 400.—Etym. doubtful.

The minute modifications of the rostellum, &c., by which the genera here united by Bentham (and most of them also by A. Gray) were characterized, do not hold good for numerous exotic species of the genus.


Dry pastures, N. to Shetland; ascends to 2,000 ft. in the Highlands; Ireland; fl. June–Aug.—Stem 6–18 in. Leaves oblong-lanceolate, keeled, acute. Spike dense or lax, narrow. Bracts as long as the ovary, green, 3-nerved.
Flowers bright rose-red or purple, broader than long, $\frac{1}{3}$ in. diam.; sepals and petals obtuse; lip broad, lobes 3, subequal, rounded; spur flexuous.—Distr. Europe (Arctic), N. and W. Asia.—Very fragrant.


Limestone pastures, Mayo and Galway; fl. June.—Habit of Gymnaden'nia al'bida, but smaller, 4–10 in. Spike dense-fld., sometimes twisted; bracts shorter than the ovary, 1-nerved. Flowers $\frac{1}{4}$ in., pink or purplish; sepals darker; petals acute; lip projecting, lateral lobes short linear, middle entire or lobed.—Distr. France, S. Europe, N. Africa, Asia Minor.—This little plant has been referred to 7 genera.


Hilly pastures, Sussex, Wales, and from York and Lancaster to Shetland; ascends to near 1,900 ft. in the Highlands; W. and N. Ireland; fl. June–Aug.—Stem 6–12 in. Leaves small, obtuse, upper acute. Spike narrow, dense; bracts green, equaling the ovary. Flowers $\frac{1}{4}$ in., subsecund, sweet-scented; ovary short; sepals and petals obtuse; lip small, projecting; lobes triangular.—Distr. Europe (excl. Greece, Turkey), W. Siberia, Greenland.—This plant has been placed under 6 genera.


Hilly meadows, Shetland to Devon and Kent; ascends to 2,500 ft. in the Highlands; Ireland; fl. June–Aug.—Tubers ovoid, often lobed. Stem 3–12 in. Leaves narrow-oblong, obtuse, smaller upwards. Spike lax; bracts green, exceeding the ovaries. Flowers $\frac{1}{2}$–$\frac{1}{2}$ in.; hood hemispheric, petals and sepals striped with dark red; lip paler, browner. Anther-cells diverging, rostellum 0.—Distr. Europe (Arctic) (excl. Greece), N. Asia, N. America.

5. **H. bifol'ia, Br.**; leaves 2, flowers whitish, lip linear-oblong entire, spur twice as long as the ovary. *Butterfly Orchis.*

Wet meadows, woods, and heaths, N. to Ross; ascends to 1,500 ft. in N. England; Ireland; Channel Islands; fl. June–Aug.—Tubers 2, ovoid. **Stem** 6–18 in. **Leaves** rarely 3, lower 3–6 in., ovate or oblong, obtuse, narrowed at the base; upper small, lanceolate. **Spike** 4–6 in., lax-fld.; bracts equalling or exceeding the ovary, green. **Flowers** 1 in. from upper sepal to tip of lip, tinged with green or yellow; sepals subacute, dorsal broad, lateral large; petals small; lip obtuse.—**Distrib.** Europe, N. Asia (Arctic).—Very fragrant. The following sub-species are, according to Darwin, distinct, and require different species of moths to fertilize them. They vary in the position and distances of their anther-cells, but intermediates occur.


Sub-sp. **H. chloran'tha, Bab.**; flowers usually larger, lateral sepals broader, spur stout decurved more clavate, anther-cells more distant diverging, caudicle longer attached by a short drum-like pedicel to the orbicular gland; fl. July–Aug.

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16. **Cypripe'dium, L.** Lady's Slipper.

**Rootstock** creeping. **Stem** leafy at the base or upwards. **Sepals** and **petals** spreading. **Lip** large, inflated. **Column** curved over and nearly closing the small orifice of the lip, bearing a terminal dilated lobe (deformed stamen), on each side of the base of which is a short antheriferous arm, and below it a discoid pedicelled stigma. **Anthers** 2, partially 2-celled; pollen viscid, granular; rostellum 0. **Ovary** straight.—**Distrib.** Trop. and temp. regions; species 40.—**Etym.** Κότρις and πάδιον, Venus' Slipper.

**C. Cal'ceolus, L.**; bracts foliaceous, lip obovoid.

Woods in limestone districts, Durham and York, very rare; fl. May.—Pubescent. **Stem** 6–18 in. **Leaves** oblong, acuminate, ribbed. **Flowers** 1–2, odorous; bracts foliaceous; sepals red-brown, upper 1–1½ in., erect, ovate-lanceolate, acuminate; lateral narrower, usually connate, placed under the lip; petals 1½ in., linear; lip as long, pale yellow, obovoid, with a rounded upturned end.—**Distrib.** Europe (Arctic) (excl. Turkey), N. Asia.

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**Order LXXVII. Iride'æ.**

Perennial herbs; rootstock tuberous, bulbous, or creeping, or a corm. **Leaves** often equitant and ensiform. **Flowers** regular or not, 2-bracteate. **Perianth** superior, petaloid, of 6 imbricate segments in 2 series, often twisted and persistent after flowering. **Stamens** 3, epigynous or inserted on the outer perianth-segments; anthers usually narrow, extrorse.
Ovary 3-celled; style simple, stigmas 3 often dilated, simple or divided; ovules very many, in the inner angles of the cells, anatropous. Capsule 3-gonous, 3-celled, loculicidally 3-valved. Seeds many, testa coriaceous or thin, albumen horny or fleshy; embryo terete, short, cylindric.—Distrib. Chiefly extra-tropical; genera about 57; species 700.—Affinities. With Amaryllideæ and Orchideæ.—Properties. Purgative and diuretic.

Segments of perianth nearly equal.
- Perianth-tube long .................................................................2* Crocus.

Segments of perianth unequal.
- Perianth regular .................................................................3. Iris.
- Perianth irregular .................................................................4. Gladiolus.

1. Romulea, Maratti.


R. Colum'nae, Seb. and Maur.; leaves wiry. Trichone'ma Colum'nae, Reichb. ; T. Bulboco'dium, Sm.


2. Sisyrinch'ium, L. Blue-eyed Grass.

Root of rigid fibres. Leaves radical, linear, equitant. Scapes usually 2-edged. Flowers umbellate. Perianth regular, tube very short; segments equal, spreading or suberect. Stamens on the throat of the perianth, free or connate at the base; anthers basifixed. Ovary short, 3-gonous; style short, stigmas 3 filiform involute. Capsule subglobose, coriaceous. Seeds subglobose or angled, testa hard.—Distrib. N. and S. America; species 56.—Etym. obscure.

S. angustifo'lium, Miller; bracts suberect lanceolate. S. Bermu'dia'na, var. a, L.

—DISTRIB. Arctic and temp. N. America.—Mr. Wynn assures me that this plant is truly wild in Kerry. It differs entirely from the Bermudian plant.

2*. CROCUS, L.

Corm with sheathing fibrous coats. Stem 0. Leaves radical, surrounded by scarious sheaths, narrow-linear, channelled, white beneath, margins recurved. Flowers solitary or fascicled, subsessile, honeyed. Perianth large, tube very long; segments equal, narrow-oblong, concave. Stamens on the bases of the outer segments, filaments free; anthers basifixed. Ovary subterranean, hidden amongst the leaf-bases, ovate; style filiform, stigmas 3 cuneate dilated or laciniate. Capsule on a long slender pedicel, fusiform. Seeds globose, testa thick.—DISTRIB. Europe, N. Africa, N. and W. Asia; species 70.—ETYM. The old Greek name.

C. NUDIFLORUS, Sm.; flowers solitary autumnal, stigmas multifid. C. speciosus, Hook.


3. IRIS, L.

Rootstock tuberous or creeping. Leaves chiefly radical, equitant, ensiform. Scape compressed; spathes terminal with scarious borders. Perianth-tube short, rarely long; sepals large, stipitate, reflexed, stipes channelled; petals smaller, suberect, stipitate, margins of stipes involute. Stamens inserted on the base of the sepals, filaments free; anthers basifixed. Ovary 3-gonous; style stout, stigmas 3 very broad petaloid arching over the stamens 2-fid and with a transverse lamella, stigmatic surface a point below the lamella. Capsule coriaceous, 3-gonous, 3-ribbed. Seeds many, flat or globose, testa coriaceous hard or thick and fleshy.—DISTRIB. N. temp. regions; species 100.—ETYM. The Greek name, from the hues of the flower.

1. Pseud-a'corus, L.; flowers yellow, petals ⅔ shorter than the sepals. Yellow Flag.

River-banks, ditches, &c., N. to Shetland; Ireland; Channel Islands; fl. May—Aug.—Rootstock creeping, stout. Leaves 2—4 ft., ½—1 in. broad. Scape 2—4 ft., leafy, often branched at the top; pedicel about as long as the ovary;
IRIDEÆ.

Order LXXVIII. AMARYLLIDEÆ.

Rootstock bulbous. Leaves radical. Scape naked. Flowers bracteate. Perianth superior, regular or irregular, coloured, of 6 lobes or segments in 2 series, with sometimes a crown at the mouth of the tube. Stamens 6,
on the perianth-tube or bases of the segments (rarely epigynous), filaments free or connate; anthers versatile, linear or oblong, bursting inwards or by terminal pores. Ovary ovoid or globose, 3-celled; style filiform or columnar, stigmas 1 or 3; ovules many, in 2 series, in the inner angles of the cells, anatropous. Fruit usually capsular, rarely fleshy, 3-celled, loculicidally 3-valved, cells 1- or more-seeded. Seeds turgid or compressed, testa various, albumen fleshy; embryo straight, axile, terete.—DISTRIB. Temp. and trop.; genera about 64; species 650.—AFFINITIES. Close with Irideae and Liliaceae.—PROPERTIES. Emetic, narcotic, and poisonous. Agave yields textiles, and a fermentable liquor (pulque).

Mouth of perianth with a circular crown ........................................ 1. Narcissus.
Crown 0. Outer perianth-segments largest ................................. 2. Galanthus.
Crown 0. Perianth-segments equal ................................................. 3. Leucojum.

1. NARCISSUS, L.

Scape compressed. Leaves narrow, linear. Flowers solitary or umbellate, large, white or yellow, drooping or inclined; spathe membranous. Perianth tubular below; segments spreading, mouth surmounted by a circular crown. Stamens inserted in the tube, included within the crown, filaments free or adnate to the tube; anthers versatile. Ovary 3-gonous; style filiform, stigma obtuse. Capsule coriaceous. Seeds globose, testa smooth, rough when dry.—DISTRIB. Europe, N. and W. Asia; species about 20.—ETYM. mythological.

N. Pseudo-narcissus, L.; leaves nearly flat, flower solitary yellow campanulate, crown campanulate as long as the perianth-segments, margin crisped obscurely 6-lobed. Daffodil, Lent Lily.

Copses and pastures throughout England, local; naturalized in Scotland and Ireland; fl. March–April.—Bulb 1 in., outer scales membranous. Leaves glaucous, obtuse. Scape 6–10 in. Flower primrose-yellow, 2 in.; pedicel short. Perianth-lobes acute. Capsule turbinate.—DISTRIB. From Gothland southd. (excl. Greece, Turkey).—Of the following forms the first only is indigenous.

N. Pseudo-narcissus proper; leaves slightly glaucous, perianth-segments oblong-lanceolate sulphur-yellow, crown lemon-yellow obscurely 6-lobed.—VAR. N. lobula'ris, Haw. (N. Bromfield'ii, Syme); perianth and corona both lemon-yellow, corona distinctly 6-lobed. The Tenby Daffodil (N. camb'ricus, Haw.) scarcely differs.—VAR. N. maj'or, L.; more robust, perianth-segments broader and corona lemon-yellow, crown with 6 rounded lobes. The great Spanish Daffodil.

N. biflo'rus, Curt; leaves keeled, flowers 1–3 salver-shaped, crown short cone-like membranous.

Naturalized in sandy fields; fl. April–May.—Bulb 1–1½ in., outer scales membranous. Leaves very long, 10–18 in., hardly glaucous, obtuse. Scape as long, acutely 2-edged. Perianth 1½ in. diam., white or pale straw-coloured, pedicel slender; tube 1 in., slender; segments broadly ovate, obtuse; crown pale yellow.—DISTRIB. W. Europe.
2. GALANTHUS, L. SNOWDROP.

Leaves 2, linear. Scape compressed. Flowers solitary, pendulous, white; spathe membranous. Perianth campanulate; sepals spreading; petals small, erect, notched, with 2 green honeyed grooves. Stamens 6, epigynous; anthers pointed, connivent, slits 2 terminal. Ovary ovoid; style subulate, stigma simple. Capsule ovoid, herbaceous. Seeds few, subglobose, testa soft white.—Distrib. Europe; species 3.—Etym. γάλα, milk, and οός, flower.


3. LEUCOJUM, L. SNOW-FLAKE.

Characters of Galanthus, but leaves numerous; spathes 2, free or connate, 1–6 fld.; sepals and petals subequal; anthers obtuse, opening by slits; style clavate; testa crustaceous fleshy.—Distrib. Chiefly European; species 9.—Etym. λευξτός, white, and οός, a violet.


2. L. vernum, L.; leaves and flowers vernal, scape 1–2-fld. Copses, Dorset; (an alien or denizen, Wats.); fl. March–April.—Much smaller than L. aestivum; leaves subdistichous; scape less winged; spathe 2-fld at the tip; flowers about as large; ovary more globose; seeds caruncled.—Distrib. From Belgium southd. (excl. Greece, Russia).

Order LXXIX. DIOSCOREÆ.

Rootstock often tuberous. Stem twining to the left, leafy. Leaves alternate, veins reticulate. Flowers inconspicuous, 1-sexual, in axillary panicles or racemes. Perianth herbaceous, superior in the female flower; segments 6, in two series, regular, persistent. Stamens 6, inserted on the perianth-segments, free; anthers introrse. Ovary 3-celled; styles 3, short, stigma entire or lobed; ovules 2, collateral or superposed, anatropous. Fruit 3-angled, 3-celled, indehiscent or loculicidally 3-valved,
rarely a berry or 1-celled. Seeds winged, compressed or globose, albumen dense; embryo small.—Distrib. Chiefly trop.; genera 6; species about 100.—Affinities. With Smilaceæ.—Properties. The acrid yam tubers are nutritious when cultivated or boiled.

1. TAMUS, L. Black Bryony.


T. communis, L.; leaves ovate-cordate acuminate.

Copse and hedges from Cumberland southd.; Channel Islands; fl. May–June.—Rootstock ovoid, black, fleshy, subterranean. Stem many feet long, very slender, angular, branched. Leaves 2–3 in., long-petioled, obscurely laterally lobed, 5–7-nerved, tip setaceous; stipules reflexed. Flowers ½ in. diam.; males solitary or fascicled in slender racemes which are branched at the base; female racemes 1 in., shorter, recurved, few-fl.; bracts minute. Berry ½ in., oblong, red.—Distrib. From Belgium southd., N. Africa, W. Asia.

Order LXXX. Lilia'ceæ.

Root fibrous; rootstock bulbous or creeping. Stem rarely shrubby or arborescent. Flowers 2- rarely 1-sexual. Perianth herbaceous, petaloid, inferior; segments 6 in 2 series, rarely 4, 8, or 10, free or connate, imbricate (rarely valvate) in bud. Stamens 6 (3 in Ruscus) hypogynous or inserted on the perianth, filaments long or short; anthers oblong or linear. Ovary 3-celled; styles 1 or 3, rarely 0, stigma simple or 3-lobed; ovules 2 or more in the inner angle of each cell, anatropous. Fruit a 3- rarely 1–2-celled capsule or berry. Seeds 1 or more in each cell, albumen horny or fleshy; embryo small, terete, radicle next to or far from the hilum.—Distrib. All climates; genera 187; species about 2,500.—Affinities. With Junceæ.—Properties various.

Series A. Rootstock not bulbous. Anthers bursting inwards. Fruit a berry.


Series C. Rootstock bulbous. Anthers bursting inwards. Fruit a loculicidal capsule.

TRIBE V. ALLIEÆ. Leaves radical. Flowers umbellated or capitate, on a naked terminal scape; heads or umbels enclosed at first in a 2-leaved membranous involucre.................................7. Allium.

TRIBE VI. SCILLEÆ. Leaves radical. Flowers 1-bracteate, racemmed on a terminal naked scape.
Perianth globose; mouth constricted 6-cleft.............................8. Muscari.
Perianth of 6 blue or red segments ......................................9. Scilla.
Perianth of 6 white segments .............................................10. Ornithogalum.

TRIBE VII. TULIPEÆ. Leaves radical and cauline. Flowers few, solitary or loosely racemmed or whorled; perianth-segments 6, free.
Flowers few, large, nodding. Nectary 0 or obscure. Anthers versatile, 10*. Lilium.
Flowers large, subsolitary. Nectary 0. Anthers erect.............12. Tulipa.
Flowers few, small (white). Nectary transverse. Anthers erect...14. Lloydia.

Series D. Rootstock various. Anthers usually bursting laterally or outwards. (Melanthaceæ.)

TRIBE VIII. COLCHICEÆ. Rootstock a corm. Leaves radical. Scape very short, subterranean, 1-3-fld. Perianth with a very long slender tube .........................................................15. Colchicum.

Style 0; stigmas 3 short. Capsule septicidal .........................17. Tofieldia.

TRIBE X. MEDEOLEÆ. Rootstock stout, creeping; stem simple. Leaves radical or cauline and opposite, or whorled. Flowers terminal, solitary or umbelmed. Fruit a berry..............................................................18. Paris.

1. RUS'CUS, L. BUTCHER'S BROOM.

Evergreen, subdioecious shrubs. Rootstock stout, creeping. Leaves minute scales, bearing in the axils leaf-like branches ("cladodes"). Flowers minute, on the face or margin of the cladode. Perianth herbaceous, persistent; segments 6, spreading, inner smaller, all partially valvate in bud. Stamens 3, filaments connate in a short stout column;
anthers sessile, cells diverging below. Ovary enclosed in a fleshy cup (staminal) 3-celled; style short, stigma discoid; ovules few. Berry usually 1-celled. Seeds solitary globose, or 2 plano-convex, testa thin, adherent, albumen horny; embryo minute, lateral, radicle far from the hilum.—DISTRIB. Temp. Europe, W. Asia, N. Africa; species 2–3.—ETYM. obscure.

**R. aculeatus**, L.; flowers 1–2 subsessile on the ovate spinescent cladodes.


2. **ASPARAGUS**, L. Asparagus,

Rootstock stout, creeping. Stem slender, branched, terete or angled (sometimes spiny and climbing). Leaves minute scales, bearing in their axils fascicles of needle-like branches ("cladodes"). Flowers small, 1–2-sexual, pendulous, axillary, honeyed; pedicel jointed. Perianth campanulate, segments conuate at the base. Stamens on the base of the segments; anthers oblong. Ovary 3-gonous; styles combined, stigmas 3; cells 2- or several-ovuled. Berry globose. Seeds 3–6, testa black brittle; embryo dorsal, clavate, radicle far from the hilum.—DISTRIB. Temp. and trop. Asia, Africa; species 100.—ETYM. The old Greek name.

**A. officinalis**, L.; stems annual suberect terete flexuous, branches slender.

Coasts of Wales, Cornwall, and Dorset, rare; naturalized elsewhere; Tramore, Ireland; Channel Islands; fl. June–Aug.—Rootstock 1–2 ft., prostrate; young shoots scaly below, scales triangular. Cladodes 1–2 in. Flowers 1–2, axillary, 1-sexual, dirty white, or yellow with red veins, males the largest; pedicel as long, jointed at the middle. Berry 1/4 in. diam., red.—DISTRIB. From Sweden southd. (excl. Greece), N. Africa, Siberia; introd. in N. America.—Diuretic. Cultivated since the Roman period.

3. **POLYGONATUM**, Tournef.

Rootstock creeping. Stem leafy. Leaves alternate opposite or whorled. Flowers axillary, solitary or racemed, pendulous, white green or purplish, honeyed, homogamous, bracteate. Perianth tubular-campanulate, mouth 6-cleft, outer lobes subvalvate with replicate edges. Stamens on the middle of the tube, included. Ovary and fruit of Convallaria.—DISTRIB. Europe, N. Asia, Himalaya, N. America; species about 23.—ETYM. πολύς and γόννα, alluding to the many nodes (knees).

1. **P. verticillatum**, All.; stem angled, leaves whorled narrow-lanceolate, perianth constricted in the middle, filaments papillose.

2. P. multiflorum, All. ; stem terete, leaves alternate subbifarious or second oblong ½-amplexicaul, perianth constricted in the middle, filaments pubescent. Solomon’s Seal.


3. P. officinale, All. ; stem angled, leaves alternate oblong subbifarious ½-amplexicaul, perianth cylindric, filaments glabrous.


4. MAIANTHEMUM, Wigg.

Rootstock slender, creeping. Stem erect, leafy. Leaves alternate. Flowers white, terminal, racemose. Perianth of 4 free segments in 1 series, or 6 in 2 series, deciduous. Stamens 4 or 6, on the bases of the segments. Ovary 2–3-celled; style short, simple, stigma obscurely 2–3-lobed; cells 1–2-ovuled. Berry and seeds as in Convallaria.—DISTRIBUTION. Europe (Arctic) (excl. Turkey), N. Asia, N. America.—ETYMOLOGY. μαλος and ἄνθεμων, May-flowerer.

M. Convallaria, Roth ; M. bifoliolm, DC. ; Smilacina bifolia, Desf.


5. CONVALLARIA, L. LILY OF THE VALLEY.

Rootstock creeping. Stem 0. Leaves 2–3, sheathed at the base. Scape slender; flowers racemose, homogamous. Perianth shortly campanulate, mouth 6-cleft, lobes recurved. Stamens on the base of the perianth, included; anthers subsagittate. Ovary ovoid, terete; style simple, stigma 3-gonous; cells 4–8-ovuled. Berry globose. Seeds 2–3, subglobose, testa thin white adherent, albumen horny; embryo dorsal, radicle far
from the hilum.—Distrib. Europe (excl. Greece), N. Asia.—Etym. convallis, a valley.

**C. maja'lis, L.**; leaves ovate-lanceolate petiolated.

Woods, from Caithness to Kent and Devon, not common; ascends to 1,000 ft. in N. England; naturalized in Scotland and Ireland; fl. May–June.—Leaves 6–8 in.; petiole long, slender, sheathing. **Scape** 6–10 in., angular; bracts membranous; raceme 6–12-fld.; pedicels curved. **Flowers** $\frac{3}{4}$ in. diam., white or rose, odoriferous, drooping, subglobose. **Berry** red.

**6. Sime'this, Kunth.**

A slender herb. **Root** of fascicated fibres. **Leaves** radical, grassy. **Scape** panicled, bracteate. **Flowers** jointed on the pedicel. **Perianth** spreading, deciduous; segments 6, almost free. **Stamens** 6, on the base of the segments, filaments woolly below; anthers oblong. **Ovary** subglobose, 3-celled; style slender, stigma a point; ovules 2 in each cell, superposed. **Capsule** loculicidally 3-valved. **Seeds** 6, subglobose, arillate, testa black crustaceous shining; embryo long, radicle near the hilum.—Distrib. S.W. France, Spain, Italy, N. Africa.—Etym. Classical.

**S. bi'color, Kunth.** *S. planifo'lia*, Woods.

Fir woods, Dorset (extinct); Derrynane, Ireland; (an alien or denizen, Wats.); fl. June.—**Root-fibres** stout. **Leaves** 6–18 in., $\frac{1}{4}$ in. diam., linear, acuminate, recurved, surrounded at the base with torn fibrous brown sheaths, flat or concave. **Scape** as long, dichotomously branched; bracts slender; pedicels rigid, slender. **Flowers** $\frac{3}{4}$ in. diam., corymbose; segments oblong, obtuse, concave, purple on the back, white inside. **Capsule** obtusely angled $\frac{1}{4}$ in. diam.

**7. Al'lium, L.**

Fetid, pungent herbs. **Bulb** coated. **Leaves** radical. **Flowers** capitate or umbelbed; spathes 1–2, membranous. **Perianth-segments** 6, free, spreading or campanulate. **Stamens** 6, hypogynous or on the base of the segments, filaments free or connate below; anthers oblong. **Ovary** 3-gonous; style filiform, simple or 3-cleft, stigmas simple; ovules few in each cell. **Capsule** membranous, top depressed, 3-lobed, loculicidally 3-valved. **Seeds** 1–2 at the base of each cell, turgid or compressed, testa black; embryo curved, excentric, radicle next the hilum.—Distrib. N. temp. regions; species 250.—Etym. Latin for Garlic.

**Section 1. Por'rum.** **Leaves** sheathing the scape to the middle. **Perianth-segments** erect. **Three outer filaments** broader, tips 3-fid; lateral cusps subulate, about as long as the antheriferous.

* **Leaves** fistular.

1. **A. vinea'le, L.**; leaves flattened or grooved above, spathe solitary short with a long beak, head globose usually with bulbils. **Crow Garlic.**

2. A. sphaerocephalum, L.; leaves terete or flattened or grooved above, spathes 2 shortly beaked, head globose dense-fld.


** Leaves not fistular, glaucous.


3*. A. Ampeloprasum, L.; leaves distichous folded, edges scabrid, sheaths cylindric, spathe 1 with a compressed long beak, head often with bulbils, anthers exserted. Wild Leek.


A. Ampeloprasum proper (A. holmen'se, Mill.); head compact, bulbils 0. Steep holmes in the Severn. — Var. bulbiferum, Syme; head compact, bulbils few. Guernsey. — Var. A. Babinto'ni, Borrer (A. Haller'i, Bab.); flowers few, bulbils very many, pedicels sometimes proliferous. Dorset and Cornwall, ? wild; Roundstone and Great Aran Is., Ireland.

Section 2. Codonoprasum. Perianth-segments erect or spreading Filaments all simple or obscurely 3-fid.


A. olera'ceum proper; leaves narrow 1⁄2-terete subfistular grooved above. Devon, Somerset, Gloucester.—Var. A. complana'tum, Bor. (A. carina'tum, Sm. not L.); leaves broader linear almost solid nearly flat. Yorkshire and Northumbd.

A. carina'tum, L.; leaves linear channelled sheathing the cylindrical scape to the middle, head with bulbins, spathes 2, beaks long slender very unequal, stamens at length twice as long as the perianth.

Nottingham, Newark, Lincoln, Edinburgh, and Perth; naturalized; fl. Aug.—Very similar to A. olera'ceum, but at once distinguished by the long filaments. Leaves flat towards the tip, with 3–5 striae. Flowers bright rose-pink, proterandrous.—Distrib. Europe (excl. Spain, Greece, Turkey).


Hedgebanks and meadows, Cornwall, Guernsey; fl. April–June.—Bulb ovoid, rather small. Leaves 5–7 in., 1⁄4–1⁄3 in. broad, recurved or revolute. Scapes 10–18 in., rather stout, bending over in fruit. Flowers second, drooping or inclined; perianth 3⁄4 in. white, campanulate; segments linear-oblong; pedicels curved, tip clavate. Stamens short, free, included, filaments slender. Stigmas 3, distinct, filiform.—Distrib. S. France, Spain, Italy.


Woods, hedgebanks, &c., from Skye and Ross southd.; ascends to 1,200 ft. in Yorkshire; Ireland; fl. April–June.—Bulb narrow, compressed, on a short rootstock, outer coat fibrous. Leaves 4–8 in., vernal, acuminate; petiole 2–4 in. Scape 6–18 in. Umbel regular, flat-topped; spathes 1 in.; pedicels strict, 1½–2 in.; bulbins 0. Flowers honeyed, proterandrous, white; segments spreading, lanceolate, acute. Stamens shorter than the segments, filaments free slender; anthers dehiscing in succession, the inner first. Stigma minute. Capsule turbinate.—Distrib. Europe (excl. Greece), N. Asia.

8. MUSCA'RI, Tourn. Grape Hyacinth.

Perianth globose, mouth 6-fld. Stamens on the middle of the tube, included, filaments very short; anthers short. Ovary ovoid, deeply 3-
lobed; style short, stigma simple; cells few-ovuled. Capsule 3-quetrous, loculicidally 3-valved. Seeds 6 or fewer, as in Scilla.—Distrib. Europe, W. Asia; species about 40.—Etym. from the musky scent.

**M. racemosum**, Miller; leaves slender prostrate flexuous.


9. **SCIL'LA, L.** Squill.

Bulb coated. Leaves radical, linear. Flowers usually racemose, blue, rarely purple or white. Perianth deciduous; segments 6, spreading or conniving, free or nearly so; nectary 0. Stamens 6, on the base of the segments or above it, filaments flattened; anthers oblong. Ovary ovoid; style filiform, stigma minute; ovules 4 or more in each cell. Capsule 3-angled, loculicidally 3-valved. Seeds many, testa black, albumen fleshy; embryo terete, radicle next the hilum.—Distrib. Chiefly Europe and W. Asia; species about 80.—Etym. Classical.

**SECTION 1.** Perianth-segments free, spreading; stamens inserted on their bases; anthers purple. Seeds angular.

1. **S. ver'na**, Huds.; leaves vernal preceding the subcorymbose flowers, bracts as long as the pedicels or longer.

Rocky pastures rare, W. coast of England and Wales from Flint to Devon; Scotland from Ayr and Berwick to Shetland; E. and N.E. Ireland, very rare; fl. April–May.—Bulb as large as a hazel-nut. Leaves 3–10 in., ½–3 in. broad, recurved, concave. Scapes 1–2, shorter than the leaves. Flowers ½ in. diam., bright-blue, fragrant; lower pedicels ½ in. Capsule ½ in. diam.—Distrib. Coasts of Norway, France, Spain.

2. **S. autumnalis**, L.; leaves autumnal narrow succeeding the shortly racemose flowers, bracts 0.


**SECTION 2.** Perianth campanulate, segments connate at the base; stamens inserted below their middle; anthers yellow. Seeds subglobose.

3. **S. nu'tans**, Sm.; leaves and flowers vernal, bracts in pairs. Ag'raphis nu'tans, Link; Endym'ion nu'tans, Dumort; Hyacin'thus nonscrip'tus, L. Bluebell, Wild Hyacinth.

Woods, banks, &c., from Caithness southd.; ascends to 1,500 ft. in the Lake District; Ireland; Channel Islands; fl. April–June.—Bulb ¾–1 in. diam.
Leaves 10-18 in., ½ in. broad, subacute, concave. Scape solitary, tall, stout. Raceme 6-12-fld.; bracts linear, membranous. Flowers 1 in., blue purple white or pink, drooping; pedicel short, curved, erect in bud and fruit. Capsule subglobose.—DISTRIB. W. Europe from Belgium south to Italy.

10. ORNITHO‘GALUM, L.

Bulb coated. Leaves all radical, linear. Flowers racemose or corymbose, white. Perianth spreading, persistent; segments 6, free, with a basal nectariferous gland. Stamens 6, hypogynous, filaments flattened; anthers versatile, linear-oblong. Ovary 3-quetrous, with 3 glands on the top; style 3-gonous, stigma obtuse; cells many-ovuled. Capsule grooved, loculicidally 3-valved. Seeds terete or angled, testa black, rough when dry; embryo cylindrical, radicle next the hilum.—DISTRIB. Europe, N. and W. Asia, N. Africa; species about 70.—ETYM. The classical name.

O. pyrena‘icum, L.; raceme many-fld., pedicels spreading, filaments much dilated to above the middle.


Copses, meadows, &c., naturalized; fl. May—June.—Bulb 1 in., with many bulbils. Leaves 6-8 in., ¼ in. broad, concave, green with a white stripe. Scape tall; rachis of corymb elongate after flowering; bracts very long. Perianth 1-1½ in. diam.; segments linear-oblong, white with a dorsal green midrib. Capsule obovoid.—DISTRIB. From Holland south.—

O. nu‘TANS, L.; racemes few-fld. drooping, filaments broadly dilated upwards 3-fld.

Copses, &c., Midland and E. counties from Yorkshire and Durham to Hereford, naturalized; fl. April—May.—Bulb 2 in. Leaves 1-2 ft., ¾-⅔ in. broad. concave, glaucous with a white stripe. Scape as long; bracts long, slender; pedicels curved, ⅓-⅔ in. Perianth 1-1½ in. broad; segments lanceolate, white with a dorsal green midrib. Capsule pendulous, broadly ovoid, green, fleshy.—DISTRIB. S. Europe.

10.* LIL‘IUM, L.

Bulb of many imbricate fleshy scales. Leaves all cauline, not sheathing, alternate or whorled. Flowers few or many, large, erect or drooping, homogamous; perianth-segments free, caducous, erect below, recurved or revolute above, nectary median, elongate. Stamens hypogynous or on the base of the segments, filaments subulate; anthers fixed above the
base in front, versatile, bursting inwards. Ovary 6-grooved; style terete, stigma obtuse; cells many-ovuled. Capsule erect and seeds as in Fritillaria.—Distrib. Temp. N. regions; species 40.—Etym. unknown.


Cepses, Mickleham, Surrey, naturalized; fl. Aug.–Sept.—Bulb large, scales white. Stem 2–3 ft., terete. Leaves 3–8 in., chiefly in a few whorls of 6–8, subacute. Flowers 1½ in. diam., drooping, odorous at night; bracts ½–1 in., green, linear-lanceolate; pedicels 1–5 in., stout, curved; perianth-segments oblong, pale purple or white, with dark raised papillae; nectary with thick raised borders. Anthers red-brown. Capsule 1 in.—Distrib. Europe from Mid. France southd. and eastd.

11. FRITILLARIA, L.

Bulbs often clustered; scales few, thick. Stem leafy, 1- or more-flowered. Leaves sessile, not sheathing. Flowers drooping; perianth campanulate; segments free, caducous, tip not recurved, nectariferous gland basal. Stamens on the very base of the segments, filaments subulate; anthers oblong or linear, fixed above the base in front. Ovary long, 3-gonous; style 3-grooved, stigmas 3 glandular inwards; cells many-ovuled. Capsule erect, oblong, 3-gonous, loculicidally 3-valved above, margins of valves ciliate. Seeds many, 2-seriate, horizontal, vertically compressed, margined or winged, testa spongy pale; embryo terete, radicle next to the hilum.—Distrib. N. temp. regions; species 50.—Etym. fritillus, a dice-box, from the chequered petals.

F. Meleagris, L.; leaves linear flat subacute. Snake’s Head.


12. TU’LIPA, L.

Bulbs of thick convolute scales. Leaves radical and cauline, lower sheathing. Flowers usually solitary, erect or inclined; perianth campanulate; segments free, tips recurved, nectary 0. Stamens hypogynous, filaments short subulate glabrous or hairy below; anthers fixed by the base, mobile, linear, bursting inwards. Ovary 3-gonous; stigma sessile with 3 radiating lobes; cells many-ovuled. Capsule erect, coriaceous, and seeds as in Fritillaria.—Distrib. Europe, N. and W. Asia; species 50.—Etym. Tulipan, a turban, in Persian.

LILIACEÆ.

Chalk pits, &c., wild in S.W. York, Norfolk, Suffolk, Somerset; naturalized elsewhere; fl. April–May.—Bulb small, ovoid, stoloniferous; scales chestnut-brown. Leaves few, 6–10 in., linear, ½–1 in. broad, glaucous. Stem 1–2 ft., terete, flexuous. Flowers 2 in., fragrant. Filaments woolly at the base. Capsule 1 in., acute above and below.—Distrib. From Holland southd.

13. GA'GEA, Salisb.

Bulb coated; coats few coriaceous. Leaves radical, linear. Scapes with leafy bracts. Flowers yellow, corymbose or umbellate, proterogynous; perianth-segments persistent, free spreading from an erect base; nectary 0. Stamens on the base of the segments, filaments flattened subulate; anthers linear, basifixed. Ovary 3-gonous or 3-quetrous; style 3-gonous, stigma obtuse; cells many-ovuled. Capsule membranous, loculicidally 3-valved. Seeds many, subglobose, pendulous, raphe thick, testa soft yellow; embryo cyllindric, radicle next to the hilum.—Distrib. Europe, N. Asia; species 20.—Etym. Sir Thomas Gage, a British botanist.

G. lu'tea, Ker; radical leaf solitary ribbed, sheath slender, bracts 1–3. G. fascicularis, Salisb.; Ornitho'galum lu'teum, L. Yellow Star of Bethlehem.


14. LLOY'DIA, Salisb.

A small slender herb. Bulb minute, thickly scaly. Leaves filiform. Stem leafy, slender, 1–2-fld. Flowers erect, honeyed, homogamous; perianth-segments persistent, free, spreading, equal, yellow or white, with a transverse cavity. Stamens 6, on the base of the segments, filaments filiform; anthers oblong, basifixed. Ovary 3-gonous; style filiform, stigma obtuse; cells many-ovuled. Capsule 3-quetrous, loculicidally 3-valved at the top. Seeds many, horizontal, 3-quetrous, testa black rugose; embryo minute, next the hilum.—Distrib. Europe, Asia, and N. America; species 2.—Etym. E. Lloyd, an antiquary, its discoverer in Wales.

L. sero'tina, Reichb.; leaves 3-gonous incurved.

15. COL'CHICUM, L. Meadow Saffron.

Corm coated. Leaves all radical, usually vernal. Bracts spathaceous. Flowers solitary or fascicled, subsessile on the corm, erect, crocus-like, honeyed, protogynous; perianth-tube very long, slender, limb campanulate; segments 6, oblong. Stamens on the mouth of the perianth, included, filaments filiform; anthers oblong, fixed above the base in front, versatile, bursting inwards. Ovary deeply 3-grooved; styles 3, free, filiform, tips recurved, stigmatic inwards; cells few- or many-ovuled. Capsule membranous, 3-grooved to the axis, septicidally 3-valved at the top. Seeds subglobose, testa rugose, funicule fleshy; embryo minute, remote from the hilum.—Distrib. Europe, N. and E. Asia; species 30.—Etym. Classical.


Rigid herbs with the habit and leaves of Tofieldia. Flowers racemose, golden-yellow; perianth-segments subequal, spreading, persistent, erect in fruit. Stamens 6, 3 hypogynous and 3 on the base of the segments, filaments subulate villous; anthers linear, fixed by the back, bursting inwards. Ovary narrow-ovoid, 3-gonous, narrowed in the short style, stigma obtuse; cells many-ovuled. Capsule 3-gonous, narrow, pointed, loculicidally 3-valved above. Seeds many, terete, testa filiform at each end, attached to the inner angle of the cell by a hair-like funicule; embryo minute, next the hilum.—Distrib. Europe N. of the Alps and Pyrenees, N. Asia, N. America.—Etym. ναρθέκιον, a rod.

N. ossifragum, Huds.; perianth-segments linear-oblong.


17. TOFIELD'IA, Huds.

Rootstock short creeping. Leaves radical, equitant, ensiform. Scape slender; bracteoles 3, minute, connate. Flowers racemod, small, green,
honeyed, homogamous; perianth-segments persistent, spreading, free. Stamens 6, on the base of the segments, filaments filiform; anthers short, fixed by the back, bursting inwards. Ovary ovoid, 3-locular; styles 3, conic, persistent, stigmas obtuse; cells many-ovuled. Follicles 3, almost free, membranous, oblong, acute. Seeds many, minute, marginal on the valves, cymbiform, testa thin; embryo minute, next the hilum.—DISTRIB. Arctic and Alpine Europe, Asia, and America; species 14.—ETYM. Tofield, a Yorkshire botanist.

T. palus'tris, Huds. ; bracteoles scarious. T. borea'lis, Wahlnb.


18. PAR'IS, L. Herb PARIS.

Rootstock stout. Stem simple, with 1 whorl of usually 4–9 leaves. Flowers solitary, not honeyed, malodorous, proterogynous. Sepals 3–5, lanceolate. Petals as many, filiform. Stamens 8–12, subhypogynous; anthers basifixed, cells narrow; connective sometimes produced. Ovary subglobose, 4–5-lobed and -celled; styles 4–5, free, stigmas decurrent; cells 4- or more-ovuled. Berry indehiscent or loculicidally 4–5-valved. Seeds few or many, testa coriaceous or fleshy, albumen horny; embryo terete, radicle next the hilum.—DISTRIB. Europe, N. Asia, Himalaya; species 3–4.—ETYM. par, equal, from the 4-nary parts of P. quadrifolia.

P. quadrifo'lia, L. ; leaves ovate-oblong or obovate.


Order LXXXI. JUNCE'Æ.

Perennial, rarely annual herbs. Rootstock usually creeping, scaly. Stems erect, usually simple, sometimes septate within, pith often thick, continuous or interrupted. Leaves slender, flat or terete, or reduced to sheathing scales. Flowers green or brown, in axillary or terminal cymes, regular, 2-sexual, bracteolate. Perianth inferior, scarious or coriaceous; segments 6 in 2 series, free, subequal, persistent, imbricate in bud. Stamens 6, inserted on the bases of the segments, rarely 3 on the outer
only, filaments flattened; anthers basifixed, usually linear, bursting inwards. Ovary free, 1–3-celled; style short or 0, stigmas 3 filiform papilllose all over; ovules 3, basilar, or many on 3 parietal or axile placentas, erect, anatropous. Capsule 1–3-celled, loculicidally 3-valved, 3–many-seeded. Seeds erect, testa membranous often lax, albumen dense; embryo next the hilum, small.—DISTRIB. Chiefly temp. and Arctic; genera 4–5; species about 130.—AFFINITIES. With Liliaceae.—Properties unimportant.


1. JUN'CUS, L. Rush.

Glabrous herbs. Outer perianth-segments keeled or midrib thickened. Flowers proterogynous, anemophilous. Stamens 6, rarely 3. Ovary 3-rarely 1-celled; ovules many, placentas axile, rarely parietal. Capsule completely or incompletely 3-celled. Seeds many; embryo minute.—DISTRIB. Of the Order; species 100.—ETYM. jungo, from their use in tying.

SECTION 1. Rootstock perennial, usually creeping. Stems rarely septate within, terete, rarely compressed. Leaves solid, not septate within.

* Leaves all reduced to sheaths. Cymes wholly lateral, many-fld.; flowers not or rarely clustered. Testa not produced at either end.


J. effu'sus proper; cymes usually lax effuse, perianth olive-green, anthers oblong, capsule not mucronate.—VAR. J. conglomera'tus, L.; cymes usually dense subglobose, perianth tinged with brown, anthers longer linear, capsule mucronate.

2. J. glau'cus, Ehrh.; stems rigid glaucous striate, pith interrupted, perianth-segments narrow-lanceolate about equalling the ovoid mucronate capsule, stamens 6.

Wet, usually stiff soils, from Aberdeen and the Clyde southd.; ascends to 1,200 ft. in N. England; Ireland; Channel Islands; fl. July–Aug.—Habit of J. communis, but not so tall, and stems deeply grooved. Cymes effuse, suberect. Perianth brown.—DISTRIB. Europe, N. Africa, Siberia.

J. diffu'sus, Hoppe (a hybrid between glau'cus and effu'sus); stems softer less glaucous and striate, pith continuous, cyme elongate, capsule more obovoid, seeds imperfect.

Sandy seashores, rarely by inland lakes, from Fife and Kincardine to Caithness; fl. July.—Rootstock creeping, not tufted. Stems few, 1-2 ft., \(1/6-1/10\) in. diam., pale green, scarcely striate. Cymes small, corymbose, suberect, few-fld. Perianth about \(1/2\) in., dark brown, midrib pale. Anthers much longer than the filaments.—Distrib. N. Germany to the Arctic circle, N. America.

4. J. filifor'mis, L.; stems wiry pale green filiform, pith interrupted, cyme midway up the stem small, perianth-segments lanceolate exceeding the turbinate obtuse mucronate capsule, stamens 6.


**Leaves all reduced to sheaths, or a few elongate and stem-like. Cymes lateral, flowers many clustered. Stamens 6. Testa produced at each end.**

5. J. ac'u'tus, L.; stems rigid pungent, sheaths long shining, perianth-segments ovate-lanceolate, inner obtuse with a broad scarious margin half as long as the broadly ovoid mucronate capsule.

Sandy seashores from Norfolk and Carnarvon to Kent and Devon, rare; S. and S.E. Ireland; Channel Islands; fl. July—Aug.—Tufts circular. Stems 2-4 ft., stout, terete, hardly striate, many flowerless. Cymes corymbose, dense-fld., very large in fruit; bracts lanceolate-subulate, exceeding the flowers; flowers \(3/4-1/2\) in. Perianth brown, inner segments retuse winged towards the tip. Capsule nearly \(3/4\) in., turgid, hardly 3-gonous.—Distrib. Coasts from France to Turkey, N. Africa.

6. J. marit'imus, Sm.; stems wiry pungent, sheaths short pale, perianth-segments lanceolate all acute and without scarious margins equalling the elliptic-oblong acuminate capsule.

Salt marshes from Isla and Elgin south; rare in Scotland; common in Ireland; fl. July—Aug.—Habit of J. ac'itus, but irregularly tufted; stems less rigid and usually more slender; cymes more interrupted, branches long erect; bracts not exceeding the very pale flowers.—Distrib. Coasts from Gothland to Turkey, N. Africa, W. Siberia, N. America.

***Leaves all terete compressed or channelled. Cymes terminal or lateral, 1-3- (rarely 6-) fld. Testa produced at each end.**

7. J. tril'gu'mis, L.; stems terete, leaves radical subulate channelled, flowers usually 3 terminal equalling the membranous bracts, perianth-segments obtuse much shorter than the ellipsoid beaked capsule.

Alpine bogs, from Carnarvon and Durham to Shetland; ascends to 3,000 ft. in the Highlands; fl. July—Aug.—Tufted, black; stolons 0. Stems 6-18 in.,
slender, wiry. Leaves very short, formed of 2 separate tubes, sheaths auricled. Flowers erect, $\frac{1}{2}-\frac{1}{2}$ in., pale red-brown in fruit.—DISTRIB. Arctic and Alpine Europe, N. Asia, Himalaya, N. America.

8. **J. biglu'mis**, L.; stems $\frac{1}{2}$-terete, leaves radical subulate compressed, flowers usually 2 shorter than the bract, perianth-segments obtuse nearly equalling the turbinate retuse 3-lobed capsule.

Bogs, alt. 2,000-3,300 ft. on the alps of Perth, Argyll, Skye; fl. July-Aug.—Not tufted, stoloniferous. **Stem** 2-6 in. **Leaves** shorter, septate within, sheaths not auricled. **Flowers** $\frac{1}{2}$ in., upper pedicelled, lower sessile, chestnut-brown. **Capsule** mucronate between the lobes.—DISTRIB. Arctic and subarctic Europe, Asia, Himalaya, N. America.

9. **J. casta'neus**, L.; stems terete leafy, leaves $\frac{1}{2}$-terete fistular, cymes 1-3 lateral and terminal 2-6-flowered, perianth-segments acute half as long as the elliptic-oblong beaked capsule.

Alpine bogs, alt. 2,500-3,000 ft., very rare; Perth, Forfar, Inverness, and Aberdeen; fl. July-Aug.—Not tufted, stoloniferous. **Stem** 6-16 in. **Leaves** 2-3, variable in length, channelled above, sheaths not auricled, walls thin. **Flowers** $\frac{1}{2}$-in., bright brown. **Capsule** nearly $\frac{1}{2}$ in., 3-gonous. **Seeds** large for the genus.—DISTRIB. Arctic and Alpine N. and Mid. Europe, N. Asia, Himalaya, N. America.

10. **J. trif'idus**, L.; stems wiry terete, leaves subulate short mostly reduced to sheaths, flowers 1-3 between 2 filiform bracts, perianth-segments acuminate shorter than the ovoid beaked capsule.

Alpine rocks, alt. 1,200-3,000 ft., from the Clyde, Perth, and Forfar to Shetland; July-Aug.—Forms dense matted rigid masses of rootstocks and sheaths. **Stems** 3-10 in. **Upper leaf-sheath** with one short subulate leaf; another leaf occurs on the stems beneath the inflorescence, with a tubular sheath, which has often scarious edges. **Bracts** 2-4 in. **Flowers** $\frac{1}{2}$ in., pale brown; perianth-segments very narrow, margins pale. **Style** and stigmas long. **Seeds** large, appendages short.—DISTRIB. Arctic and Alpine Mid. Europe, N. and W. Asia, N. America.

**** Leaves chiefly radical, flat or grooved above. **Cymes** terminal, 3-many-fl.d. **Testa** not produced at either end.

11. **J. squarro'sus**, L.; rigid, stems compressed, leaves subulate $\frac{1}{2}$-terete below channelled above, cymes terminal, clusters 2-3-fl.d., perianth-segments oblong obtuse equalling the obtuse mucronate capsule.

Moorlands, &c., N. to Shetland; ascends to 3,200 ft. in the Highlands; Ireland; fl. June-July.—Stems densely tufted, 4-10 in., stout, solid, naked or with 1-2 leaves. **Leaves** 3-7 in., densely crowded, recurved from the broad keeled sheath, striate. **Cyme** irregularly corymbose, branches erect; bracts broad, scarious, shorter than the flowers. **Flowers** $\frac{1}{2}$ in., pale. **Capsule** obtusely 3-gonous.—DISTRIB. N. Europe (excl. Greece), Siberia, Greenland.

12. **J. ten'uis**, Willd.; stems wiry terete, leaves channelled, cymes terminal, bracts long, perianth-segments lanceolate acuminate larger than the ovoid obtuse or retuse pointed capsule.


*J. compressus* proper; stems tufted, capsule broader almost obovoid shortly mucronate much longer than the perianth.—Rather rare.


**Section 2.** Rootstock perennial, usually creeping. *Stems* solid. *Leaves* hollow and separte within. *Testa* not produced.

14. **J. obtusiflorus**, Ehrh.; stem tall and leaves (few) erect terete, cymes lateral or subterminal in very compound corymbs, branches zigzag, perianth-segments obtuse equalling the ovoid mucronate capsule.

Marshy places, from the Clyde and Haddington southd.; rare in Scotland and Ireland; fl. July–Aug.—Rootstock widely creeping. *Stems* not tufted, 2–3 ft., usually stout, soft, hardly striate, sheathed at the base. *Leaves* 1–2, like the stem. *Flowers* ⅓ in., sessile in dense peduncled or sessile clusters of 3–8, pale; bracts small, obtuse, scarious.—Distr. From Gothland southd. (except Greece, Turkey, and Russia), N. Africa.

15. **J. articulatus**, L.; stems slender and leaves slightly compressed, cymes lateral or subterminal compound corymbose, perianth-segments acuminated not exceeding the obovoid narrow acuminate capsule.

Bogs, especially in mountain districts, N. to Shetland; ascends to near 3,500 ft. in the Highlands; Ireland; Channel Islands; fl. June–Aug.—Very variable in habit, size, robustness, amount of foliage, and size and composition of the cyme; the following sub-species express its principal modifications.—Distr. Europe, N. Africa, N. and W. Asia, Himalaya.

*J. articulatus* proper (*J. acutiflorus*, Ehrh.); tall, leaves very conspicuously jointed when dry, flowers in dense distant sessile or peduncled clusters of 3–12 dark chestnut, bracts acuminate ⅙–⅔ as long as the flower, perianth-segments equalling the narrow acuminate capsule, stamens 6. *J. sylvaticus*, Reichb.—Ascends to 1,200 ft. in the Lake District.
Sub-sp. **J. supin'us, Müch**; rootstock sometimes tuberous, stems terete 3–10 in. often floating with flaccid straggling branches, joints very obscure, leaves slender, cymes terminal, branches few long suberect, bracts scarios acute sometimes equalling the flower, perianth-segments acute equaling the ovoid obtuse mucronate capsule, stamens 3.—Ascends to 3,500 ft.—**Var. J. uliginosus**, Sibth; erect.—**Var. J. subverticillatus**, Wulf.; decumbent or floating.

Sub-sp. **J. lamprocarpus, Ehrh.**; stem slightly compressed stout or slender, and leaves evidently sepalate when dry, cyme terminal, branches long suberect, perianth-segments shorter than the narrow beaked glossy capsule, inner obtuse, stamens 6.—Ascends to 2,400 ft. in the Highlands; also found in N. America.—Of *J. nigritellus*, D. Don (not Koch), of the Clova Mts., nothing satisfactory is known; garden specimens from Don himself in Borrer’s Herbarium have compressed stems, and seem to be *lamprocarpus*.

**SECTION 3. Annual.** Stem hollow, sepalate within or not. **Testa** not produced.

16. **J. bufo'nius**, L.; very pale, stems slender sepalate, upper part or cyme dichotomously branched, perianth-segments lanceolate much longer than the obtuse mucronate capsule, stamens 3 or 6.

Moist places, N. to Shetland; ascends to near 2,000 ft. in the Lake District; Ireland; Channel Islands; fl. June–Aug.—Very variable, densely aggregated, from the seedlings growing in masses. **Stem** 1–8 in., erect or ascending. **Leaves** few, setaceous, channelled above, not jointed, pale green, very narrow, sheaths short. **Cyme** occupying most of the stem; branches short or long, often flexuous; flowers ½–1 in., solitary and distant, or in clusters of 2–4, lateral open and hexandrous, terminal cleistogamous and 3-androus; bracts small, scarios, obtuse. **Flowers** usually secund, pale green. **Perianth-segments** very unequal, long-acuminate, sometimes much longer than the pale obovoid capsule.—**Distrib.** Europe, N. Africa, N. Asia, Himalaya, N. America, N. Zealand.

17. **J. capita'tus**, Weigel; stems setaceous grooved not sepalate, heads terminal bracteate, perianth-segments elliptic-ovate acuminate awned longer than the broadly ovoid mucronate capsule, stamens 3.

Sands inundated in winter, W. Cornwall, Channel Islands; fl. May–July.—Very small, 1–4 in., tufted, reddish when dry. **Stems** strict. **Leaves** all radical, short, setaceous, channelled; sheaths short. **Heads** solitary, rarely 2–3, 2–6-fld; outer bracts setaceous, about twice as long as the flowers, inner smaller, broadly ovate, aristate. **Perianth** ½ in., pale, tips recurved.—**Distrib.** Europe, N. Africa.

18. **J. pygmæus**, Rich.; stems slender terete not sepalate, flowers few bracteate, perianth-segments linear-lanceolate acuminate not awned longer than the narrow acute capsule, stamens 3 or 6.

Damp places, Lizard and Kynance Downs; fl. May–June.—Very small, 1–2 in., tufted, pink when dry. **Stem** simple or once branched. **Leaves**, radial setaceous faintly jointed channelled, cauline solitary base auricled. **Flowers** 1–5, subsessile; bracts ovate. **Perianth** ¼ in., segments membranous 3-nerved, with hyaline margins. **Anther** shorter than the filament. **Capsule**
oblong-lanceolate, obtuse, 3-gonous, pale. *Seeds* many, filiform, ribbed.—

**Distrib.** Holland to Portugal and Greece.

2. **Lu’zula, DC.** Wood-rush.

Characters of *Juncus*, but always perennial, foliage more grass-like always more or less ciliate with long flexuous white hairs. *Flowers* protrogynous, anemophilous. *Anthers* usually longer than the filaments. *Ovary* 1-celled; ovules 3, subbasal, erect. *Capsule* 1-celled, 3-valved, 3-seeded. *Seeds* with a basal or terminal appendage.—*Distrib.* All temp. and cold regions; species about 26.—*Etym.* *luciola*, a glowworm.

1. **L. max’ima, DC.**; tall, cymes very compound, flowers clustered, perianth-segments awned hardly equaling the ovoid acute beaked capsule, seeds tubercled at the tip. *L. sylvat’ica*, Gaud.

Woods and heaths, especially uplands, N. to Shetland; ascends to 2,300 ft. in the Highlands; Ireland; Channel Islands; fl. May–June.—Rootstock short, tufted; stolons short. *Stems* few, 1–2 ft. *Leaves*, radical ½–1 ft., often ½ in. broad, with scanty silky hairs, channelled; cauline few, short. *Cymes* large, branches often 3–4 in., spreading in fruit. *Flowers* ½ in., pale, usually 3–4 together; bracteoles ovate, acute, scarious.—*Distrib.* Europe (Arctic) (excl. Greece, Russia).

2. **L. verna’lis, DC.**; slender, cymes lax, branches few reflexed in fruit, flowers subsolitary, perianth-segments acuminate shorter than the very broadly ovoid obtuse capsule, crest of seeds long curved terminal. *L. pilo’sa*, Willd.

Shady places, N. to Shetland; ascends to near 1,900 ft. in the Highlands; Ireland; Channel Islands; fl. April–May.—Rootstock short, tufted; stolons slender. *Stems* many, ½–1 ft. *Leaves* about half as long as the stem, ½–¾ in. broad, soft, sparingly hairy. *Cymes* with capillary branches and pedicels. *Flowers* ½–1 in., chestnut-brown, rarely in pairs; bracteoles broad, short. *Capsule* very broad below, suddenly contracted to a conical top above the middle.—*Distrib.* Europe (Arctic) (excl. Greece), N. Africa, ten p. Asia, N. America.—*L. Bor’reri*, Bromf., is a hybrid? found in S. England and Wicklow, with an acute shorter capsule that ripens no seed.

3. **L. Fors’teri, DC.**; characters of *L. pilo’sa*, but more slender, capsule acuminate, and seeds with a shorter terminal straight obtuse crest.

Shaded places in chalky soil, from S. Wales, Oxford, and Essex to Cornwall and Kent; Channel Islands; fl. April–June.—Habit of *L. pilo’sa*, from which luxuriant specimens can hardly be distinguished, except by the characters given above.—*Distrib.* Mid. and S. Europe and N. Africa.

4. **L. campes’tris, Willd.**; leaves very hairy, cymes short, flowers in dense clusters, perianth-segments acuminate longer than the broad obovoid obtuse apiculate capsule, seeds with a conical white basal appendage.

Heaths, meadows, and pastures, N. to Shetland, ascends to 3,200 ft. in the Highlands and Wales; Ireland; Channel Islands; fl. April–June.—Rootstock creeping, tufted. *Stems* 4–12 in., stout or slender. *Leaves* shorter
than the stem, usually copiously hairy. *Cymes* very variable; clusters subsessile, or on long drooping branches. *Flowers* ½ in., pale or dark; bracteoles ciliate. *Seeds* with no terminal crest.—*Distr. Europe (excl. Greece), all temp. and cold regions.

*L. campestris* proper; usually short, clusters usually 3–4-fld., seeds subglobose. 
—VAR. *L. erecta*, Desv. (*L. multiflora*, Lej.; *L. congesta*, Lej.); larger, stouter, cymes more contracted, flowers more in a cluster, perianth-segments narrower, filaments longer, capsule narrow, seeds oblong with a shorter basal appendage.—Most frequent on heaths.

5. *L. spicata*, DC.; leaves slender, cymes drooping dense-fld. spike-like, bracteoles silvery, perianth-segments awned exceeding the broad ellipsoid apiculate capsule, seeds with an obscure white basal appendage.


6. *L. arcuata*, Swartz; dwarf, leaves short, cymes umbelied, branches few outer slender recurved, perianth-segments acuminate exceeding the broadly ovoid apiculate capsule, seeds with an obscure basal appendage.


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**Order LXXXII. Eriocauloneae.**

Perennial, scapigereous herbs. *Leaves* chiefly radical, often cellular, sheaths narrow. *Flowers* minute, usually monoeccious, in involucrate heads, bracteate.—*Male* Perianth membranous or scarios, outer of 2–3 free segments; inner a 2–3-lobed tube. *Stamens* 2–3, inserted on the tube opposite its lobes, with sometimes alternate perfect or imperfect ones, filaments inflexed in bud; anthers fixed by the back, 2-celled, bursting inwards. *Ovary* rudimentary.—*Female* Perianth inferior, persistent, outer as in the male, inner of 2–3 petals or pencils of hairs. *Staminodes* 0. *Ovary* of 2–3 connate carpels; style short, terminal, persistent, stigmas 2–3 slender; ovules solitary and pendulous from the top of each cell, orthotropous. *Capsule* membranous, 2–3-celled, loculicidally 2–3-valved. *Seed* pendulous, testa coriaceous, epidermis hyaline splitting into hairs, albumen floury; embryo outside and at the base of the albumen.
farthest from the hilum.—Distrib. Chiefly trop.; genera 6; species 325.—Affinities. With Restiaceae and Xyridaceae.—Properties unimportant.

1. **ERIOCAULON, L.** Pipe-wort.

Male fl. chiefly in the centre of the head. Outer perianth-segments subspathulate. Stamens 4 or 6.—Distrib. Of the Order; species 100.—Etym. ἐριοκαύλος and καύλος, from the woolly scapes of some species.

**E. septangulare, With.**; leaves subulate, scape 6–8-furrowed.


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**Order LXXXIII. TYPHA'CEÆ.**

Marsh or aquatic herbs. Rootstock creeping. Leaves narrow, linear, obtuse, bases sheathing. Spathe 0 or caducous. Flowers monoeous, in cylindric oblong or globose spikes or heads, the male heads uppermost. Perianth of persistent membranous scales or hairs.—Male. Stamens few or many, filaments slender; anthers basifixed, 2-celled, dehiscence lateral.—Female. Ovary sessile or stalked, 1- rarely 2-celled, contracted into a simple persistent style, stigmatose ventrally; ovule 1, pendulous from the top of the cell, anatropous. Fruit small, coriaceous, or a drupe. Seed pendulous, albumen fleshy or mealy; embryo straight, terete, radicle next the hilum.—Distrib. Temp. and trop.; genera 2; species about 16.—Affinities. With Aridaeæ and Pandanaceæ (screw-pines), of which Sparganium is almost a member.—Properties. The roots of Typha are farinaceous; and the pollen is made into cakes in Sind and New Zealand.

Flowers in globose heads........................................1. Sparganium.
Flowers in cylindric or oblong spikes........................................2. Typha.

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**1. SPARGA'NIUM, L.** Bur-reed.


2. **Typha**, *L.* Reed-mace, Cat’s-tail, Club-rush.

Spikes superposed, cylindric, with deciduous leafy bracts. Perianth of 2–3 extremely slender cellular hairs. Stamens several, monadelphous; connective produced. Ovaries stalked, many imperfect; style very slender, stigma unilateral narrow. Fruit minute, stalked, dehiscent along the inner face. Seed cylindric, testa striate.—*Distrib.* Temp. and trop.; species 10.—Etym. *τιφος*, a fen.


2. **T. angustifolia**, *L.*; leaves ⅓–⅔ in. broad dark-green not glaucous convex beneath, spikes separate, rachis hairy. Ditches and ponds, from Fife and Lanark southd.; E. Ireland, rare; Channel Islands; fl. July.—Smaller in all its parts than *T. latifolia*; leaves narrower,
TYPHACEÆ.

Order LXXXIV. AROIDEÆ.

Herbs or shrubs. Leaves various. Spathe 1-leaved. Flowers on a spadix, 1- or 2-sexual; perianth 0, or hypogynous and polyphyllous. Slumens few or many; anthers 2-celled, dehiscing outwards, or by terminal pores. Ovary 1- or more-celled; style simple or 0, stigma capitate or discoid; ovules 1 or more, variously attached. Berry 1- or more-celled. Seeds 1 or more, albumen abundant fleshy or mealy, rarely 0; embryo various.—Distrib. Trop. and temp. regions; genera 100; species 1,000.


Flowers 1-sexual; perianth 0.............................................1. Arum.
Flowers 2-sexual; perianth-segments free................................2. Acorus.

1. A'RUM, L.

Rootstock tuberous. Leaves radical, nerves reticulate; petiole sheathing at the base. Scape terete. Spathe convolute, contracted above the base. Spadix contracted below the middle, terminated by a naked cylindrical column, bearing from the base upwards, 1stly a crowd of naked sessile ovaries; 2dly pistillodes; 3dly a crowd of naked sessile anthers; 4thly staminodes. Anthers 2-4-celled, dehiscence terminal. Ovary 1-celled; stigma sessile; ovules few, basal, erect, orthotropous. Berry fleshy. Seeds few, testa coriaceous, albumen mealy; embryo short, radicle opposite the hilum.—Distrib. N. temp. and sub-trop. regions; species about 20.—Etym. doubtful.


2. A. ital'icum, Miller; leaves hibernal, spathe thrice as long as the spadix.

channelled towards the base; spikes ½–3 in. diam., separated by ½–1 in., female often interrupted, bracteate; female flowers bracteate, perianth-scales dilated towards the tip; stigmas broader.—Distrib. Europe (excl. Greece), N. Africa, N. Asia, India, N. America.
Cornwall to Sussex, very local; Channel Islands; fl. June.—A larger, stouter plant than *A. maculatum*, leaves more triangular; spathe falling over at the top as soon as it expands; spadix always yellow; pistillodes much longer; berries longer; seeds larger.—**Distrib.** W. France, S. Europe, N. Africa.

**2. A’CORUS, L. Sweet-flag.**


*A. Cal’amuS*, *L.*; midrib of leaf thick.

Ditches, ponds, &c., from York and Lancaster to Somerset and Sussex, rare; naturalized in Scotland and Ireland; fl. June–July. *Leaves* 3–6 ft., $\frac{3}{4}$–$1\frac{1}{4}$ in. diam., margins waved. *Scape* leaf-like, $\frac{1}{2}$ in. diam. *Spathe* long. *Spadix* 3–4 in., $\frac{3}{4}$ in. thick, curved. *Perianth-segments* not longer than the *ovary*. *Fruit* obovoid, top pyramidal.—**Distrib.** Europe (excl. Greece), N. Asia, Himalaya, N. America.—Aromatic, stimulant, tonic. Supposed to have been introd. from India. I have never seen fruit.

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**Order LXXXV. Lemna’ceæ.**

Minute annual floating green scale-like plants, rootless or with capillary simple roots, propagated by budding, and by autumnal hibernating bulbs, rarely by seed; vascular tissue 0 or rudimentary; roots tipped by a membranous sheath. *Flowers* rarely produced, most minute, 1–3 in a spathe, or naked. *Perianth* 0. *Stamens* 1–2; anthers 1–2-celled, dehiscence transverse; pollen spherical. *Ovary* 1-celled; style short, stigma truncate or funnel-shaped; ovules 1–7, orthotropous anatropous or $\frac{3}{4}$-anatropous. *Utricle* bottle-shaped. *Seeds* 1 or more, testa coriaceous, inner coat thickened and discoid over the radicle, albumen fleshy or 0; embryo axile, straight, stout, cylindric.—**Distrib.** All standing waters; genera 2; species about 20.—**Affinities.** With Naiadaceæ and Aroideæ. —**Properties** 0.


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**ARUM.**
1. **LEM'NA, L.** Duckweed.

Fronds with roots. *Flowers* in marginal clefts of the frond. *Stamens* 1–2, filaments slender; anthers 2-celled, didymous; pollen muricate. *Ovules* 1–7.—*DISTRIB.* All latitudes; species 7.—*ETYM.* The Greek name.

**SECTION 1. Lem'na proper.** Root single. *Ovule* 1, \( \frac{1}{2} \)-anatropous. *Seed* horizontal; albumen copious.

1. **L. mi'nor, L.**; frond obovate or oblong slightly convex beneath.

Still waters, N. to Orkney; ascends to 1,200 ft. in Derby; Ireland; Channel Islands; fl. July.—*Frond* \( \frac{1}{3}–\frac{1}{2} \) in., young sessile on the old, soon disconnected, green above, paler beneath; epidermal cells with flexuous walls. *Spathe* unequally 2-lipped. *Stamens* 2, developed successively (each a male flower). *Style* long.—*DISTRIB.* Almost ubiquitous.

2. **L. trisul'ca, L.**; frond flat obovate-lanceolate, tip serrate, young hastate persistent. *Ivy-leaved Duckweed.*

Still waters, from Lanark and Banff southd.; rare in Scotland; local in Ireland; Channel Islands; fl. June–July.—*Frond* \( \frac{1}{2}–\frac{1}{3} \) in., narrowed at the base, without epidermis, proliferous on one or both sides; young fronds numerous, placed crosswise to the old. *Style* very short. *Testa* rough, grooved.—*DISTRIB.* Europe, Siberia.

**SECTION 2. Telmatopha'ce, Schleid.* (gen.). Root single. *Ovules* 2–7, erect, anatropous. *Seeds* erect; albumen scanty or 0.

3. **L. gib'ba, L.**; frond obovate or orbicular tumid beneath, stamens 2, utricle bursting transversely.

Still waters, from Edinburgh and Lanark to Devon and Kent; local in Ireland; Channel Islands; fl. June–Sept.—*Frond* \( \frac{1}{3}–\frac{1}{2} \) in., opaque, pale green, young sessile; cells beneath very large, epidermal with flexuous walls.—*DISTRIB.* Europe (excl. Greece), Siberia, N. Africa, America.


4. **L. polyrhi'za, L.**; frond broadly obovate plano-convex 7-nerved.

Ponds and ditches, from Lanark and Edinburgh to Devon and Kent; local (if native) in Scotland; Mid. Ireland.—*Frond* \( \frac{1}{2}–\frac{1}{3} \) in., dark green above, purple beneath, tracheae abundant; epidermal cells with flexuous walls. *Spathe* 2-lipped. *Stamens* 2.—*DISTRIB.* Europe (excl. Greece), Siberia, Madeira, N. America.—Flower unknown in Britain.

2. **WOLFF'IA, Hork.**

Fronds like grains of sand, rootless, oblong or subglobose, flattened above, proliferous, cleft near the base. *Flowers* bursting through the upper surface of the fronds. *Spathe* 0. *Anthers* sessile, 1-celled; pollen smooth. *Ovary* globose; style short, stigma depressed; ovule 1, erect,
orthotropous. *Utricle* spherical, indehiscent. Seed oblique; albumen fleshy, scanty.—**Distrib.** Europe local, Africa, America; species 12.—

**Etym.** J. F. Wolff, a writer on *Lemna*.


Ponds, Essex, Middlesex, Kent, Surrey, probably common elsewhere.—The smallest known flowering plant. *Frond* $\frac{1}{10}$ in. long, $\frac{1}{10}$ in. broad, young solitary at the base of the old, soon detached; epidermal cells with straight walls. *Flowers* described from African specimens.—**Distrib.** Europe local, from Holland southd.

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**Order LXXXVI. Alisma'ce.**

Marsh or aquatic scapigerous herbs. *Leaves* chiefly radical, erect or floating; petiole sheathing. *Flowers* usually 2-sexual, usually panicked or umbellate. *Perianth* inferior of 6 segments in two series. *Stamens* 6, 9, or more, hypogynous, filaments free; anthers oblong. *Ovary* of 3, 6, or more carpels, free or subconnate; styles short or 0, stigma terminal simple or feathery; ovules 1 or more in each cell, anatropous or campylo-tropous. *Fruit* of indehiscent coriaceous carpels or follicles. *Seeds* 1 or more in each carpel, testa coriaceous or membranous, albumen 0; embryo straight or hooked, radicular end thick, next the hilum.—**Distrib.** All climates; genera 10; species about 50.—**Affinities.** With *Naiadaceae.** —**Properties unimportant.**


*Flowers* bisexual, subsolitary; carpels free. *Leaves* floating........2. Elisma.

*Flowers* bisexual, whorled; carpels connate. *Leaves* erect..3. Damasonium.


**Tribe II. Butome'ce.** *Petals* and *sepals* similar. *Ripe carpels* dehiscent. *Ovules* numerous, on branching parietal placentas.............5. Butomus.

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1. **Alisma, L.**


Ditches, edges of streams, &c., from Ross southd., rare in the N.; Ireland; Channel Islands; fl. June–Aug.—Base of stem swollen, fleshy. Leaves 6–8 in., petioled, ovate-lanceolate, base acute obtuse or subcordate, 5–7-ribbed, young submerged or floating. Scape 1–3 ft.; pedicels 1–1½ in. Flowers ½ in. diam., homogamous. Petals pink or rose, claw yellow. Carpels 20–30.—Distrib. Arctic and N. temp. regions, Himalaya, Australia.—Juice acrid.

A. Plantago proper; leaves subcordate, sepals oblong, styles twice as long as the ovary.—Var. A. lanceolatum, With.; leaves lanceolate, sepals ovate, styles as long as the ovary.

2. A. ranunculoides, L.; leaves erect linear-lanceolate, flowers umbel- bellated or whorled, carpels capitulate 4–5-ribbed turgid, styles terminal.

Bogs and ditches, from Ross southd.; Ireland; Channel Islands; fl. May–Sept.—Tufted. Leaves petioled, blade 2–3 in., 3-ribbed; the first developed submerged, pellucid, sometimes floating. Scape 6–18 in.; pedicel 1–3 in. Flowers as in A. Plantago, pale purplish. Carpels ovoid, apiculate.—Distrib. From Gothland southd. (excl. Greece, Turkey), N. Africa.

A. ranunculoides proper; erect or suberect.—Var. A. repens, Davies; stem procumbent geniculate rooting. Lakes, N. Wales and Ireland.

2. ELIS’MA, Buchenau.


E. na’tans, Buch. Alisma na’tans, L.


3. DAMASO’NIUM, Juss. STAR-FRUIT.

Habit and inflorescence of Alisma, but carpels 6–10, connate at the base, spreading horizontally, 2- or more-ovuled. Fruit of as many stellately spreading 1- or more-seeded long-beaked carpels. Seeds, lower erect, upper horizontal, testa membranous rugose; embryo hooked.—Distrib. Europe, California, Australia; species 4.—Etym. obscure.

Gravely ditches and pools, rare, from Salop and Suffolk to Kent and Hants; fl. May–July.—Leaves many, 2 in., obtuse, floating or emersed; petiole stout, 2–5 in. Scape 4–6 in., stout, with usually 2 whorls of flowers; pedicels 1 in. Flowers ½ in. diam.; petals caducous. Fruit ⅓ in. diam., carpels dehiscing ventrally.—Distrib. France, Spain, Italy, N. Africa.

4. SAGITTARIA, L.

Habit and inflorescence of Alis'ma, but flowers 1-sexual; stamens numerous; anthers basifixed, dehiscence lateral.—Distrib. Temp. and trop.; species about 15.—Etym. sagitta, an arrow.

S. sagittifolia, L.; leaves hastate obtuse or acute. Arrow-head.

Ditches, canals, &c., from Cumberland to Kent and Devon; naturalized in Scotland; local in Ireland; fl. July–Sept.—Stem swollen at the base, stoloni-ferous; stolons producing globose winter tubers ½ in. diam. Leaves 2–8 in., erect, lobes long more or less diverging acuminate, the first developed submerged, pellucid, linear; petiole 8–18 in., stout, 3-gonous. Scape 6–18 in., with 3–5 distant whorls of 3–5 flowers each; bracts short, obtuse, membranous; lower whorls female, pedicels short; upper male with longer pedicels. Flowers ⅓ in. diam., males larger. Petals white, caducous, claw purple. Anthers purple. Ripe carpels numerous, much compressed laterally, obliquely obovate, apiculate, wings broad thick, cell small. Seeds as in Alis'ma.—Distrib. Europe (Arctic) (excl. Greece), N. Asia, N.W. India.

5. BUTOMUS, L. Flowering Rush.

A tall marsh herb. Rootstock creeping. Leaves slender, erect. Scape naked. Flowers in a bracteate umbel. Perianth-segments 6, oblong, spreading, subequal, all coloured. Stamens 9, hypogynous, 6 in pairs opposite the outer segments, 3 opposite the inner, filaments subulate; anthers basifixed, oblong, introrse. Carpels 6, beaked, connate below; styles short, stigmas sessile; ovules covering the walls of the carpel, anatropous, ascending. Follicles 6, beaked, coriaceous, turgid. Seeds many, minute, ascending, testa thin furrowed; embryo straight.—Distrib. Europe, N. and W. Asia, N.W. India.—Etym. obscure.

B. umbellatus, L.; leaves long slender 3-quetrous, scape terete.


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Order LXXXVII. NAIA'DACEÆ.

Marsh- or water-herbs. Rootstock usually creeping. Stems elongate (rarely 0), jointed, branched, slender. Leaves often floating, alternate or distichous, rarely opposite, sheathing at the base; stipules 0
or sheathing and inserted within the petiolar sheath. Flowers inconspicuous, 1-2-sexual, green. Perianth 0, or tubular, or cup-shaped, or of 3-4 inferior valvate segments. Stamens hypogynous; anthers 1-2-celled. Ovary of 1-4 carpels; style 1, stigma various; ovules one in each carpel, rarely more, erect or pendulous. Fruit of one or more utricles achenes or drupes. Seed solitary, testa membranous, albumen 0; embryo straight or curved, radicular end very large.—Distrib. All climates; genera 16; species 120.—Affinities. With Alismaceae.—Properties unimportant.

TRIBE I. JUNCAGINÆ. Erect marsh herbs, with rush-like leaves. Flowers spiked or racemed, 1-2-sexual. Perianth-segments 3 or 6, herbaceous. Stamens 6. Carpels 3 or more; ovules basilar, erect, anatropous. Embryo straight.


TRIBE II. POTAMEÆ. Aquatic herbs. Flowers spiked, 2-sexual. Perianth-segments 4, herbaceous, or 0. Stamens 2 or 4. Carpels 4; ovules solitary, axile, campylotropous. Embryo curved.

Perianth 0. Achenes stipitate.................................4. Ruppia.

TRIBE III. ZANNICHELLIÆ. Aquatic herbs. Flowers axillary, 1-sexual. Perianth 0 or hyaline. Stamen 1. Carpels 2-9; ovules solitary, pendulous, orthotropous. Embryo induplicate or involute.

Perianth 0..............................................................5. Zannichellia.


1. TRIGLO'CHIN, L.

Roots fibrous. Leaves erect, very narrow. Flowers racemed, small, green, ebracteate, anemophilous, proterogynous. Perianth-segments 6, all similar, cucullate, subequal, deciduous. Stamens 6, on the base of the perianth-segments, filaments very short; anthers broad, extrorse. Ovary 6-celled; stigmas 3 or 6, feathery; ovules one in each cell or the alternate cells empty, anatropous. Fruit of 3-6 1-seeded coriaceous carpels, separating from a central axis and dehiscing in front. Seeds erect, terete, testa coriaceous.—Distrib. Temp. regions, many Australian; species 12.—Etym. τρές and γλωξία, from the 3-pointed carpels.
1. **T. palus'tre**, **L.**; leaves filiform ½-terete throughout, fruit clavate, carpels 3 slender long attached to the axis by a point.


2. **T. marit'imum**, **L.**; stems tufted thickened at the base, leaves slightly flattened at the tip, fruit oblong of 6 separable carpels.

Salt marshes, N. to Shetland; Ireland; Channel Islands; fl. May–Sept.—Larger and stouter than *T. palus'tre*; *scape* curved; *raceme* longer, not dense-fld., nor so long in fruit; flowers larger; fruit not appressed to the scape, and carpels grooved at the back.—**Distr.** Coasts of Europe (Arctic) (excl. Greece, Turkey), N. Africa, salt districts of Asia, N. America.

2. **Scheuchze'ria**, **L.**


**S. palus'tris**, **L.**; leaves ½-terete, sheaths turgid.


3. **Potamo'-ton**, **L.**

Aquatic herbs. *Leaves* submerged and translucent, or floating and opaque, alternate or opposite; stipules connate, membranous or 0. *Flowers* 2-sexual, in axillary or terminal spikes, proterogynous. *Perianth-segments* 4, small, herbaceous, clawed, persistent, valvate in bud. *Stamens* 4; anthers subsessile on the claw, 2-celled, extrorse. *Carpels* 4 (rarely 1) free, sessile, stigma subsessile; ovules solitary, ascending, campylotropous. *Drupelets* 4 (rarely 1), small, green. *Seed* curved round a lateral process from the cell, testa membranous; radicular end of embryo inferior, large, cotyledonary narrowed hooked or involute, plumule immersed.—**Distr.** Temp. regions, more rare in trop.; species about 50.—**Etym.** ὑπάμος, a river; and γείτων, a neighbour.
Mr. A. Bennett, F.L.S., of Croydon, has given me the benefit of his unrivalled knowledge of this difficult genus by revising my MS. for this edition.

SECTION 1. Leaves alternate, or the upper opposite, oblong obovate or lanceolate, not truly linear, margins involute in bud; stipules free.

* Flowering-stem without barren branches below; upper leaves oblong floating, lower (rarely all) submerged; peduncles axillary, many- and dense-fld.

1. **P. natans**, L.; leaves long-petioled, submerged 0 or reduced to phyllodes, floating elliptic to lanceolate coriaceous, stipules very long acuminate, peduncle stout, spike dense-fld., dry drupelets large keeled dorsally, beak short.

Lakes and ponds, N. to Shetland; Ireland; Channel Islands; fl. June–Sept. —Stem terete. Floating leaves 2–6 in., mostly alternate, blade very shortly decurrent on the petiole, with the margins minutely incurved or auricled; submerged 6–12 in., with very rarely a limb. Drupelets ½ in., ventral margin convex, dorsal ¾-circular.—Distrib. Europe, N. Asia, India, Africa, N. America, Australia.—P. polygonifo'lius, var. linea'ris, Syme, with submerged leaves 12–16 by ¾ in., from Killarney, is probably referable here, but the fruit is unknown.

2. **P. polygonifo'lius**, Pourr.; leaves long-petioled, submerged narrowly lanceolate, phyllodes 0, floating obovate to narrowly lanceolate rather membranous, peduncles and spike slender, dry drupelets very small not keeled, beak very short. *P. oblon'gus*, Viv.

Lakes and pools on heaths, &c., N. to Shetland; ascends to 1,600 ft. in the Lake District; Ireland, rare; fl. June–Sept.—More membranous than *P. natans*, with well-developed submerged leaves, blade often very decurrent on the petiole, base acute rounded or cordate; upper opposite. Drupelets ¾ in., red, margins rounded.—Distrib. Europe, Asia, Canada?, N. Zealand.—Var. flu'itans, Syme, is a deep-water form with very long submerged leaves and subcoriaceous floating ones.

3. **P. plantagin'neus**, Du Cros; leaves long-petioled chiefly submerged all membranous translucent from orbicular and cordate to elliptic-lanceolate upper opposite, stipules short broad obtuse, peduncle very slender, spike dense-fld., dry drupelets very small rounded not keeled green, beak obsolete.

Ditches, fens, &c., from the Clyde and Haddington to Somerset and Kent Ireland; Channel Islands; fl. June–Sept.—Leaves broader, more membranous and translucent with more slender petioles than *P. polygonifo'lius* and *natans*, and with very different stipules. Drupelets ¾ in. long.


Ponds, canals, and ditches, from Caithness southdl.; ascends to 3,000 ft. in Perthshire; Ireland; fl. July–Sept.—Stem 1–4 ft., terete. Leaves reddish,
quite entire, upper 2–7 in., obovate or oblong-lanceolate, obtuse, lower sessile; stipules very variable, obtuse, not winged. Peduncles 2–7 in. Drupelets ventrally convex, dorsally $\frac{1}{2}$-circular, keeled.—Distrib. Europe (Arctic), N. Asia, N.W. India, N. America.—Var. P. spatulatus, Koch and Ziz, almost connects this with P. polygonifolius.—Perthshire.

** Flowering-stem with copious barren branches below; upper leaves usually floating, broader than the lower submerged ones; peduncles axillary and terminal, many- and dense-fld.

5. P. heterophyllus, Schreb.; stem slender, submerged leaves linear-lanceolate, stipules small, peduncle stout thickened upwards, dry drupelets small 3-keeled, beak short.

Pools and lakes, from Shetland to Hants and Kent; ascends to 2,800 ft. in Perthshire; Ireland, rare; fl. June–Sept.—Stem 2–4 ft., terete, green or reddish, much branched below. Submerged leaves 1–7 in., sessile, flaccid, acuminate or cuspitate, floating or similar or oblong petioled and coriaceous. Peduncles axillary and terminal. Drupelets $\frac{2}{3}$ in., ventrally nearly straight, dorsally $\frac{1}{2}$-circular.—Distrib. Europe (Arctic), N. Asia, N. America.

P. heterophyllus proper; leaves not amplexicaul almost flat, upper opposite coriaceous floating. P. graminifolius, Fries, Koch.

Sub-sp. P. xitens, Weber; much branched, leaves usually all submerged alternate recurved undulate shining, peduncles less thickened upwards, spike shorter, drupelets smaller.—Aberdeen to Northumbd., Anglesea, Surrey; Ireland, rare.

6. P. lanceolatus, Sm.; stem filiform fragile, leaves sessile straight linear- or oblong-lanceolate obtuse entire translucent nerves fenestrate, upper opposite petioled, stipules slender acuminate, peduncles short not thickened upwards, spike very short, dry drupelets ventrally 3-toothed.

Rivers, Anglesea, Cambridge; Co. Down; fl. July–Sept.—Resembles slender forms of P. heterophyllus, but leaves darker green, very obtuse, fenestrate all over; peduncles very slender, and spike shortly ovoid. Drupelets $\frac{1}{4}$ in., nearly straight dorsally, much rounded ventrally, with a ventral and 2 lateral teeth, beak ventral.

7. P. lonchites, Tuckerm.; stem stout, submerged leaves alternate very long straight strap-shaped 7–9-ribbed quite entire translucent, floating 0 or opposite oblong-lanceolate long-petioled, peduncle slightly thickened upwards, spike short, dry drupelets obovoid dorsally 3-keeled, beak short.

Ireland, River Boyne; fl. June–Sept.—Stems much longer and less branched than in P. heterophyllus, and submerged leaves much longer, drupelets larger more like those of P. fluitans, cotyledonary end of embryo involute.—Distrib. Canada and California to Mexico and Florida.—Fruit described from American specimens.

8. P. lucens, L.; stem stout, leaves large subsessile all translucent linear- or oblong-lanceolate cuspitate undulate serrulate upper opposite
often floating, stipules large long 2-winged or keeled, peduncle robust thickened upwards, spike stout, dry drupelets small turgid, beak short. Lakes, ponds, and streams, from Banff and Argyll to Devon and Kent; Ireland; fl. June–Sept.—The largest British species, very lucid and glistening, pale green. Stem 3-6 ft. Leaves 4-10 in., mostly submerged, very variable, many-nerved, mostly serrulate towards the long or short tip; upper broader rarely floating or coriaceous. Peduncles very variable in length; spike usually dense-fld. Drupelets 1-10 in., convex on both faces, beak obtuse. —DISTRIB. Europe, N. Africa, N. Asia, N.W. India, N. America, Australia.

P. lu'cens proper; leaves shortly petioled, strongly serrulate apiculate or mucronate, peduncles usually short.—VAR. P. acumina'tus, Schum. (P. longi'foll'ius, Gay); leaves very narrow tapering to both ends, peduncles more than twice as long as the spike.

Sub-sp. P. Zi'hu, Roth; much branched, lower leaves often recurved, upper cuneate at the base, floating obovate or oblong subcoriaceous, peduncles very long, spike 1-2 in., drupelets more rounded.—Forfar and Perth to Hants and Surrey.—The Lough Corrib plant, of which only one specimen is known, and which was referred by Babington to P. longifolius, Gay, differs in the narrower entire leaves and small scattered flowers.

Sub-sp. Decip'i'ens, Nolte; leaves sessile very variable suborbicular to oblong-lanceolate mucronate subentire undulate, stipules short scarcely winged, peduncles stouter, spike denser, drupelets smaller.

*** Flowering-stem with barren branches below; leaves uniform, ½- or wholly-amplexicaul, all submerged, oblong or ovate-oblong, upper opposite.

9 P. Griffith'i, A. Bennett; stem terete, lower leaves subamplexicaul, strap-shaped, tip concave, upper long-petioled oblonglanceolate tapering into the petiole, stipules long narrow obtuse, peduncles slender, spike dense-fld.

Wales, near Aber; fl. summer.—Stem branched. Lower leaves 7-12 in., 11-nerved, with 4-5 fainter nerves near the midrib; upper 13-17-nerved. Peduncles shorter than the upper leaves. Young drupelets ovoid, beak terminal from the ventral face.—Habit between praelong'ges and rufesc'ens.

10. P. prælon'gus, Wulfen.; stem terete robust, leaves ½-amplexicaul oblong obtuse entire 3-nerved tip usually concave, stipules large obtuse not winged, peduncles very long stout, spike dense-fld., dry drupelets large strongly acutely keeled. Lakes and deep rivers, chiefly in the E.; Caithness to Essex and Salop; ascends to 2,800 ft. in Perthshire; rare in Ireland; fl. May–July.—About as large as P. lu'cens, but barren branches few. Stem greenish-white. Leaves 3-10 by 1-1½ in., linear-oblong, midrib dilated, upper opposite, nerves numerous and close. Peduncles hardly thickened upwards. Drupelets twice as large as in P. lu'cens.—DISTRIB. Europe (Arctic), Himalaya, America.

11. P. salicifo'lius, Wolfy.; stem slender terete, leaves all translucent, submerged ½-amplexicaul lanceolate acute or subacute entire, stipules obtuse, peduncles not enlarged upwards, spike short, dry drupelets compressed rounded obtuse. P. lithuan'icus, Gorski.
NAIADACEÆ. [Potamogeton.]


13. P. cris'pus, L.; stem slender compressed, leaves distichous $\frac{1}{2}$-amplexicaul oblong acute or obtuse crisped serrulate 3-nerved, stipules small obtuse caducous, peduncles curved tapering upwards, spikes few-fld., dry drupelets acuminatae, beak long.

Ponds, ditches, &c., from Orkney southd.; Ireland; Channel Islands; fl. July–Aug.—Dichotomously branched. Leaves 1½–3 in., close-set, spreading and recurved, margins rarely flat (P. serr'atus, Huds.). Peduncles stout or slender; flowers 6–8, lax, very small. Drupelets $\frac{1}{6}$ in., obliquely ovoid, compressed.—Distrib. Europe, N. Asia, India, Japan, N. America, Australia.

Section 2. Leaves all subopposite, margins involute in bud; stipules 0.


Ponds and streams, from the Forth of Clyde to Somerset and Kent; ascends to 1,000 ft. in the Lake District; very local in Scotland and Ireland; fl. July–Sept.—Dichotomously branched. Leaves $\frac{1}{2}$–1 in., close-set, recurved, acute or acuminate, keeled, the nodes of the subopposite pairs being confluent, but their bases overlap. Peduncles rarely longer than the leaves, at length recurved; spike laxly 3–6-fld. Drupelets compressed, pericarp thin; cotyledonary end of embryo circumvolute.—Distrib. From Denmark southd., Himalaya, N. Africa, America.

Section 3. Leaves alternate or the upper opposite, all similar, ligulate (not broader in the middle), margins flat in bud; stipules free.

15. P. zosterifo'lius, Schum.; stem compressed winged, leaves $\frac{1}{2}$-amplexicaul linear abruptly acuminate 3–rarely 5-nerved, stipules large acuminate, peduncle much longer than the spike, drupelets subreniform 3-ribbed. P. cuspid'a'tus, Sm.; ? P. compres'sus, L.
Forfar to York and Essex, local; Co. Down; fl. July–Aug.—Stem broad, internodes long. Leaves 4-10 in., often \( \frac{1}{2} \) in. broad, with 3 strong and many slender nerves. Peduncles 2-3 in.; spike many-fld. Drupelets \( \frac{1}{3} \) in., slightly compressed; beak terminal.—DISTRIB. Europe, N. Asia, N. America.—The \( P. \) compressus, L., being a doubtful plant, the name zosterifolius is adopted by most authors.

16. \( P. \) acutifo'lius, Link; stem compressed, leaves \( \frac{1}{2} \)-amplexicaul linear finely acuminate 3-nerved, stipules lanceolate acute, peduncle rarely equalling the very short spike, dry drupelets convex with a strong tooth near the base ventrally, beak recurved.

Lakes and ditches, Yorkshire to Kent and Dorset, rare; fl. June–Aug.—Stem narrower than in \( P. \) zosterifolius. Leaves 2-6 in., with 3 strong and many slender nerves. Peduncles \( \frac{1}{2} \) (rarely) 1 in.; spike about \( \frac{1}{3} \) in. Drupelets \( \frac{1}{3} \) in., compressed; beak ventral.—DISTRIB. Europe, Australia.

17. \( P. \) obtusifo'lius, Mert. and Koch; stem slender compressed, leaves sessile linear subacute or obtuse 3-nerved, stipules very obtuse, peduncles very short, spike small ovoid, dry drupelets broad keeled, beak straight. \( P. \) graminifolius, Sm., not L.

Pools and ditches from Aberdeen to Hants and Kent; Ireland, rare; fl. July–Aug.—Stem flexuous, much branched, 4-gonous, not winged. Leaves 2-6 by \( \frac{1}{8} - \frac{1}{2} \) in., dark green, rather opaque, with no visible nerves between the 3 principal ones; stipules \( \frac{1}{3} \) in., tip broad. Peduncles much shorter than the leaves, terminal or in the forks, equalling or exceeding the densely few-fld. spike. Drupelets compressed, broadly obliquely ovoid.—DISTRIB. Europe, W. Siberia, N. America.

18. \( P. \) pusil'lus, L.; stem filiform, leaves \( \frac{1}{2} \)-amplexicaul narrowly linear acute acuminate or subacute 1-3- (rarely 5-7-) nerved, stipules small acute, peduncles slender, spike few-fld., dry drupelets small turbid obtusely keeled, beak stout.

Rivers, ponds, and ditches, from Orkney southd.; ascends to 1,000 ft. in the Highlands; Ireland; fl. July–Aug.—Stem often much branched, rarely slightly compressed. Leaves \( \frac{1}{2} - 3 \) by \( \frac{1}{10} - \frac{1}{100} \) in., rarely acuminate, green, rather opaque. Peduncle usually much longer than the 6-10-fld. spike; flowers minute. Drupelets obliquely ovoid; beak subterminal. DISTRIB. Europe (Arctic), N. Africa, N. Asia, N. America.

\( P. \) pusillus proper; leaves acute or subacute, 1-3-nerved.—VAR. tenuis'sima, Koch (\( P. \) gracilis, Bab., not Fries); smaller, leaves acuminate more spreading 1-nerved.—VAR. rigida, A. Benn.; rigid, fragile, lateral nerves of leaf faint or 0, stipules long, spike \( \frac{1}{2} \) in., drupelets obscurely keeled.—Orkney.

Sub-sp. P. Fries'ii, Rupr.; stem compressed, leaves often fascicled broader 5-rarely 7-nerved, peduncles 1-2 in. compressed, spike \( \frac{1}{2} - \frac{2}{3} \) in., interrupted, dry drupelets larger, beak shorter. \( P. \) mucronatus, Schrad.; \( P. \) compressus, Sm.—Orkney to Dorset, local; Sussex and Hants; Co. Down.

Sub-sp. P. Sturrock'ii, A. Benn.; stem filiform, leaves 2-3 in. subobtuse 3-5-nerved bright-green pellucid, peduncles very slender 2-4 in., spike \( \frac{1}{8} - \frac{1}{10} \) in., dry drupelets much smaller, beak short.—Forfar and Perth.—A very elegant and delicate plant.

F F 2
19. P. tricho‘ides, Cham. and Schl.; stem capillary, leaves 1⁄2-amplexicaul cauline setaceous 1- (rarely 3-) nerved, stipules slender acute, peduncles filiform much longer than the few-flowered spike, dry drupelets solitary, beak short.

Muddy ponds and ditches, Norfolk, E. Suffolk; W. Ireland; fl. Aug.–Oct.—Stem repeatedly dichotomously and divaricatingly branched. Leaves 1–2½ in., spreading, acuminate, dark green, rigid. Peduncles curved, longer than the leaves; flowers 3–6, very minute, monogynous. Drupes 1⁄16 in., obliquely ovoid, compressed, dorsally more or less tubercled, ventrally toothed near the base.—Distrib. From Sweden southd. and eastd., N. Africa.

SECTION 4. Leaves all similar, submerged, linear, margins flat in bud; stipules adnate with the leaf-base into a sheath.

20. P. pectina‘tus, L.; stem filiform, densely distichously branched, leaves very long linear or filiform acuminate 1–3-ribbed, peduncles long slender, flowers few remote, dry drupelets large turgid, beak short.

Fresh and brackish ditches, &c., from Orkney southd.; Ireland; Channel Islands; fl. June–Aug.—Forms dense masses. Root a small tuber. Leaves 3–8 by ½–2 in., lower 5-nerved; stipulary sheath often 1–1½ in., tip free. Peduncles not thickened upwards; flowers interruptedly whorled. Drupes very large for the plant, ½ in., dimidiate-ovoid, obscurely keeled dorsally, ventrally slightly convex.—Distrib. Europe (Arctic), N. Asia, India, Africa, N. America, Australia.

P. pectinatus proper; upper leaves 1-nerved, channelled bifistular, lower flat 3-ribbed, lateral ribs of dry drupelets conspicuous. Common. P. marî’nus, Huds., not L., is a var. with stems naked below.

Sub-sp. P. flabellâtus, Bab.; upper leaves 1–3-nerved, lower flat 3–5-nerved, lateral ribs of dry drupelets obscure. P. juncifo’lius, Kerner.—England, Scotland (very rare), Ireland.

21. P. filiformîs, Nolte; stem filiform, branches short, leaves capillary 1-nerved, peduncles longer than the leaves very slender, flowers in distant whorls, dry drupelets small, beak very short.

Lakes and ditches, Shetland to Berwick, local; Anglesea; Ireland, rare; fl. July–Sept.—Stem branched below, simple above. Leaves all capillary 1-nerved and channelled. Flowers in dense whorls. Drupes scarcely keeled, beak terminal.—Distrib. Europe (Arctic), N. Asia, N. India, N. America, Australia.

4. RUP’PIA, L.

Slender brackish-water herbs. Leaves alternate or subopposite, submerged, filiform, with stipuliform sheaths. Flowers minute, 2-sexual, proterandrous, usually 2 on opposite sides of a filiform rachis; peduncle ebracteate, terminal, but apparently lateral from being pushed aside by an axillary shoot from the last leaf, elongate after flowering. Perianth 0. Stamens 2, an upper and a lower, filaments short broad; anthers attached by the back; cells reniform distant, dehiscence vertical; pollen a curved tube with 1 median and 2 terminal nuclei. Carpels 4, sessile; stigmas
sessile peltate; ovules solitary, pendulous. Drupelets stipitate, ovoid, carried up on the greatly lengthened usually spirally coiled peduncle. Seed pendulous, testa thin; radicle large ovoid, cotyledonary end small hooked subterminal.—Distrib. Temp. and trop. regions; species 1 or more.—Etym. H. B. Ruppius, a botanical author.

**R. marit'ima, L.;** leaves opposite and alternate.
Brackish ditches, &c., N. to Shetland; rare in W. Scotland; Ireland; Channel Islands; fl. July-Sept.—Habit of *Potamogeton pectinatus.* Stem filiform, much branched, 2 ft. and upwards. Leaves 1-3 in.; the first leaf of each axillary shoot is opposite to a narrow obtuse or notched cellular scale \(\frac{1}{2}\) in. long arising from the base at the side next the axis. Peduncle short and straight in flower, fruiting 5-6 in. Drupelets \(\frac{1}{8}-\frac{1}{4}\) in., green, beaked, pedicel 1-2 in.—Distrib. All shores temp. and trop.

R. marit'ima proper; sheaths inflated, fruiting peduncles spirally coiled, anther-cells oblong, drupelets nearly straight, beak short. R. spir'al'is, Hartm.—Orkney to Somerset; rare in Ireland.

Sub-sp. R. rostell'ata, Koch; sheaths appressed, fruiting peduncles short flexuous, anther-cells subglobose, drupe gibbous, beak longer. Common; flowers earlier.—Var. na'na, Syme, has creeping stems buried in the mud, and very short pedicels. Orkney.

5. **ZANNICHEL'lia, L.** HORNED PONDWEED.

Slender water-plants. Leaves submersed, usually opposite, linear; stipules adherent to the sheathing leaf-base. Flowers minute 1- or 2-sexual, solitary or in pairs, axillary, situated in a cup-shaped sheath. Stamens 1; anther 2-celled, sagittate, cells adnate to the slender filament, dehiscence lateral, connective excurrent; pollen globose. Carpels 4-6, styles long or short, stigma peltate persistent; ovule pendulous, orthotropous. Drupelets 4-5, sessile or stalked, oblong, curved. Seed pendulous, testa membranous; radicle large, clavate; cotyledonary end slender, twice folded.—Distrib. Temp. and trop. regions; species 1 or several.—Etym. Zannichelli, a Venetian botanist.

**Z. palus'tris, L.;** achene curved, keel smooth tubercled or crenulate.
Fresh and brackish ditches and pools, N. to Orkney; rare in W. Scotland; Ireland; Channel Islands; fl. May-Aug.—Annual. Stem 3-6 in., filiform or setaceous; branches divericate. Leaves 1-3 in., opposite, subwhorled, often capillary. Flowers sessile or shortly pedicelled. Achene about \(\frac{1}{2}\) in., narrow.—Distrib. Europe, N. Africa, Siberia, India.—The following forms are defined by Mr. Baker.

Z. palus'tris proper; drupelets 2-4 sessile, back rarely crenulate, style half as long, stigma small and crenulate, filament \(\frac{1}{2}-1\) in., anther 4-celled.—Z. macroste'mon, Gay.

Sub-sp. Z. brachyst'e'mon, Gay; drupelets 2-4 nearly sessile, back crenate, style about as long, stigma large crenulate, filament \(\frac{1}{4}-\frac{1}{2}\) in., anther 2-celled. Z. palus'tris, E. B.; Z. ma'jor, Bonn.—Common.

Sub-sp. Z. peduncul'ata, Reichh.; drupelets pedicelled, back strongly muricate, style about as long, stigma large crenulate, filament \(\frac{1}{4}-\frac{1}{2}\) in., anther 2-celled. Z. pedicell'ata, E. B.
Sub-sp. Z. Polyca'pa, Nolte; drupelets often 5–6 subsessile, back cylindric, style \( \frac{1}{2} - \frac{1}{3} \) as long, stigma large repanded, filament \( \gamma_{0} - \frac{1}{3} \) in., anther 2-celled. —VAR. tenuis'sima, Fr.; very slender.


Grass-like marine plants; rootstocks matted, creeping. Stem compressed. Leaves distichious, sheathing, long, linear; stipules adherent to the sheathing leaf-base. Flowers in 2 parallel series of alternating anthers and carpels on one surface of a linear membranous peduncled spadix, which is enclosed in a sheathing leaf-like spathe. Perianth 0. Anthers sessile, 1-celled, dehiscence longitudinal; pollen of slender tubes. Carpels ovoid, fixed laterally; style subulate persistent, stigmas 2 capillary exserted from the spathe, deciduous; ovule pendulous, orthotropous. Utricle dehiscent. Seed ovoid, testa tough; embryo large, oblong, deeply grooved, cotyledonary end sigmoid, slender, sunk in the groove, plumule immersed.—DISTRIB. Various coasts; species 4.—ETYM. ζωστήρα, a riband.

1. Z. mari'na, L.; spathe dilated above the peduncle, its blade long, spadix many-fld. margin entire.

Muddy and sandy estuaries near low-water mark, N. to Shetland; Ireland; Channel Islands; fl. July–Sept.—Rootstock slender, rather fleshy. Leaves 1–3 ft., \( \frac{1}{3} - \frac{1}{2} \) in. broad, obtuse, bright green, opaque, 1–7-nerved. Spathe, including the leafy portion, 6–10 in., varying in breadth as the foliage does. Spadix 1–3 in. Flowers green, usually in series of 2 anthers (perhaps one 2-celled anther) and an ovary. Fruit \( \frac{1}{4} \) in. furrowed.—DISTRIB. Most temp. coasts (Arctic).

VAR. mari'na proper; leaves \( \frac{1}{4} - \frac{1}{3} \) in. broad 3–7-ribbed.—VAR. angustifol'ia, Syme; leaves \( \frac{1}{3} - \frac{1}{2} \) in. broad 1–3-nerved. Orkney, &c.

2. Z. na'na, Roth; spathe dilated above the peduncle, its blade short, spadix few-fld., margin with inflexed membranous appendages.

Estuaries, rare, from Forfar and Argyll to Sussex and Cornwall; Dublin Bay; fl. July–Sept.—Similar to Z. marina, var. angustifol'ia, but leaves not more than 6 in. by \( \frac{1}{2} - \frac{1}{3} \) broad; fruit shorter and very obscurely striate.—DISTRIB. Atlantic coast of Europe, N. Africa.

7. Na'ias, L.

Very slender, submerged, fresh-water herbs. Leaves linear, opposite fascicled or whorled; stipules adnate to the leaf-base. Flowers 1-sexual, solitary or crowded.—MALE. A solitary 1–4-celled anther enclosed in 2 sheaths, the outer sheath toothed; pollen large, globose.—FEMALE. A solitary sessile carpel, naked or enclosed in sheaths; style short, stigmas 2–4 persistent subulate; ovule basal, erect, anatropous. Drupe small; epicarp thin, separable. Seed ovoid, testa thin; embryo straight, oblong, radicular end largest.—DISTRIB. Various climates; species 10.—ETYM. υάις, a water-nymph.


Order LXXXVIII. Cyperaceae.

Grassy or rush-like herbs, usually perennial. *Stem* solid, often 3-gonous. *Leaves* with closed sheaths. *Flowers* 1–2-sexual, in the axils of small bracts (*glumes*), which are arranged in terete angled or compressed spikelets, beyond which the anthers and styles project. *Glumes* concave, often rigid, distichous or inserted all round the rachis, lower of each spikelet often empty. *Perianth* 0, or of 3–6 or more hypogynous scales or bristles. *Stamens* 1–6, hypogynous, filaments linear flat; anthers basifixed, linear, dehiscing inwards, 2-celled, often with a claw at the tip. *Ovary* 1-celled (in *Carex* enclosed in a coriaceous utricle, *perigynium*) formed of 1 folded or 2 convolute bracteoles; style 1, stigmas 2–3 filiform papilllose all over; ovule solitary, erect, anatropous. *Fruit* small, indehiscent, compressed or 3-gonous (in *Carex* enclosed in the perigynium). *Seed* erect, testa membranous, albumen floury; embryo minute, lenticular, at the base and outside of the albumen.—*Distrib.* All climates; genera 61; species 2,200.—*Affinities* obscure.—*Properties* 0.


Tribe II. Rhynchosporae. Spikelets 1- or few-fl., terete or compressed. *Flowers* upper or all bisexual. *Perianth* 0, or of bristles. Spikelets terete. Bristles slender or 0. Nut beaked ......5. Rhynchospora. Spikelets compressed; *glumes* distichous. Bristles various or 0.


TRIBE IV. CARICEÆ. Spikelets many-fld., terete, glumes most or all flower-bearing. Flowers unisexual; male naked; female enclosed in a perigynium. 9. Carex.

1. CYPERUS, L.

Perennial, rarely annual, rushy or grass-like herbs of various habit. Spikelets linear, compressed, in lateral or terminal usually bracteate heads, or branched umbels, or panicles. Glumes many, distichous, concave, keeled, deciduous, all or most flower-bearing. Flowers 2-sexual. Bristles 0. Stamens 1–3. Styles deciduous, not tumid at the base, stigmas 2–3. Nut 3-gonous or compressed.—DISTRIBUT. All climates but cold; species about 700.—ETYM. The old Greek name.


Marshes, very rare, Pembroke, and from Kent to Cornwall; Channel Islands; fl. Aug.–Sept.—Stem 2–3 ft., stout, creeping. Stems 2–3 ft., stout, erect, 3-quetrous, leafy at the base. Leaves few, flat, keeled; margins hardly scaberulous. Rays many, 3–6 in., slender, again umbellate. Bracts leaf-like, far exceeding the rays. Spikelets ½–⅔ in., 4–8, linear, curved, distichously crowded. Glumes lanceolate, midrib green scabrid. Nut 3-quetrous, pale.—DISTRIBUT. From France and Germany southd., N. Africa.—Rootstock aromatic, formerly used as a medicine.

2. C. fus'cus, L.; annual, dwarf, spikelets corymbose or capitate, glumes at length spreading green or pale brown.


2. HELEO'CHARIS, Br.

Tufted, erect, usually perennial glabrous herbs. Stems slender, sheathed at the base. Spikelets solitary, terminal, erect, terete angled or compressed. Glumes many, imbricate all round the rachis; lower 1–2, if any, flowerless. Flowers 2-sexual. Bristles 3–6, not longer than the glumes. Stamens 3. Style deciduous, articulate with the top of the fruit, stigmas 2–3. Fruit compressed or 3-gonous, tipped with the style-base.—DISTRIBUT. All climates, especially temp.; species about 89.—ETYM. ελος and χαλω, from delighting in marshes.
1. **H. palustris**, Br.; rootstock stout creeping branched with many tufts of leaves and stems, lowest glume broadest, bristles 4–6, nut compressed, stigmas 2.


Sub-sp. **H. uniglumis**, Link; glumes brown, edges narrow, lowest ovate almost embracing the base of the spikelet, nut faintly striate.

2. **H. multicaulis**, Sm.; rootstock short with one tuft of leaves and stems, lowest glume largest, bristles 5–6, fruit 3-gonous, stigmas 3.

Marshes, pools, &c., chiefly on moorlands, N. to Orkney; Ireland; Channel Islands; fl. July–Aug.—Similar to *H. palustris*, but differs in habit, in the obliquely truncate leaf-sheaths, and usually blunter glumes with narrower margins. *Nut* hardly striate.—**Distrib.** N. Europe, N. America.

3. **H. acicula'ris**, Sm.; rootstock stoloniferous, stems setaceous obtusely 4-gonous grooved, spikelets minute, glumes ovate obtuse, lowest broadest, bristles 1–3, nut 3-gonous ribbed, stigmas 3.


3. **SCIR'PUS, L.**

Leafy or leafless, usually tall, marsh- or water-plants; rootstock creeping. *Spikelets* several, in terminal or lateral cymes heads or clusters, or solitary, terete or compressed. *Glumes* imbricate all round the rachis or distichous, all but the 1–2 lowest flower-bearing. *Flowers* 2-sexual. *Bristles* 1–6, included, or 0. *Stamens* 3. *Style* 2–3-cleft, not swollen at the base, deciduous. *Nut* compressed or 3-gonous, top not swollen.—**Distrib.** All climates; species about 300.—**Etym.** The old Latin name.

**Section 1.** *Spikelets* large, lateral or terminal, cymose or clustered and sessile; glumes numerous. *Bristles* 1–6.
1. **S. lacus’tris**, *L.*; stems terete usually leafless, cymes terminal longer than the bracts, branches stout, spikelets solitary or clustered, glumes obtusely 2-lobed mucronate ciliate. *Bulrush.*

Lakes, ditches, and marshes, N. to Shetland; Ireland; Channel Islands; fl. July-Aug.—**Stems** 1–8 ft., spongy, as thick as the thumb or less, base sheathed. **Leaves** 0, or short flat and keeled in still water, or long and strap-shaped in streams. *Cyme* lateral at first, then expanding and over-topping the stem; branches few, \( \frac{1}{2}–3 \) in., strict, stout. **Spikelets** 1–6, \( \frac{1}{4}–s in., sessile, cylindric in flower, ovoid in fruit, red-brown. **Glumes** mucronate or awned. **Bristles** 4–6, shorter than the broad nut.—**DISTRIB.** Arctic, temp. and trop. regions.

S. *lacus’tris* proper; stems terete green, leaves often floating, glumes glabrous, anther-tips ciliate, nut 3-gonal.

Sub-sp. **S. Tabernæmontā’ni, Gmel.**; stems terete glaucous, glumes scabrid, anther-tips glabrous, nut compressed. *S. glauc’cus*, *Sm.*—Usually near the sea, from Forfar and Dumbarton southd.; Ireland; Channel Islands.

Sub-sp. **S. Carina’tus, Sm.**; stems green obtusely 3-gonal above, glumes smooth, anther-tips glabrous, nut compressed.—Tidal rivers, Middlesex, Kent, Cornwall.

2. **S. tri’queter, L.**; stem 3-quetrous usually leafless, cymes lateral, branches short stout, spikelets solitary or few elongate ovoid, glumes obtusely 2-lobed mucronate.

Muddy tidal rivers; Middlesex and Sussex to Cornwall; fl. Oct.—**Rootstock** slender. **Stems** 1–3 ft., strict, spongy, concave on one side. **Leaves** 0, or very short on the upper sheath. **Spikelets** in sometimes sessile clusters. **Glumes** obovate, brown, smooth. **Anther-tip** glabrous. **Bristles** 2–6. **Nut** obovoid, 3-gonal, smooth, shining.—**DISTRIB.** From Denmark southd. (excl. Spain, Greece, Turkey), E. Asia, Africa, America, Australia.


Sandy banks of St. Ouen’s Pond, Jersey; fl. June–July.—**Habit** of *S. tri’queter*, but smaller, more slender, 6–18 in.; leaves 4–6 in., channelled, keeled; spikelets \( \frac{1}{2} \) in., sessile; glumes red-brown; anther-tips acute; bristles 1–2; nut obovoid, pale.—**DISTRIB.** W. Europe, from Denmark southd.

** Stem 3-gonal, leafy. *Cymes* terminal, leafy.

4. **S. marit’imus, L.**; leaves channelled, cymes corymbose, spikelets few cylindric red-brown, glumes acutely 2-lobed awned.

Salt marshes from Ross and Skye southd.; Ireland; Channel Islands; fl. July-Aug.—**Rootstock** often tuberous. **Stems** 1–3 ft., tufted, rigid, leafy below. **Leaves** often \( \frac{1}{2} \) in. broad, elongate, keeled, dark green. **Spikelets** \( \frac{1}{2}–1 \) in., brown, peduncled or sessile; bracts \( \frac{1}{2}–1 \) ft.; glumes glabrous or pubescent. **Bristles** 1–6. **Nut** compressed or 3-gonal, truncate, dotted, shining.—**DISTRIB.** Europe (Arctic), N. Africa, W. Siberia, N.W. India, N. America.
5. **S. sylvaticus**, *L.*; leaves flat, cymes effuse, branches many divaricate, spikelets small ovoid green, glumes entire obtuse.

Moist shaded places, from Argyll and Banff southd.; Ireland; fl. July.—

**SECTION 2.** Spikelets small, lateral, sessile, fascicled, rarely solitary; glumes few or many. Bristles 0. *(Isolepis, Br.)*

6. **S. setacea**, *L.*; stems filiform, leaves 1–2 narrow channelled, spikelets 1–3 lateral, nut obovoid 3-gonous ribbed and striate.


7. **S. Sa'vii**, *Scb. and Maur.*; stems filiform, leaves 1–2 narrow channelled, spikelets 1–3 subterminal, fruit subglobose 3-gonous not furrowed.

Wet bogs, W. Scotland, from Isla southd.; Lancashire; Wales and Suffolk to Hants and Corwall; Ireland; Channel Islands; fl. July.—Very similar to *S. setacea*, but larger, paler, often 10 in., with longer leaves; fruit paler, shining, dotted in lines. Spikelet sometimes solitary (*S. pyg'mea*, Kunth).—DISTRIB. W. France, S. Europe, N. Africa.


9. **S. Holoschæ'nus**, *L.*; stems tall terete stout, leaves few erect subulate rigid channelled, spikelets in compact globose cymose heads, fruit subglobose mucronate transversely wrinkled.


**SECTION 3.** Spikelets small, terminal, solitary; glumes few or many. Bristles 3–8. *(Bæothryon, Ehrh.)*
10. **S. caespitosus**, L.; rootstock and leaves very short, 2 lowest glumes fertile equalling or exceeding the spike mucronate or awned, bristles 4-6 smooth, obovoid 3-quetrous acuminate. *Eleocharis*, Link.


Moorlands, N. to Caithness; ascends to 2,100 ft. in Yorkshire; Ireland; Channel Islands; fl. July–Aug.—Similar to *S. caespitosus*, but: leafless, smaller; lowest glume obtuse, with the rib not produced to the top; and anthers not apiculate. *Nut* pale, minutely striate; beak slightly contracted at the base, representing the tumid top of the nut of *Heleocharis*.—DISTRIB. Europe (Arctic) (excl. Greece), N. and W. Asia, N. America.


**SECTION 4.** Spikelets small, in a terminal erect bracteate distichous spike; glumes few. *Bristles* 3–6. (*Blys'mus*, Panz.)


Wet pastures, especially near the sea, from N. Wales and Lincoln to Shetland; N. Ireland; fl. July.—Rootstock creeping. *Stems* tufted, 3–12 in.

4. ERIOPH'ORUM, L. Cotton-Grass.

Perennial, tufted herbs. Spikelets terminal or lateral, solitary or cymose, terete. Glumes imbricate all round the rachis, all but 2–3 lowest flower-bearing. Flowers 2-sexual. Bristles 4–6 or very many, capillary, flat, at length greatly exceeding the spikelets. Stamens 1–3. Style deciduous, base not tumid, stigmas 2–3. Nut 3-gonous or compressed.—Distr. N. temp. and Arctic regions; species about 12.—Etym. ἔριος and φόδα, from the cottony heads.

* Spikelet solitary, terminal, ebracteate.

1. E. vagina'tum, L.; stems glabrous, leaves filiform 3-quetrous, spikelet ovoid many-fl., bristles very many.

Boggy moors, Shetland to Sussex and Cornwall; ascends to near 3,000 ft. in the Highlands; Ireland; fl. April–May.—Rootstock short. Stems many, tufted, 6–10 in., longer in fruit, terete below, 3-gonous above, with 1–2 inflated leafless sheaths above the middle. Leaves very short. Spikelet ⅓–1 in., erect. Glumes hyaline, broadly ovate, olive-green. Nut obovoid, obtuse, mucronate, compressed.—Distr. N. and Mid. Europe (Arctic), N. and W. Asia, N.W. Tibet, N. America.


** Spikelets in lateral corymbiform cymes, drooping, bracteate.


Bogs, Shetland to Cornwall and Sussex; ascends to near 3,500 ft. in the Highlands; Ireland; Channel Islands; fl. May–June.—Rootstock stout. Stems 6–18 in., stout or slender, smooth, leafy. Leaves chiefly radical, variable in breadth. Heads rarely solitary, very variable in number, size, and length of peduncles. Glumes ⅓–⅔ in., lead-coloured, oblong- or ovate-lanceolate, membranous. Bristles when fully grown 1½–2 in.—Distr. Europe (Arctic) (excl. Greece), N. Asia, N. America. E. polysta'chion proper; rootstock long, stems not tufted solid, leaves channelled 3-gonous above the middle, branches of cyme smooth, glumes ovate, margins broad scarios. E. angustifo'lium, Roth.; E. grac'ile, Sm., not Koch.

Sub-sp. E. latifo'lium, Hoppe; rootstock short, stems tufted slender trique-trous hollow, leaves flat tip short 3-gonous, branches of cyme scaberulous,
glumes lanceolate with very narrow scarious margins. *E. pubes'cens*, Sm.—
Local; ascends to 1,500 ft. in N. England; rare in Ireland.

4. *E. grac'ile*, Koch; stems very slender 3-gonous, leaves very narrow 3-quetrous throughout channelled, bracts 1–2 small, spikelets 3–6, fruit narrowly obovate-lanceolate obtuse not mucronate.

Bogs, very rare, Yorkshire, Surrey, Hants; fl. June–July.—A doubtful species somewhat intermediate between *polysta'chion* and *latifo'lium*. Stem very slender, 1–2 ft., leaves short, exceedingly narrow; heads small; glumes broad, obtuse, distinctly ribbed, brown, without scarious margins; nut very narrow.—Distrib. N. and Mid. Europe (Arctic), Siberia, N. America.

5. **RHYNCHO'SPORA**, Vahl.

Perennial, tufted, leafy sedges. Spikelets terete, in axillary and terminal corymb or panicles. Glumes imbricate all round the rachis, 1–2 only flower-bearing. Flowers 2-sexual, or the upper 1-sexual. Bristles 6 or more, rarely 0. Style-base tumid, hardened, persistent, stigmas 3. Nut compressed or 3-gonous, tipped by a tumid tubercle.—Distrib. Temp. and trop.; species about 200.—Etym. ὁνξος and ἁρπα, from the beaked fruit.

1. *R. al'ba*, Vahl; spikelets pale 1-fld., bristles many barbed, stamens 2, fruit obovoid contracted below equalling the tumid tubercle.


6. **SCHÆ'NUS**, L.

S. nigricans, L.; stems terete, spike obovoid usually much shorter than the bract.


7. CLADIDUM, P. Brown.

Coarse, harsh, perennial, usually tall, grassy herbs. Spikelets terete, usually panicked or cymose. Glumes few, concave, imbricate all round the rachis, 1–3 only flower-bearing. Flowers 2-sexual, or the lower male. Bristles 0. Stamens 2–3. Style deciduous, tumid but not jointed at the base, stigmas 2–3. Nut globose ovoid or 3-gonous, mucronate or beaked, pericarp thick corky, endocarp hard.—Distrib. All climates except very cold; species about 20.—Etym. κλάδος, a twig.

C. Maris’cus, Br.; stems terete, spikelets clustered on the branches of many crowded compound cymes. C. germanicum, Schrad. (an older name).


8. KOBRESIA, Willd.

Small perennial sedges. Leaves rigid, keeled. Spikelets in a terminal compressed ovoid spike, few-fld., some male, others male (upper) and female. Glumes 2–3, imbricate all round the rachis, lowest flowerless. Bristles 0.—Male fl. Stamens 3.—Female fl. at the base of a convolute bract. Ovary 3-gonous; style-base simple, stigmas 3. Nut 3-gonous.—Distrib. Arctic and Alpine Europe, N. Asia, Himalaya; species 8.—Etym. De Kobres, a German patron of botany.

K. caricina, Willd.; lower spikelets with one female flower.

Upland moors, York, Durham, Westmoreland, Argyll, and Perth (ascends to about 2,500 ft.); fl. Aug.—Rootstock short. Stems 4–9 in., densely tufted,
rigid, terete, leafy at the base only. Leaves 2–5 in., wiry, recurved, grooved, margins convolute. Spike ½–1 in., narrow. Spikelets subdistichous, sessile, cylindric; bracts small, lowest with a rigid serrulate point. Glumes ½ in., rigid, ovate-oblong, obtuse, pale brown, basal always empty, second of the lower spikelets female, the third male; in the upper spikelets both flowers are male. Nut as long as the glumes, linear, beaked, pale.—Distrib. Arctic and Alpine Europe, Greenland, Rocky Mts.


Perennial grass-like herbs. Stems usually leafy. Spikelets 1–2-sexual, rarely dioecious, terete, solitary or in heads spikes racemes or panicles, all 2-sexual or lower female with often a few male fl. at the base or top, and upper male with often a few female at the top or base. Glumes imbricate all round the rachis, persistent or deciduous.—Male fl. Stamens 2–3, without perianth or bristles.—Female fl. a compressed or 3-quetrous ovary, included in an urceolate 2-toothed sac, from which the 2–3 stigmas project. Nut minute, coriaceous, compressed or 3-gonous, included in the sac (perigynium).—Distrib. All climates, rare in trop., abundant in Arctic and cold; species about 500.—Etym. kelpa, from the cutting foliage.—Sometimes a slender rudimentary rachis (racheola) occurs in the perigynium, at the base of the ovary.

Section 1. Spikelet solitary, terminal.

1. C. pauciflora, Lightf.; monoeccious, leaves involute, spikelet ebracteate, glumes 4–6, upper male, perigynia reflexed, stigmas 3.


2. C. pulicaris, L.; monoeccious, leaves involute, spikelet ebracteate, glumes 6–12, upper male, perigynia reflexed, stigmas 2.

Bogs, N. to Shetland; ascends to 2,700 ft. in the Highlands; Ireland; Channel Islands; fl. May–June.—Rootstock tufted; stolons 0 or short. Stems 3–8 in., smooth, rather rigid, terete, grooved. Leaves setaceous, often exceeding the stem. Spikelets ½–1 in. Glumes ⅓ in., lower sometimes remote, ovate-oblong, subacute, about ⅓ as long as the ovate-lanceolate stalked compressed beaked pale perigynia. Racheola linear, sometimes floriferous. Fruit oblong, plano-convex, grey.—Distrib. N. and Alpine Europe, N. Asia.

3. C. Davallia’na, Sm.; dioecious, leaves filiform flat rough, spikelet ebracteate, glumes numerous, perigynia reflexed, stigmas 2.

Near Bath (extinct); fl. June.—Rootstock tufted, stolons 0. Stems 6–18 in., very slender, strict, rough. Spikelet ⅓–⅔ in. long, cylindric-oblong; male very narrow, glumes linear-oblong; female glumes ovate, acuminate, pale
chestnut-brown, persistent, equalling the ovoid-lanceolate rather decurved sessile beaked perigynia.—Distrib. From Holland and the Pyrenees E. to Austria and S. Russia.

4. *C. dioic'a, L.*; leaves setaceous smooth, spikelet ebracteate dioecious or male below, glumes many, perigynia erect or spreading, stigmas 2.

Bogs and moorlands, Shetland to Somerset and Sussex; ascends to nearly 2,900 ft. in the Highlands; rarer in Ireland; fl. May–June.—Rootstock creeping, stoloniferous. Stems 6–12 in., terete, striate, wiry. Spikelets: male 1 1/3–2 in., very narrow, cylindric, glumes oblong-lanceolate, pale; female 1 1/2–2 in., ovoid, glumes ovate, brown, deciduous, shorter than the sessile ovoid beaked ribbed plano-convex perigynia. Nut lenticular, chestnut-brown.—Distrib. Europe (Arctic), Siberia, N. America.

5. *C. rupe'stri, All.*; leaves channelled, bract subulate or 0, glumes few, upper male, perigynia erect, stigmas 3.


Section 2. Spikelets short, sessile, most or all 2-sexual, all similar. Bracts 0, or setaceous or leafy, never sheathing. Stigmas 2.

* Spikelets in simple spikes or heads, male usually at the top only (spike sometimes compound at the base in 8, dis'ticha; see also 12, murica'ta). Rootstock creeping.

6. *C. incur'va, Lightf.*; stems short, spikelets capitate, bract 0, perigynia longer than the ovate obtuse glumes, beak abrupt short smooth.


7. *C. divi'sa, Huds.*; slender, spikelets short crowded bracteate, perigynia ovoid equalling the ovate cuspidate glumes, beak 2-fid serrulate.


8. *C. dis'ticha, Huds.*; stems long, spikelets in an elongate head, bracts small, perigynia stipitate elliptic-ovoid ribbed exceeding the acuminate glumes, wing and 2-fid beak serrulate. *C. interme'dia, Good.*
Wet meadows and marshes, from Lanark and Aberdeen southd.; ascends to 1,200 ft. in the Highlands; Ireland; fl. June.—Rootstock creeping. Stems 1–3 ft., stouter than in C. divisa, leafy, 3-gonous, scaberulous above. Leaves ½–1 in. broad, flat. Spike ½–3 in., subdistichous, pale brown, sometimes compound at the base, the upper and lower spikelets usually wholly male, intermediate chiefly male; bract never large and leafy. Nut ovoid, ferruginous.—Distrib. Europe, N. Asia, N. America.

9. C. arenaria, L.; stems short, spike oblong, bracts setaceous, perigynia substipitate elliptic-ovoid ribbed winged exceeding the subaristate glumes, wing broad and 2-fid beak serrulate.

Sandy sea-shores, N. to Shetland, and inland in Surrey, Norfolk, and Suffolk; Ireland; Channel Islands; fl. June.—Very near C. disticha, but habit different, shorter; leaves rigid, curved; glumes more mucronate, and fruit with a broad coriaceous wing. Rootstock very long, stout, branched, binding the sands. Stems 8–12 in., stout, curved, 3-quetrous, scabrid above. Leaves chiefly radical, stiff, margin involute. Spike 1–3 in., compressed, pale brown. Spikelets many, lower female, upper usually male, intermediate 2-sexual. Nut plano-convex, chestnut, shining.—Distrib. Europe, Siberia.

Var. C. ligervica, Gay, is a more slender form with female spikelets at the top.—Scilly Islands. N. and W. Europe.

** Spikelets male at the top only, in compound heads spikes or panicles (rarely simply spiked or capitulate in 12, murica'ta; see also 8, dis'ticha).

10. C. paniculata, L.; stout, rootstock very short, spikelets many in a broad or narrow elongate panicle, perigynia ovoid many-nerved below broadly 3-gonous equalling the pale margined ovate subaristate glumes, beak narrow 2-toothed serrulate.

Wet copses and marshes, from Orkney southd.; Ireland; Channel Islands; fl. June–July.—Rootstocks densely matted, forming tussocks 2–4 ft. diam. Stems 1–4 ft., leafy, stout, 3-quetrous, scaberulous above. Leaves harsh, long, narrow, flat. Panicle 2–6 in., very variable, rarely reduced to a simple spike, pale brown. Branches short or long; bracts 0 or setaceous. Spikelets crowded, pale brown. Perigynia truncate or cordate below, opaque, narrowed into the long beak. Nut ovoid, base narrowed, biconvex, base of style tumid.—Distrib. From Sweden southd., Canaries, W. Siberia.

C. paniculata proper; panicle usually broad.

Sub-sp. C. paradox'a, Willd.; stem clothed below with black erect nerves of old sheaths, panicles smaller laxer, beak of perigynia narrower split to the base with overlapping margins, nerves as in C. paniculata.—Bogs, very rare; Middlesex, Norfolk, York, Westmeath.—Distrib. Europe (Arctic), Siberia.

11. C. teretiscula, Good.; slender, rootstock obliquely creeping, panicle narrow spike-like, spikelets few, perigynia spreading ovoid turgid few-nerved exceeding the ovate acuminate glumes, beak long rough 2-toothed.

Bogs and meadows, from Caithness to Devon and Kent; Ireland; fl. June.—Near C. paniculata, but forming scattered tufts (not tussocks), rootstock creeping; stems wiry, much more slender; spike shorter, broader, more
Cyperaceae.

simple; perigynia brown, shining, ribbed only at the back, where 2-4 main ribs diverge from the base and then converge under the beak. Nut obpyriiform, biconvex.—Distr. Europe (Arctic) (excl. Greece), Canaries, Himalaya, N. America, N. Zealand.—C. Ehrhartia'na, Hoppe (C. pseudo-paradoxa, Gibs.), with more numerous stems and a larger more interrupted spike, found near Manchester and Birmingham, seems hardly a variety.

12. C. murica'ta, L.; slender, spikelets few in spikes or slender panicles, bracts 0 or setaceous, perigynia spreading elliptic-ovoid smooth longer than the acuminate glumes, beak broad serrulate 2-fid. C. spica'ta, Huds.


C. Murica’ta proper; stems erect, spike more continuous, glumes brown with green keels, beak serrulate.—Drier places.—A var., pseudo-divul’sa is recorded from Malvern Links; it is intermediate between Murica’ta and divul’sa, the spike being interrupted below. It grows with Murica’ta in W. Suffolk.

Sub-sp. C. divul’sa, Good.; more slender, stems curved, spike elongate much interrupted, perigynia less spreading narrower and glumes paler, beak less serrulate.—Moist places, from York and N. Wales southd., Channel Islands.

13. C. vulpi’na, L.; stout, leaves broad flat, spike subcylindric bracteate, perigynia spreading ovoid truncate below obscurely ribbed equaling the ovate awned pale brown glumes, beak long serrulate 2-fid.


*** Spikelets male at the base, rarely at the top also, distant, alternate (rarely close in 14, echina’ta). Bracts often long and foliaceous.

14. C. echina’ta, Murr.; slender, leaves narrow, spikelets 3-5 subglobose squarrose, bracts small, perigynia broadly ovoid plano-convex striate exceeding the ovate acute glumes, beak broad notched scabrid. C. stellula’ta, Good.

Moors and bogs, N. to Shetland; ascends to near 3,000 ft. in the Highlands; Ireland; Channel Islands; fl. May–June.—Rootstock densely tufted. Stems 6-18 in., 3-gonous, minutely scabrid above, stolons 0. Leaves channelled, shorter than the stem. Spikes ½-1 in., usually very pale; upper spikelets more slender. Glumes green or with pale brown sides. Perigynia olive-green, sessile, base rounded, lateral ribs stout, facial faint. Nut lenticular, pale olive.—Distr. Europe (Arctic), N. Africa, N. Asia, N. America.—Var. C. Gry'pos, Schk.; glumes with two broad red-brown bands. Perth.
15. **C. remota**, L.; slender, leaves narrow, bracts long, spikelets oblong, perigynia erect narrow-ovoid plano-convex striate exceeding the oblong-ovate acuminate glumes, beak broad and margins above serrulate.

Copse, from Argyll and Ross southd.; ascends to 1,000 ft.; Ireland; Channel Islands; fl. June.—Tufted; branches spreading Stem 1–2 ft., inclined, 3-gonous. Leaves \( \frac{1}{10}–\frac{3}{10} \) in. broad, equalling the stems, flat. Spike 2–5 in., rachis scabrid; lower bracts often very long. Spikelets 3–9. Glumes pale brown, midrib broad green, margins white scabrid. Perigynia pale, narrowed below. Nut plano-convex, narrowed.—Distrib. Europe, N. Africa, N. Asia, Himalaya, N. America.—C. tenella, Sm., not Schk., is a starved form.—C. axillaris, Good. (A hybrid with murica ta), has taller stouter 3-quetrous stems, shorter bracts, larger spikelets, the lower crowded and compound, and broader rigid glumes. Marshes, from York southd.; Ireland.—C. Bunninghauseniana, Weihe (? a hybrid with paniculata), has slender 3-quetrous scabrid stems, long spikes, no bracts, small spikelets, pale membranous glumes, and perigynia serrulate below the middle. Marshes, from Banff southd.

**** Spikelets male at the base, or both at the top and base, in a compact head or spike. Bracts 0 or subulate (except C. leporina).

16. **C. leporina**, L.; stout, leaves narrow, spike lobed compact, perigynia elliptic-ovoid plano-convex striate equalling the lanceolate acute glumes, margins winged and long 2-fid beak serrulate. C. ovalis, Good. Wet places, N. to Shetland; ascends to 1,700 ft. in the Lake District; Ireland; Channel Islands; fl. June.—Rootstock tufted; stolons 0. Stems 5–12 in., 3-quetrous, slightly scabrid above. Leaves shorter than the stem, flat \( \frac{1}{10}–\frac{3}{10} \) in. broad, points fine. Spike \( \frac{3}{4}–1 \) in., often as broad, pale brown, compressed; spikelets male at the base only; bracts 0, or subulate (C. argyrolothina, Lond. Cat. 1867, not Hornem.). Glumes pale brown, midrib green, edges white, acuminate or cuspidate. Perigynia sessile. Nut stipitate, oblong, lenticular, shining.—Distrib. Europe (Arctic), N. and W. Asia, Rocky Mts.

17. **C. canescens**, L.; slender, leaves narrow, spike interrupted, bract 0 or minute, perigynia elliptic-ovoid plano-convex ribbed equalling the ovate acute pale glumes, beak short 2-fid serrulate. C. curta, Good. Bogs and marshes, from Isla and Elgin southd.; ascends to nearly 2,200 ft. in the Highlands; Ireland; fl. June–July.—Rootstock tufted; stolons 0. Stems 12–18 in., 3-quetrous, longer than the leaves, hardly scabrid above. Leaves flat, \( \frac{1}{10}–\frac{3}{10} \) in. broad. Spike \( \frac{3}{2}–1 \frac{1}{2} \) in., slender; spikelets 3–8, ovoid, male at the base only; bracts 0, rarely 1, subulate. Glumes very pale, edges broad scabrid. Perigynia erect, pale olive, not winged, ribs slender, beak obscure. Nut ovoid or obovoid, lenticular, pale.—Distrib. Europe (Arctic) (excl. Spain, Greece, Turkey), N. Asia, N. America, S. Chili. Var. C. alpica, Wahl. (C. vitilis, Fries; C. Persoonii, Sieb.), has spikelets fewer, few-fld., glumes browner, bead deep 2-fid in fruit.—N. Wales, York to Ross, rare, ascends to 3,600 ft.

Aberdeen Alps, alt. 3,600 ft., very rare; fl. Aug.—Rootstock tufted; stolons short. Stems 6-10 in., 3-quetrous, often curved below, smooth or scabrid above. Leaves \frac{10}{16}-\frac{1}{2} in. broad. Spikelets \frac{4}{5} in. ovoid. Glumes few, broad, dark brown, midrib green, edges white. Perigynia red-brown. Fruit obovoid.—Distr. Arctic and Alpine Europe, N. Asia, N. America.

19. C. elongata, L.; slender, leaves narrow, spike slender, spikelets many close, perigynia elliptic-lanceolate biconvex ribbed much exceeding the ovate acute glumes, beak subulate entire decurved.

Wet copses and marshes, from York to Sussex and Kent; Lough Neagh; fl. June.—Rootstock tufted, matted; stolons 0. Stems very many, 1-2 ft., 3-quetrous, scabrid, graceful, leafy. Leaves longer than the stems, flaccid, flat, \frac{1}{2}-\frac{1}{2} in. broad. Spike 1-2\frac{1}{4} in.; bracts 0. Spikelets erect or spreading, lower rarely distant. Glumes red-brown, midrib green, edges white. Perigynia pale, sessile, spreading, strongly ribbed, gradually narrowed into the beak. Fruit oblong, obtuse, plano-convex.—Distr. Europe (Arctic), N. Asia, N.W. America.

SECTION 3. Spikelets 2-6, short, ovoid, approximate, all subsimilar, 2-4 lower wholly female, upper male at the base only (rarely at the top or throughout). Lowest bract foliaceous, sheath very short or 0. Stigmas 3.

20. C. Buxbaumii, Wahl.; leaves narrow, sheath-edges filamentous, spikelets 3-5 subsessile, perigynia green ellipsoid nerved larger than the lanceolate dark glume, beak 0. C. polygama, Schk.

Stony banks, Lough Neagh; fl. July.—Rootstock short, creeping, stoloniferous. Stems 1-2 ft., rigid, 3-quetrous, leafy below. Leaves flat, \frac{1}{4}-\frac{1}{2} in. broad; sheaths red-brown, rigid. Lower bracts leafy, often exceeding the spike. Spikelets \frac{3}{4}-\frac{3}{4} in., obtuse, conspicuous from the small dark glumes and large broad imbricating perigynia. Glumes rounded, mucronate acuminate or awned, dark red-brown, midrib green. Perigynia plano-convex, mouth 2-fid, ribs slender. Nut obovoid, 3-quetrous, brown, covered with white dots.—Distr. Arctic and Alpine Europe, N. Asia, N. America, Australian Alps.

21. C. alpina, Swartz; leaves short flat, spikelets 2-4 sessile subglobose, perigynia ovoid nerveless much larger than the ovate acute blackish glumes, beak very short notched scabrid. C. Vahl'ii, Schk.

Rocky mts., Aberdeen, Forfar, alt. 2,400-2,600 ft.; fl. Aug.—Rootstock with short stolons. Stem 6-18 in., solitary, rigid, 3-quetrous, smooth or scaberulous above. Leaves short, recurved \frac{1}{2}-\frac{1}{2} in. broad. Spikelets \frac{1}{2}-\frac{3}{4} in., close, lateral subhorizontal black; bract slender. Glumes crowded, subacute, broad, without a green midrib. Perigynia broad, yellow-brown, scaberulous. Nut ellipsoid or ovoid, 3-quetrous, pale.—Distr. Arctic and Alpine Europe, N. Asia, Himalaya, N. America.

22. C. atra, L.; leaves broad, spikelets 4-6 pedicelled inclined subcylindric, perigynia suborbicular 3-gonous compressed smooth larger than the ovate subacute blackish glumes, beak short slender smooth.
Ledges of Alpine rocks, N. Wales, Westmoreland, Dumfries, and Mid. Scotland, alt. 2,400-3,700 ft.; fl. July-Aug. — Rootstock tufted, small, stoloniferous. Stem 10-28 in., inclined, 3-gonous, hardly scabrid above. Leaves rather large, \( \frac{3}{4} \) in. broad, flat, keeled. Spikelets \( \frac{1}{2}-\frac{3}{4} \) in., rarely remote, uppermost sometimes wholly male; bracts usually exceeding the spikelets, sheaths very short. Glumes erect, imbricate. Fruit 3-quetrous, elliptic. — Distr. Arctic and Alpine Europe, N. Asia, Himalaya, N. America. — Diandrous and 2-sexual flowers occur (Boott).

**SECTION 4. Spikelets mainly 1-sexual, lower all or chiefly female; upper different-looking, usually more slender, all or chiefly male.**

*Stigmas* 2 (rarely 3 in 27, *aquatilis*, and 28, *Goodenovii*). Bracts equalling the female spike, sheaths 0. (See also 50, *vesicaria*, sub-sp. *saxatilis*, and 59, *paludosa*.)

† Leaves with revolute or recurved margins (best seen when dry).

23. **C. rigida**, Good. ; stout, leaves broad short recurved, sheaths all leafing, edges not filamentous, spikelets erect short, perigynia obovoid lenticular green equalling the obtuse dark glumes, beak very short smooth.

Stony mts., from N. Wales and York to Shetland; ascends to 4,300 ft.; W. and N. Ireland; fl. June-Aug. — Rootstock creeping, tufted or not. Stems rigid, 3-quetrous, usually curved, nearly smooth. Leaves many, stiff, keeled, \( \frac{1}{4}-\frac{1}{2} \) in. broad. Bracts never much exceeding the stem. Spikelets very variable, sub sessile; male cylindric, clavate or fusiform, sometimes female below; females 3–5, \( \frac{1}{4}-\frac{1}{2} \) in., sometimes pedicelled, obtuse, cylindric or oblong, sometimes male at the top. Glumes dark, midrib green, edges narrow pale. Perigynia broad, smooth, sub obtuse. — Distr. Arctic and Alpine Europe, N. Asia, Himalaya, N. America.

24. **C. acuta**, L. ; rigid, leaves long broad, sheath-edges not filamentous, spikelets many long, perigynia compressed green broader than the dark narrow glumes, beak very short entire. **C. gradilis**, Curtis. Wet places, from the Clyde and Berwick to Kent and Somerset; Ireland; fl. May–June. — Rootstock tufted, stoloniferous or not. Stems 2–3 ft., 3-quetrous, smooth, or scabrous. Leaves equalling the stem, \( \frac{1}{4}-\frac{1}{2} \) in. broad, flaccid, lowest sheaths sometimes leafless. Spikelets 1–4 in., many, inclined, sub sessile, sometimes long-pedicelled; males 2–4, stout or slender; females 3–5. Glumes obtuse acute or cuspidate, midrib green. Perigynia elliptic or sub orbicular, smooth, sub obtuse, variable in size and breadth; ribs 3–5, faint, beak smooth. Nut plano-convex, orbicular or obovoid. — Distr. Europe (Arctic), N. and W. Asia, E. and W. N. America. — Perigynia sometimes antheriferous. — **C. tricosta**ta, Fries, is a slight variety with more orbicular and stronger ribbed perigynia, found N. Ireland.

25. **C. stricta**, Good. ; slender, leaves long erect flat, sheath-edges filamentous, lower leafless, spikelets sessile, perigynia orbicular-ovoid compressed green nervd much larger than the oblong obtuse dark glumes, beak very short notched. **C. exspitosa**, Gay, not L. Marshy places, local, from the Clyde to Kent and Dorset; Ireland; fl. May–June. — Rootstock in large dense tufts. Stems 1–3 ft., 3-quetrous, slightly

†† *Leaves* with incurved or involute margins (best seen when dry).

26. **C. trinervis**, Degl.; rigid, leaves narrow, female spikelets 2-3 sessile oblong or cylindric, perigynia oblong compressed smooth 3-5-nerved, dotted equalling the dark obtuse glumes, beak very short.


27. **C. aquatilis**, Wahl.; stem stiff, leaves long erect flat, spikelets 3-6 cylindric, perigynia suborbicular compressed pale smooth nerveless rather larger than the dark obtuse glumes, beak short smooth or 0.

Bogs and marshes in Scotland, from the Border to Caithness, rare; ascends to 3,300 ft.; fl. June-Aug.—*Rootstock* tufted, creeping, stoloniferous. *Stems* 10-24 in., 3-gonous, stout, polished, leafy below. *Leaves* ½-3 in. broad; sheaths all leafing, not filamentous. *Spikelets* 1-2½ in., slender, lower usually pedicelled; males 1-3, more slender and pale; bracts long, leafy. *Glumes* oblong or ovate, midrib bright green, margins not pale. *Perigynia* much compressed, very pale brown. *Fruit* variable, ovoid obovoid or orbicular, lenticular or 3-quetrous.—*Distrb.* Scandinavia (Arctic), Greenland, N. America.

*C. aquatilis* proper (including *var.* *minor*, Booth); stem scaberulous above, bracts long, spikelets large pale. High mts.—*Var.* *Watsoni*, Syme; stems shorter smooth, leaves narrower, bracts shorter, spikelet smaller, glumes darker purple brown. The lowland form.

28. **C. Goodenioidii**, Gay; leaves very narrow erect, spikelets 3-5 sub-sessile short, perigynia suborbicular plano-convex nerved below larger than the obtuse dark glumes, beak very short terete smooth. *C. cespito'sa*, Sm.; *C. vulgaris*, Fries.

Marshes and wet meadows, N. to Shetland; ascends to nearly 3,000 ft.; Ireland; Channel Islands; fl. May-July.—*Rootstock* tufted or creeping, sometimes extensively. *Stems* 6-24 in., 3-quetrous, scaberulous above, rigid, short and curved or long slender and erect. *Leaves* sometimes very slender, ⅓-⅕ in. broad, at others short, recurved, ¼ in. broad. *Spikelets* ½-1 in., erect, close or rather distant. *Glumes* imbricate, concolorous, or midrib green. *Perigynia* usually obtuse, green or olive, sometimes pitchy, much compressed, nerves slender, sometimes confined to the base. *Nut* orbicular, lenticular, rarely 3-quetrous.—*Distrb.* Europe (Arctic), N. America.

*C. Gibsoni*, Bab.; glumes ⅓ shorter than the more elongate acute fruit.
Yorkshire, extinct. Its author suggests its being an abnormal Goodenovii.

** Stigmas 3. Beak of perigynium short or 0; mouth truncate, entire or obliquely notched (rather long in 34, vaginata, and 35, capillaris). (See also 27 aquatilis, 28 Goodenovii, 46 extensa, 55 strigosa, 56 vesicaria, subsp. saxatilis, 59 paludosa, and 60 riparia.)

† Perigynia glabrous.

29. C. limosa, L.; stems filiform, leaves narrow glaucous, bracts short, female spikelets 1–2 drooping short, pedicels capillary, perigynia ellipsoid green equalling the broad cuspidate pale glumes, beak very short entire.

Spongy bogs, local, Caithness to Dorset and Hants; Ireland; fl. June.—Rootstock slender, creeping. Stems 6–12 in., 3-quenous. Leaves as long, \( \frac{1}{3} \) in. broad, recurved, margins scabrous. Male spikelet erect, slender, sometimes female at the top; female 1–3, \( \frac{1}{3} \) in., about equalling the pedicels, cylindric or oblong; bracts scarcely sheathing. Glumes few, large, lax, midrib greenish ribbed, edges brown. Perigynia sub-3-gonous, cuspidate, glaucous. Nut oval, 3-gonous.—Distrib. Europe (Arctic) (excl. Greece, Turkey), N. and W. Asia, N. America.

C. limosa proper; stem scabrid above, leaves concave, edges rough, glumes with green midrib, perigynia compressed, strongly ribbed.—England, Scotland, Ireland.

Sub-sp. C. irrig'ua, Hoppe; stems almost smooth, leaves flat shorter scarcely glaucous, glumes larger, points elongate, midrib not green, perigynia more turgid.—Argyll to Dorset.

30. C. rariflo'ra, Sm. ; stems wiry, leaves narrow erect, bracts short, female spikelets 2–3 pendulous few-fld., perigynia pedicelled elliptic or obovoid green embraced by the obtuse shining glume, beak short entire.

Alpine bogs, Forfar, Aberdeen, Banff, Inverness, alt. 2,400–3,000 ft.; fl. June–July.—Rootstock creeping. Stems 3-gonous, 6–12 in., smooth, leafy below only. Leaves flat, \( \frac{1}{3} \) in. Male spikelet 1, short, suberect; female \( \frac{1}{3} \) in., about equalling the capillary pedicels, 6–8-fld. Glumes pale brown, membranous, concolorous, midrib indistinct. Perigynia brown, 3-gonous, smooth, obscurely nervé. Nut oblong, 3-gonous, dotted.—Distrib. N. Scandinavia (Arctic), Kamtschatka, N. America.

31. C. glau'ca, Murr. ; stems wiry, leaves narrow flat glaucous, female spikelets 4–6 suberect cylindric many-fld., perigynia sessile turgid equalling the short dark glumes, beak short terete deflexed entire.

Rocks, woods, and pastures, N. to Shetland; ascends to 2,000 ft. in Yorkshire; Ireland; Channel Islands; fl. June–July.—Rootstock creeping, stoloniferous. Stems few, \( \frac{1}{3} \)–2 ft., trigonous, smooth. Leaves erect or recurved, \( \frac{1}{3} \)–\( \frac{1}{2} \) in. broad. Male spikelets several; female \( \frac{1}{3} \)–2 in., shortly pedicelled; bracts with short sheaths or 0. Glumes close-set, acute or obtuse, dark brown, midrib greenish, margins green or not. Perigynia not ribbed, obovoid or orbicular, rough.—Distrib. Europe, N. Africa, Siberia.

C. glau'ca proper (C. recur'va, Huds.); spikelets cylindric, glumes acute.—Var. C. Michelid'na, Sm.; spikelets cylindric, glumes obtuse. Alpine.—
32. *C. pallescens*, L.; stems wiry, leaves hairy erect flat, female spikelets 2–3 close oblong, perigynia elliptic 3-gonous obtuse smooth shining green larger than the ovate cuspidate glumes, beak obscure entire.

Marshy copses and meadows, from Caithness southd.; ascends to 1,900 ft. in the Highlands; Ireland; Channel Islands; fl. June–July. Rootstock tufted, stolons 0. *Stems* 1–2 ft., 3-quetrous, slender, often leafy, scaberulous. *Leaves* $\frac{1}{4}$–$\frac{1}{2}$ in. broad, green; hairs scattered, soft. *Male spikelets* erect, pale yellow-red; *female* $\frac{1}{2}$ in., shortly pedicelled; bracts foliaceous, sheaths short. *Glumes* few, very pale brown, margins whitish, midrib green. *Nut* obovoid, 3-quetrous, dotted and striate.—*Distrib.* Europe (Arctic) (excl. Spain, Greece), Siberia, N. America.

33. *C. panicea*, L.; stems curved, leaves glaucous flat, bract-sheaths long, spikelets oblong, perigynia 3-gonous smooth dotted exceeding the ovate dark glumes, beak very short terete decurved obliquely notched.

Wet meadows, &c., N. to Shetland; ascends to 2,300 ft. in the Highlands; Ireland; Channel Islands; fl. June–July.—Rootstock tufted, creeping, stoloniferous. *Stems* 1–2 ft., leafy, 3-gonous, smooth. *Leaves* $\frac{1}{4}$–$\frac{1}{2}$ in. broad, margins rough. *Male spikelets* 1–2, narrow, clavate; *female* 2–4, $\frac{1}{4}$–$\frac{3}{4}$ in., rather distant, inclined, oblong or cylindric, dark, lower rarely long-pedicelled; bracts variable. *Glumes* obtuse acute or cuspidate, midrib broad green rarely concolorous, edges pale. *Perigynia* ovoid, pale brown, nerves obsolete. *Nut* 3-quetrous, brown, dotted.—*Distrib.* Europe (Arctic), N. Asia, N. America.

34. *C. vagina*ta, Tausch; stems curved, leaves recurved keeled, bract long, sheath loose, spikelets short lax-fld., perigynia 3-gonous turgid smooth longer than the ovate brown obtuse glumes, beak cylindric decurved obliquely 2-fld. *C. salit'na*, Don; *C. Mieli'chafé'ri*, and *C. phaeosta'chya*, Sm. not Schk.; *C. scot'ica*, Spr.; *C. sparsisto'ra*, Steud.

Rocky mts. of Dumbarton to Sutherland, alt. 2,000–3,800 ft.; fl. July.—Habit, &c., of *C. panicea*, but leaves more radical, broader, recurved, never glaucous; bracts shorter, sheaths looser; spikelets laxer-fld.; glumes paler, more obtuse; perigynia longer obovoid and decurved, beak longer, cylindric. *Nut* elliptic, 3-quetrous, beaked.—*Distrib.* Arctic Europe and America, Germany, Siberia.—Stigmas 2–4 (*Boott*).

35. *C. capillaris*, L.; stems short, leaves recurved flat, bracts large, sheath long, female spikelets few-flowered pendulous, perigynia pedicelled elliptic-lanceolate 3-gonous smooth shining much exceeding the pale hyaline obtuse glumes, beak slender entire.

Grassy mountain banks and rocks, local, York to Shetland; ascends to 2,700 ft. in the Highlands; fl. June–July.—Rootstock tufted. *Stems* 4–8 in., 3-gonous, smooth. *Leaves* chiefly radical, soft. *Spikelets* small; *male* very slender; *female* 2–3, $\frac{1}{4}$–$\frac{3}{4}$ in., shorter than the capillary pedicel; upper bracts with hyaline tips, lower much larger. *Glumes* scattered, embracing.
the fruit, caducous, margins broad pale, nerves brown. Perigynia slightly decurved, not ribbed. Nut elliptic-ovoid, 3-quetrous.—Distrib. Arctic N. and Alpine Europe, N. Asia, N. America.

36. C. pen'dula, Huds.; stems tall leafy, leaves broad flat, bract-sheaths long, spikelets many very long slender drooping, perigynia ovoid turgid. 3-gonous smooth membranous green much exceeding the awned glumes, beak short terete decurved smooth notched.

Damp woods, &c., from Lanark and Elgin southd.; local in Ireland; fl. May–June.—Rootstock tufted, stolons 0. Stems 3–6 ft., 3-gonous, smooth or scaberulous. Leaves pale-green, not glaucescent beneath, ½–1 in. broad. Spikelets 3–5 in., males 1–3, inclined, sometimes interruptedly male and fem., or fem. at the base only; females subsessile, graceful, curved, obtuse, dense-fld., pedicels wholly included in the very leafy bracts. Glumes spreading, small, oblong, obtuse or 2-fld., pale brown, awn hispid, midrib green, margins pale ragged. Perigynia narrow at both ends, gibbous above. Nut short, broad, pale, 3-quetrous.—Distrib. From Belgium southd., N. Africa.

†† Perigynia hairy. Spikelets short in all but 42, 43.

37. C. pra'e'cox, Jacq.; leaves short flat curved, bract-sheaths short, spikelets few close, perigynia broadly ellipsoid turgid 3-gonous hispid brown equalling the brown obtuse or cuspidate glumes, beak very short.

Moors, heaths, and pastures, N. to Shetland; ascends to 2,300 ft. in the Highlands; Ireland; Channel Islands; fl. April–May.—Rootstock creeping, stoloniferous. Stems 6–12 in., 3-gonous, quite naked above, smooth or scaberulous. Leaves ½–1 in. broad, densely tufted, keeled. Spikelets crowded, subsessile; male slender, erect; female 2–3, ½–3 in., inclined, oblong, rather dense-fld. Glumes small, broad, edges brown, midrib green; bracts variable. Perigynia subsessile, coriaceous, olive, opaque. Nut 3-gonous, short, brown, crowned with a minute ring.—Distrib. Europe, N. Asia; introd. in N. America.

38. C. toment'o'sa, L.; slender, leaves glauncous beneath, bract-sheaths 0, spikelets few short close, perigynia obovoid 3-gonous pubescent green exceeding the acute glumes, beak very short notched.

Wet meadows, N. Wilts; fl. June.—Rootstock creeping, stoloniferous. Stems 10–18 in., 3-quetrous, scaberulous above. Leaves 3 in. broad, curved, glabrous, flat. Spikelets subsessile; male solitary, erect; female 1–2, inclined, ½–1 in.; bracts long or short. Glumes very small, ovate, sometimes cuspidate, midrib green, edges brown. Perigynia coriaceous, turgid, beak distinct slightly decurved. Nut 3-gonous, obovoid, pale.—Distrib. From the Baltic to France, and E. to Italy and Turkey.

39. C. pilulif'er'a, L.; slender, leaves recurved, bract-sheath 0, spikelets few short few-fld. close, perigynia stipitate subglobose pubescent equalling the ovate cuspidate brown glumes, beak very short notched.

Heaths, woods, and moors, N. to Shetland; ascends to 3,300 ft. in the Highlands; Ireland; Channel Islands; fl. June.—Rootstock tufted, stolons 0. Stems 6–20 in., 3-gonous, scaberulous. Leaves ½–1 in., chiefly radical, broad,
short, flat, keeled. Spikelets sessile; male slender; female $\frac{1}{6}-\frac{1}{3}$ in., sub-globose; bracts hardly leafy. Glumes rather spreading, brown, midrib green, edges brown or narrowly pale. Perigynia opaque, hardly 3-gonous, pedicel flat. Nut subglobose, brown.—Distrib. Europe (Arctic), W. Asia, Kamtschatka, N. America.—Var. Lee’sii, Ridley (C. saxum’bra, Lees), is a drawn-out form growing in shaded places in Yorks.

40. C. monta’na, L.; slender, leaves narrow, bract glumaceous, spikelets few small close, perigynia obovoid 3-gonous hirsute ribbed exceeding the obovate mucronate glumes, beak notched. C. colli’na, Willd.

Heaths, woods, and fields, local; Worcester, Hereford, Monmouth, Gloster, Devon, Hants, Sussex; fl. April–May.—Rootstock very stout, creeping and tufted. Stems 6–15 in., 3-quetricous, strict, then curved, scaberulous above. Leaves $\frac{1}{2}-\frac{3}{4}$ in. broad, usually shorter than the stem, straight or flexuous; young pubescent. Spikelets sessile, usually very close, bright red-brown, polished; male $\frac{1}{6}$ in., solitary, stout; female 1–3, $\frac{1}{4}$–$\frac{1}{3}$ in., more slender, few-fld.; bract broad; membranous, awn subulate or green or 0, sheath very short. Glumes broad, chestnut-brown, embracing the spreading subtilimate perigynia, obtuse or retuse and mucronate, midrib pale, edges brown. Nut pedicelled, pale.—Distrib. Europe, W. Siberia.

41. C. ericeto’rum, Poll.; stems short curved, leaves recurved keeled, bract glumaceous, spikelets few capitate, perigynia obovoid pubescent equaling the broadly ovate obtuse ciliate brown glumes, beak entire. C. cilia’ta, Willd.

Chalk banks, Norfolk, Suffolk, Cambridge; fl. May–June.—Rootstock branched, creeping and tufted. Stems 2–6 in., 3-gonous, stiff, smooth. Spikelets sessile, small; male $\frac{1}{6}$ in., solitary, fusiform; female 1–3, $\frac{1}{4}$–$\frac{1}{3}$ in., 6–10-fld.; bracts hardly sheathing. Glumes pale brown, midrib concolorous; margins broadly scarious. Perigynia subsessile, opaque, short. Nut obovoid, sessile, pale, 3-quetricous.—Distrib. Europe (Arctic), N. Asia.

42. C. digita’ta, L.; stems slender curved, leaves recurved flat, bract subulate, sheath long brown, spikelets slender curved, perigynia remote stipitate narrow-obovoid 3-gonous pubescent embraced by the mucronate shining glumes, beak very short straight entire.

Copse on limestone, York, Derby, Notts, Hereford to Devon and Wilts; fl. May.—Rootstock very stout, tufted. Stems 6–10 in., smooth, obtusely 3-gonous. Leaves $\frac{1}{2}$–$\frac{3}{4}$ in. broad, soft, flat, linear. Spikelets and their slender pedicels enclosed in the bracts; male solitary, $\frac{1}{2}$–$\frac{3}{4}$ in., female 2–3, $\frac{1}{2}$–1 in., 6–8-fld.; bracts membranous, brown, tip green subulate. Glumes convolute, broad, obtuse, scarious, pale red-brown, midrib narrow green, margins hyaline. Perigynia concealed, curved, green, beak terete. Nut stipitate, 3-quetricous, brown.—Distrib. Europe, Siberia.

C. digita’ta proper; bracts subulate, female spikelets close, perigynia equaling the glumes.

Sub-sp. C. ornithopo’da, Willd.; bract ovate awned, female spikelets distant, perigynia longer than the glumes, beak 0.—Derby, York.
43. *C. humilis*, Leyss. ; stems shorter than the stiff involute curved leaves, bracts glumaceous, spikelets very remote slender lax-fld., perigynia stipitate narrow-ovoid 3-gonal pubescent embraced by the very broad scarious glumes, beak short entire or 0. *C. clandesta'na*, Good.

Dry grassy hills, Hereford, Gloster, Wilts, Somerset, Dorset, Hants; fl. May. Rootstock very stout, creeping, tufted. Stems 1–3 in., 3-gonous, smooth, concealed amongst the narrow leaves. Spikelets white, scattered up the whole stem; *male* solitary, narrow, 1–1 ¼ in.; *female* 3–5, 1–1 ¼ in., enveloped in the obtuse apiculate or truncate scarious silvery bracts. Glumes silvery, clouded with pink and green. Perigynia greenish, 1-ribbed on 2 faces. *Nut* 3-quetrous, pale brown, smooth, beaked.—DISTRIB. From Belgium southd., Siberia.

*** Stigmas 3 (2–3 in 59, paludosa). Fruit with a long, usually slender, often forked beak (beak short in 46 extensa, 55 striyosa, 56 vesicaria sub-sp. saxatilis, 59 paludosa, and 60 riparia; see also 34 vaginata and 35 capit'laris).

† Perigynia hairy, nerv'd. Male spikelets several.

44. *C. hir'ta*, L. ; leaves long flat hairy, bracts leafy, sheaths long, spikelets long-pedicelled erect cylindric, perigynia ovoid turgid ribbed much longer than the ovate awned glumes, beak 2-cuspidate.

Damp copses, &c., from Inverness southd.; ascends to 1,200 ft. in N. England; Ireland; Channel Islands; fl. May–June.—Rootstock long, creeping, jointed, scaly. Stems slender, 1–2 ft., leafy, glabrous, 3-gonous, shining. Leaves 1 ¼–1 ½ in. broad, sheaths split. Spikelets: *male* 2–3, close, 1–1 ½ in., pale, glistening; *female* 2–5, 1–1 ½ in., green, distant; pedicel exserted; lower bract exceeding the stem. Glumes small, broad, scarious, midrib green; awn rigid scabrid often spreading; of male lanceolate, hyaline. Perigynia large, 1 ½ in., sessile, plano-convex, narrowed into the beak. *Nut* 3-quetrous, beaked, pale brown.—DISTRIB. Europe, N. Africa, N. Asia.—VAR. hir'afor'mis, Pers., with glabrous leaves and glumes; and VAR. ebractea'ta, Syme (found near Epsom), with glabrous obtuse glumes and leaves and bracts reduced to a subulate point, are abnormal forms.

45. *C. filiformis*, L. ; slender, leaves very long, margins involute, bracts long, sheaths short, spikelets erect, perigynia narrow-ovoid turgid pubescent equalling the lanceolate acuminate glumes, beak 2-cuspidate.

Bogs and marshes, local, Sutherland to Devon and Hants; Ireland; fl. May.—Rootstock creeping, stoloniferous. Stems 2–3 ft., slightly scabrid above, 3-gonous, leafy. Leaves numerous, very slender, stiff; sheaths red-brown, stout, lower 2–3 very long, edges filamentous, without a blade. Male spikelets 2–3, very slender, 1–2 ½ in., brown; *female* 1–3, ¾–1 in., rather lax-fld.; lower bracts filiform, overtopping the stem. Glumes chestnut-brown, margins concolorous; midrib green, of male fl. narrower and more membranous. Perigynia ¾ in., plano-convex, green, narrowed into the beak. *Nut* stipitate, 3-quetrous.—DISTRIB. Europe (Arctic), Siberia, N. America.
CAREX. [**CYPERACEAE.**]

++ *Perigynia glabrous*. Male spikelets solitary; female short, distant; bracts leafy, sheaths long (except 46 extensa and 47 flava).

46. **C. extensa**, Good.; slender, leaves setaceous, bracts very long, sheaths short, spikelets subsessile dark, perigynia rhombic or elliptic-ovate 3-gonous inflated ribbed much larger than the broad acute or mucronate glumes, beak short straight smooth 2-toothed.

Brackish marshes, from Orkney southd.; Ireland; Channel Islands; fl. June.
—Rootstock tufted. **Stems** 10–18 in., 3-gonous, smooth, slender. **Leaves** mostly below the middle, 1/4–1/2 in. broad, rigid, flexuous, shorter than the stem; margins involute. **Spikelets** 3–4, subsessile; male 1/3–3/4 in., slender, brown; female 2–4, 1/2 in., 2 upper or all contiguous; bracts at length horizontal, sheath variable. **Glumes** small, brown, midrib green, edges concolorous. *Perigynia* rather spreading, opaque, coriaceous, dull green, dotted, gradually narrowed into the beak. **Nut** shortly elliptic, olive-brown, 3-quetrous.—**Distr.** Europe, N. Africa, W. Asia, N. and S. America.

47. **C. flava**, L.; stems curved, leaves flat, bracts long, sheaths short, spikelets oblong green, perigynia spreading or deflexed ovoid 3-gonous inflated ribbed much exceeding the obtuse or subacute glumes, beak long slender scabrid 2-cuspidate.

Heaths, bogs, and marshes, from Orkney southd.; ascends to 2,900 ft. in the Highlands; Ireland; Channel Islands; fl. May–June.—**Rootstock** tufted, stolons 0. **Stems** 3–18 in., angles rather acute. **Leaves** 1/2 to nearly 1/4 in. broad, chiefly radical, often recurved, shorter than the stem, usually flat. **Spikelets** usually contiguous, sessile or pedicelled; male 3/8–1 in., fusiform; female 2–4, 1/2 in., subcylindric, squarrose; bracts spreading, sheaths variable. **Glumes** small, usually green clouded with brown. *Perigynia* sessile, variable in size, green, coriaceous, gradually narrowed into the beak. **Nut** short, 3-gonous, olive-brown, angles acute.—**Distr.** Europe (Arctic), Madeira, W. Asia, India, N. America.—In the following sub-species the spikelets are so variable that I have not introduced them.

**C. flava** proper; beak of perigynium decurved scabrid.—**Var.** **C. lepidocar'pa**, Tausch.; perigynium small, beak short nearly straight or abruptly deflexed almost smooth.

Sub-sp. **C. E'deri**, Ehrh.; usually smaller, beak of smaller perigynium straighter scabrid.

48. **C. distans**, L.; slender, leaves flat, bracts leafy, sheaths long, spikelets distant lower pedicelled, perigynia suberect ovoid turf ribbed exceeding the ovate glumes, beak slender flat scabrid 2-cuspidate.

Marshes and wet meadows, from Caithness southd.; ascends to 1,900 ft. in the Highlands; Ireland; Channel Islands; fl. June.—**Rootstock** tufted, creeping. **Stems** 10–18 in., 3-gonous, smooth or slightly scabrid above, leafy below the middle. **Leaves** 1/5–1 in. broad, glaucous, often recurved. **Spikelets**: **male** 1/3–1 in., long-pedicelled, slender; **female** 1–3, 1/2–1 in., very distant, erect, cylindric-oblong; lower bract not equalling the stem, and often not its spikelet. **Glumes** broad, subacute, brown, midrib green, margins and tip white. *Perigynia* sessile, green, opaque, gradually narrowed into the
slender flattened short straight beak, mouth membranous. *Fruit* broad, obovoid, 3-quetrous, brown.—*Distrib.* Europe, N. America?

*C. dis'tans* proper; leaves darker, bracts usually longer, female spikelets 3-4 longer, glumes more obtuse mucronate or awned less hyaline at the tip, perigynia broader black-dotted.—Brackish marshes, rare inland; extends to N. Africa.

Sub-sp. *C. ful'va*, Good.; bracts rarely equalling the stem, female spikelets 2-3, glumes obtuse or acute not mucronate, tips more or less hyaline, perigynia broad at the base not dotted. *C. Hornschuchiana*, Hoppe; *C. speirosta'chya*, Sm. Chiefly subalpine.—I have again gone into the question of *C. ful'va*, Good., this time with Mr. Baker, and we do not doubt this being the plant figured by Goodenough, and afterwards confounded with something else.—*C. xanthocar'pa*, Degl., is a sterile form, or a hybrid with *C. dis'tans*.

49. *C. biner'vis*, Sm.; slender, leaves rigid recurved flat, bracts leafy, sheaths long, spikelets all pedicelled cylindric, perigynia ovoid 3-gonous faintly ribbed green much exceeding the oblong-ovate glumes, beak flattened 2-cuspidate scabrid.

Heaths, moors, &c., N. to Shetland; ascends to 3,200 ft. in the Highlands; Ireland; fl. June-July.—Similar to *C. dis'tans*, and perhaps another sub-sp., but much coarser, often 3 ft.; rootstock stout, tufted, creeping; stems 3-quetrous, smooth, leafy; leaves often short, more rigid, keeled and recurved; female spikelets ½-1 in., browner, more numerous, stouter, longer; beak stouter and more 2-fid; glumes obtuse or mucronulate, red-brown; perigynia and leaves beneath at times dotted; I do not find the nut always obovoid, but like *ful'va*.—*Distrib.* W. Europe, N. Africa, W. Asia.

50. *C. læviga'ta*, Sm.; tall, leaves short broad, spikelets distant pedicelled inclined or drooping cylindric, perigynia subsessile elliptic-oblong or ovoid turgid ribbed green dotted longer than the acuminate glumes, beak long slender 2-cuspidate.

Wet copses and marshes, from Mull and Aberdeen southd.; ascends to 1,000 ft. in Northumbd.; Ireland; fl. June.—Closely allied to *C. biner'vis*, but much larger, 1-3 ft.; leaves almost ½ in. broad, dotted beneath; sheath auricled opposite the blade; male spikelets 1-2½ in., 3-gonous, rarely 2, with obtuse mucronate glumes; female 1½-2 in., drooping; perigynia nearly ½ in., 3-gonous, opaque, purple-dotted, beak obscurely scabrid, cusps long nearly straight. *Nut* stipitate, 3-quetrous, dotted, pale.—*Distrib.* From Holland southd., N. Africa, N. America.

51. *C. puncta'ta*, Gaud.; slender, leaves short flat subrecurved, bracts leafy, sheaths long, perigynia spreading ovoid membranous turgid dotted not ribbed shining longer than the ovate glumes, beak slender 2-fid smooth.

Marshy places near the sea, Suffolk, Hants to Cornwall, Wales, Kirkcudbright; S. Ireland; Guernsey; fl. June.—Similar to *C. dis'tans*, but very distinct in the tumid shining membranous hardly 3-gonous perigynia, ribbed at the 2 obscure angles only, and the more slender subterete beak. *Glumes* obtuse or mucronate, mucro scabrid.—The nut does not differ materially from *ful'va*—*Distrib.* Norway, Friesland, France, Italy, Switzerland, Azores.
52. **C. frigida**, Allioni; slender, leaves long flat, bracts leafy, sheaths long, spikelets red-brown shortly cylindric long pedicelled, perigynia hardly stipitate narrow lanceolate exceeding the oblong acute glumes, beak long slender, margins scabrid or smooth.

Wet turf, Aberdeen, alt. 2,700 ft.; fl. Aug.—Rootstock tufted, shortly creeping. *Stems* 6–18 in., 3-gonous, slender, with 1–2 leaves. *Radical leaves* numerous, flat, $\frac{1}{8}$–$\frac{1}{4}$ in. broad, green. *Bracts* long, leafy, shorter or longer than the inflorescence, smooth. *Spikelets* inclined, rich dark brown, remote; *male* solitary, slender, fusiform; *female* 3–5, $\frac{3}{4}$–$\frac{1}{2}$ in., long-pedicelled. *Glumes* numerous, erect, loosely appressed, dark purple with a green midrib, of the male subacute. *Perigynia* $\frac{1}{2}$–$\frac{1}{4}$ in., dark brown, not ribbed, smooth; beak straight, half as long as the body. *Stigmas* 3.—Distr. Alps of Central and S. Europe, Central Asia.—A rare instance of an alpine Scotich plant not being Scandinavian.

53. **C. depauperata**, Good.; slender, leaves long flat, bracts leafy, sheaths long, spikelets 3–4-fld. green, perigynia stipitate narrowed at both ends turgid ribbed green much larger than the lanceolate pale glumes, beak slender tip membranous.

Dry woods, Surrey, Somerset, and Kent, very rare; fl. May–June.—Rootstock tufted, shortly creeping. *Stems* 10–24 in., 3-gonous, slender, smooth, leafy. *Leaves* $\frac{1}{4}$–$\frac{1}{2}$ in. broad. *Bracts* scabrous, almost equalling the stem, flat. *Spikelets* erect, very short and distant; *male* very slender, 1–$\frac{1}{4}$ in., many-fl.; *female* 3–5, $\frac{3}{4}$–$\frac{1}{2}$ in., pedicel of lowest sometimes 2–3 in. *Glumes* remote, membranous, acuminate, embracing the base of the perigynia, back green; of the male numerous, obtuse, ciliate. *Perigynia* large, nearly $\frac{1}{2}$ in., obscurely 3-gonous, polished, ribs many slender; beak very long, straight, obscurely scabrid. *Fruit* obovoid, or obtusely 3-gonous, pale.—Distr. From France and Spain eastd. to Russia and Turkey, N. Asia.

+++ *Perigynia* glabrous. *Male spikelet* solitary; *female* long, curved or drooping. *Bracts* leafy, sheaths long.

54. **C. sylvatica**, Hudson.; slender, leaves flat broad soft, spikelets long-pedicelled very slender drooping lax-fl., perigynia stipitate short turgid 3-gonous equalling the lanceolate thin pale glumes, beak membranous very long slender 2-fl.

Damp woods, from Argyll and Aberdeen southd.; ascends to 2,000 ft. in the Highlands; Ireland; fl. May–June.—Rootstock tufted, shortly creeping. *Stems* 1–3 ft., 3-quetrous, smooth. *Leaves* $\frac{1}{4}$–$\frac{1}{2}$ in., membranous, bright green. *Bracts* leafy, sheaths long, spikelets 1–$\frac{1}{2}$ in., distant or contiguous; *male* pale; *female* sometimes branched at the base. *Glumes* lax or scattered, acuminate, membranous, with pale green back and keel; of the males brownish, obtuse, mucronate or subacutet. *Perigynia* subsessile, elliptic, rather small, brown, straight, rather shorter than the slightly compressed herbaceous smooth beak, angles ribbed, faces quite smooth. *Nut* broad 3-quetrous.—Distr. Europe, N. Asia.

55. **C. strigo'sa**, Hudson.; leaves flat broad, spikelets very slender drooping, perigynia remote elliptic-lanceolate 3-gonous ribbed a little
longer than the oblong-lanceolate acute glumes, beak obscure obliquely truncate smooth hyaline.

Woods and copses, from York and Chester to Kent and Somerset; local in Ireland; fl. May–June.—Rootstock tufted, creeping. Stems 1–2 ft., smooth, 3-gonous, leafy. Leaves \( \frac{1}{3} - \frac{1}{2} \) in. broad, usually short, pale green, flaccid; sheaths auricled opposite the blade. Male spikelet 1, \( \frac{1}{3} - 2 \) in., slender, pale; female 1\( \frac{1}{2} \)–3 in., lowest long-pedicelled, often flexuous; rachis exposed between the glumes, many-fld.; bracts leafy, usually shorter than the stems, sheaths long. Glumes small, membranous, white, base enveloping the perigynia, centre pale green. Perigynia \( \frac{1}{3} \) in., membranous, green, slightly decurved, narrowed at both ends. Nut narrow-elliptic, 3-gonous, pale.—DISTRIB. N. and Mid. Europe, Italy, W. Asia, N. Africa.

†††† Perigynia glabrous. Male spikelets several (rarely one in 56, vesicaria); female stout, usually curved and drooping. Bracts leafy, sheaths 0.

56. C. vesica'ria, L.; stout, leaves flat, spikelets cylindric, perigynia large spreading conic-ovoid inflated ribbed pale exceeding the lanceolate subacute scariosus-tipped glumes, beak stout 2-cuspidate smooth.

Bogs and marshes, from Inverness and Perth southd.; Ireland; fl. May–June.—Rootstock tufted and creeping. Stems 1–2 ft., scabrid, 3-quetrous. Leaves long, \( \frac{1}{3} - \frac{1}{2} \) in. broad, soft, sheath-edges filamentous. Spikelets many, stout; male 1–3, \( 1\frac{1}{2} - 2\frac{1}{2} \) in., slender, pale brown, sometimes female at the top; female 1–3 in., shortly pedicelled, inclined or drooping, \( \frac{1}{2} \) in. diam. when ripe; bracts overtopping the stem, sheath 0. Glumes much smaller than the perigynia, narrow, chestnut-brown, midrib pale, tip obtuse; of the males linear-oblong. Perigynia nearly \( \frac{1}{3} \) in., obscurely 3-gonous, nerves faint, dull yellow, shining; beak rigid, brown, pungent. Nut broadly elliptic, 3-gonous, pale, beak long.—DISTRIB. Europe (Arctic), N. Africa, N. and W. Asia, N.W. India, Greenland.

C. vesica'ria proper; stems 1–2 ft., male spikelets 2–3, female large 1–2\( \frac{1}{2} \) in. stout cylindric pale, perigynia elongate ribbed with a slender rigid 2-cuspidate beak, stigmas 3.—VAR. C. involu'ta, Bab., with margins of leaves involute, apiculate glumes and narrower perigynia, is intermediate between this and C. ampulla'ceae.—Hale Moss, Manchester.

Sub-sp. C. Graha'mi, Boott; perigynia brown less strongly nerv'd, beak shorter less strongly cuspidate more slender, stigmas 2.—Lofty mts. Perth, Forfar.

Sub-sp. C. saxat'ilis, L.; stems 4–10 in., male spikelet 1 rarely 2, female small \( 1\frac{1}{2} - \frac{1}{3} \) in. ovoid very dark, perigynia ovoid ribs faint or 0 with a short notched or 2-fid beak, stigmas usually 2. C. pull'la, Good., C. vesica'ria var. alpi'g'ena, Fries.—Scotch alps from Ben' Lomond northd., alt. 2,500 to 3,800 ft.—DISTRIB. Scandinavia, N. Russia, N. America.—This and C. dichroa, Anders., are alpine forms of C. vesica'ria, to which var. Graha'mi forms a passage. I accept Boott's authority for its being the true saxat'ilis of Linneus, from the testimony of his Herb., and of his pupil Solander (in Herb. Banks). The Swedish authorities, however, refer saxat'ilis to rig'ida.

57. C. ampulla'ceae, Good.; stout, leaves glaucous, margins involute, female spikelets stout cylindric pale, perigynia spreading ovoid inflated ribbed
exceeding the obovate-lanceolate scarious-tipped glumes, beak very slender 2-cuspidate smooth. *C. rostrata*, Stokes (an earlier name).

Marshes and bogs, N. to Shetland; ascends to 2,700 ft. in the Highlands; Ireland; fl. June.—Rootstock tufted and creeping. *Stem* 1–2 ft., 3-gonous, smooth, angles obtuse. *Male spikelets* 2–3, slender, sometimes fem. at the base; *female* 2–4, 1–2½ in., sessile or pedicelled, inclined, often squarrose, dense-fld.; bracts overtopping the stem, sheath 0. *Glumes* much as in *C. vesicaria*, and perigynia similar and shining, but much smaller, yellow-brown, ½–⅓ in., as broad as long, 3-quetrous, horizontal or deflexed when ripe, abruptly contracted into the long beak. *Nut* obovoid, yellow.—**DISTRIB.** Europe (Arctic), Siberia, Himalaya, N. America.

58. *C. Pseudocype'rus*, L.; stout, leaves broad, male spikelets solitary, female very long-pedicelled drooping cylindric, perigynia stipitate spreading elliptic-lanceolate ribbed green equalling the narrow awned glumes, beak very long smooth 2-cuspidate.

Banks of rivers, lakes, &c., from Elgin and Isla to Kent and Devon; rare in Ireland; fl. June.—Rootstock tufted. *Stems* 1–3 ft., 3-quetrous, scabrid. *Leaves* ⅓–½ in., flat, scabrid. *Spikelets* towards the top of the stem; *male* slender, 2–3 in., pale, often female at the top; *female* 4–5, 2–3 in., sub-squarrose, pale green; pedicels capillary, curved, sometimes 4 in.; bracts overtopping the stem, very broad, sheath 0. *Glumes* small, lanceolate or subulate, awn serrate. *Perigynia* ½ in., slender, horizontal or deflexed, 3-gonous, shining, ribs many close; beak rigid, pungent, deeply split. *Fruit* pale, 3-gonous; style persistent.—**DISTRIB.** Europe, temp. N. and S. Africa, Asia, America, Australia.

59. *C. paludo'sa*, Good.; tall, stout, leaves broad glaucous, male spikelets stout, anthers mucronate, female erect dark cylindric, perigynia ovoid ribbed exceeding the lanceolate awned glumes, beak short 2-toothed. *C. acu'la*, Curt., not L.


60. *C. riparia*, Curtis; tall, stout, leaves very broad, male spikelets stout, anthers cuspidate, female long stout cylindric, perigynia ovoid ribbed a little exceeding the ovate-oblong cuspidate glumes, beak short 2-toothed.

River-banks and ditches, from Banff and Dumbarton southd.; local in Ireland; Channel Islands; fl. May.—Much the largest British species, 3–5
ft. Rootstock creeping and tufted. Stem 2-5 ft., 3-quetrous, scabrid. Leaves flat, ½ in. broad and upwards, sheath-edges filamentous. Bract broad, overtopping the stem. Spikelets very large; male 3-6, crowded, 1½-2 in. diam., dark brown, acute, sometimes fem. at the base, mucro of anthers longer than in C. paludo'sa; female 4-6, 2-3 in., pedicelled, inclined, sometimes compound at the base or male at the top. Glumes narrow, margins brown, midrib green, tip scabrid; of male slender, acute. Perigynia ½ in., erecto-patent, dull green, narrowed into the beak; ribs many, close. Fruit elliptic, 3-quetrous, yellow.—Distrib. Europe, N. Africa, Siberia, N. and S. America.—This and the preceding are allied to C. aquat'ilis.

Order LXXXIX. Gramineae.

Herbs, usually tufted and slender. Stem cylindric or compressed, jointed, internodes usually hollow. Leaves alternate, narrow; sheath split to the base, with often a transverse membrane (ligule) or ring of hairs at its mouth. Spikelets in terminal spikes, racemes, or panicles, usually composed of one pair of flowerless (empty) glumes enclosing or subtending one or more sessile or stalked normally flower-bearing (but sometimes also empty) glumes, which are distichously arranged on a slender rachis (rachilla). Flowering glumes boat-shaped, enclosing a 1-2-sexual flower, and a flat often 2-nerved scale (palea) with inflexed edges. Perianth of 2 (rarely 0 or 3 or more) minute scales, placed opposite the palea. Stamens 3 (rarely 1, 2, 6, or more), filaments capillary; anthers 2-celled, versatile, pendulous. Ovary 1-celled, style long short or 0, stigmas usually 2 long or short feathery; ovule 1, basal, erect, anatropous. Fruit a membranous utricle, often adherent to the palea, and sometimes to the flowering glume. Seed usually adnate to the pericarp, testa membranous, albumen hard flouiry; embryo small, outside the base of the albumen, cotyledon reduced to a sheath enclosing the plumule, radicle conical below, obliquely dilated above into a broad scutellum which extends upwards and backwards beyond the cotyledon with its back against the albumen.—Distrib. All climates; genera 300; species about 3,200.—Affinities obscure.—Properties. Nutritious herbage, and farinaceous seeds; stem and leaves used for textile and other purposes.

The tribes and genera of Grasses are most difficult of classification and definition. Many systems have been proposed. The primary divisions of Fries, adopted in earlier editions of this work, namely Clisanthea (styles long, stigmas slender with simple hairs protruded at the top of the glume) and Euryanthea (style short, stigmas feathery protruded from the sides of the glume), has broken down under Bentham's searching revision of the Order (see Journ. Linn. Soc. xix. 14, and Gen. Plant. iii. 1074). I have followed Bentham's classification.
SERIES A. PANICA'CEÆ. Spikelets joined upon the pedicel below the lowest glumes; rachilla not jointed at the base nor produced beyond the uppermost glume, persistent. Glumes 4 or fewer; the terminal only bearing a 2-sexual flower, rarely a lower one bears an imperfect flower.

TRIBE I. PANICE'Æ. Spikelets dorsally compressed (laterally in Spar-tina). Fl. glume 3- or more-nerved, not awned, hardening round the fruit. (See 11, Mibora in Agrostideæ.)
Glumes 4. Pedicels of spikelets naked or hairy .................1. Panicum.

TRIBE II. ORYZE'Æ. Spikelets laterally compressed. Empty glumes minute or 0. Fl. glume and palea 1-nerved or keeled........4. Leersia.

SERIES B. POA'CEÆ. Spikelets rarely joined upon the pedicel below the lowest glume (except Alopecurus, Polypogon, and Holcus); rachilla joined at the base above the (usually 2) lowest flowerless glumes, often produced beyond the uppermost glume, and deciduous. Glumes 3 or more, 2 lowest flowerless and often persistent (Nardus has no empty glumes; and all but the uppermost spikelet in Lolium have only one lowest empty glume).

TRIBE III. PHALARIDE'Æ. Spikelets laterally compressed; rachilla not produced beyond the uppermost glume. Glumes 6, uppermost only with a 2-sexual flower. Palea 0 or in the perfect flowers 1-nerved.
Glumes 6, 3d and 4th imperfect, not awned. Stamens 3.......5. Phalaris.
Glumes 6, 3d and 4th awned, triandrous; 5th diandrous....7. Hierochloe.

TRIBE IV. AGROSTIDE'Æ. Spikelets terete or laterally compressed; rachilla produced or not beyond the fl. glume. Glumes 3, flower solitary 2-sexual; palea 2-nerved.

* Rachilla not produced beyond the fl. glume.
Panicle dense, cylindric. Fl. glume enclosing the fruit......10. Phleum.
Spikelets dorsally compressed in a simple subdistichous spike.

11. Mibora.

** Rachilla produced beyond the fl. glume.
Empty glumes large, boat-shaped; fl. glume minute, 4-toothed

15. Gastridium.
Empty glumes large; fl. glume 2-fid, awned ..................16. Apera.
Empty glumes large; fl. glumes awned, rachilla ciliate.....17. Deyeuxia.
Spikelets large, rachilla long silky.........................18. Ammophila.
Empty glumes plumose; fl. glume 3-awned..................19. Lagurus.

II H 2
TRIBE V. AVENÆ. Spikelets paniced, terete or laterally compressed, 2- rarely 3-4-fld.; rachilla produced beyond the fl. glume (except in some Airae). Glumes 4 or more, 2 lowest empty usually larger than the others, 2 or more upper flowering with a dorsal bent and twisted (except some Airae and Deschampsia) awn.

* Rachilla not produced beyond the uppermost fl. glume. .............. 20. Aira.
** Rachilla produced beyond the uppermost fl. glume; flowers all perfect or the upper imperfect.

Flowers 2; awn bent in the middle, tip clubbed .......... 21. Corynephora.
Flowers 2; awn straight ........................................... 22. Deschampsia.
Flowers 2; lower not awned, upper imperfect awned .......... 23. Holcus.
Flowers 2-6; fl. glume deeply 2-fld and awned .............. 24. Trisetum.
Flowers 2-6; fl. glume entire or 2-toothed, long-awned .......... 25. Avena.


TRIBE VI. CHLORIDEÆ. Spikelets 1-2-seriate on a flattened rachis, laterally compressed, 1- or more-fld. .............. 27. Cynodon.

TRIBE VII. FESTUCEÆ. Spikelets paniced or subsperate, terete or laterally compressed; rachilla usually produced beyond the fl. glume, often bearing a rudimentary glume. Glumes 6 or more, 2 lowest empty, the others flowering; awn terminal or 0.


SUB-TRIBE 3. Seslerieæ. Spikelets subsperate or capitate, with empty glumes (imperfect spikelets) on the pedicels below them.
Pedicels with soft glumes below the spikelets ..................... 30. Sesleria.
Pedicels with bristle-like glumes below the spikelets ............ 31. Cynosurus.

SUB-TRIBE 4. Eragrosteeæ. Spikelets 2- or more-fld. Fl. glumes 1- or 3-nerved.
Spikelets in a contracted panicle, conical, terete ............... 33. Molinia.
Spikelets in an effuse panicle with whorled branches .......... 34. Catabrosa.


Spikelets paniced, pendulous. Glumes broad, scarious, obtuse. 37. Briza

Spikelets panicked or spicate. Fl. glumes convex, tip served acute or awned. Ovary glabrous..........................40. Festuca.
Spikelets panicked, many-fld Fl. glumes convex. Ovary tip villous.

41. Bromus.
Spikelets racemed or spicate. Fl. glumes convex. Ovary tip villous.

42. Brachypodium.

TRIBE VIII. HORDEÆ. Spikelets 1- or more-fld., sessile in the notches of a simple rachis; rachilla produced beyond the uppermost fl. glume (except in Nardus). Fl. glume with a terminal awn or 0.

SUB-TRIBE 1. Triticeæ. Spikelets solitary in the notches, 3- or more-fld.
Spikelets many-fld., with their sides to the rachis ..................43. Lolium.
Spikelets many-fld., with their faces to the rachis .................44. Agropyrum.

Empty glumes 0. Spikelets second. Style long..................46. Nardus.

SUB-TRIBE 3. Elymææ. Spikelets 2 or more in each notch, collateral; the central perfect; the lateral perfect or reduced to bristles.
Spikelets 1-fld..................................................47. Hordeum.
Spikelets 2-6-fld...............................................48. Elymus.

1. PA'NICUM, L.

Spikelets without bristles at the base, or with slender hairs only, spiked racemed or panicked, 1-fld., or if 2-fld. the lower male. Empty glumes 2 in the 2-fld. spikelets, 3 in the 1-fld. ; lowest small or minute, 2d larger, strongly nervèd. Fl. glume nerved, hardening and enclosing the palea and fruit. Scales 2, fleshy, truncate. Stamens 3. Ovary glabrous; stigmas penicillate, shorter than the styles. Fruit compressed or plano-convex.

—DISTRIB. Chiefly tropical; species 270. —ETYM. The Latin name.

SECTION 1. Digita'ria, Scop. (gen.). Spikelets unilateral, on digitate spikes. Flowering glume not awned.

Sandy soil in the S.E. counties, from Norfolk to Hants, local; fl. July-Aug.—Annual. Root fibrous. Stems 6-12 in., prostrate or decumbent. Leaves narrow, flat; sheaths flat, mouth hairy; ligule short. Spikes 2-3 in., flexuous, channelled on the face. Spikelets ½ in., in pedicelled pairs, plano-convex, elliptic, purplish; empty glumes hairy, lower minute appressed or 0.—DISTRIB. Most warm climates.

SECTION 2. Echinochlo'a, Beauv. (gen.). Spikelets in racemes or panicles. Flowering glume awned or pointed.

P. CRUS-GAL'LI, L.; spikelets panicked 1-fld.
Fields and waste places in S.E. England; naturalized; fl. July.—Annual. *Stems* 1-4 ft., stout, ascending. *Leaves* ½ in. diam., flat, glabrous, edges rough, often waved; ligule 0. *Panicle* 3-6 in.; branches subunilateral; rachis 3-quetrous, pubescent; pedicel hairy. *Spikelets* ½ in., plano-convex, greenish; upper empty glume hispid, pointed or rigidly awned; fl. glume polished.—*Distrib.* All temp. and trop. regions.

2. *SETA'RIA*, Beauv.

*Spikelets* in a dense cylindric spike-like panicle, as in *Panicum*, but awnless, and with stout rough bristles at the base on one side.—*Distrib.* All warm and trop. regions; species 10.—*Etym.* *seta*, a bristle.

*S. vir'idis*, Beauv. ; bristles clustered scabrid.

Sporadic, from Aberdeen to Kent and Devon; a colonist; fl. July–Aug.—Annual. *Stems* suberect, scaberulous above. *Leaves* flat, smooth, edges rough; sheaths smooth, edges ciliate; mouth with a ring of hairs. *Panicle* 1-3 in., green; branches whorled, hispid, 3-quetrous; bristles ¼-½ in., flexuous, purplish. *Spikelets* ½ in., elliptic, obtuse; empty glumes membranous; fl. glumes shining, punctulate, striate.—*Distrib.* All warm climates; introd. in America.

S. *VERTICILLA'TA*, Beauv. ; bristles single or in pairs barbed.

Cultivated fields, Norwich, Surrey, and Middlesex; fl. July–Aug.—Habit of *S. vir'idis*, but panicle usually narrower, and the bristles truly barbed, their asperities pointing downwards.—*Distrib.* As of *S. vir'idis*.

3. *SPARTI'NA*, Schreber.

*Spikelets* long, laterally compressed, sessile in 2 ranks on one-sided paniced erect 3-gonous appressed spikes, 1-fld., with rarely a rudimentary 2d flower. *Empty glumes* 2, narrow, unequal, pointed or awned; upper 5-nerved, exceeding the flowering; lower smaller. *Fl. glume* sessile, coriaceous, edges membranous, awnless, 1-nerved, palea long 2-nerved. *Scales* 0. *Stamens* 3. *Ovary* glabrous; style very long, stigmas long hairy. *Fruit* terete or subcompressed, enveloped in the palea and fl. glume.—*Distrib.* Chiefly warm climates; species 5 or 6.—*Etym.* *σπαρτίνη*, a cord, from the use of the leaves.

*S. stric'ta*, Roth ; point of rachis of spike subulate.

Muddy salt creeks and marshes, rare, from Lincoln to Devon and Kent; Channel Islands; fl. July–Aug.—Rootstock long, branched, extensively creeping. *Stems* 1-4 ft., erect, strict, stout, polished, leafy throughout. *Leaves* ¼-½ in. broad, strict, erect, coriaceous, convolute, smooth, pungent, glaucous above; ligule short, silky. *Panicle* 3-8 in., strict; spikes 2-8, 1-3 in.; rachis angled, smooth, point equalling or exceeding the upper spikelet. *Spikelets* ¼-⅔ in., erect, yellowish green; empty glumes acute, lowest acuminate, upper 2-toothed and tipped with a stiff awn, a little silky; keel somewhat scabrid.—*Distrib.* Belgium and Spain to Austria and Italy, N. America.—Very variable.—*S. alternifl'o'ra*, Loisel, from
Southampton, has the tip of the rachis exceeding the spike.—*S. Townsen’dii*, Groves, from Hythe (Hants), has shorter leaves and a flexuous tip to the rachis.—American specimens show similar variations.

4. **LEER’SIA**, Soland.


L. **oryzoides**, Swartz; panicle effuse, stamens 3.


5. **PHAL’ARIS**, L.

*Spikelets* much laterally compressed, in open or contracted or spike-like panicles, 1-fl.d., with 2 or more rudimentary glumes (scales or pedicels) beneath the fl. glume on one side. *Empty glumes* 2, enclosing the flowering, subequal, keeled. *Fl. glume* broad. *Pala* much smaller. *Scales* 2, minute. *Stamens* 3. *Ovary* glabrous; styles long, stigmas slender feathery. *Fruit* compressed, enclosed in the coriaceous glume and pala.—**Distrib.** Trop. and temp. regions; species 9 or 10.—**Etym.** The old name.


P. arundinae, L.; panicle elongate, branches short.

Rivers, lakes, &c., N. to Shetland; ascending to nearly 1,400 ft. in N. England; Ireland; Channel Islands; fl. July–Aug.—Perennial, glabrous. Rootstock creeping. Stems 2–6 ft., stout, erect. Leaves $\frac{1}{2}$–$\frac{3}{2}$ in. broad, flat; sheaths smooth; ligule large. Panicle 4–8 in., suberect; branches scabrid, spreading only when flowering. Spikelets $\frac{2}{3}$ in., ovate, often purplish; empty glumes 3-nerved, acuminate, glabrous; fl. glume rather shorter, ovate-lanceolate, nerveless, silky; scales 2, narrow, silky.—Distrib. N. temp. and Arctic regions.

6. Anthoxanthum, L. Vernal Grass.

Sweet-scented. Spikelets cylindric, in a spike-like panicle, 1-fld., protogynous. Glumes 6 (or 5 and a palea); 2 lowest persistent acute or mucronate, very unequal, lowest 1-nerved; 2d large, 3-nerved; 3d and 4th short, keeled, hairy, 2-fid with a dorsal bent awn; 5th fl. glume, and 6th minute hyaline obtuse, awnless, outer broad 5–7-nerved, inner narrow (palea?) 1-nerved. Scales 0. Stamens 2; anthers large, linear, purple or yellow. Ovary glabrous; styles long, stigmas feathery. Fruit terete, acute, enclosed in the brown shining fl. glume and palea.—Distrib. N. temp. and cold regions of the Old World; species 4 or 5.—Etym. ἀνθός and θῦμος, from the yellow anthers.

A. odoratum, L.; perennial, panicle interrupted below, awn short scarcely exserted.

Meadows, &c., N. to Shetland; ascends to 3,400 ft. in the Highlands; Ireland; Channel Islands; fl. May–June.—Stems 6–18 in., shining, glabrous or scabrid. Leaves flat, hairy; sheaths furrowed, often pubescent, mouth hairy. Panicle 1–5 in., pubescent or villous; branches short. Spikelets $\frac{1}{3}$–$\frac{2}{3}$ in., fascicled, often squarrose, green, glabrous or hairy; 2 lowest glumes ovate, acute, upper lanceolate, almost awned; two succeeding awned glumes curved, with obliquely truncate tips; fl. glume glabrous.—Distrib. Europe (Arctic), N. Africa, N. Asia, Greenland; introd. in N. America.—Odour of Woodruff.

A. Puel’i, Lecoq. and Lamotte; annual, very slender, much branched, panicle lax, awn long slender much exserted.

Pastures and fields, Roxburgh to Devon and Hants, &c.; a modern introduction.—Stems very numerous from the root, 6–10 in., bent at the nodes. Leaves narrow, glabrous or hairy; sheaths smooth. Panicle 1–2 in., subacute. Spikelets pedicelled; 2 lowest glumes very unequal, scaberulous, membranous, lower half the length of the acuminate upper; awned glumes straight, with erose tips.—Distrib. S. and Central Europe, Mediterranean.—Odour faint.


Spikelets laterally compressed, panicled, 3-fld.; upper flower 2-sexual, 2-androus; 2 lower male, 3-androus. Empty glumes subequal, about equalling the flowering, membranous, keeled, 3-nerved. Fl. glumes
pedicelled, 5-nerved, awned or not. *Palea* of the 2-sexual fl. keeled, 1-nerved; of the male fl. 2-nerved. *Scales* lanceolate. *Ovary* glabrous; styles long, stigmas feathery. *Fruit* terete, free.—*Distrib.* Arctic and cold regions; species 10.—*Etym.* ἱερός and χάρις, sacred grass, from its being formerly strewn on church floors.

**H. borealis**, *R.* and *S.*; fl. glumes shortly awned near the tip.

Wet banks, Caithness, (Forfar, extinct); fl. May–June.—*Rootstock* creeping. *Stems* 10–18 in., tufted, smooth, glabrous. *Leaves* flat, acute, edges scabrid; sheaths smooth; ligule long. *Panicle* pyramidal, subunilateral, sparingly branched, pedicels smooth. *Spikelets* ½ in. broad, ovate, fulvous or brown, shining; empty glumes membranous, translucent, acute, toothed, mucronate; fl. glumes similar, of the male fl. hispid, ciliate; of the 2-sexual fl. hairy above.—*Distrib.* Arctic, Alpine, and N. Europe, N. and W. Asia, N. America.

### 8. ALOPECURUS, *L.* FOXTAIL GRASS.


* Empty glumes connate to or nearly to the middle.

1. **A. agrestis**, *L.*; panicle acute, keel of subglabrous glumes narrowly winged shorty ciliate, awn twice as long as the fl. glume.


2. **A. alpinus**, *Sm.*; panicle short ovoid obtuse, keel of acute silky empty glumes silkily ciliate, awn very short.

Springs and edges of alpine streams, alt. 2,100 to 3,600 ft., Ross, Aberdeen, Perth, Forfar, Inverness; fl. July–Aug.—*Perennial*. *Stems* creeping below, then erect, 6–18 in., rather stout, smooth, contracted at the top. *Leaves* short, broad, flat; sheaths inflated, upper much longer than its leaf; ligule short, obtuse. *Panicle* ½–3 in., ¾–1½ in. broad, dense; branches with 4–6 spikelets, short, silky. *Empty glumes* ½ in., ovate, very silky, shining; fl. glume glabrous, obtuse; awn variable, dorsal, rarely 0; anthers linear; yellow.—*Distrib.* Arctic regions, Fuegia.—*Var.* Watsoni, Syme,
from Aberdeenshire, has a laxer panicle, more acute purplish empty glumes, with an awn $\frac{3}{4}$ of their length.

** Empty glumes distinct or connate towards the base.

3. **A. praten'sis**, L.; stem erect, panicle slender cylindric obtuse, keel of hairy acute empty glumes villously ciliate, awn twice as long as the fl. glume.

Meadows and pastures, N. to Shetland; ascends to 2,000 ft. in N. England; Ireland; Channel Islands; fl. May-June.—Perennial, stoloniferous. **Stems** 1-3 ft., erect or lowest internode inclined, smooth. **Leaves** scaberulous, flat; sheath smooth, upper inflated, longer than its leaf; ligule large, truncate. **Panicle** 1½-2½ in., dense, soft, pale green; branches very short, with 3-6 spikelets. **Empty glumes** $\frac{1}{2}$ in., ovate-lanceolate, acute; fl. glume subacute, glabrous, ciliate, margins connate $\frac{1}{2}$ of its length.—**DISTRIB.** Europe, N. Africa, N. and W. Asia, N.W. India; introd. in America.—An excellent fodder.


Wet meadows and ditches, ascending to nearly 2,000 ft. in the N. of England; fl. May-Aug.—Perennial, rarely annual, glabrous. **Stems** 8-18 in., procumbent and rooting below. **Leaves** flat, scaberulous above and on the edges. **Panicle** 1-1½ in., slender, dense-fld.; branches with 1 spikelet. **Empty glumes** hairy and silky as in **A. praten'sis**, but smaller, $\frac{1}{10}$ in.; anthers purplish, linear.—**DISTRIB.** Europe, N. Africa, N. and W. Asia, India; introd. in N. America.

A. **genicula'tus proper**; not glaucous, sheaths cylindric, panicles cylindric, empty glumes connate at the base, fl. glume with a subbasal awn not twice its length. Common, N. to Shetland; Ireland; Channel Islands.—**A. pro'mus**, Mitt., is a prostrate form.

Sub-sp. **A. ful'vus**, Sm.; glaucous, sheaths rather inflated, panicle longer paler, empty glumes smaller $\frac{1}{3}$ in. connate below obtuse villously ciliate, awn inserted near the middle of and a little longer than the fl. glume, anthers small yellow.—N. Wales, Chester and Norfolk to Devon and Sussex.

Sub-sp. **A. bulbo'sus**, Gouan; taller, more erect, not glaucous, lowest internodes tuberous, upper sheath inflated, panicle slender subacute, empty glumes acute, free to the base, keel shortly ciliate, flowering glume longer than the palea awn subbasal twice its length.—Salt marshes, N. Wales, York and Chester, to Kent and Cornwall.

9. **MIL'ium, L.** Millet-Grass.

**Spikelets** minute, in an effuse panicle, 1-fld.; rachilla produced. **Empty glumes** 2, equalling the flowering, broad, subequal, obtuse, awnless, 3-nerved. **Fl. glume** rigid, ovate, tumid, obscurely 3-nerved, awnless. **Palaec** 2-nerved. **Scales** 2, fleshy, acute, toothed on one side. **Ovary** glabrous; styles short, stigmas feathery. **Fruit** terete, included in the hardened glumes and palea.—**DISTRIB.** Temp. and trop.; species 5 or 6.—**ETYM.** Latin for Millet, misapplied.
**M. effusum**, *L*.; leaves broad flat thin.

Damp woods from Argyll and Elgin southd.; ascends to 1,000 ft. in the Lake District; Ireland; fl. May–June.—Perennial, pale green. **Stems** 2–4 ft., tufted, erect, smooth, shining, leafy. **Leaves** $\frac{3}{2}$–3 in., linear-oblong, acute, scabrid above; sheaths smooth; ligule long, truncate, torn. **Panicle** 5–10 in., very lax and slender; branches capillary, spreading or deflexed, in remote whorls, few-fld. **Empty glumes** $\frac{3}{10}$ in., elliptic-ovoid, obtuse, scabrous, edges hyaline; fl. glume quite smooth, white, and polished when ripe.—**Distrib.** Europe (Arctic), N. and W. Asia, N. America.

**10. PHLE'UM, L.** Cat's-tail Grass.

**Spikelets** in crowded spike-like panicles, 1-fld., with rarely a rudimentary 2d. **Empty glumes** exceeding the flowering, equal, much laterally compressed, keeled, awned, or mucronate. **Fl. glume** hyaline, awned or not, 3–5-nerved, toothed. **Palea** small. **Scales** 2, hyaline, toothed on the outer margin. **Stamens** 3. **Ovary** glabrous; styles long, stigmas slender feathery. **Fruit** compressed, enclosed in the fl. glume and palea.—**Distrib.** N. and S. temp. and Arctic regions; species 10.—**Etym.** The old Greek name.

* Empty glumes truncate, tip scarious. **Fl. glume** 3-nerved.

1. **P. praten'se**, *L*.; leaf-sheaths appressed, panicle cylindric, keel of empty glumes hispid, awn rigid $\frac{1}{2}$ their length. **Timothy-grass.**

Pastures, &c., N. to Shetland; ascends to 1,400 ft. in N. England; (?) native N. of the Caled. Canal, Wats.); Ireland; Channel Islands; fl. June–Aug.—Perennial. **Stems** 6–18 in., tufted, ascending, smooth. **Leaves** short, flat; ligule long. **Panicle** 1–6 in., obtuse, green. **Spikelets** crowded, shortly pedicelled; empty glumes with a stout green keel, ciliate with stiff setae, sides pale; awns $\frac{1}{2}$ in., scabrid, rigid; fl. glumes membranous, cuspidate, 5-nerved; anthers oblong, yellow or purple.—**Distrib.** Europe, N. Africa, Siberia, W. Asia; introd. in N. America.—An excellent fodder. Syme distinguishes two varieties. **P. praten'se proper**; stems erect rarely geniculate, spikes stout cylindric, glumes greenish, keel dark.—**Var. P. nudo'sum, L.*; stem recumbent geniculate, lower internodes swollen, leaves narrower, spike slender, glumes pale, keel green.—**Var. stolonifera**, Bab., has copious stolons.

2. **P. alpi'num**, *L.*; upper sheaths inflated, panicle ovoid or oblong, empty glumes equalling their rigid awn, keel hispid.

By alpine springs and rills, Perth, Forfar, Aberdeen; alt. 2,100 to 3,600 ft.; fl. July.—Perennial. **Stems** 6–18 in., solitary, creeping below, smooth, ascending, rigid. **Leaves** short, flat, spreading; lower sheaths appressed; ligule short. **Panicle** $\frac{3}{2}$–1$\frac{1}{4}$ in., dull purple and green. **Empty glumes** as in **P. praten'se**, but larger, $\frac{1}{2}$ in. including the awn.—**Distrib.** Arctic and Alpine Europe and Asia, Himalaya, N. America, Fuegia.
** Empty glumes gradually pointed; fl. glume 3-nerved, with the pedicel of a 2d at its base.

3. **P. arenarium**, L.; upper sheaths inflated, panicle cylindric-oblong narrowed at the base, empty glumes hardly awned, keel ciliate above.

Sandy dunes, &c., local, from Aberdeen (E. Scotland only) southd.; Ireland; Channel Islands; fl. May–June.—Annual, glabrous. Stems 2–6 in., crowded, leafy. Leaves broad, flat; sheaths smooth; ligule long. Panicle ½–1 in., most contracted at the base, glaucous. Spikelets ½ in., crowded; empty glumes lanceolate, acuminate, punctulate; fl. glume very small, hairy; anthers minute, short, yellow.—Distrib. Europe, W. Africa.


Sandy and chalky fields, Norfolk and Bedford to Essex and Herts; fl. July.—Annual, glabrous. Stems 10–18 in., ascending, smooth. Leaves short, flat, scabrid, rather glaucous; upper ligules long. Panicle 2–4 in., rather narrow, obtuse, green, slightly interrupted. Spikelets ½ in., fascicled; empty glumes linear-oblong, obliquely truncate below the short rigid subulate awn, very coriaceous, green; margins white, punctulate; fl. glume minute; anthers linear-oblong.—Distrib. Europe, N. Asia.


A minute annual. Spikelets minute, subsessile, laterally or distichously arranged on a simple slender flexuous rachis, dorsally compressed, 1-fld. Empty glumes 2, a little exceeding the flowering, broad, subequal, concave, not keeled, truncate, awnless, membranous, 1-nerved, upper next the rachis. Fl. glume hyaline, very hairy, truncate, 5-nerved. Palea 2-nerved or 0. Scales 2, very minute. Stamens 3; anthers short. Ovary glabrous; styles 2, very long, stigmas slender hairy. Fruit ellipsoid, compressed, enclosed in the fl. glume and palea.—Distrib. W. Europe from Hanover to Spain and Italy, N. Africa.—Etym. unknown.

**M. ver’na**, Adans.; stems capillary. Sturm’ia min’ima, Hoppe; Knap’pia agrostide’a, Sm.; Chamagrostis min’ima, Borkh.

Wet sands, especially near the sea, Anglesea; Channel Islands; formerly in Essex; naturalized in Haddington; fl. March–April.—Stems 1–3 in., tufted. Leaves short, strict, setaceous, scaberulous, obtuse, margins involute; sheaths white, inflated; ligule short. Spike ½–1 in.

12. **Agrost’is**, L. Bent.

Spikelets very small, in an open or contracted panicle with whorled branches, 1-fld., rachilla not produced. Empty glumes 2, exceeding the flowering, unequal, membranous, awnless, convex, keeled. Fl. glume hyaline; awn slender, dorsal, or 0. Palea 2-nerved or 0. Scales glabrous, entire. Stamens 3. Styles short, stigma feathery. Fruit enclosed in
the glume, terete, glabrous.—Distrib. All temp. and cold climates; species 100.—Etym. An old Greek name.

Section 1. Tricho'dium, Michx. (gen.). Upper empty glume smaller than the lower. *Pala* very minute or 0.

1. *A. cani'n*a, L.; leaves narrow flat smooth.

Moors, heaths, &c., N. to Shetland; ascends to 1,500 ft. in Derby; Ireland; Channel Islands; fl. July-Aug.—Perennial, glabrous, smooth. *Stems* 6–24 in., sometimes stoloniferous. *Leaves* 2–5 in., \( \frac{3}{5} - \frac{1}{2} \) in. broad; ligule oblong. *Panicle* 2–4 in., slender, flexuous, flowering open, fruiting contracted, purplish or green; branches capillary, scabrid. *Fl. glume* \( \frac{1}{2} \) shorter than the empty, truncate, nerves 5, excurrent; awn from above the base, variable in length, bent in the middle.—Distrib. Europe (Arctic), N. and W. Asia; Himalaya; N. and S. America, Australasia.


Dry downs, Glamorgan, Berks, Surrey, Cornwall to Sussex; fl. June–July.—Perennial. *Stems* 8–12 in., strict, scaberulous. *Leaves* very many, erect, rigid; ligule oblong. *Panicle* 1\(\frac{1}{2}–3\frac{1}{2} \) in., and spikelets much as in *A. cani'n*a, but empty glumes scabrid, almost awned; fl. glumes with a longer rather twisted awn, and 2 minute tufts of hairs at the base; *palea* minute.—Distrib. Belgium, France, Spain.

Section 2. *Agros'tis* proper. Empty glumes subequal, or upper smaller than the lower. *Pala* 2-nerved.


Meadows and marshy places, N. to Shetland; ascends to 3,200 ft. in the Highlands; Ireland; Channel Islands; fl. June–Sept.—Perennial. *Stems* 6–24 in., ascending, smooth. *Leaves* short, flat, scabrid; sheaths smooth. *Panicle* 1–3 in., narrowly ovate, but variable in form. Empty glumes \( \frac{1}{2} \) in., subequal, ovate or lanceolate, acute, nearly smooth, dull red or purplish and green; fl. glume a little shorter, truncate, 3-nerved, 3 times longer than the *palea*; awn 0 or short.—Distrib. Europe, N. Africa, Himalaya, N. America.

*A. vulga'ris* proper; slender, panicle usually elongate, fl. glume rarely awned. —Var. *A. pul'mila*, L.; short, stout, panicle shorter, branches stout, empty glumes broader, fl. glume usually awned.—Var. *A. ni'gra*, With.; taller more robust, panicle more scabrid, branches more rigid, spikelets larger.—Salop, Stafford, Worcester, Warwick.


Pastures and waste places, N. to Shetland; ascends to 1,400 ft. in Yorkshire; Ireland; Channel Islands; fl. July–Sept.—Perennial. *Stems* 6–24 in., more or less prostrate below, scaberulous above. *Leaves* flat, scabrid or not; sheaths smooth. *Panicle* 1–8 in., branched or lobed, green or yellowish branches scabrid. Empty glumes much as in *A. vulga'ris*, but rather larger more rigid, not so shining; fl. glume 5-nerved, rarely awned.—Distrib.
Europe (Arctic), N. Africa, N. Asia, N. America.—*A. stolonifera*, L. (*β subré'pens*, Bab.), is a more stoloniferous state.

13. POLYPO'GON, Desf. BEARD-GRASS.

Spikelets in a contracted or spike-like panicle, jointed on the pedicle, 1-fld. Empty glumes 2, much exceeding the flowering, equal, concave, keeled, 2-fld or notched, sinus awned. *Fl. glume* sessile, hyaline, base naked, broad, truncate, toothed, awned near the top. *Palea* small 2-nerved. Scales 2, falcate, entire. *Stamens* 1–3; anthers small. Ovary glabrous; styles short, free, stigmas feathery. *Fruit* terete, wrapped in the hyaline glumes and palea.—Distr. Warm regions; species 10.—ETYM. πολύς and πῶς, from the many awns.

1. **P. monspelien'sis**, Desf.; annual, awns much exceeding the scabrid deeply-notched glumes, fl. glume not awned.

Damp pastures on the S.E. coast, rare; from Norfolk, Essex, Kent, to Hants; Channel Islands; introd. elsewhere; *fl. June–July.—Stems* \( \frac{3}{4} \)–4 ft., erect, stout, smooth. *Leaves* large, broad, flat, scabrid; sheaths smooth; ligule large, obtuse. *Panicle* 1–6 in., oblong-ovoid or fusiform, cylindric or lobed, obtuse, pale greenish-yellow, dense, soft. Empty glumes nearly \( \frac{1}{2} \) in., narrow linear; awn straight, 2–3 times as long; fl. glume not \( \frac{1}{2} \) as long as the empty, silvery.—Distr. From Holland southd., N. Africa, W. Asia, India.

2. **P. littora'lis**, Sm.; perennial, awns as long as the nearly smooth acute obscurely notched glumes, fl. glume awned.

Muddy salt marshes, very rare; Norfolk, Essex, Kent, Hants; *fl. July.—Perennial, variable in size. Stems* 1–6 ft., erect or decumbent, usually more slender below than in *P. monspelien'sis*; panicle smaller, more lobed, purplish; empty glumes much smoother, more acute, awns shorter, keel scabrid; fl. glume about \( \frac{3}{4} \) shorter than the empty; awn exerted.—Distr. W. Europe.—Supposed by Duval-Jouve to be a hybrid between *monspelien'sis* and *Agrostis al'ba*.

14. CALAMAGROSTIS, Adans.


1. **C. Epige'jos**, Roth; panicle open, empty glumes subulate-lanceolate and hairs twice as long as the flowering, awn dorsal inserted above the middle of the fl. glume.
Damp woods, local, from Mull and Aberdeen to Devon and Kent; Aran Island and Derry in Ireland; Channel Islands; fl. July–Aug.—Stem 2–6 ft., simple, stout, scabrid above. Leaves very long, flat, scabrid, glaucous beneath, point slender; ligule acute, torn. Panicle 4–12 in., purplish-brown; branches suberect. Empty glumes ½ in., very narrow, tip and keel scabrid; awn produced for ½ its length beyond the fl. glume.—DISTRIB. Europe (Arctic) (excl. Spain), Himalaya, N. Asia.

2. C. lanceolata, Roth; panicle open, empty glumes lanceolate twice as long as the flowering, hairs rather longer than the fl. glume, awn terminal minute. Arundo Calamagrostis, L.

Damp copses, hedges, &c., from the Border to Devon and Kent; fl. July–Aug.—Stem 2–4 ft., slender, erect, smooth. Leaves much narrower and smoother than C. Epigejos, more convolute; ligule shorter. Panicle 2–6 in., purplish; branches spreading, tip drooping. Empty glumes nearly as large as in Epigejos, but broader; awn minute.—DISTRIB. Europe (Arctic), N. and W. Asia.—Andersson observes that the pedicel of an upper flower is sometimes present.

15. GASTRIDIUM, Beauv.


G. lendigerum, Gaud.; glumes lanceolate, awn exserted. Agrostis austroba'lis, L. Nit-grass.

Maritime sandy marshes, &c., from S. Wales, Warwick, and Norfolk southd.; Channel Islands; (a colonist, Wats.); fl. June–Oct. Stem 6–10 in., densely tufted, erect or ascending, slender, leafy. Leaves short, flat, scaberulous; sheaths smooth; ligule oblong. Panicle large, 1–3 in., cylindric-fusiform, dense, pale green, glistening; branches scaberulous; pedicels swollen at the top. Empty glumes ½ in., erect, very acuminate, the swollen base polished, keel obscurely scabrid; fl. glume white, shining, 4-toothed; awn near the top, very slender.—DISTRIB. Europe, W. Asia, N. Africa.

16. APE'RA, Adams.

**A. Spi’ca-vent’ti,** Beav.; panicle large pyramidal effuse or contracted, awn much exceeding the fl. glume. *Agrostis Anemagrostis,* Syme.

Sandy, often inundated fields, S.E. England, from York to Kent and Hants; fl. June—July.—*Stems* 1–3 ft., densely tufted, stout or slender, erect from a decumbent base, smooth. *Leaves* flat, glabrous or hairy, scabrid beneath and on the edges; ligules short, torn. *Panicle* 3 in., sometimes 3 in. broad, green or purple; branches many in a whorl, capillary, scabrid. *Empty glumes* \( \frac{1}{10} \) in., lanceolate, acuminate, membranous, closed in fruit, nearly smooth, shining; fl. glume hairy, awn subterminal, 3 times its length, erect, very slender; palea with 2 tufts of silky hairs at the base.—DISTRIB. Europe, N. Africa, Siberia.

A. Spi’ca-vent’ti proper; panicle large broad effuse, anthers linear. *Agrostis,* L. A. *Interrup’ta,* Beav.; panicle contracted interrupted, anthers oblong.—E. counties. *Agrostis,* L.

### 17. DEYEUX’IA, Clarion.

Perennial grasses. Spikelets panicled, 1-fl.; rachilla produced into a hairy or penicillate tip, bearded below the fl. glume. *Empty glumes* subequal, keeled. *Fl. glume* longer or shorter, 5-nerved, tip entire or 2–4-toothed; awn twisted, dorsal, or 0. *Palea* thin, 2-nerved. *Scales* ovate, entire or lobed. *Styles* short, distinct, stigma plumose. Fruit often oblique enclosed within the fl. glume and pale, free or subadherent.—DISTRIB. All temp. regions; species 120.—ETYM. *N. Deyeux,* an eminent French chemist.

**D. neglec’ta,** Kunth; panicle close, empty glumes oblong-lanceolate slightly exceeding the flowering, awn from below the middle of the fl. glume straight. *Calamagrostis lappon’ica,* Hook., not Hartm.; C. stric’ta, Nutt.

Bogs and marshes, very rare; Delamere Forest; (Forfar extinct); Caithness; Ireland; fl. June—July.—*Stems* 1–3 ft., strict, slender, smooth, polished. *Leaves* short, all flat or lower filiform with convolute margins, almost smooth; ligule short. *Panicle* 2–6 in., narrow, erect, pale purplish and green. *Empty glumes* \( \frac{1}{10}–\frac{1}{2} \) in., acute, nearly smooth.—DISTRIB. Scandinavia (Arctic), Dahuria, N. America.—Leaves in cultivated (Irish) specimens quite flat.

**D. neglec’ta** proper; upper ligule obtuse, lower empty glumes acuminate, upper acute twice as long as the hairs.—(Forfar extinct), Cheshire.—VAR. Hook’eri, Syme; upper ligule acute, lower empty glumes acute, upper broader one third longer than the hairs.—Lough Neagh.

### 18. AMMOPH’ILA, Host. Marram-Grass.

Spikelets large in a contracted panicle, much laterally compressed, 1-fl.; rachilla produced beyond the fl. glume. *Empty glumes* 2, scarcely exceeding the flowering, rigid, subequal, long, narrow, keeled, subacute. *Fl. glume* rigid, with an oblique callus and a short pencil of silky hairs at the base, 5-nerved; awn minute, subterminal. *Palea* equalling the glume, rigid, 2-nerved. *Scales* very acuminate. *Stamens,* ovary, and fruit of *Calamagrostis.*
Ammophila.]  

GRAMINEÆ.  

—Distrib. Shores of Europe, N. Africa; species 4.—Etym. ἀμοὺς and φιλός, sand lover.

1. A. arundina'cea, Host.; panicle subcylindric white, fl. glume linear-oblong acute 3 times as long as the hairs. Psamma arenaria, R. and S.

Sand-hills by the sea, N. to Shetland; Ireland; Channel Islands; fl. July.—Rootstock widely creeping, binding the sand. Stems 2–4 ft., smooth or scabrid above. Leaves long, rigid, convolute, polished without, scabrid and glaucous within; sheaths long; ligule very long, 2-fid, torn. Panicle 3–6 in., straight, broadest and sometimes lobed at the base, yellowish; branches short. Spikelets erect, pedicels scabrid; empty glumes ½–⅓ in., acute, keel scabrid; fl. glume and palea quite like the empty glumes in colour and texture. Anthers ⅛ in., linear, yellow.—Distrib. Of the genus.

2. A. baltica, Link; panicle elongated interrupted, fl. glume lanceolate acuminate twice as long as the hairs. P. samma baltica, R. and S.

Ross Links and Holy Isle, Northumbrd.; fl. Aug.–Sept.—Habit of A. arundina'cea, but distinguished by its laxer less cylindric panicles, more lanceolate and acuminate glumes, and by the length of the hairs. The flowering glumes are 5-nerved in both, but more faintly in A. baltica.—Distrib. Seashores from Holland to Gothland.

19. LAGU'rus, L. Hare's-tail Grass.

Annual. Spikelets in a dense villous ovoid head, 1-fld., laterally compressed; rachilla produced. Empty glumes 2, much exceeding the flowering, equal, long, with slender feathery points. Fl. glume membranous, shortly stipitate, with the pedicel of an upper flower at the back of the palea, narrow; terete, with 2 short awns and an intermediate long bent and twisted one. Palea 2-nerved. Scales 2, fleshy. Stamens 3. Ovary glabrous; styles very short, stigmas long feathery. Fruit smooth, embraced by the glume and palea.—Distrib. W. and S. Europe, N. Africa, W. Asia.—Etym. λαγός and ὀβὸς, hare's tail.

L. ova'tus, L.; leaves short flat, ligule short.

Sandy places, Guernsey; naturalized near Saffron Walden; fl. June.—Stems 6–10 in., very many, erect or decumbent below, stout, pubescent, leafy below. Leaves broad, and inflated sheaths pubescent or villous. Heads 1–1½ in., ⅔ in. broad, white, obtuse. Empty glumes ⅛ in., very slender; awn twice as long as the nearly glabrous fl. glume.

20. A'I'RA, L.

Spikelets laterally compressed, loosely panicked, 2-fld., rachilla not produced. Empty glumes 2, equalling the flowering, membranous, subequal, acute, 1-nerved. Fl. glumes pedicelled, membranous, subequal, convex, 3-nerved, toothed, awned at the back. Palea 2-nerved, 2-fid. Scales acuminate, entire or 2-fid. Stamens 3. Ovary glabrous; stigmas
subterminal, feathery to the base. *Fruit* grooved, free or adnate to the fl. glume and palea.—**Distrib.** Temp. regions; species 4–5.—**Etym.** A Greek name for some grass.

1. **A. caryophyllea**, *L.*; sheaths scabrid, panicle spreading, branches long trichotomous.

Sandy meadows, &c., N. to Shetland; ascends to 1,400 ft. in the Highlands; Ireland; Channel Islands; fl. June–July.—**Stems** 2–10 in., tufted, leafless and scabrid above, bent below, often purplish. **Leaves** scabrous, short, scabrid, obtuse; ligule long. **Panicle** 1–2 in. **Spikelets** ½ in., ovate, shining; lower empty glume ovate, acuminate, exceeding the flowering, keel scabrid; awn twice as long as its glume, twisted.—**Distrib.** Europe, N. Africa; introd. in N. America.

2. **A. praecox**, *L.*; sheaths glabrous, panicle contracted, branches very short with 1–2 spikelets.

Dry pastures, &c., N. to Shetland; ascends to 1,800 ft. in Yorkshire; Ireland; Channel Islands; fl. April–June.—Habit of *A. caryophyllea*, but panicle very different; whole plant greener; spikelets narrower; 2-fid points of flowering glume shorter; awn inserted higher up.—**Distrib.** Europe; introd. in N. America.

21. **Coryneph'orus**, *Beauv.*

Annual grasses. **Spikelets** small, panicled, 2-fid.; rachilla produced, penicillate. **Empty glumes** 2, subscarious, subequal, acute. **Fl. glumes** shorter, hyaline; awn dorsal, bent, twisted below the bearded joint, tip clavate. **Pala** narrow, 2-nerved. **Scales** 2-fid. **Stamens** 3. **Styles** short distinct, stigmas feathery. **Fruit** grooved, adhering to the fl. glume and palea.—**Distrib.** Europe, W. Asia; species 2.—**Etym.** κόρυνη and φέρω, from the clubbed awn.

**C. canes'cens**, *Beauv.*; tufted, leaves short rigid. *Aira canescens*, *L.* Sandy coasts, Norfolk, Suffolk; Channel Islands; fl. July.—Tufts hard, rigid, pungent. **Stems** 4–8 in., bent below, glabrous above. **Leaves** 1–2 in., glaucous, involute; upper sheaths long, scaberulous; ligule lanceolate. **Panicle** 1–3 in., narrow-oblong, spreading in flower; branches thickened at the forks, short. **Spikelets** ½ in., narrow, pale silvery or purplish; empty glumes narrow, acuminate, tips hyaline; fl. glumes shorter, villous at the base; keel channelled; awn included or shortly exserted, purplish below, bearded at the middle where bent, above gradually thickened, white; anthers purplish.—**Distrib.** Europe, Siberia.

22. **Deschamps'ia**, *Beauv.*

Perennial grasses. **Spikelets** panicled, 2-fid.; rachilla produced, sometimes bearing a male flower. **Empty glumes** subequal, keeled, shining, truncate, toothed, 3–5-nerved; awn dorsal, straight or twisted. **Pala** narrow, 2-nerved. **Scales** entire, lanceolate. **Stamens** 3. **Styles** distinct,
stigmas feathery. Fruit grooved, included in the fl. glume and palea, free.—Distr. Temp. and cold regions; species 20.—Etym. M. H. Deschamps, a French chemist.

1. **D. flexuos'a**, Trin.; leaves filiform terete solid, branches of panicle spreading capillary, spikelets subterete. *Ai'ra flexuosa*, L.

Dry woods, heaths, &c., N. to Shetland, ascends to 3,700 ft. in the Highlands; Ireland; Channel Islands; fl. June-Aug.—Stems ½—2 ft., erect, slender, polished, naked above. Leaves short, curved, obtuse, grooved (not involute), sheath of upper long; ligule short, obtuse. Panicle 2—5 in.; branches 2—3-nate. Spikelets ½ in.; purplish or yellow-brown, shining; empty glumes acuminate; awn about ½ as long as the spikelet, erect, then bent or twisted.—Distr. Europe (Arctic), N. and W. Asia, N. America, Fuegia.—Often viviparous.

Var. *Ai'ra monta'na*, Huds.; subalpine, glumes larger more purple.—Var. *A. setacea*, Huds. (uligino'sa, Weihe); leaves capillary, upper fl. glume longer pedicelled.


Wet meadows, woods, &c., N. to Shetland; ascends to nearly 3,000 ft. in the Highlands; Ireland; fl. June—July.—Stems 2—4 ft., rather stout, leafy, shining, smooth. Leaves coriaceous; sheaths shining, smooth or rough, upper very long; ligule obtuse. Panicle 4—8 in., linear-oblung, spreading in flower. Spikelets ¼ in., very shining, fulvous or purplish; empty glumes narrow, obtuse, shorter than the flowering, keel scabrid or smooth, upper obscurely 3-nerved; fl. glumes 1—3 (3d always imperfect), silky at the base; awn short, inserted below the middle, variable in length.—Distr. N. and S. temp., Arctic, and mountain regions.—A variable grass.

D. caespitosa proper; tall, leaves longer broader scabrid, branches of panicle rough, awn inserted below the middle usually equalling the glume.


## 23. Holcus, L.


1. **H. lana' tus**, L.; softly tomentose, root fibrous, awn of the flowering glume included, tip scabrous or smooth.
Meadows, copses, waysides, &c., N. to Shetland; ascends to 1,800 ft. in Yorkshire; Ireland; Channel Islands; fl. June-Aug.—Perennial, densely tufted. Stems 6-24 in., ascending, slender, leafy. Leaves flat, soft, upper sheaths inflated; ligule short. Panicle 2-5 in., pale green or pinkish; branches 2-3-nate. Spikelets ½ in., elliptic-oblong; empty glumes acute, nerves strong.—DISTRIBUTION. Europe, N. Africa, Siberia; introd. in N. America.

2. H. molliis, L.; villous at the nodes, rootstock creeping, awn of fl. glume exserted at length inflexed scabrid throughout.

Sandy and waste places, woods, &c.; less common than H. lanatus; ascends to 1,500 ft. in N. England; fl. June-Aug.—Similar to H. lanatus, but usually more slender; glumes more scabrid and very acuminate.—DISTRIBUTION. Europe except N. Russia, N. Africa.

24. TRISE'TUM, Pers.

Perennial grasses. Spikelets panicled, compressed, 2- rarely 3-6-fld.; rachilla produced, with sometimes a male fl. glume. Empty glumes membranous, unequal, keeled, acute. Fl. glumes shorter, with 2 awned points and an intermediate dorsal twisted awn. Palea hyaline, 2-nerved. Scales membranous, lanceolate. Styles distinct, stigmas feathery. Fruit furrowed ventrally, glabrous or tip pubescent, enclosed in the fl. glume and palea.—DISTRIBUTION. All temp. regions; species 50.—ETYMOLOGY. tri, three, and seta, from the 3-awned fl. glume.

T. flaves'cens, Beauv.; panicle open, branches in ½-whorls, fl. glume 2-cuspidate 3-awned. Ave'na flaves'cens, L.

Dry pastures from Elgin and the Clyde southd.; ascends to 1,600 ft. in N. England; Ireland; Channel Islands; fl. July-Aug.—ROOT fibrous, stoloniferous. Stems 1-2 ft., erect, smooth, glabrous. Leaves flat, and sheaths hairy; ligule truncate, ciliate. Panicle 2-4 in.; branches many, capillary. Spikelets ¼ in., many, 3-4-fld., shining, yellowish; empty glumes ovate, acuminate; awns very divergent.—DISTRIBUTION. Europe, N. Africa, N. Asia, Himalaya.

25. AVE'NA, L.

Annual or perennial grasses. Spikelets large, terete, panicled, 2- or more-fld., upper flower usually imperfect. Empty glumes 2, equalling the flowering, usually subequal, rather membranous, 1-11-nerved. Fl. glumes more rigid, rounded at the back or 2-cuspidate, 2-fld with a long beut and twisted awn from the sinus. Palea 2-nerved. Scales 2-fld. Stamens 3. Ovary hirsute at the top; styles short, distant, stigmas feathery. Fruit furrowed, adherent to the glume, top hairy.—DISTRIBUTION. Temp. and cold regions; species 40.—ETYMOLOGY. The old Latin name.

* Annual. Spikelets at length drooping. Empty glumes 5-11-nerved.

1. A. fat'ua, L.; spikelets 2-3-fld., empty glumes 9-nerved, fl. glume below and pedicels hairy. Wild Oat.
Cornfields, N. to Shetland, but not indigenous in Scotland; Ireland; Channel Islands; (a colonist, Wats.); fl. June-Aug.—Stems 1-3 ft., stout, smooth; nodes hairy. Leaves flat, scaberulous; sheaths smooth; ligule short, torn. Panicle 6-10 in., equally spreading; branches whorled, scabrid. Spikelets 1 in., green. Fl. glumes 2-fid, with long fulvous hairs below, half as long as the brown awn.—DISTRIB. Europe, N. Africa, Siberia, N.W. India.

A. strigo’sa, Schreb.; spikelets 2-fld., empty glumes 7-9-nerved, fl. glumes and pedicels glabrous. Cornfields, rare, not indigenous; fl. June–July.—Smaller and more slender than A. fat’ua; leaves sometimes hairy; panicle unilateral, branches fewer; fl. glume more deeply 2-fld., segments awned.—DISTRIB. Of A. fat’ua.

** Perennial. Spikelets suberect. Empty glumes 1-3-nerved.**

2. A. praten’sis, L.; leaves glaucous glabrous, lower branches of panicle 2-nate with 1–2 3-6-fld. spikelets.

Moors and dry pastures, Ross and Skye to Devon and Kent; ascends to 2,200 ft. in the Highlands; Channel Islands; fl. June–July.—Root fibrous, stoloniferous. Stems ½–3 ft., erect, scaberulous, bent at the base. Leaves flat or involute; lower sheaths more or less scabrid; ligule ovate, acute. Panicle racemose, contracted after flowering. Spikelets ½–3½ in., pale, shining; fl. glume scabrid; pedicel silky; awn faintly bent, equalling the glume.—DISTRIB. From Norway southd. and eastd. to Thrace and S. Russia (excl. Spain).

A. praten’sis proper; leaves involute, sheaths terete nearly smooth.—VAR. A. alpi’na, Smith (A. planicul’mis, Sm., not Schrad.); leaves flat, lower sheaths much compressed. Mountains.

3. A. pubes’cens, Huds.; leaves pubescent, lower branches of panicle 5-nate with 2-4 2-fld. spikelets.

Dry pastures, N. to Shetland; ascends to 1,600 ft. in N. England; Ireland; fl. June–July.—Habit of A. praten’sis, but less densely tufted; leaves flatter; sheaths very pubescent; awns more spreading.—DISTRIB. From Norway southd. and eastd. to Bosnia (excl. Spain), Siberia.

26. ARRHENATH’ERUM, Beauv.

Perennial grasses. Spikelets panicled, terete, 2-fld.; lower fl. male, upper female or 2-sexual; rachilla hairy between the fl. glumes, produced. Empty glumes scarious, very unequal. Fl. glumes rigid, 5-7-nerved, 2-toothed, lower with a long basal bent and twisted awn, upper with a short dorsal awn or 0. Palea 2-nerved. Scales lanceolate, toothed laterally. Stamens 3. Styles short, distinct, stigmas feathery. Fruit pubescent, loosely enclosed in the fl. glume and palea, pubescent.—DISTRIB. Europe, N. Africa, W. Asia; species 3.—ÉTYM. ἀρρην, masculine, and ἄνθροπος, awn.

A. avena’ceum, Beauv.; panicle narrow long nodding, lower fl. glume long-awned, upper usually awnless. A. elatisus, Presl.; Ave’na elat’ior, l.
Fields, hedgerows, and pastures, N. to Shetland; ascends to 1,500 ft. in N. England; Ireland; Channel Islands; fl. June–July.—Rootstock widely creeping, nodes often tuberous (var. bulbo'aa, Lindl.). Stems 2–4 ft., erect, slender, smooth. Leaves flat, scabrid; sheaths smooth; ligule truncate. Panicle 6–12 in.; branches 2–3-nate, suberect, very scabrid. Spikelets $\frac{1}{2}$ in., pale, shining; lower empty glume much smallest; upper oblong-lanceolate, acute; fl. glume subsesile, hairy below the middle, half as long as the dark twisted bent awn (the 2 fl. glumes are sometimes equally awned).—Distrib. Europe, N. Africa, W. Asia; introd. in N. America.—A pest.


C. Dac'tylon, Pers.; leaves short involute, tips obtuse.  
Sandy shores of S.W. England, Dorset to Cornwall; casual at Kew; Channel Islands; fl. July–Aug.—Stems 4–10 in., stout, woody, prostrate and extensively creeping, with short suberect leafy and flowering branches, smooth; fl. branches clothed with strongly furrowed sheaths. Leaves subulate, stiff, glaucous, strongly nerved; sheaths pale, mouth hairy. Spikelets 3–6, 1–2 in., radiating, purplish; rachis convex, grooved above. Spikelets $\frac{1}{10}$–$\frac{1}{12}$ in., imbricate; empty glumes ovoid, acute; keel scabrid.—Distrib. From Holland southd., Asia, Africa; introd. in N. America.—The chief pasture (Doab and Bermuda grass) of many dry climates.

28. TRIO'DIA, Br.  

T. decum'bens, Beauv.; spikelets 6–10 turgid. Dantho'nia, DC.  
Dry pastures and moors, N. to Shetland; ascends to 1,800 ft. in Yorkshire; Ireland; Channel Islands; fl. July.—Perennial, bright green. Root fibrous. Stems 6–12 in., densely tufted, rigid, glabrous, leafy. Leaves obtuse, coriaceous, slender, at length involute, hairy below; sheaths grooved, lower hairy; mouth with a row of hairs. Panicle 1–2 in., erect; rachis and branches flexuus. Spikelets $\frac{1}{4}$–$\frac{1}{3}$ in., obovoid, shining, pale green and purplish, rachilla very short; empty glumes large, ovate, acute, keel scabrid, margins hyaline; fl. glumes ovoid, not keeled, coriaceous, imbricate,
bearded at the base, ciliate on the lower margins.—Distr. Europe, N. Africa.

29. PHRAGMITES, Trin. Reed.

Perennial stout water-reeds. Spikelets subterete, paniced, 3-6-fld.; lower fl. male, the rest 2-sexual. Empty glumes 2, short, unequal, membranous, keeled. Fl. glumes distant; lowest naked, 1-3-androus; the rest 3-androus, enveloped in long silky basal hairs, very long acuminate, 3-nerved, entire. Palea very short. Scales large, obtuse. Stamens 3. Ovary glabrous; styles short, stigmas feathery. Fruit terete, loosely wrapped in the fl. glume.—Distr. Arctic and temp. zones; species 1 or 2.—Etym. obscure.

P. communis, Trin.; panicle very large soft dull purple nodding, silky hairs equalling the fl. glumes. Arundo Phragmites, L.

Edges of lakes, &c., N. to Shetland; Ireland; Channel Islands; fl. July-Aug.—Rootstock extensively creeping, jointed. Stems 6-10 ft., stout, terete, erect, smooth. Leaves ½-1 in. broad, flat, rigid, acuminate, glaucous beneath, edges hispid; sheath smooth, mouth bearded. Panicle 10-18 in., ovoid, dense; branches smooth, with long scattered hairs. Spikelets ½-¾ in., 3-5-fld. (or fewer, P. nigricans, Dumort.), shining; empty glumes lanceolate, ½ the length of the very narrow subulate flowering.—Distr. Europe (Arctic), Asia, Africa, America, Australia.

30. SESLE'RIA, Scop.

Spikelets compressed, in a contracted dense ovoid or subcapitate bracteate panicle, 2-6-fld.; bracts small or large, entire toothed or multifid, sheathing the lower peduncles; rachilla jointed above the lower glumes. Empty glumes 2, longer than the flowering, subequal, 1- rarely 3-nerved. Fl. glumes 2-3, the upper rudimentary, keeled, 3-cuspidate. Palea 2-keeled. Scales 2, 3-5-toothed. Stamens 3. Ovary hairy at the top; styles terminal, connate below, stigmas very long barbellate. Fruit oblong enclosed in the fl. glume and pala.—Distr. Europe, N. Africa, W. Asia; species 12.—Etym. L. Sesler, an Italian botanist.

S. caerulea, Scop.; panicle oblong subsecund silvery-grey.

Hilly pastures, especially in limestone districts, from Ross to York and Lancaster; ascends to 2,500 ft. in the Highlands; W. Ireland, local; fl. April–June.—Perennial. Root fibrous. Stems 6-18 in., erect, smooth. Leaves narrow, flat, glaucous above, tip scabrid mucronate, glabrous or hairy, upper very short; sheaths compressed, breaking up into fibres; ligules short, ciliate. Panicle ½-1 in., blue-grey, glistening. Spikelets ½ in., in sub sessile fascicles, the lower embraced at the base by a small convolute bract or glume; empty glumes ciliate, acuminate; fl. glumes pubescent, 3 central nerves confluent; awn very short.—Distr. From Belgium to Greece and S. Russia.

Spikelets dimorphous, in dense spike-like panicle; terminal spikelet of each fascicle terete 2–5-fld. with an upper flowerless glume, lower spikelets reduced to an involucre of pectinately arranged distichous rigid subulate empty glumes surmounting the terminal. Empty glumes 2, shorter than the lowest fl. glume, unequal, rigid. Fl. glumes terete, 3-keeled, nerved, mucronate, coriaceous, opaque. Palea with 2 ciliate nerves. Scales with a basal lobe. Stamens 3. Ovary glabrous; styles short terminal, stigmas feathery. Fruit adherent to the fl. glume and palea.—Distrib. N. temp. regions; species 3 or 4.—Etym. κυών and ὀπήδ, dog’s tail.

1. C. cristatus, L.; spike linear unilateral, fl. glumes shortly awned.

Dry pastures and banks, N. to Shetland; ascends to 1,800 ft. in N. England; Ireland; Channel Islands; fl. July–Aug.—Perennial, tufted, stoloniferous. Stems 1–2 ft., terete, strict, smooth, naked above. Leaves almost filiform, slightly hairy; sheaths smooth; ligule 2-fld. Spike 1–2 in., strict, rigid; rachis flexuous; spikelets ½ in., sessile between 6–10 rigid scabrous scarios scaberulous; spikelets fewer on each branch, ½ in. Empty glumes hyaline; fl. glumes green.—Distrib. Mid. and S. Europe, N. Africa, W. Asia.

2. C. echinatus, L.; panicle dense, awn equalling the fl. glume.

Sandy seashores, Channel Islands; introduced on the British coasts; casual in Ireland; fl. July.—Annual; larger and more robust than C. cristatus; leaves broad, flat; panicle ¾–1½ in., ovoid, lobed, squareose, shining, branches ½ in., pectinate; segments of branches ¾–1½ in., subulate, slender, scarious, scaberulous; spikelets fewer on each branch, ¾ in. Empty glumes hyaline; fl. glumes green.—Distrib. Mid. and S. Europe, N. Africa, W. Asia.

32. Koeleria, Pers.


K. cristata, Pers.; panicle silvery interrupted below.

Banks and pastures, N. to Caithness; ascends to 1,800 ft. in Yorkshire; Ireland; Channel Islands; fl. June–July.—Perennial, pubescent or silky, pale green. Root fibrous, stoloniferous. Stems 1–3 ft., slender. Leaves narrow, glabrous beneath, soon involute; sheaths striate; ligule 0. Panicle 1–4 in., linear-oblong or lanceolate; branches 2–3-nate, very short. Spikelets ½ in., shining, pale green; empty glumes oblong-lanceolate, acute, broadly hyaline, glabrous pubescent or scabrid; keel minutely scaberulous; rachis
pubescent; fl. glumes linear-lanceolate, scaberulous, mucronate.—Distrib. N. and S. temp. regions.

33. **Molina**a, Schrank.


Wet moors, &c., N. to Shetland; ascends to 3,000 ft. in the Highlands; Ireland; Channel Islands; fl. July-Aug.—Stems 1-4 ft., terete, striate, node solitary, near the base, naked above. Leaves smooth, rigid, hairy at the base, tips very slender; sheaths smooth; ligule 0. *Panicle* 1-12 in., usually stout, very contracted; rachis flexuous, compressed; branches erect. *Spikelets* few, $\frac{1}{2}$ in., narrow, reddish or violet-purple or green; empty glumes subacute; fl. glumes deciduous, ovate-lanceolate, subacute; anthers violet-brown.—Distrib. Europe (Arctic), N. and W. Asia, N. Africa.

**M. caerulea** proper; spikelets blue-purple 2-3-fld., fl. glumes 3-nerved.—Var. *M. depauver'a*, Lindl.; spikelets green 1-fld., fl. glumes 3-5-nerved.

34. **Catabrosa**, Beauv.

A perennial soft grass. *Spikelets* minute, subterete, obconic, in branched effuse panicles, 1- or 3-4-fld.; rachilla jointed between the fl. glumes, glabrous. Empty *glumes* 2, much shorter than the flowering, unequal, scarious, convex, awnless; upper truncate, crenulate. *Fl. glumes* coriaceous, cuneate, terete, 5-nerved, torn at the membranous tip, back smooth, awnless; lower 1-nerved sessile; upper 3-nerved pedicelled, often flowerless or male. *Palea* as long. *Scales* ovate-oblong. *Stamens* 3. *Ovary* ovoid, glabrous; stigmas sub sessile, feathery. *Fruit* compressed, not or obscurely furrowed, enclosed in the fl. glume.—Distrib. Temp. and cold regions. —Etym. καταβρόσις, from the erose top of the glumes.

**C. aquatica**, Beauv.; panicle pyramidal.

Watery places, N. to Shetland, common; Ireland; Channel Islands; fl. May-June.—Terrestrial or aquatic, soft, bright green, flaccid. *Rootstock* stout, branched, creeping and rooting. *Stems* 6-12 in., bent below, then erect, compressed, smooth, striate, leafy, sometimes much branched. Leaves flat, $\frac{1}{2}-\frac{3}{4}$ in. broad, linear, obtuse, upper short; sheaths inflated, smooth; ligule ovate, obtuse. *Panicle* 1-4 in., rachis stout, grooved; branches whorled, divided, slender. *Spikelets* $\frac{1}{10}$ in., subsolitary, pedicelled, green and purplish; empty glumes, green, tips very broad, nerves very obscure; fl. glumes fulvous or purplish, smooth, nerves green; anthers white.—Distrib. Europe, N. Africa, N. Asia, Himalaya, N. America.—Var. littoralis, Parn. (minor, Bab.), has smaller 1-fld. spikelets. Sandy coasts.
35. **Melica**, L.

Perennial grasses. **Spikelets** terete, racemed or panieled, 1-2-fld.; rachilla elongate bearing a clavate head of fl. glumes. Empty glumes 2, membranous, convex, subequal, awnless, 3-5- or upper 7-nerved. Fl. glumes cartilaginous, convex, 5-9-nerved, awnless. **Palea** 2-nerved. Scales fleshy, free or connate. Ovary glabrous; stigmas broad, sessile, feathery. Fruit oblong, subterete, loosely wrapped in the fl. glume.

DISTRIB. Temp. and subtrop. regions; species 20.—ETYM. An old name.


Woods, from Argyll and Ross to Monmouth and Hereford, W. of England only; ascends to 1,400 ft. in the Highlands; fl. May–June.—Stoloniferous. **Stems** 10-18 in., filiform, inclined, 3-quetrous, scabrid above, with scaly sheaths below. Leaves flat, slender, sparsely hairy, edge and keel scabrid; ligule 0. **Racemes** 1-2 in., drooping; rachis flexuous. **Spikelets** 6-10, ½-1 in., very shortly peduncled, broad; empty glumes purple, oblong, edges and tips broadly scarios; fl. glumes greenish, strongly keeled, purple below the scarios tip, glabrous.—DISTRIB. Europe (Arctic), N. Asia.

2. **M. uniflora**, Retz.; spikelets very few erect panicked on long capillary peduncles 2-fld., upper flower male.

Woods, from the Clyde and Elgin southd.; ascends 1,500 ft. in N. England; Ireland; fl. May–July.—Habit, foliage, spikelets, and colouring of **M. nutans**, but inflorescence very different; ligule long, from the auricles of the sheath; rachis of panicle capillary, lower branches 2-nate, 1-1½ in.; pedicels capillary, scabrous.—DISTRIB. Europe.

36. **Dactylis**, L. *Cock’s-foot Grass*.

A perennial grass. **Spikelets** laterally compressed, secund, sessile, densely imbricate at the end of the branches of a one-sided panicle, 3-4-fld.; rachilla glabrous. Empty glumes 2, mucronate, keeled, membranous; upper larger, 3-nerved. Fl. glumes larger, cartilaginous, keeled, 5-nerved; awn subterminal, short, scabrid. Palea as long, 2-fld., nerves ciliate. Scales 2, acutely toothed. Stamens 3. Ovary glabrous; styles terminal, stigmas feathery. Fruit dorsally compressed, ventrally grooved, loosely enveloped in the glume.—DISTRIB. Europe (Arctic), N. Africa, Siberia, N. India; introd. in N. America.—ETYM. *Daktylos*, a finger’s breadth; of obscure application.

**D. glomerata**, L.; rough, leaves broad flat.

Pastures, waste places, &c., N. to Shetland; ascends to 1,600 ft. in N. England; Ireland; Channel Islands; fl. June–July.—Stems 2-3 ft., creeping below, erect, stout, smooth. Leaves long, flat, keeled, compressed; sheaths scabrid; ligule long. **Panicle** strict, 1-6 in., green and violet; lower branches few, long, strict, scabrid, horizontal in flower, erect in fruit. **Spikelets** ½ in., oblong, scabrid.
37. BRI'ZA, L.  QUAKING GRASS.

Spikelets large, ovate or cordate, turgid, pendulous, in effuse panicles, many-fl.; branches in ¼-whorls; pedicels capillary; rachilla jointed between the fl. glumes. Empty glumes 2, longer or shorter than the lowest flowering, subequal, broad, rounded at the back. Fl. glumes imbricate, boat-shaped or sacate, very obtuse, many-nerved, upper often flowerless. Palea small, nerves ciliate. Scales 2, ovate-lanceolate. Stamens 3. Ovary glabrous; styles short, terminal, stigmas feathery. Fruit broadly ovoid, compressed, enclosed in the hardened glume.—Distrib. Temp. Europe, Africa, and Asia: species 10.—Etym. An old Greek name.

1. B. me'dia, L.; perennial, ligule short, spikelets ovate, empty glumes shorter than the 1st fl. glume.

Meadows and heaths, &c., from Ross southd.; ascends to 2,100 ft. in Yorkshire; Ireland; Channel Islands; fl. June.—Stems solitary, creeping below, 6–18 in., very slender, smooth. Leaves flat, smooth or scabrid; sheaths smooth, upper inflated. Panicle pyramidal; branches very long, capillary. Spikelets 4 1/2 in., green or purplish, shining; fl. glumes 5–9, sheathing one another.—Distrib. Europe, N. and W. Asia; introd. in N. America.

2. B. mi'nor, L.; annual, ligule long, empty glumes longer than the 1st fl. glume.

Fields, Hants to Cornwall; Cork; Channel Islands; fl. July.—Stems tufted, 4–10 in. Panicle almost as in B. me'dia, but spikelets more numerous, smaller, ½ in. diam., broader than long.—Distrib. From France and Spain to Turkey, N. Africa.

38. PO'A, L.  MEADOW-GRASS.

Spikelets compressed, 2–many-fl., in branched—usually effuse panicles; branches 2-nate or in ¼ whorls; rachilla jointed between the fl. glumes. Empty glumes 2, shorter than the lowest flowering, unequal, acute or obtuse, keeled; lower 1–3-nerved; upper larger, 3-nerved, awnless. Fl. glumes often webbed below, keeled, acute, 5–7-nerved, tips hyaline. Palea 2-fl., nerves 2 ciliate. Scales tumid below. Stamens 3. Ovary glabrous; styles 2, short, terminal, stigmas feathery. Fruit obtusely 3-gonous, grooved, enclosed in the glume, glabrous.—Distrib. Chiefly cold and temp. regions; species 80.—Etym. πῶα, fodder.

* Annual. Branches of the panicle solitary or 2-nate.

1. P. an'nu'a, L.; stems compressed, leaves obtuse, ligule long acute, branches of panicle 2-nate at length deflexed, fl. glumes 3–7 5-nerved.

Waste places, &c.; ascends to 3,200 ft. in the Highlands; Ireland; Channel Islands; fl. April–Sept.—Flaccid, bright green, sometimes glaucous, quite glabrous and smooth. Stems 6–12 in., weak. Leaves linear, subacute, often waved. Panicle 1–3 in., subpyramidal, subsecund, green or purplish. Spikelets 4 in., subsessile; empty glumes broadly hyaline, upper
broadest in the middle; fl. glumes glabrous or hairy below the middle. —
DISTRIB. N. temp. Europe (Arctic), Asia, and N. Africa; N. America,
native (?)

** Perennial; rootstock creeping, stoloniferous.

2. P. praten'ssis, L.; stem smooth terete, upper leaf shorter than its
sheath, ligule long, branches of diffuse panicle 3–5-nate scabrid, fl. glumes
3–5 acute webbed, edges and keel silky, nerves 5 distinct.
Meadows, banks, and pastures, N. to Shetland; ascends to 2,400 ft. in York-
shire; in Ireland to 2,800 ft.; fl. June–July.—Glabrous, pale green. Stems
1–2 ft., rather stout, very stoloniferous. Leaves linear, flat, acute, tip often
concave; sheaths subcompressed. Panicle 2–6 in., pyramidal, closed or
open after flowering; branches long or short, rarely 2–3-nate. Spikelets
½–⅓ in., green or purplish; empty glumes acuminate, keel scabrid; fl. glumes
broadly hyaline.—DISTRIB. N. temp. and Arctic regions.—P. subcaerulea,
Sm., is a small glaucous state, and P. angustifolia, L., one with slender
leaves.—P. striyo'ssa, Gaud., is a small state, growing in dark places, with
convoluted leaves, and a narrow panicle that closes after flowering.

3. P. compres'sa, L.; stem smooth compressed, upper leaf equalling
or exceeding its sheath, ligule short, branches of diffuse panicle 2–3-nate
scabrid, fl. glumes 4–9 obtuse nearly glabrous, nerves obscure.
Dry banks, walls, &c., from Ross southd.; rare in Ireland; Channel Islands;
fl. June–July.—Smooth or slightly rough, glabrous, more or less glaucous.
Stems 1–2 ft., usually much bent towards the base. Leaves flat, rough or
not. Panicle 1–3 in., usually more secund and contracted than in P.
praten'ssis, but sometimes effuse. Spikelets ⅛ in., green or bluish-purple;
empty glumes subequal; fl. glumes broadly hyaline, 3-nerved (P. subcom-
pres'sa, Parn.) or 5-nerved (P. polyno'da, Parn.) and then more usually
webbed.—DISTRIB. Europe, N. and W. Asia; native (?) of N. America.

*** Rootstock shortly creeping, stolons 0.

4. P. trivi'a lis, L.; stems and sheaths usually rough, ligule oblong
acute, branches of diffuse panicle 5-nate scabrid, fl. glumes 3–5 acuminate
glabrous or webbed, nerves 5 distinct.
Woods and meadows, N. to Shetland; ascends to 2,500 ft. in the Highlands;
Ireland; Channel Islands; fl. June–July.—Very near indeed to P. praten'ssis,
and chiefly distinguishable by the roughness, absence of stolons, and
erect panicle. Var. P. Koeleri, DC., which grows in woods, has smooth
sheaths. Var. parvi'ora, Parn., is a weak state with 1–2 fld. spikelets.—
DISTRIB. Europe, N. Africa, N. Asia; introd. in N. America.

5. P. nemora'lis, L.; stems and sheaths smooth, ligule short or 0,
branches of the subsecond panicle 2–5-nate scabrid, fl. glumes 1–5 sub-
acute, edges and keel pubescent, nerves obsolete.
Copses and woods, from Skye and Elgin southd.; ascends to 1,600 ft. in the
Highlands; Ireland, rare; Channel Islands; fl. June–July.—Smooth, bright
green, glaucous or not. Stems 1–3 ft., very slender, terete or subcompressed.
Leaves linear, very narrow, flaccid; sheaths smooth, striate. Panicle 2–5
in., slender, nodding. *Spikelets* small, ½ in., yellow-green and purplish; empty glumes often equaling the flowering, acuminate; fl. glumes 2-5, scarcely hyaline at the tip or margins.—*Distrib.* Europe, N. Asia, Himalaya, N. America.—Very variable. I am quite unable to define the forms into which it has been divided, and about which no two authors are agreed. I recognise the following British varieties, but I cannot correlate them with exotic ones satisfactorily. The characters taken from the length of the upper leaf and its sheath and the position of the upper node are valueless.

**Var.** *P. Parnellii*, Bab.; smaller, more slender, with smaller spikelets.—**Var.** *P. Balfourii*, Parn. (*P. montana*, Parn.; *P. caesia* and *glauca*, Sm.); stouter, panicle more erect, spikelets larger.—Alpine cliffs; ascends to 3,000 ft.

6. **P. laxa**, Hanke; stems slightly compressed, leaves short, ligules long torn acute, branches of narrow lax subsecund panicle solitary or 2-nate smooth, fl. glumes 2-4, keel and margins villous, nerves 3-5 obscure.

Rocks, on the alps of Aberdeen and Inverness; alt. 2,000 to 3,600 ft.; fl. July-Aug.—Flaccid, smooth, pale glaucous green. *Stems* 4-10 in., compressed and prostrate below. *Leaves* linear, obliquely mucronate, upper longer than its sheath; sheaths compressed. *Panicle* 1-3 in., drooping, lax or open, branches rarely scaberulous. *Spikelets* ½-⅓ in., often viviparous, green and purplish; empty glumes acuminate, tips hyaline.—*Distrib.* N., Alpine, and Arctic Europe, Siberia, N. America.—Often with difficulty distinguished from *P. alpina*.

**P. laxa** proper; leaves channelled tip concave, panicle open in flower closed in fruit. *P. flexuosa*, Sm.; *P. mi‘nor*, Gaud.

Sub-sp. **P. stricta**, Lindb.; leaves flat to the tip, panicle open in flower spreading in fruit.

7. **P. alpina**, L.; stems glabrous terete, leaves broad firm tip rounded, upper ligules long acute, branches of erect spreading panicle 2-nate, fl. glumes 3-9, keel and margins pubescent, nerves 3-5 obscure.

Rocks, &c., on lofty mts., N. Wales, York to Sutherland; alt. 3-4,000 ft.; W. Ireland, very rare; fl. June-Aug.—Smooth. *Rootstock* stout, creeping. *Stems* 10-15 in., stout. *Leaves* rather short, strict, rigid, keeled, mucronate, edges thickened scabrid, upper shorter than its sheath; lower sheaths broad, white, membranous, persistent, leafless, upper compressed smooth. *Panicle* oblong or pyramidal, 1-3 in. broad. *Spikelets* ½ in., green and purplish, often viviparous; empty glumes unequal, ovate, acute; fl. glumes with hyaline tips, webbed, also broad.—*Distrib.* N., Alpine, and Arctic Europe, N. and W. Asia, Himalaya, N. America.

8. **P. bulbosoa**, L.; lower nodes tuberous, stem and terete sheaths smooth, leaves narrow, ligules all long acute, branches of panicle 2-nate scabrid, fl. glumes 3-6, margins and acute keel pubescent, nerves obsolete.

Spikelets ½ in. broad, green and purplish-brown; empty glumes ovate, acute, keel scabrid; fl. glumes also broad, acute.—Distr. Europe, N. Africa, Siberia.—Very near P. alpina, but differing in locality, habit, and the close ovate panicle.


Perennial tall grasses; leaf sheaths entire. Spikelets linear, subterete, in effuse or contracted panicles, many-fld., branches in ½-whorls; rachilla jointed between the fl. glumes. Empty glumes 2, shorter than the lowest flowering, 1–5-nerved, unequal, membranous, convex, awnless; upper larger. Fl. glumes caducous, cartilaginous, convex, not keeled, tip obtuse usually scarious; nerves 3–9 evanescent upwards. Palea 2-fld., nerves ciliate. Scales fleshy, truncate. Stamens 3. Ovary glabrous; styles terminal, short or 0, stigmas feathery. Fruit oblong, enveloped and sometimes adnate to the fl. glume, channelled.—Distr. Temp. and cold climates; species 30.—Etym. γλυκέρας, in allusion to the sweet grain.

Section 1. Hydroclaoa. Scales fleshy truncate or 0. Fruit thick obtuse, hardly compressed, furrow very narrow or 0.


Watery places, from Elgin and Mull southish.; Ireland; Channel Islands; fl. July–Aug.—Rootstock stout, extensively creeping. Stems 2–6 ft., stout, smooth, striate. Leaves 1–2 ft., ½–1½ in. broad, flat, suberect, acute; sheaths smooth; ligule short. Panicle 6–12 in. Spikelets ½ in., yellow-green and purple; glumes scabrid; empty short, shining; flowering rigid, obtuse; nerves strong.—Distr. Europe, Siberia, Himalaya, N. America.


Watery places, N. to Shetland; ascends to 1,600 ft. in Yorkshire; Ireland; Channel Islands; fl. July–Aug.—Rootstock stout, widely creeping. Stem 1–3 ft., stout, branched, terete, floating or creeping, smooth. Leaves ½–1½ in. broad, flat, acute, short, or the upper long and floating; sheaths long, compressed; ligule broad, acute. Panicle 1–2 ft., simple or branched; rachis 3-gonous; branches remote, smooth. Spikelets ½–2 in., erect, green or tips purplish; empty glumes unequal, tips torn; fl. glumes scabrid, tips often ragged.—Distr. Europe, N. Africa, W. Siberia, Himalaya, N. America.—A very variable plant.

Var. G. plicata, Fr., has divaricate fruiting spikelets, and fl. glumes twice as long as broad.—Var. G. pedicellata, Towns., has broader blunter leaves, with rough furrowed sheaths, 3-toothed fl. glumes, not exceeding the palea (it never fruits).—Var. G. declinata, Brebiss, is a dwarf form with smooth sheaths, few-fld. spikelets, and the palea longer than the 3-toothed fl. glume. Hampshire and Scilly Islands.

Section 2. A' tropis, Rupr. (gen.). Scales slender, distinct. Fruit thick, dorsally compressed, ventrally hollow or broadly furrowed.

Muddy, &c., sea-coasts, N. to Shetland; Ireland; Channel Islands; fl. July.—Rootstock widely creeping. *Stems* 8–16 in., terete, smooth. *Leaves* involute or channelled, acute or pungent; sheaths smooth; ligule rather long, oblong. *Panicle* 1–3 in., oblong, contracted; branches appressed or horizontal, rarely deflexed, or more than 3-nate; rachis subterete, grooved on one side. *Spikelets* ¾–1 ⅔ in., ovate-oblong or linear-elongate, green or purplish; empty glumes subacute; fl. glumes obscurely 3-toothed, tip hyaline or not.—**DISTRIB.** Europe, N. Africa, Siberia, N. America.—**VAR. his'pida**, Parn.; panicle rough.—**VAR. ripa'ria**, Towns.; more slender, spikelets fewer, flowers later. Hants.


Sandy chiefly maritime places, N. to Shetland Ireland, rare; fl. July–Aug.—Rarely stoloniferous; leaves broad, flat; stem in the typical states tall, slender; panicle with long horizontal and deflexed branches, and spikelets ¾–1 ⅔ in. or less.—**DISTRIB.** Europe, N. Africa, Siberia, Himalaya, N. America.


**40. FESTU'CA, L. FESCUE GRASS.**

*Spikelets* subterete, racemied or panicled, 3-or more-fl'd.; rachilla jointed between the fl. glumes. *Empty glumes* 2, rarely 1, shorter than the lowest fl. glume, unequal, membranous, acute; upper larger, 3-nerved; lower 1-nerved. *Fl. glumes* convex, 3–5-nerved, mucronate or awned at or near the tip, upper sometimes empty. *Palea* 2-fl'd, nerves hairy. *Scales* 2,
notched. Stamens 1-3. Ovary glabrous; styles short, terminal, stigmas feathery. Fruit free or adherent to the fl. glume and palea.—Distr. Arctic, cold, and temp. regions; species 80.—Etym. An old Latin name.


* Leaves flat; ligule of upper sheath short.

1. *F. elatior*, L.; panicle diffuse nodding, fl. glumes 3-7 glabrous acute or almost awned, ovary glabrous.

River-banks and wet places, N. to Shetland; ascends to 1,300 ft. in N. England; Ireland; Channel Islands; fl. June-July.—Rootstock creeping, stoloniferous. Stems 2-6 ft., nodding, smooth. Leaves 4-10 in. broad, smooth, striate. Panicle 3-6 in., contracted after flowering; rachis 3-quetrous, smooth; branches 2-nate, scabrid. Spikelets many, ½-3 in., linear-oblong, green and dull purple; empty glumes broadly hyaline; fl. glumes scabrid above, rarely awned; margins hyaline.—Distr. Europe (Arctic), N. Africa, W. Siberia, Himalaya, N. America.—A large maritime state with rougher sheaths and branches of panicle divaricate after flowering is the *F. arundinacea*, Schreb.

2. *F. pratensis*, HUDS.; panicle subsecund nodding close, fl. glumes 4-10 glabrous obtuse or mucronate, ovary glabrous. *F. elatior*, L., in part.

River-banks and wet places, from Caithness south.; ascends to 1,600 ft. in N. England; Ireland; fl. June-July.—Perhaps only a sub-species of *F. elatior*, but smaller, less stoloniferous; panicle much narrower, more distichous and simple, sometimes 10 in., branches shorter, in pairs, one with 1 spikelet, the other with 2 or more; fl. glumes more numerous, sometimes shortly awned.—Distr. Europe (Arctic), N. Asia; introd. in N. America.

*F. lotiacea*, Curt. (not HUDS.), with inflorescence racemose or spiked, spikelets distichous, awn 0, fl. glumes more obtuse, is a hybrid with *Lolium perenne*.

3. *F. gigantea*, Vill.; panicle very open nodding, fl. glumes 3-8 scabrid, awn double their length, ovary glabrous. *Bromus*, L.

Damp woods and hedgebanks, from Argyll and Elgin south.; ascends to 1,000 ft. in Yorkshire; Ireland; fl. July-Aug.—Habit of *Bromus*. Root fibrous. Stems 2-4 ft., smooth, terete, nodding. Leaves flaccid, ½-1 in. broad, bright green, striate, scaberulous above; sheaths smooth. Panicle 8-12 in.; branches in pairs, and 3-quetrous rachis long slender scabrid. Spikelets ½ in., linear-ovate or -oblong, membranous, pale green; empty glumes lanceolate, broadly hyaline; fl. glumes 2-fid, awn variable, very slender, flexuous; styles subterminal.—Distr. Europe, Siberia.—Flowers sometimes few (*F. triflor'ra*, Sm.).

** Leaves involute; ligule of upper sheath long, not awricled.

Woods in hilly districts, from Banff and Inverness to Wilts and Sussex; absent in E. England and ? Wales; rare in Ireland; fl. July. — Root fibrous; stolons short. Stems 2-3 ft., stiff, erect, smooth, terete. Leaves ½-1½ in., broad, glaucous above, edges scabrid; sheaths almost smooth, lower lax leafless brown. Panicle 3-6 in., ovate, much branched; rachis and 2-4-nate branches very slender, slightly scabrid. Spikelets ¼ in., broadly ovate, small, flat, pale yellow-green; axis scabrid; empty glumes linear-subulate; fl. glumes spreading, slender, acuminate, shortly awned, scaberulous.—DISTRIB. W. Europe to Austria, Germany, and Italy.—F. decid'ua, Sm., is a narrower-leaved 2-3-fld. variety.

SECTION 2. Festu'ca proper. Perennial. Lower (or all) leaves setaceous; ligule auricled. Spikelets paniced. Flowers 3-androus; awn short.

5. F. ov'i'na, L.; glaucous, leaves setaceous or upper flat, ligule 2-lobed, panicle subunilateral, spikelets 3-12-fld. purplish, fl. glumes terete mucronate or shortly awned.

Dry hilly pastures, woods, &c., N. to Shetland, at all elevations; Ireland; Channel Islands; fl. June–July. — One of the most abundant grasses, 3-24 in., slender, variable in size, colour, and habit; the following sub-species express its principal modifications.—DISTRIB. Europe, N. Africa, Siberia, Himalaya, N. and S. America, Mts. of Australasia.

F. ov'i'na proper; densely tufted, leaves all setaceous, sheaths glabrous, panicle contracted subsecund, spikelets small 3-5-fld., fl. glumes ½ in. mucronate or awned often viviparous.—Upland copses, moors and sandy places; ascends to 4,300 ft. (Arctic). — Syme has grouped the prevalent forms as follows: F. ov'i'na proper; leaves setaceous flaccid green, radical short, fl. glumes awned.—F. tenuif'olia, Sibth.; leaves setaceous flaccid green radical longer, fl. glume mucronate.—VAR. F. glau'ca, Lamk.; leaves stouter, rigid, glaucous, radical short often recurved, fl. glume awned.—VAR. ma'jor; taller, panicle larger, stem leaves broader than the radical, fl. glume usually awned.

Sub-sp. F. duri'us'cula, L.; less densely tufted, stoloniferous, stem-leaves flat, sheaths downy, panicle more open, spikelets usually many-fld., fl. glumes ½ in. narrow. F. cae'sia, Sm.? — Pastures and meadows; ascends to 2,700 ft. in the Highlands.

Sub-sp. F. rub'ra, L.; taller, laxly tufted, stoloniferous, leaves flat or involu- lute, lower sheaths hairy, panicle effuse subsecund, spikelets pale red, fl. glumes ½-1½ in. broader awned. Shaded places in low grounds.—VAR. F. aren'a'ria, Osb. (F. sabu'tic'ola, Duf., F. oraria, Dum., F. rubra, Sm. not L.); rigid, creeping, leaves all involute. Sandy shores.


6. F. Myu'ros, L.; panicle branched at the base only very long and slender, lower empty glume small, fl. glumes 5-8 equalling their slender awns, stamens 1-3.

Walls, sandy and gravelly pastures, N. to Sutherland; Mid. and S. Ireland; Channel Islands; fl. June.—Root fibrous. Stems 6-18 in., very slender,
leafy, glabrous, lower setaceous; upper sheaths long, terete, grooved, smooth; ligule very short. Panicle 4–10 in., strict or flexuous, very narrow, opaque or shining, glabrous or pubescent, rachis and branches angular smooth or scaberulous; lower branches appressed; upper very short. Spikelets with the awns $\frac{1}{2}–\frac{3}{4}$ in., cuneate when expanded, rachilla smooth; empty glumes subulate; fl. glumes distant, terete, almost subulate, narrowed into the slender awn, nerves obscure.—Distrib. Europe, N. Africa; introd. in N. America.

F. Myu'ros proper; slender, upper sheath exceeding the stem and often the long slender panicle, lower empty glume $\frac{1}{3}$ shorter than the upper. F. pseudo-myu'ros, Koch. From York (ascending 1,000 ft.) southd.—F. ambiy'ua, Le Gall, is shorter, with upper empty glume 3–6 times as long as the lower, stamen 1. I. of Wight, Suffolk, Norfolk, Dorset.

Sub-sp. F. sciuroi'ides, Roth; stem shorter naked above, panicle shorter more open, lower branches slender, lower empty glumes twice as long as the upper. F. bromoi'ides, Sm.—N. to Caithness.

7. F. uniglu'mis, Sol.; panicle or spike short, branches very short, lower empty glume minute or 0, fl. glumes 4–10 shorter than the awns, flowers 2–3-androus. Vul'pia membranacea, Link.

Sandy sea-coasts, from Lancaster and Norfolk to Devon and Kent; S. Wales; E. Ireland, local; Channel Islands; fl. June–July.—Root fibrous. Stems 4–10 in., bent below, slender, glabrous. Leaves setaceous, short; upper sheaths large, inflated; ligule short, auricled. Panicle $\frac{1}{2}$–2 in., oblong, unilateral, pale green, shining, rachis smooth; lower branches 2-nate. Spikelets with the awns $\frac{3}{4}$–1 in., almost subulate; fruiting cuneate; pedicels short, stout; rachilla smooth; empty glumes with subulate tips or awns, upper 3-nerved, broadly hyaline; fl. glumes distant, very narrow, strongly nerves, scabrid, terete below, compressed above, gradually narrowed into the subulate awn; ovary glabrous.—Distrib. W. Europe from Belgium S. and E. to Turkey, N. Africa.

Section 4. Catapo'dium, Link (gen.). Annual, rigid. Spikelets sessile or subsessile alternate on a simple or branched flat (not excavate) rachis. Fl. glumes subacute or mucronate.

8. F. rig'id'a, Kth.; branches of panicle distichous with 3–5 subsessile spikelets, fl. glumes 7–10 acute, nerves faint. Glyce'ria, Sm.; Sclerochlo'a, Link.

Dry rocks, walls, &c., from Ross southd. ; Ireland; Channel Islands; fl. June.—Often purple, glabrous, smooth. Root fibrous. Stem 3–6 in. Leaves involute, subsetaceous; sheaths terete, grooved; ligule oblong. Panicle $\frac{1}{2}$–2½ in., strict; rachis broadly channelled, edges scabrid. Spikelets $\frac{1}{2}$–$\frac{1}{2}$ in., rarely solitary (then spiked); pedicels short, stout, ½-terete; fl. glumes quite terete, shining, smooth.—Distrib. W. and S. Europe from Holland southd., Canaries.

Sandy shores, from Fife and Wigton southd.; Ireland; Channel Islands; fl. July-Aug.—Green, smooth, glabrous. Root fibrous. Stems spreading and erect, leafy. Leaves small, flat or involute; sheaths smooth; ligule oblong. Spikes strict, 1–2½ in.; rachis stout, ½-terete, hardly flexuus, edges smooth. Spikelets ¼–½ in., sessile, erect, green; fl. glumes broad, obtusely-keeled, smooth; lateral nerves strongest.—Distr. S. and W. Europe from France to Dalmatia, N. Africa.

41. Bro'mus, L. Brome Grass.

Annual or perennial grasses. Spikelets subterete or laterally compressed, panicked or racemous, 5–many-fld.; rachilla jointed between the fl. glumes. Empty glumes 2, shorter than the lowest fl. glume, unequal, coriaceous, acute, awnless; lower smaller 1–5-nerved; upper 3–9-nerved. Fl. glumes convex or keeled, 5–9-nerved, tip entire or 2-fld, 1–3-awned, mid awn often bent or twisted. Palea 2-fld, nerves ciliate. Scales entire. Stamens 3, rarely 2. Ovary hairy at the top; styles short, inserted below the top, stigmas feathery. Fruit linear, grooved, oblong, adherent to the palea.—Distr. Temp. and cold climates; species 40.—Etym. Greek name for Oat.

Section 1. Festucoides, Coss. and Dur. Lower empty glume 1-nerved, upper 3-nerved. Fl. glumes distant, narrow, convex below, keeled and compressed above, 5-nerved, awn terminal. Styles lateral on the ovary.

* Keels of palea pubescent. Fl. glumes spreading in flower, erect in fruit.

1. B. as'per, Murr.; leaves flat and sheaths hairy, panicle second nodding, fl. glumes 5–8 twice as long as the awn. B. ramosus, Huds.

Damp woods, hedgebanks, &c., from Elgin and Mull southd.; ascends to 1,200 ft. in Yorkshire; Ireland; fl. June–July.—Annual or perennial. Root fibrous. Stem 2–6 ft., smooth. Leaves ¼–½ in. diam., green, long, hairs scattered, reflexed on the sheath; ligule short. Panicle 3–5 in., lower branches 2–6-nate, long, lax, capillary, and rachis scabrid. Spikelets 1 in., narrow, glaucous green, rachilla scabrid; empty glumes acuminate, hairy or glabrous; fl. glumes with the awn ½–3 in., diverging in flower, then erect, more or less hairy, lateral nerves strong, tip 2-toothed; awn variable in length.—Distr. Europe, Siberia; introd. in N. America.

B. sero'tinus, Beneck., has sheaths all with reflexed hairs, lower panicle branches 2-nate, empty glumes unequal, fl. glume glabrous next the midrib.

—B. Benecken'ii, Syme, has upper sheaths glabrate, lower panicle branches 3–6-nate, with a semilunar thickening at the base, empty glumes subequal, fl. glume hairy all over. Near London, a doubtful native.

2. B. erec'tus, Huds.; leaves involute hairy, panicle erect narrow, fl. glumes twice as long as the awn.

Fields and waste places in dry soil, from Fife to Kent and Sussex; Ireland, rare; fl. June–July.—Perennial. Rootstock stout, creeping; stolons 0. Stems 1–3 ft., rigid, smooth, bent below, then erect. Leaves narrow, rigid, almost subulate, hairy; hairs scattered on the upper sheaths, erect; ligule...
short. *Panicle* 4–6 in., subsimple, strict, branches 2–3-nate and rachis scabrid. *Spikelets* \( \frac{3}{4} \)–1\( \frac{1}{4} \) in., subsolitary, green or purplish; empty glumes longer than in *B. asper*; fl. glumes hairy all over (var. *villo'sa*, Bab.), or on the nerves only, much the same in both.—DISTRIB. Europe, N. Africa.

**Annual.** Keels of *palea* pectinate-ciliate. Fl. glumes erect both in flower and fruit (except *B. max'imus*).

3. *B. ster'ilis*, L.; leaves flat hairy, sheaths compressed, panicle very lax, branches few very long in \( \frac{1}{2} \)-whorls, spikelets subsolitary, fl. glumes 7–10 much shorter than their awns.

Fields and waste places, N. to Caithness; ascends to 1,200 ft. in Derby; Ireland; Channel Islands; fl. June–July.—Root fibrous. *Stems* 1–2 ft., erect, smooth, leafy. *Leaves* \( \frac{3}{8} \)–1 in. broad, flaccid, ribbed; sheaths glabrous or pubescent. *Panicle* 6–16 in. broad, nodding, very lax and open; branches horizontal and drooping. *Spikelets* with the awns 2 in., nodding, green; empty glumes long, narrow, upper twice the longest; fl. glumes very narrow, gradually narrowed into the very slender straight awn, with 7 strong equidistant ribs, margins hyaline.—DISTRIB. Europe, W. Siberia, N. Africa; introd. in N. America.

4. *B. madriten'sis*, L.; leaves narrow flat hairy, sheaths terete, panicle erect, branches few strict erect, fl. glumes 6–8 half as long as the straight stout awn.

Sandy waste places, S. Wales to Oxford, and Kent to Devon; Tipperary; Channel Islands; (native? *Wats.*); fl. June–July.—Stems 6–14 in., strict from an ascending base, smooth, leafy. *Leaves* \( \frac{3}{10} \)–\( \frac{1}{6} \) in., more or less hairy or tomentose; hairs on sheaths reflexed; ligule short, truncate. *Panicle* 2–4 in., oblong, compressed; branches appressed, short, and slender rachis scabrid. *Spikelets* \( \frac{3}{4} \)–\( \frac{1}{3} \) in., excluding the awns, dull green, rachilla smooth; lower empty glume subulate, half as long as the narrow linear upper; fl. glumes \( \frac{1}{4} \) in., very narrow, scabrid, nerves 7 lateral close together, margins and 2-fid tip broadly hyaline; awn slender; stamens usually 2.—DISTRIB. From France and Spain to Turkey, N. Africa.

*B. madriten'sis* proper (*B. dian'drus*, Curt.); rachis pedicels and glumes scabrous. VAR. *Curtis'ii*, Bab.—VAR. *B. rig'idus*, Roth; rachis pedicels and glumes pubescent. Channel Islands.

5. *B. max'imus*, Desf.; leaves flat hairy, sheaths terete, panicle erect, branches few strict, fl. glumes 4–6 not \( \frac{1}{2} \) as long as the straight awn.

Sandy shores, Channel Islands; fl. June–July.—Root fibrous. *Stems* 6–10 in., terete, pubescent. *Leaves* \( \frac{1}{8} \)–\( \frac{1}{4} \) in. broad, bright green; hairs on sheaths spreading or reflexed; ligule short, truncate. *Panicle* 4–7 in., at length nodding; branches short, appressed, and rachis pubescent. *Spikelets* with the awns 2–3 in., pale green or purplish; rachilla glabrous; empty glumes hyaline, very narrow, awned; upper twice as long as the lower, almost equalizing the lowest fl. glume; fl. glumes thin, narrow, scabrid, narrowed into the scabrid awn; nerves faint; stamens 2–3.—DISTRIB. France, Spain, Mediterranean.
SECTION 2. Zeobro'mus, Griseb. Annual or perennial. Lower empty glume 5- upper 7-9-nerved. Fl. glumes close, convex, 5-7-nerved, 2-fid, awned in the sinus. Palea with pectinate-ciliate nerves. Styles inserted below the top of the ovary. Serrafal'cus, Pârl. (gen.).

* Fl. glume longer than its palea.

6. B. mol'lis, L.; pubescent or tomentose, panicle ovoid strict, lower empty glume broadly ovate, fl. glumes 6–10 densely imbricate pubescent opaque equalling the slender awn.

Roadsides and waste places, N. to Shetland; ascends to 1,800 ft. in N. England; Ireland; Channel Islands; fl. May–July.—Glaucescent green. Stems 4–24 in., terete. Leaves flat, \( \frac{1}{2} \) – 1 in. broad, soft, edges scabrid; sheaths terete, villous; ligule short. Panicle 1–3 in., erect or nodding; branches very short, subsimple. Spikelets \( \frac{1}{2} \) – 3 in., compressed, oblong, tips conic; empty glumes broadly ovate, acute, strongly nerved, upper much largest; fl. glumes caducous, broadest and obtusely angled above the middle, 2-fid, pubescent.—Distrib. Europe, N. Africa, W. Siberia; introd. in N. America.—Very variable; Syme enumerates three forms, the typical with pubescent spikelets, and erect nearly straight awns; a smaller glabrescent one (glabres'cens); and Lloydia'nus (mollif or'mis, Lloyd) with awns spreading outwards in fruit. B. hordea'ceus, Fr., is a prostrate maritime form.

7. B. racemo'sus, L.; leaves and sheaths glabrate or hairy, panicle narrow, lower empty glume lanceolate, fl. glumes 6–10 imbricate scabrid shining equalling the slender awn.

Fields and waste places, N. to Shetland; ascends to 1,200 ft. in the Highlands; Ireland; Channel Islands; fl. June–July.—Very similar to B. mol'lis, but subglabrous, often 2–3-ft., rigid; leaves rigid, more ciliate; branches of panicle 3–5-nate, long and slender; spikelets narrower, more acute, scabrid; empty glumes narrower, especially the lower; fl. glume broadest above the middle, margin obtusely angled.—Distrib. Europe (excl. Russia), N. Africa; introd. in N. America.

B. commuta'tus, Schrad. (B. praten'sis, Ehrh., B. arven'sis, Sm.), is stouter, panicle more compound drooping, spikelets shorter, margins of caducous fl. glumes less rounded at the broadest part.

8. B. secali'nus, L.; glabrate or sheaths hairy, panicle effuse hairy, fl. glumes 5–8 not imbricate terete scabrid longer than their awns.

Cornfields, from Isla and Ross southd.; (a colonist, Wats.); fl. June–July.—Root of stout fibres. Stems 1–4 ft., strict, rigid, smooth, rarely pubescent (B. veluti'nus, Schrad., and B. multiifo'rus, Sm.) Leaves \( \frac{1}{2} \) – 1 \( \frac{1}{2} \) in. broad, glabrous or slightly hairy, scabrid above; sheaths grooved; ligule short. Panicle 3–5 in., oblong; branches 3–5-nate and rachis flexuous, scabrid, subsimple. Spikelets \( \frac{1}{2} \) – 3 in., compressed; empty glumes unequal, broadly oblong; scabrid, mucronate, upper larger; fl. glumes spreading, linear-oblong, 7–9-nerved, margins incurved, straight, hyaline, notched, at length coriaceous; awn variable.—Distrib. Europe, N. Africa, W. Siberia; introd. in N. America.
**Fl. glume not longer than its palea**

**B. arvensis**, L.; leaves and sheaths hairy, panicle pyramidal effuse, branches horizontal, fl. glumes imbricate equalling the straight awn.

Casual from Fife southd.; fl. July–Aug.—Root fibrous or creeping. **Stems** 1–2 ft., smooth. **Leaves** ¼–½ in. broad, flat, short, hairy beneath; sheaths grooved, pubescent; ligule obtuse. **Panicle** 4–8 in., 3–5 in. broad; branches 5–7-nate, spreading, very long, capillary, scaberulous, with a few spikelets towards the tips. **Spikelets** ½ in., lanceolate, compressed, green or dull violet; rachilla smooth; empty glumes ovate-oblong, keel scabrid, upper much the largest, acute or shortly awned; fl. glumes ⅛ in., imbricate till quite mature, then rather distant, oblong, 2-fld, strongly nerved; awn dark.—**DISTRIB.** Europe.

### 42. BRACHYPO'DIUM, Beauv.

Perennial grasses. **Spikelets** subsessile, distichous, terete, spiked, inserted broadside to the rachis, very many-fl.; rachilla jointed between the fl. glumes. **Empty glumes** 2, rarely 1, much shorter than the flowering, straight. **Fl. glumes** densely imbricate; awn terminal or 0, 7–9-nerved, nerves converging to the tip. **Palea** with ciliate nerves. **Scales** 2, ovate. **Stamens** 2–3. **Ovary** hairy at the top; styles distant, stigmas feathery. **Fruit** adhering to the palea.—**DISTRIB.** Europe, temp. Asia, N. Africa; species 5 or 6.—**ETYM.** βραχύς and ποδίων, from the subsessile spikelets.


Copses, hedgerows, &c., N. to Orkney; ascends to 1,000 ft. in N. England; Ireland; Channel Islands; fl. June–July.—**Stems** 1–3 ft., very slender, terete, inclined, leafy. **Leaves** ½–3 in. broad, flat, bright green, ciliate; sheaths terete; ligule obtuse. **Spike** 2–6 in.; rachis flattened, smooth, slender. **Spikelets** 8–18, 1–2 in., appressed, linear, very shortly pedicelled, hirsute or glabrate, green; empty glumes cuspidate, strongly 3–5-nerved; fl. glumes 8–10, ⅜ in., linear-oblong, nerves strong, tip acuminate awned; palea ciliate at the tip, equalling the glume.—**DISTRIB.** Europe, N. Africa, N.W. Himalaya.


Downs and hedgerows in chalky soil, from York to Devon and Kent; absent in Wales, Cambridge only in the E. counties; fl. July.—Glaucous. **Stems** 1–3 ft., very slender, terete, naked, smooth. **Leaves** rigid, almost glabrous, involute, rarely flat; ligule ciliate. **Spike** 1–6 in.; rachis flattened, smooth. **Spikelets** ¼–1½ in., erect, curved away from the rachis, glabrous or pubescent, green and purplish; empty and fl. glumes much as in **B. sylvaticum**, but glabrous or nearly so, and tips of the latter suddenly contracted into the short awn.—**DISTRIB.** Europe, N. Africa, Siberia.

Characters of *Agropy'rum*, but upper empty glume absent except in the terminal spikelet; lower persistent, facing the rachis.—Distr. N. temp. regions; species 2 or 3.—Etym. An old Latin name.

1. *L. peren'ne*, L.; perennial, empty glume shorter than the spikelet.

Waste places, N. to Shetland; ascends to 1,600 ft. in N. England; Ireland; Channel Islands; fl. May–June.—Root fibrous, stolons leafy. *Stems* 18 in., bent below, ascending, smooth, slightly compressed. *Leaves* flat, edges and upper surface scabrid; sheaths smooth, compressed; ligule short. *Spike* 4–10 in., strict, stout and 6–10-fld. or slender and 3–4-fld. (*L. ten'ue*, L.); rachis smooth, channelled on one side. *Spikelets* ⅓–½ in. (much longer in var. *ital'icum*), quite smooth, shining; empty glumes strongly ribbed, linear-lanceolate; fl. glume linear-oblong, terete, obtuse or cuspidate or awned, ribbed.—Distr. Europe, N. Africa, W. Asia; introd. in N. America.—*L. ital'icum*, A. Br., *L. remo'rum*, Schrk., *L. multiflo'ra*, Lamk., and *L. peren'ne*, var. *arista'ta*, are cultivated annual or biennial forms, with many flowers, not known in a wild state.—*L. festuca'ceum*, Link (*Festuca lol'id'cea*, Curt., not Huds.), is a hybrid with *F. ela'tior* (Nyman).

2. *L. temulen'tum*, L.; annual, empty glume equalling or exceeding the spikelets. *Darnel.*

Cornfields, N. to Shetland; Ireland; Channel Islands; (a colonist, *Wats.*); fl. June–Aug.—Similar to *L. peren'ne*, but always annual, without stolons, empty glume longer, and fl. glumes more turgid, awn short or long or 0 (*L. arven'se*, With.).—Distr. Europe, N. Africa, W. Siberia, India; introd. in N. America.—Fruit very poisonous.

44. *Agropy'rum*, J. *Gärtn.*


Woods, banks, and waste places, from Sutherland southd; ascends to 1,800 ft. in Yorkshire; Ireland; fl. July.—Bright green. *Stems* 1–3 ft., slender. *Spike* 2–10 in., very slender, often flexuous and nodding; rachis with scabrid edges. *Spikelets* ½–⅔ in., green, rather slender; pedicel very short, pubescent or glabrous; empty glumes scabrid, cuspidate or shortly awned, nerves usually 3, very firm; fl. glumes linear-lanceolate, smooth except at the 5-nerved tip; awn scabrid, longer or shorter than the palea.—Distr. Europe, Siberia, Himalaya, N. America.
2. A. repens, Beauv.; rootstock creeping, rachis of spike not brittle, empty glumes 5-ribbed, fl. glumes 4–5 rigid cuspidate or acuminate rarely awned. Triticum, L. Couch or Quitch Grass.

Fields and waste places, N. to Shetland; ascends to 1,300 ft. in N. England; Ireland; Channel Islands; fl. June–Aug.—Excessively variable. Rootstock stout, long, creeping, jointed. Stems 1–4 ft., bent and ascending, smooth, glabrous. Leaves flat or involute, usually scabrid above and glabrous beneath, sometimes hairy; sheaths terete; ligule very short. Spike 2–10 in., rigid, slender or robust, strict or curved, not nodding, rachis glabrous or pubescent. Spikelets ¾–1 in., very rigid; empty glumes acute obtuse or notched, rigid short points or awns of variable length; fl. glumes quite similar, but nervous only at the tip.—DISTRIB. Europe, N. Africa, N. Asia, Himalaya, N. America.—Triticum canin'unum, var. bi'jü'dra, Mitt. (T. alp''num, Don MSS.), found on Ben Lawers, and said to want the creeping rootstock, is (judging from the specimen) only A. repens.—There is no accordance amongst specialists as to the limits of the forms of this plant and their nomenclature.

A. repens proper; stems solitary hollow, leaves flaccid usually hairy, nerves slender scabrid in one line, spikelets 3–7-fld., rachis slender.—VAR. barba'ta has empty glumes tapering subulate or awned, fl. glumes awned.—VAR. obtu'sa has empty glumes obliquely truncate, fl. glumes obtuse apiculate.

Sub-sp. A. fun'gens, R. and S.; stems densely tufted solid above, leaves firm involute ribbed, ribs scabrid in one line, spikelets 5–12-fld., rachis with broad internodes. Seashores and tidal rivers.—A. litora'le, Reichb. (Triticum, Host.), has glumes acuminate, fl. glume mucronate or awned.—A. pyca'n-thum, Gren. and Godr., is more glaucous, spike more compact, empty glumes rounded obtuse, fl. glumes obtuse mucronate.

Sub-sp. A. acu'tum, R. and S.; stems loosely tufted solid geniculate at the base, leaves firm not so involute ribbed glabrous or hairy, ribs scabrid all over, spike arching lax long, spikelets 5–8-fld., rachis with very broad internodes. Triticum acu'tum, DC.; T. lax'um, Fries.—Sandy shores.—Intermediate between repens and jun'ceum.

3. A. jun'ceum, Beauv.; rootstock creeping, rachis of spike fragile, spikelets large shining, empty glumes 5–11-ribbed, fl. glumes 4–10 obtuse acute notched or truncate rarely mucronate. Triticum, L.

Sandy seashores, local, Orkney to Devon and Kent; Ireland; Channel Islands; fl. July–Aug.—Often glaucous, rigid, forming large masses. Rootstock stout; extensively creeping. Stems bent below, ascending, smooth, sheathed at the base. Leaves coriaceous, involute, pubescent above, glabrous beneath; sheaths smooth, rather inflated; ligule short. Spike 2–4 in., stout, curved; rachis very stout, smooth. Spikelets ¾–1¼ in., distant, very stout, pale, rigidly coriaceous, smooth, shining; empty glumes strongly or faintly nerves; fl. glume obscurely so; internodes of rachis much dilated upwards.—DISTRIB. Europe, N. Africa, N. America?

45. LEPTU'RUS, Br.

Slender grasses. Spikelets solitary, sessile, distichous, alternate in a small spike, placed broadside to and in excavations of the jointed rachis,

**L. filifor'mis**, Trin.; annual, glabrous, spike slender.

Waste places by the sea, from Eife and Isla southd.; Ireland; Channel Islands; fl. July.—*Root* fibrous. *Stems* 4–10 in., bent or curved below, ascending, stout or slender, shining, terete, leafy. *Leaves* short, coriaceous, scaberulous, soon involute; sheaths slightly compressed, smooth, upper inflated; ligule very short, auricled. *Spike* 2–6 in., straight or curved, short or long; rachis rigid, grooved, hollowed on one side. *Spikelets* ¼ in., green, appressed or spreading; empty glumes rather oblique, linear-oblong, pointed; fl. glumes with 1 green nerve; palea with glabrous keels.—*Distrib*. From Gothland southd., excl. Russia; N. Africa.

**L. filifor'mis** proper; stem and spike slender, the latter nearly straight.—

**Var.** L. *incru'ratus*, Trin.; stem and spike stouter, the latter strongly curved. Ballast heaps, Fife.

### 46. NAR'DUS, L. MAT-WEEED.


**N. stric'ta**, L.; glabrous, leaves setaceous channelled scaberulous.

Heaths and dry pastures, N. to Shetland; ascends to 3,300 ft. in the High-
lands; Ireland; Channel Islands; fl. June–July.—*Rootstock* stout, creeping, densely tufted. *Stems* 2–8 in., erect, filiform, rigid, striate, angled; base with long pale sheaths. *Leaves*, upper erect, lower almost horizontal; sheaths smooth; ligule short. *Spike* 1–3 in., solitary; rachis very slender, strict. *Spikelets* rather distant; fl. glume ½ in., slender, reddish or purplish; divericate after flowering, scabrid above, narrowed into the short awn.—Rejected by sheep, on account of the harsh foliage.

### 47. HOR'DEUM, L. BARLEY.

*Spikelets* 2–3-nate, subsessile, distichous, compressed, spiked, inserted broadside to the rachis, 1-fld., rachilla produced with a subulate rudimen-
tary glume; lateral spikelets, rarely the central, neuter male or 2-sexual. *Empty glumes* 2, exceeding the flowering or not, equal, collo-
laterally placed in front of the spikelet, awned. Fl. *glume* rounded at
the back, awned. Palea as long, narrow, 2-keeled. Scales 2, ciliate. Ovary hirsute; stigmas 2, subsessile, feathery. Fruit free or adherent to the palea, grooved in front.—DISTRIB. N. temp. and warm regions, S. America; species 12.—ETYM. The old Latin name.

* Flowers of lateral spikelets 2-sexual, of middle male.


Copses and woods in chalky soil, from Northumbd. to Hants and Kent; absent in Wales and the E. counties; Dublin (native?) ; fl. June–July.—Perennial, bright green. Stems 1–3 ft., strict, erect, smooth. Leaves ½–⅔ ft. broad, flat, thin, scaberulous; sheaths hispid, hairs reflexed; ligule very short. Spikes 2–4 in. strict, erect, terete, green. Spikelets ⅓ in. erect, subsessile; empty glumes awned, 3-nerved; fl. glumes linear-oblong, dorsally compressed, scabrid, shorter than the straight flexuous awn, nerved towards the tip; palea with smooth keels. Fruit very narrow.—DISTRIB. From Gothland to Spain, Italy, and Russia.

** Lateral spikelets flowerless or male, middle 2-sexual.


Wet meadows, &c., from Berwick southd.; Ireland, local; fl. June–July.—Rootstock creeping. Stems very slender, 1–2 ft., terete, scabrid above. Leaves ⅛–½ ft. narrow, flat, at length involute, scabrid above, hairy beneath, as are the narrow sheaths; ligule very short. Spike 1–3 in., ⅛–⅓ ft. broad, inclined, linear, yellow-green. Spikelets with the awns ⅚ ft. in., rather spreading, scabrid all over, not ciliate; fl. glumes terete, smooth, about equaling the awn, obscurely nerved; palea as long, acute, keels not ciliate.—DISTRIB. From Gothland to Spain and Russia, N. Asia, N.W. India, N. America.


Waste places, N. to Caithness; E. Scotland only; Ireland, very rare; Channel Islands; fl. June–July.—Root fibrous. Stems ascending,'6–18 in. smooth, glabrous. Leaves small, narrow, scabrid; sheaths inflated, glabrous; ligule very short. Spikes 1½–2 in., stout, inclined, green. Spikelets 1 in., densely imbricate; empty glumes filiform; fl. glumes lanceolate, flattened, much shorter than the straight awn; palea with distantly ciliate keels.—DISTRIB. From Gothland southd., N. Africa.—VAR. arena'ria, Bab., is a form from sandy places with the stem below branched and rooting.

4. **H. marit'imum**, With.; annual, spike subterete, empty glume scabrid, upper of the mid. spikelet ½-lanceolate, the rest setaceous. Squirrel-tail Grass.

Waste maritime localities, Durham to Kent and Devon; absent in Wales; Channel Islands; fl. June.—Stems 6–12 in., bent below, then erect, terete, smooth, leafy. Leaves short, straight, narrow, flat, glaucous, scabrid; lower sheaths
pubescent, upper inflated; ligule very short. Spike 1–2 in., stout, erect, subterete, at length yellow-brown. Spikelets $\frac{1}{2}$ in. without the awns, rather spreading, rigid; larger empty glume of mid. spikelet green with scarious margins, shorter than the rigid awn; fl. glume lanceolate, flattened, about equalling the rigid awn.—DISTRIB. From Denmark southd., N. Africa.

48. EL'YMUS, L. LymE-Grass.

Tall perennial grasses. Spikelets 2–3-nate, sessile, distichous, compressed, spiked, inserted broadside to the rachis, 2–7-fld. Empty glumes 2, equalling or exceeding the flowering, equal, placed in front of the spikelet. Fl. glumes 5-nerved, coriaceous, awned or not. Palea with 2 ciliate keels. Scales ovate, usually ciliate. Stamens 3. Ovary hirsute; stigmas sessile, distant feathery. Fruit grooved, adnate to the fl. glume and palea.—DISTRIB. N. temp. regions; species 20.—ÉTYM. διάω, the fruit being rolled up in the palea.

E. arena'rius, L.; fl. glumes rigid acuminate, awn 0.

Sandy seashores, from Essex and N. Wales to Shetland; Ireland; Channel Islands; fl. July.—Glaucus. Rootstock stout, creeping, stoloniferous. Stems 3–6 ft., very stout, smooth, terete. Leaves rigid, strict, pungent, $\frac{1}{2}$–3 in. diam.; sheaths smooth, grooved; ligule very short. Spike 6–12 in., stout, strict; rachis flexuous, plano-convex, hirsute. Spikelets 1 in., imbricate, appressed; rachilla stout, pubescent; empty glumes linear-lanceolate, purplish; fl. glumes 1–3, lanceolate, ciliate and hirsute, keeled towards the cuspidate tip; palea as long as the glume.—DISTRIB. Europe, N. Asia, N. America.

Class III. ACOTYLE'DONES or CRYPTOGRAMS.

Order XC. FIL'ICES.

Perennial herbs (very rarely annual), sometimes shrubby or arborescent, with fibrous roots, or creeping rootstocks. Leaves (fronds) tufted or alternate on the rootstock, simple pinnatifid or 1–4-pinnate, usually circinate in vernation; petiole (stipes) sometimes jointed at the base and rachis, grooved on the upper surface. Fructification of microscopic spores, contained in usually minute capsules that are collected in masses (sori) on the under surface or edge of the frond, or rarely on separate fronds or parts of the frond, and are naked or covered with an involucre formed of or upon the margin or back of the frond. Capsules membranous, sessile or stalked, often mixed with jointed club-shaped hairs (imperfect capsules). Spores usually obtusely 4-hedral.—DISTRIB. Chiefly humid temp. and trop. regions; genera 75; species 2,500. —AFFINITIES. With Lycopodia'ceae.
In germination the spore develops a flat cellular scale (prothallus), on the under surface of which are formed cavities some containing male and some female organs. The male cavities (antheridia) contain sperm-cells (spermatozooids or antherozoids), which enclose a spiral filament. The female cavities (archegonia) contain a solitary free germ-cell. The antherozoids find their way into the archegonia and fertilize the germ-cell, which thereupon develops into a plant, the prothallus withering away.

** Tribe I. Hymenophyllæ. ** Frond very membranous, translucent, reticulate. Involucre 2-valved, urceolate or 2-lipped. Capsules minute, membranous, reticulate, sessile on a clavate or filiform receptacle, girt by a complete horizontal or oblique ring. **Vernation** circinate.

<table>
<thead>
<tr>
<th>Involucre 2-valved</th>
<th>1. Hymenophyllum.</th>
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<tr>
<td>Involucre urceolate</td>
<td>2. Trichomanes.</td>
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** Tribe II. Polypodiæ. ** Frond more or less coriaceous, opaque. Involucre marginal or dorsal or 0. Capsules minute, membranous, reticulate, not raised on an elevated receptacle, stalked, partially girt by a vertical ring, bursting transversely. **Vernation** circinate.

* Sori marginal; involucre continuous with the reflexed or recurved margin of the frond.

Sori oblong, short. Fronds all similar.................................3. Adiantum.  
Sori linear, continuous. Fronds all similar..............................4. Pteris.  
Sori subglobose, on special fronds ........................................5. Cryptogramme.  
Sori linear, on special fronds...............................................6. Lomaria.

** Sori dorsal, linear; involucre linear.

Involucre on a nerve, single ..................................................7. Asplenium.  
Involucre on a nerve, double..................................................8. Scolopendrium.

*** Sori dorsal, globose; involucre short.

Involucre lacerate, attached under the sorus..............................9. Woodsia.  
Involucre hooded, on one side of the sorus ................................10. Cystopteris.  
Involucre orbicular, peltate...................................................11. Aspidium.  

**** Sori dorsal; involucre 0 (see Ceterach under Asplenium).

Sori globose or oblong ............................................................13. Polypodium.  

** Tribe III. Osmundæ. ** Frond coriaceous or membranous. Involucre 0. Capsules sessile or shortly stalked, vertically 2-valved, with a short lateral or subterminal striate areola. **Vernation** circinate...15. Osmunda.

** Tribe IV. Ophioglossæ. ** Capsules large, 2-valved, without a ring or areola, coriaceous, in spikes or panicles. **Vernation** straight.

1. HYMENOPHYLLUM, Sm. FILICES.

Rootstock filiform, creeping. Fronds usually matted and 2-4-pinnatifid or -pinnate, pellucid, reticulate; segments with a midrib; veins 0. Sori marginal, axillary or terminal; involucr free or sunk in the frond, 2-valved or 2-lipped, opening outwards; capsules sessile on a columnar receptacle; ring complete, oblique.—Distrib. Trop. and temp. regions; species 70.—Etym. ὑμήν and φυλλος, from the membranous fronds.

1. H. tunbridgen’s, Sm.; frond ovate pinnate below, pinnatifid above, pinnae spreading spinulose-serrate, involucr toothed. Moist shaded rocks or copses, from Stirling, Mull, and Argyll southd. to W. York, and from Kent to Cornwall (ascending to 1,000 ft.); Ireland, rare; Channel Islands; frt. June-July.—Rootstocks capillary, interlaced. Stipes 1-2 in., winged above. Frond 1-3 in., glabrous; pinnae distichous, flabellately pinnatifid, lobes linear; involucr solitary, axillary, suborbicular, lips strongly irregularly toothed.—Distrib. Belgium, France, Germany, Italy, Canaries, S. temp. regions.

2. H. unilatera’le, Willd.; frond oblong pinnate below or through-out, pinnules decurved spinulose-serrate, involucr entire. H. Wilso’ni, Hook.

Moist shaded rocks or copses, Shetland to York; Stafford, Salop, Wales, Devon, Cornwall; ascends to 2,800 ft. in the Hebrides, and 2,400 in Ireland; frt. June-July. —Perhaps only a sub-species of H. tunbridgen’se, but more rigid, darker green; involucr more ovoid and turgid; pinnae pinnatifid chiefly on the upper side.—Distrib. As H. tunbridgen’s.

2. TRICHOM’ANES, L. BRISTLE-FERN.

Rootstock creeping or tufted, stout or slender. Frond erect or pendulous, simple pinnate or 1-4-pinnatifid, usually pellucid, reticulate; segments with a stout simple or forked midrib. Sori marginal, axillary or terminal; involucr elongate, free or sunk in the frond, tubular or campanulate, mouth entire or 2-lipped, opening outwards; capsules sessile on a long often exserted receptacle.—Distrib. Chiefly trop. and damp warm climates; species 78.—Etym. obscure.

T. radi’cans, Sw.; rootstock creeping, frond 2-3-pinnatifid. T. specio’sum, Willd.

Wet shaded rocks, Killarney, York, S. Wales, Argyll, Arran; frt. July-Sept.—Rootstock slender, wiry, extensively creeping, tomentose. Stipes 2-6 in., stout, wiry, ascending, naked below, winged above. Frond 4-12 in., membranous, firm; rachis winged; lower pinnae 1-4 in., rhomboid-ovate; pin-nules the same shape, pinnatifid, toothed, nerves 1 to each segment. Sori lateral, 1-4 to each pinnule; tube of involucr short, lips small; receptacle exserted.—Distrib. W. Europe, trop. Africa and America, Himalaya, Japan, Polynesia.
3. **ADIAN'TUM, L.** MAIDENHAIR.

*Rootstock* tufted or creeping. *Frond* compound, 2–4-pinnate, rarely simple; rachis and branchlets capillary; veins forked or netted. *Sori* rounded or oblong, parallel with and on the margin; involucre formed of the reflexed often kidney-shaped coriaceous margin of the frond, opening inwards, surface veined.—*Distrib.* All temp. and hot climates; species 62.—*Etym.* The old Greek name.

**A. Capill'us-Ven'eris, L.**; frond 3–4-pinnate, pinnules cuneate lobed earnate glabrous.

Damp rocks, walls, &c., especially near the sea, local, Dorset to Cornwall, I. of Man, Glamorgan; W. Ireland, local; frt. May–Sept.—*Rootstock* creeping, scaly. *Stipes* 4–9 in., slender, black, polished, naked. *Frond* 4–12 in., ovate, with a short terminal and many spreading capillary branches; lower pinnate; pinnules ¼–1 in., membranous, outer edge rounded; stalks ½ in.; veins repeatedly forked. *Sori* in the crenatures of the pinnules; involucre subreniform.—*Distrib.* From France southd.; temp. and trop. Old and New World.

4. **PTER'IS, L.** BRAKE, OR **BRACKEN.**

*Rootstock* usually creeping. *Frond* various; veins free, forked or netted. *Sori* continuous; involucre scarios or membranous, confluent with the recurved margin of the frond, not recurved in age.—*Distrib.* All regions; species 83.—*Etym.* πτερόν, from the wing-like fronds.

**P. aquili'na, L.**; frond coriaceous 3–4-pinnate, veins free.

Forests, heaths, moors, &c., N. to Shetland; ascends to 2,000 ft. in the Highlands; Ireland; Channel Islands; frt. July–Aug.—*Rootstock* stout, subterranean, extensively creeping. *Stipes* 1–6 ft., stout, erect, pale, dark at the base. *Frond* 2–3 ft.; rachis glabrous or pubescent; upper pinnæ simple, next cut into linear pinnules, lower stalked, 1 ft. or more, again pinnate; pinnules 1 in., sessile, auricled at the base; veins close, 1–2-forked. *Involucre* glabrous villous or ciliate, sometimes double, inner very narrow.—*Distrib.* Arctic Europe, and all temp. and many trop. regions.

5. **CRYPTOGRAM'ME, Br.** PARSLEY-FERN, ROCK-BRAKE.

*Rootstock* tufted, often elongate. *Fronds* outer barren, inner fertile, 2–4-pinnatifid; veins forked, free. *Sori* terminal on the veins, subglobose, afterwards confluent along the margins of the fertile pinnules; involucre membranous, continuous with the recurved margin of the frond; spreading in age.—*Distrib.* N. temp. and Arctic regions; species 1.—*Etym.* κρύπτως and γραμμή, from the concealed sori.

**C. cris'pa, Br.**; fertile pinnules fusiform. *Allosoro'rus,* Bernh.
Loose stony places in mt. districts, from Harris and Caithness to N. Devon; absent in E. England; ascends to 3,500 ft. in the Highlands; Ireland, very rare; frt. June-July.—Rootstock scaly, clothed with broken bases of fronds. Stipes of barren fronds 1–2 in., of fertile 2–5 in. slender, naked, pale brown. Fronds deltoid-ovate, submembranous; barren 2-pinnate, pinnules 2–3-pinnatifid, cuneate or oblong, 2–3-toothed; fertile 2–3-pinnate; pinnules fusiform or oblong-lanceolate, obtuse, entire, subpetiolo.

6. LOMA'RIA, Willd. HARD-FERN.

Rootstock usually short or creeping. Fronds tufted, of 2 kinds; outer barren or fertile below only; inner fertile; veins free, simple or forked. Sori linear, close to the margin, continuous round the pinnule, often covering its lower surface; involucre linear, close to and parallel with the margin, opening inwards, scarious.—DISTRIB. Trop. and temp. chiefly south regions; species 40.—ETYM. λάμια, from the marginal sori.

L. Spi'cant, Desv.; barren fronds narrow-lanceolate pinnatifid above, pinnate below. Blech'num boreal'le, Sw.

Heaths, woods, banks, &c., N. to Shetland; ascends to 2,000 ft. in the Highlands; Ireland; Channel Islands; frt. July–Aug.—Rootstock stout, creeping, scaly. Stipes of barren fronds 2–3 in., of fertile 6–9 in., polished, red-brown. Fronds erect or spreading; barren 6–9 in., narrowed to the base, coriaceous, green, glabrous; pinnules ½–⅔ in., linear-oblong, sessile by a broad base, obtuse, quite entire, sinus narrow, veins inconspicuous; fertile pinnate, pinnae distant, falcate, narrow, obtuse, dilated at the base, lower minute very distant. Involucre marginal in a young state.—DISTRIB. Europe (Arctic), Canaries, N.E. Asia, N.W. America.

7. ASPLE'NIUM, L. SPEENWORT.

Rootstock usually short, tufted. Fronds various. Sori dorsal on the veins, linear or oblong, oblique, distant from the midrib, except when the frond is much divided; involucre oblong or linear, membranous, laterally attached to the vein, opening towards the midrib.—DISTRIB. All climates but very cold; species 280.—ETYM. α and σπλήν, having been a reputed spleen medicine.

Sub-gen. 1. Asple'nium proper. Involucre straight, narrow, margin entire or erose. Frond not scaly beneath. Veins free.

* Ultimate pinnules without a distinct midrib.

1. A. Ru'ta-mura'ria, L.; frond oblong or ovate rigid irregularly 2-pinnate, pinnae 3–7 obovate-cuneate, tip rounded or truncate toothed.

Walls and rocks, N. to Orkney; ascends to 2,000 ft. in the Highlands; Ireland; Channel Islands; frt. June–Oct.—Rootstock stout, shortly creeping, without scales. Stipes tufted, 2–4 in., wiry, black below. Frond 1–2 in., recurved, often deltoid; pinnae stalked, upper entire, lower again pinnate; pinnules ½–⅔ in., often rhomboid; midrib obsolete; veins flabellate, forked. Sori many, linear-oblong, 2–5 on each pinnule; involucre entire or margins erose.—DISTRIB. Europe (Arctic), N. and S. Africa, N. Asia, N.W. Himalaya, N. America.

Rocks, very rare; N. Wales, N. England, Roxburgh, Perth, Fife; frt. June-Sept.—Rootstock densely tufted, creeping, without scales. *Stipes* 2—4 in., slender, erect, black below. *Frond* rather flaccid, 2—3 in.; pinnae 7—9, 1/2—3 in., very variable, sometimes fan-shaped, lower shortly stalked, irregularly 2—3-lobed; lobes crenate or toothed; midrib obsolete, veins forked. *Sori* 2—4 on each pinna or segment, parallel, linear-oblong; involucre entire, at length covering the breadth but not the length of the segments.—**Distrib.** Europe (excl. Greece and Turkey), Himalaya, China.


Walls and rocks, rare; Devon, Somerset, N. Wales (ascending to 3,000 ft.), northd. to Perth and Aberdeen; frt. June-Oct.—Rootstock densely tufted, hardly scaly. *Stipes* many, 3—4 in., erect, rigid, black below. *Frond* coriaceous, 1—2 in., lanceolate, simple or cleft into slender segments; midrib obsolete; veins forked. *Sori* 1—4 on each pinna, parallel, at length covering the pinna; involucre narrow.—**Distrib.** Europe, N. and W. Asia, Himalaya, N. America.

**Ultimate pinnules with a distinct midrib.**


Walls and rocks, N. to Orkney; ascends to 2,000 ft. in Wales; Ireland; Channel Islands; frt. May-Oct.—Rootstock stout, shortly creeping; scales few, subulate, blackish. *Stipes* 1—4 in., crowded, naked, polished, red-brown, black below. *Frond* 6—12 in., rigid; pinnae 15—40, horizontal, dark green lower smaller, base obliquely cuneate truncate rounded or auricled, sometimes incised; midrib subcentral; veins few, oblique, forked above the middle. *Sori* oblique, short; involucre pale brown, entire or erose.—**Distrib.** Europe, N. Africa, N. and W. Asia, N. America, S. temp. regions. —A. an’ceps, Sol., is simply a larger form.—A. Clermont’æ, Syme (A. Petrarc’hæ, Newm., not DC.), from a garden wall at Newry, is considered by its author, with hardly a doubt, to be a hybrid with *A. Ru’ta-mura’ria*, from which latter it differs in its simply pinnate linear frond, more sessile pinnae, and more divergent veins.

5. A. vir’ide, Hud. ; frond linear pinnate, rachis green slender, pinnae 1/2—3 in. many shortly stalked rhombic-ovate crenate.

Wet rocks in mt. districts, from Shetland to S. Wales and Derby; ascends to 2,800 ft. in the Highlands; W. Ireland; frt. June-Sept.—Perhaps an alpine sub-species of *A. Trichomanes*, distinguished by its more flaccid habit, pale rachis, shorter paler and shortly stalked pinnae.—**Distrib.** Europe (Arctic), N. and W. Asia, N. America.

6. A. mari’num, L.; frond oblong or lanceolate coriaceous pinnate below, pinnae 1—2 in. oblong-ovate crenate.

Sea-cliffs and caves, Shetland to York on the E. coast, and to Cornwall and Hants on the W. and S.; Ireland; Channel Islands; frt. June-Sept.—
Rootstock stout, clothed with purple-brown chaffy scales. Stipes 3–6 in., red-brown below, stout, polished. Frond 3–10 in.; rachis stout, winged, green; pinnæ acute or obtuse, base truncate cuneate or cordate auricled above sinuate-lobed or serrate, upper confluent; midrib and forked veins obscure. Sori large, oblique; involucre coriaceous.—Distrib. France, Spain, Italy, N. Africa, N. America.

7. A. lanceolatum, Huds.; frond broadly lanceolate membranous 2-pinnate, pinnules broad crowded acutely serrate.

Wet rocks; York, Wales, Gloster, Cornwall to Kent; Cork; Channel Islands; frt. June–Sept.—Rootstock short, stout, clothed with subulate scales. Stipes 2–4 in., chestnut-brown, glossy. Frond 6–9 in., bright green; pinnæ many, shortly petaled, lower smaller distant, cut to the rachis into ovate or obovate pinnules; veins forked. Sori short, at length confluent.—Distrib. Europe from France, Spain, and Germany to Turkey, N. Africa.


Rocks and walls, N. to Shetland; ascends to 1,900 ft. in the Highlands; Ireland; Channel Islands; frt. June–Oct.—Rootstock stout, oblique, scales subulate. Stipes 6–9 in., almost naked, polished, chestnut-brown. Frond 6–12 in., coriaceous; rachis brown below, winged and compressed above, pinnæ polished ovate-lanceolate, pinnules 2/3–3 in.; veins pinnate and forked. Sori copious, short, crowded, at length confluent; involucre free, pale brown, edges entire.—Distrib. Europe, N. Africa, W. Asia, Himalaya. Var. A. acutum, Bory; lower pinnæ triangular acuminate, segments narrow very acute; S.W. Ireland.—Var. A. obtusum, Willd. (A. Serpenti'ni, Tausch); pinnæ triangular, ultimate segments broad obtuse. Aberdeenshire, on Serpentine.

Sub-gen. 2. Athyrium, Roth (gen.). Involucre short, oblong or obliquely reniform, reflexed after dehiscence, margin laciniate. Frond not scaly beneath; veins free.

9. A. Filix-fœmina, Bernh.; frond large membranous oblong-lanceolate 2–3-pinnate, pinnules very many close-set subsessile oblong serrate.

Moist woods, rocky places, &c., N. to Shetland; ascends to 2,200 ft. in N. England; Ireland; Channel Islands; frt. July–Aug.—Rootstock stout, ascending, often 6–8 in., clothed with broad ferruginous scales. Stipes 6–12 in., stout, copiously scaly below, brittle, brown or pale yellow. Frond 1–5 ft., bright green, flaccid, waving; pinnæ sessile, close-set, lancolate, acuminate, spreading and ascending; pinnules 1/3–1/2 in., sessile, spreading, obtuse, lower pinnatifid, upper coarsely serrate; veins pinnate in the segments. Sori many, small; involucre variously curved, membranous, very convex, margin fringed or erose.—Distrib. Europe (Arctic), Africa, N. and W. Asia, Himalaya, America. A. Filix-fœmina proper; frond 2-pinnate, pinnules separate pinnatifid obtuse, basal shorter, sharply toothed at the sides and tip.—Var. A. rheticum, Roth (var. convex'a, Newm.); frond 2-pinnate, pinnules narrow convex toothed, basal longest.—Var. A. molle, Roth; stipes short, frond small pinnate, pinnules oblong flat confluent below less toothed.—Var. A.
incisum, Hoffm.; frond very large 3-pinnate, pinnæ broad, lower pinnules again pinnate flat toothed.—Var. Ath. latifolium, Bab., is a form with very broad much imbricated sharply incised pinnules, once found near Keswick.


10. A. Ceterach, L.; frond pinnatifid. Ceterach officinarum, Desv: Rocks and walls, chiefly in W. counties, from Argyll and Perth southd.; Ireland; Channel Islands; frt. April–Sept.—Rootstock short, stout. Stipes 1–3 in., wiry, blackish, chaffy. Frond 4–6 in., erect or spreading, leathery, linear-lanceolate or oblong, bright opaque green above, beneath densely clothed with rusty ovate toothed scales; segments 1/2 in., horizontal, broadly ovate or oblong, quite entire, lower segments free, sinus broad deep rounded. Sori linear, hidden under the scales; involucre a very narrow membrane, or a ridge on the swollen nerve.—Distrib. From Belgium southd., N. Africa, W. Asia, N.W. Himalaya.

8. Scolopen'drium, Sm. Hart's-Tongue.

Rootstock stout, short, inclined. Fronds tufted, simple, coriaceous; veins free or anastomosing. Sori linear on opposite contiguous veins, almost confluent; involucre linear, attached to the vein, those of the contiguous sori opening opposite one another.—Distrib. Temp. and trop. regions; species 9.—Etym. The old Greek name.

S. vul'gare, Sm.; frond oblong-ligulate, base cordate.

Hedgebanks, rocks, copses, &c., N. to Shetland; Ireland; Channel Islands; frt. July–Aug.—Rootstock, stipes, and often midrib clothed with subulate scales. Stipes very stout, 4–8 in. Fronds 6–18 in., broadest in the middle, coriaceous, flaccid, bright green; basal auricles converging; margin undulate; midrib stout; veins in groups of 2–4, indistinct, free or casually anastomosing, horizontal. Sori parallel, at right angles to the midrib, very variable in length and number.—Distrib. From Gotland southd., N. Africa, W. Asia, Japan, N.W. America.—A multitude of varieties are cultivated, presenting wonderful departures from the normal state.

9. Wood'sia, Br.

Rootstock short, tufted. Stipes usually articulate above the base. Fronds pinnate. Sori globose; involucre inferior, membranous, at first calyciform, then usually breaking up into capillary segments.—Distrib. Arctic and N. temp. regions, Andes, S. Africa; species 14.—Etym. J. Woods, an eminent English botanist.

W. hyperbo'rea, Br.; frond lanceolate pinnate, pinnæ ovate-oblong or cordate.

Wet alpine rocks, alt. 2,000–3,000 ft., N. Wales; Durham to Dumfries, Forfar, and Perth; frt. July–Aug.—Rootstock stout, subelongate. Fronds 3–6 in., densely tufted. Stipes shining, clothed with ferruginous scales. Pinnae subdistant, 1–6 in., pubescent and ciliate; veins simple and forked. Sori
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3–5 on each lobe.—**Distrib.** Arctic, N. and Alps of Mid. Europe, N. Asia, Himalaya, N. America.

W. *Hyperbo'rea* proper; frond linear-lanceolate, pinnae ovate-cordate, lobes few broad.—N. Wales, Forfar, Perth.

Sub-sp. W. *Ilyen'sis*, Br.; frond broadly lanceolate, pinnae deeply pinnatifid with oblong subcrescent lobes.—N. Wales to Forfar.


Delicate flaccid ferns. *Rootstock* short or creeping. *Fronds* tufted or scattered, 1–4-pinnate; veins pinnate or forked, venules free. *Sori* small, dorsal on the middle of a venule, globose; involucre membranous, attached by a broad base to the venule below the sorus, ovate, convex, acute, at length reflexed.—**Distrib.** Cool damp regions; species 5.—**Etym.** Κώστής and πτερίς, from the bladder-like involucre.


Rocks and walls in mountain districts, Orkney to Cornwall and Sussex; absent in E. half of England, S. of York and N. of Middlesex; ascends to 4,000 ft. in the Highlands; Ireland; frt. July–Aug.—**Rootstock** densely clothed with pale brown lanceolate membranous scales. *Stipes* 2–4 in., brittle. *Frond* 4–8 in.; rachis slightly winged above, larger pinnae 1–1 ½ in., lobes or teeth obtuse or acute. *Sori* 2–12 on each segment.—**Distrib.** Arctic, N. and S. temp. regions.

*C. frag'ilis* proper; frond tripinnatifid, pinnules generally incised half-way to the rachis, ultimate division contiguous.—**Var.** C. *denta'ta*, Hook.; pinnae ovate-lanceolate obtuse obtusely toothed, sori submarginal.—**Var.** C. *Dick-i'ēana*, Sim; frond ovate-oblong obtuse membranous, pinnae ovate obtuse subdepressed segments broad crowded obtuse crenate.

Sub-sp. C. *Alpi'na*, Desv.; frond quadripinnatifid, pinnules incised nearly to the rachis, ultimate divisions not quite contiguous.—Teesdale.

2. *C. monta'na*, Link; rootstock creeping, frond deltoid 3–4-pinnate, pinnae and pinnules spreading.

Alpine wet rocks, alt. 2,300–3,600 ft., very rare, Perth, Forfar, and Aberdeen; frt. July–Aug.—**Rootstock** widely creeping, sparingly scaly. *Stipes* 6–9 in., very slender. *Frond* 4–6 in., as broad as long, lowest pinnae 1–1 ½ in., segments cut to the rachis, deeply sharply toothed, especially towards the tip. *Sori* small, 18–24 on the lowest pinnules. *Involucre* cut at the edge.—**Distrib.** Arctic and alpine regions, Europe, Asia, America.

### 11. Aspidium, Sw. Shield-Fern.

Habit various. *Sori* dorsal, globose; involucre superior, orbicular, peltate.—**Distrib.** All regions; species 55.—**Etym.** άσπις, a shield, from the form of the involucre.—The British species belong to the section Polystichum, having free veins.

1. *A. Lonchi'tis*, Sw.; frond linear-oblong pinnae

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Clefts of alpine rocks, &c., from Caithness to N. Wales and York; ascends to 3,200 ft. in the Highlands; Ireland; frt. June-Aug.—**Rootstock** densely tufted, oblique, scaly. **Fronds** densely tufted, 6–18 in., coriaceous, bright green, glabrous except the scaly short stout stipes and rachis and veins beneath. **Pinnae** many, \( \frac{1}{2} \)–1 in., narrow-ovate, base auricled and obliquely rhomboid, falcate, acuminate, spinulose-serrate. **Sori** in 2–3 rows on each side the midrib.—**Distrib.** Europe (Arctic), N. and W. Asia, Himalaya, N. America.


Woods, shaded hedgebanks, &c., from Orkney southd.; ascends to 2,500 ft. in Yorkshire; Ireland; Channel Islands; frt. July-Aug.—**Rootstock** short, stout, and stipes and rachis densely clothed with ferruginous scales. **Frond** 6–12 in., scaly beneath; lower pinnae 4–6 in., close-set, lanceolate; pinnules obliquely rhomboid-ovate auricled, teeth mucronate or awned. **Sori** 1-seriate on each side the midrib, dorsal on the veins.—**Distrib.** From Belgium southd., W. Asia, N. America, S. temp. regions.

A. aculea'tum proper; rather flaccid, pinnules sessile lower free, serratures spinulose.

Sub-sp. **A. loba'tum**, Sw.; frond 2-pinnate, pinnules very rigid sessile decurrent confluent below, upper basal longest.—**Var. lonchitidoi'des**; narrower, approaching A. Lonchitidis.

Sub-sp. **A. angula're**, Willd.; submembranous, pinnules small petioled lax sometimes again pinnatifid, teeth large awned.—From the Clyde southd.


**Sori** subglobose, dorsal or terminal on the venules; involucre reniform, superior, attached by the sinus.—**Distrib.** All regions; species 224. —**Etym.** ρεφός, from the kidney-shaped involucres.—The British species all belong to the sub-genus Lastre'α, Presl, with free veins.

1. **N. Fil'ix-mas**, Rich.; rootstock tufted, stipes and rachis with lanceolate scales, frond 1–2-pinnate, pinnules deeply obtusely lobed contracted at the base, involucre convex eglandular. **Male Fern.**

Woods and shaded places, N. to Ross; ascends to 2,400 ft. in Yorkshire; Ireland; Channel Islands; frt. July-Aug.—**Rootstock** sometimes 6–10 in., solid and woody. **Fronds** 1–3 ft., and stipes more or less scaly beneath, oblong-lanceolate, rather rigid, rarely simply pinnate; segments entire or serrate at the tip; veins simple or forked. **Sori** large, 1-seriate. **Involucre** smooth, firm.—**Distrib.** N. temp. regions, India, Africa, Andes.

**N. Fil'ix-mas** proper; frond 2-pinnate, pinnae long crowded acuminate, pinnules obtuse serrate, lower distinct.—**Var. affinis**, Fisch. (var. incis'a, Newm.); pinnules oblong-lanceolate incised less crowded.—**Var. Borré'rɪ, Newm.**; rachis very scaly, frond bright golden yellow, pinnules very obtuse almost truncate less serrate.—**Var. L. abbrevia'ta**, D.C.; frond pinnate, pinnae pinnatifid or crenate oblong obtuse with one row of sori along the midrib.

2. **N. crista'tum**, Rich.; rootstock shortly creeping, stipes with ovate or oblong scales, rachis naked, frond oblong-lanceolate sub-2-pin-
nate, pinnules deeply obtusely lobed toothed attached by a broad base, involucre flat eglandular.

Bogs and marshes, Notts, Hunts, Chester, Yorks; Renfrew; frt. Aug.—*Rootstock* and stout pale stipes clothed with large bullate acuminate pale scales. *Frond* 1-1½ ft., narrow, glabrous; pinnae shortly petioled, oblong, base truncate obtuse apiculate, teeth short not awned, veins forked. *Involucre* quite glabrous, entire.—*Distrib.* Europe, W. Siberia, N. America. *Lastrea uliginosa*, Newm., with pinnules more divided, teeth slightly spinulose, is intermediate between *N. spinulosum* and *cristatum*, and occurs with the typical form.

3. *N. rigidum*, Desv.; rootstock tufted and stipes scaly below, frond oblong-lanceolate, lower pinnae rhomboid lobed to the rachis with mucronate pinnules flat subglandular beneath, involucre gland-ciliate.

Mountains of Lancashire, York, and Westmoreland, rare; ascends to about 1,500 ft.; frt. July-Aug.—*Rootstock* and stout stipes densely clothed with long concolorous scales. *Frond* 12-18 in., subglandular beneath, narrow; pinnae 2-3 in.; pinnules acutely toothed, lower with subpinnate venules. *Sori* close to the midrib. *Involucre* firm, convex.—*Distrib.* W. Europe to Greece, W. Asia, N. America.

4. *N. spinulosum*, Desv.; rootstock tufted, stipes sparingly scaly, frond oblong-lanceolate, lower pinnae subdeltoid, pinnules lobed to the rachis flat, teeth awned, involucre smooth gland-ciliate or not.


*N. spinulosum* proper; scales ovate concolorous, frond oblong-lanceolate eglandular beneath pale green, involucre not gland ciliate.

Sub-sp. *N. dilatatum*, Desv.; scales denser narrower centre dark brown, frond larger ovate-lanceolate or subdeltoid 2-3-pinnate more deeply cut darker and brighter green, pinnae closer glandular beneath, involucre evanescent gland-ciliate.—*Var. glandulosa*, Newm., is more glandular beneath, frond broader.—*Var. na'na*, Newm., is smaller.—*Aspidium Bootii*, Tuck. (*Lastrea colli'na*, Newm.), has pinnules subentire.—*Aspidium dumetorum*, Sm., connects it with *dilatatum*.—Ascends to 3,700 ft. in the Highlands; Channel Islands.

Sub-sp. *Aspidium remo'tum*, Braun; scales lanceolate concolorous extending up the rachis, frond oblong-lanceolate, pinnae close lanceolate, pinnules ovate-oblong cut half away to the rachis eglandular beneath, lower only free, involucre eglandular.—Windermere.—Between *spinulosum* and *F'lix-mas*.

5. *N. aemulum*, Baker; rootstock tufted, stipes densely scaly below, frond subdeltoid 3-pinnate, pinnules triangular-ovate concave above, glandular beneath, lowest largest spinous-serrate, edges of involucre
eglandular. N. fœnise'cii, Lowe; Lastrea recur'va, Bree; L. a‘mula, Brack.

Hilly districts, from Orkney southd., local; Ireland; frt. July–Sept.—Hardly distinct from N. spinulosum, frond more triangular and divided, remarkably concave and curved upwards; scales more fimbriate and undulate, glands of involucre sessile.—Distrib. Europe, Madeira, Azores.—Smells of hay.

6. N. Thelyp’teris, Desv.; rootstock creeping, stipes naked, frond lanceolate pinnate, pinnae deeply pinnatifid, margins entire recurved.


Mountain heaths and pastures, N. to Shetland; ascends to 3,000 ft. in the Highlands; local in Ireland; frt. July–Aug.—Rootstock erect or decumbent, and short stout stipes and rachis below scaly. Frond 1½–2 ft., broadly oblong-lanceolate; pinnae 3–4 in., spreading, sessile, lanceolate, lower smaller more obtuse and distant; lobes flat, obtuse, entire, costa pubescent; lower venules forked. Sori near the margins. Involucre membranous.—Distrib. Europe (excl. Sweden), W. Asia.—Fragrant.

13. POLYPO'DIUM, L. POLYPODY.

Ferns of various habit. Fronds simple, lobed, pinnatifid or compound. Sori dorsal, globose; involucre 0.—Distrib. All regions, but chiefly trop. ; species 390.—Etym. πολύς and πούς, from the many stipes of some.

Section 1. Polypo'dium proper. Stipes articulate with the rootstock.

1. P. vulga're, L.; rootstock creeping densely scaly, fronds alternate pinnatifid, segments linear-oblong obtuse or acute entire crenate-serrate.

Walls, banks, trees, &c., N. to Shetland; ascends to 3,400 ft. in Yorkshire; Ireland; Channel Islands; frt. June–Sept.—Rootstock stout; scales pale brown, lanceolate. Stipes stout, 3–4 in. Frond 6–12 in., linear-oblong or ovate-oblong, coriaceous, naked and glabrous; segments ¼–⅓ in., broad; venules pinnate, tips thickened. Sori large, 1-seriate, terminal on a lateral venule.—Distrib. Europe, N. and S. Africa, N. and W. Asia, N. America. P. cam'bricum, L., is a var. with pinnatifid segments.

Section 2. Phegop’teris. Stipes not articulate with the rootstock.

Damp shaded places, Shetland to Cornwall and Somerset; absent in England S. of Derby and E. of Gloster; ascends to 3,500 ft. in the Highlands; local in Ireland; frt. June-Aug.—Rootstock long, slender; scales scattered. Stipes 6–9 in., slender, base scaly. Frons 6–9 in., subdeltoid, slightly hairy beneath, rather membranous, pinnae below, pinnatifid above; pinnae sub-opposite, elongate, sessile; lower 2–3 in.; segments subentire; venules 6–8 on each side, lower forked, tips thickened. Sori submarginal, dorsal on the venules.—DISTR. Europe, N. and W. Asia, N. America.


Dry shaded places, from Shetland southd. to Derby, Wales, Cornwall, and Devon; absent in England E. of Derby, Gloster, and Devon; ascends to 2,700 ft. in the Highlands; N. Ireland, rare; frt. July–Aug.—Rootstock long, slender; scales orange-brown. Stipes very slender, 6–12 in., scaly below. Frons 6–12 in., flaccid, glabrous; lower pinnae largest; lowest segments sometimes free; venules forked, tips thickened. Sori submarginal, dorsal on the venules.—DISTR. Europe, N. and W. Asia, Himalaya, N. America.

P. Dryopteris proper; frond glabrous flaccid.

Sub-sp. P. Robertianum, Hoffm.; rootstock stouter, frond more coriaceous glandular-pubescent. P. calcaratum, Sm.—Limestone rocks from Perth to Wales and Derby; Salop and Stafford to Gloster; Wilts, Somerset, Bucks, Oxford. Extends to Tibet.


P. alpestre proper; stipes short, pinnae spreading or ascending narrow-lanceolate broadest at the base, pinnules crowded.—VAR. P. flex'il, Moore; stipes very short, pinnae short spreading or deflexed, pinnules rather distant. Forfar.

14. GYMNOGRAM'ME, Desv.

Frons of various habit, 1–3-pinnate; veins free or anastomosing. Sori dorsal, oblong or linear, usually spreading in irregular lines, branched and confluent on or between the veins; involucre 0.—DISTR. Chiefly warm regions; species 84.—ETYM. γυμνός and γραμμή, from the naked sori.

G. leptophy'la, Desv.; glabrous, annual, frond 2–3-pinnate.
Moist banks, Jersey; frt. March-May.—Annual. *Fronds* fragile, 1-3 in., shortly stipitate, broadly ovate-oblong; inner with longer stipes, narrower, more fertile; pinnules obovate-cuneate, 2-3-lobed, lobes obtuse decurrent; veins dichotomous. *Sori* oblong, simple or confluent.—*Distrib.* S. Europe, Africa, Asia, America, Australasia.

15. OSMUN'DA, L. Fern-Royal.

*Rootstocks* often very large, tuberous or massive. *Fronds* coriaceous, tufted, 1-2-pinnate, some of the pinnae altered, contracted, and covered with naked confluent sori; veins forked, free. *Capsules* globose, sub-sessile, with a short lateral or subterminal striate areola (an incomplete contracted ring).—*Distrib.* Temp. and trop. regions; species 6.—*Etym.* After the god Thor (Osmunder).

O. *regalis*, L.; fronds 2-pinnate fertile at the top.

Bogs, marshy woods, &c., N. to Shetland; ascends to 1,000 ft. in N. England; Ireland; Channel Islands; frt. June-Aug.—*Rootstock* large, densely clothed with matted fibres, many-headed. *Stipes* 2-10 ft., stout, erect, naked, brown. *Frond* glabrous; barren pinnae 3-12 in., sessile or shortly petioloed, oblong, obtuse, truncate cordate or auricled at the often unequal base, serrulate; fertile pinnules subcylindric, lobed.—*Distrib.* Europe, Africa, Asia, America.

16. OPHIOGLOS'SUM, L. Adder's-Tongue.

*Rootstock* short, with fleshy fibrous roots. *Frond* consisting of a barren oblong linear or lanceolate reticulately-veined blade, and a fertile flattened distichous spike of opposite confluent globose capsules that burst transversely and are obscurely striate at the top. *Spores* minute.—*Distrib.* All climates; species 3 or 4.—*Etym.* ὑφις and γάμος, snake's tongue.

O. *vulga'tum*, L.; blade ovate linear or elliptic-oblong.

Damp pastures, banks, woods, &c., N. to Shetland; ascends to 1,000 ft. in the Lake District; Ireland; frt. May-July.—*Rootstock* not tuberous. *Frond* 6-9 in., stout or slender. *Blade* 2-4 in., obscurely petioloed, coriaceous midrib obsolete. *Spike* 1-2 in., peduncled; capsules 6-20.—*Distrib.* Europe, W. Siberia, Himalaya, N. America, S. temp. regions.

O. *vulga'tum* proper; blade large ovate or oblong, epidermal cells flexuous, spike 2-4 in., spores tubercled.—*Var. ambig ua*, Coss. and Germ.; smaller, blade linear oblong, spike 1-2 in.—Orkney, Wales, Scilly, Donegal.

Sub-sp. O. *lusitan'icum*, L.; rootstock more tuberous, blade ½-1 in. oblong or lanceolate, epidermal cells straight, spike ½ in., spores smooth.—Guernsey; frt. Jan.-Feb.—W. Europe, W. Africa.

17. BOTRYCH'IUM, Sw. Moonwort.

*Rootstock* small, tuberous; roots of thick fleshy fibres. *Frond* consisting of an erect barren 1-4-pinnate flabellately-veined blade, and a
fertile branched receptacle, covered on the surface facing the blade with small globose coriaceous capsules which burst transversely. **Spores** minute.

**Distrib.** Temp. and trop. regions; species 6.—**Etym.** βότρυς, from the clustered sori.

**B. Luna'ria, Sw.**; blade about the middle of the frond pinnate.

Pastures and grassy banks, N. to Shetland; ascends to 2,700 ft. in the High-
lands; Ireland; frt. June-Aug.—**Rootstock** tuberous, enclosing at its top the bud of the next year’s frond. **Frond** 3–6 in., stout, terete, fleshy, glabrous; blade ½–2 in., oblong; pinnae ½-circular or lunate, close-set, entire crenate toothed or subpinnatifid. **Receptacle** ½–3 in., erect, segments narrow, in-
curved. **Capsules** sub-2-seriate on the segments.—**Distrib.** Europe (Arctic), N. and S. temp. and cold regions.

A form with the frond deltoid, pinnules 3–4 pairs incised or pinnatifid, lobes linear or cuneate 1-nerved, found on the sands of Barry, has been doubtfully referred to **B. rutaceum**, Sw.

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**Order XCI.**—**Equiseta'ceae.**

**Rootstock** creeping. **Stem** erect, terete, jointed, grooved, hollow except at the joints, and with air-cells in their walls under the grooves, joints terminating in toothed sheaths; teeth corresponding with the ridges; branches if present arising from the sheath-bases, solid. **Capsules** 6–9, 1-celled, on the under surface of the peltate scales of a terminal cone. **Spores** of one kind, attached to 4 clubbed elastic threads (*elaters*), which are coiled round the spore when moist, and uncoil when dry.—**Distrib.** Chiefly temp. N. regions, a few are sub-trop. ; none are high southern; genus 1 ; species 25.—**Affinities.** None direct.—**Properties.** The cuticle abounds in siliceous cells; whence the stems of some are used for polishing.

Germination and impregnation as in **Filices**; but the prothallus is usually (functionally) 1-sexual.

**1. Equiset'tum, L.** Horse-tail, Paddock-pipes.

Characters of the Order.—**Etym.** equus, seta, horse bristle.

* Fruiting stems simple or rarely branched, succulent; barren appearing later, branched; branches simple.

**1. E. arven'se, L.**; barren stems 6–19-grooved, branches spreading, sheaths of fruting stems distant loose with teeth ribbed to the tip.

Roadsides, banks and fields, N. to Shetland; ascends to 2,000 ft. in N. England; Ireland; Channel Islands; frt. April.—**Barren stems** erect or de-
cumbent, slightly scabrid, usually ending in a long naked point; branches crowded, 4-gonous; **fertile stems** (rarely with branches) stouter, shorter; sheaths scarious.—**Distrib.** Europe (Arctic) N. Africa, N. Asia, Himalaya, N. America.

Marshes, rare, from Caithness to York; ascends to 1,200 ft. in N. England; N. Ireland; frt. April.—Closely allied to *E. arven’se*, but greener, less glaucous, more scabrid, with more numerous ribs and branches; the barren stem terminates in an abrupt brush of branches as in *E. sylvat’icum*. Barren stems 1–2 ft., sometimes bearing a cone, slender, abrupt; branches simple, slender, usually spreading, 3–4-gonous, sheaths very short; fertile much stouter, sheaths very lax, funnel-shaped. *Cones* $\frac{3}{4}$–1½ in.—**DISTRIB.** Europe (Arctic) N. of the Alps, Italy, Siberia, N. America.


Bogs, ditches, &c., from Skye, Lanark, and Edinburgh southd.; ascends to 1,200 ft. in Yorkshire; Ireland; Channel Islands; frt. April.—**Barren stems** 3–6 ft., $\frac{3}{4}$ in. diam.; branches 4-gonous, slender, erecto-patent, sheaths very short; fertile 8–10 in., $\frac{3}{4}$–3 in. diam. including the large lax sheaths. *Cones* 2–3 in., obtuse.—**DISTRIB.** From Denmark southd., N. Africa, N. and W. Asia, N. America.

**Fruiting and barren stems subsimilar, simple or branched.**

4. **E. sylvat’icum**, L.; stems 10–18-grooved, branches recurved or deflexed divided, stem-sheaths lax, teeth long obtuse, teeth of branch-sheaths 3-ribbed to the tip.

Copse and hedgebanks, from Shetland to Devon and Kent; ascends to 2,700 ft. in the Highlands; Ireland; Channel Islands; frt. April–May.—Readily recognised by the elegant appearance of the whorls of compound recurved branches. **Stem** 1–2 ft., nearly smooth. **Teeth** of branch-sheaths 3–5, large. *Cones* $\frac{3}{4}$–1 in., short, ovoid-oblong, obtuse.—**DISTRIB.** Europe, N. Asia, N. America.


Wet places, N. to Shetland; ascends to 2,500 ft. in the Highlands; Ireland; Channel Islands; frt. June–July.—Very variable. **Stem** 6–18 in., deeply furrowed, branched throughout, slightly rough. *Cones* short, blunt, those on the branches small.—**DISTRIB.** Europe, N. and W. Asia, N. America.—**VAR. polysta’chya** bears cones on the branches also.—**VAR. alpi’na** (or subnu’da) is a stunted state.


Sides of lakes and ditches, N. to Shetland; ascends to 2,500 ft. in the Highlands; Ireland; Channel Islands; frt. June–July.—Easily distinguished by the hardly furrowed stems, and close and short sheaths. **Stems** stout, 1–3 ft.,
slender, with short suberect branches or none. Cones short, oblong, obtuse:
—DISTRIB. Europe, N. Asia, N. America.
E. limosum proper; smooth, branches short rigid equalling the internodes, cones subsessile.—VAR. E. fluviatile, L.; scaberulous above, branches tapering longer than the internodes, cones peduncled.

7. E. hyemale, L.; stems scabrid 8–34-grooved, branches all sub-radical or 0, sheaths white with black tip and base, teeth black with deciduous tips. Dutch Rush.
Marshes in woods, local, from Ross and Moray to Kent and Hereford; ascends to 1,700 ft. in Forfar; rare in Ireland; frt. July–Aug.—Easily distinguished by its size, glauceous colour, scabridity, and stems simple or branched at the base only. Stems 1–3 ft.; branches simple, grooves shallow. Cones small, conoid, acute.—DISTRIB. Europe, N. Africa, N. Asia, N. America.
E. hyemale proper; stems perennial or biennial, sheaths close, tip of teeth black.—VAR. E. Moor'ei, Newm. (E. paleaceum, Schleich.); stems annual, sheaths loose, teeth truncate, tip white. Wicklow, near the sea.

8. E. variegatum, Schleich.; stems filiform more or less scabrid 4–14-grooved, branches basal, sheaths green below black above, teeth obtuse apiculate membraneous.
Wet places and sandy shores, local, from Ross and the Clyde to York; Chester, Wales, Norfolk, Devon; Ireland; frt. July–Aug.—Usually small. Stems 4–12 in., often decumbent and branching dichotomously below. Sheaths short, rather distant, appressed; teeth membranous, white, or edges black. Cone small, ovoid, acute.—DISTRIB. Europe, N. Africa, Siberia, N. America.
E. variegatum proper; erect, 1–2 ft., teeth of sheaths short acute. Wet banks, &c.—VAR. E. arena'rium, Newm.; stems decumbent more slender, teeth of sheaths 6–8 cuneate. Sandy shores, from Lancashire northd. —VAR. E. Wilso'ni, Newm.; tall, erect, 2–3 ft., teeth of sheaths short obtuse. Watery places.—VAR. E. trachy'odon, Braun (E. Mackai'i, Newm.); stem erect or almost decumbent stouter, branches longer flexuous, sheaths black, teeth at length white. Damp woods, N.E. Ireland, Scotland.

Order XCII.—LYCOPODIACEÆ.
Rootstock running, creeping, or a corm, or 0. Stem dichotomously branched, usually rigid, leafy throughout. Leaves imbricate all round or 2–6-fariously, small, simple, nerveless or 1-nerved. Capsules (sporangia) sessile in the axils of the leaves or of the scales of a terminal or axillary sessile or peduncled cone, 1–3-celled, compressed, often reniform, 2-valved. Spores marked with 3 radiating lines at the top.—DISTRIB. All climates; genera 4; species 100.—Affinities. With Filices.
In germination the spore develops a prothallus upon which archegonia and antheridia are produced, as in Filices.
1. LYCOPODIUM, L. Club-moss.

Perennial. Stem erect prostrate or creeping. Leaves small. Capsules coriaceous, flattened, reniform, 1-celled, 2-valved.—Distrib. Of the Order; species about 50.—Etym. λυκος and ποδες, from a fancied resemblance to a wolf's foot.

* Stem creeping. Capsules in terminal cones.

1. L. clava'tum, L.; leaves hair-pointed, cones peduncled.

Heaths and moors, Shetland to Cornwall, Hants, and Essex; ascends to 2,500 ft. in Yorkshire; Ireland; frt. July—Aug.—Stems 1–3 ft., rigid, flexuous, much branched, densely leafy. Leaves imbricate all round, ½–⅔ in., subsecund, incurved, linear-oblong or lanceolate, acuminate, hair-point variable in length. Cones 1–3 in., solitary or in pairs on a rigid erect peduncle covered with minute appressed subulate leaves, cylindric, obtuse; scales appressed, broadly ovate or cordate, acuminate. Capsules orbicular-reniform.—Distrib. Arctic, and N. and S. temp. and cold regions.

2. L. anno'tinum, L.; leaves acuminate entire or serrate, cones sessile, scales broadly ovate toothed.

Rocks and stony alpine moors, from Orkney to the Clyde and Perth; N. Wales, Cumberland, Westmoreland, Lancashire, Leicester; ascends to 2,700 ft. in the Highlands; frt. June—Aug.—Habit of L. clava'tum, but less branched, branches constricted here and there, leaves more lax, obscurely 5-farious, sometimes spreading, linear-lanceolate; scales of obtuse cone broad, abruptly acuminate.—Distrib. Europe (Arctic), N. and W. Asia, Himalaya, America.

3. L. complana'tum, L.; leaves 2–4-farious lanceolate quite entire, cones peduncled or sessile, scales broadly ovate subentire.

Stony moors, heaths, &c., from Shetland to York, Derby, Wales, Somerset and Hants; Ireland; frt. July—Aug.—Stem 6–18 in., rigid, wiry, flexuous, sparingly leafy; branches fastigiate, much forked, ascending or erect. Leaves ½–⅔ in., dark green, appressed, of 2 sizes; larger (lateral) adnate, subdecurrent, concave, obtuse; smaller shorter, more subulate, free. Cones ½–1 in., oblong, obtuse, terete.—Distrib. Temp. and cold regions of the N. hemisphere and mts. of the tropics.

L. complana'tum proper; leafy branches longer less crowded, leaves dimorphic, central ones on the flattened stem more erect and narrower than the lateral, spikes usually several peduncled. Gloster and Worcester. (Temp. regions and mts. of tropics.)

Sub-sp. L. alpi'num, L.; leafy branches shorter more crowded not flattened, leaves uniform, spikes solitary sessile.—Common in Wales and N. to Shetland, ascends to 4,000 ft. in the Highlands. (N. temp. and Arctic regions.)


Wet heaths and bogs, from Ross southd., local; Ireland, very rare; frt. June—Aug.—Stems short, 2–6 in., closely appressed to the ground. Leave
secund, though inserted all round the stem, dark green, midrib indistinct. *Cones* 1–3 in., fusiform, on strict erect leafy branches, the leaves of which are erect and not secund; scales erect, narrow, much longer than the leaves, bases sometimes cordate.—**Distrib.** Europe, temp. and trop. N. and S. regions.

**Stem decumbent at the base. Capsules axillary in the upper leaves.**

5. *L. Selagó, L.*; branches stout uniform in height, leaves subulate-lanceolate quite entire.

Moors and heaths, Shetland to Sussex and Cornwall; ascends to 3,500 ft. in the Highlands; Ireland; frt. June–Aug.—*Stem* stout, rigid, shortly creeping at the base; branches 2–8 in., ¼–⅔ in. diam., densely leafy, erect, strict, obtuse. *Leaves* erect, appressed, incurved, squarrose or spreading, acuminate, pungent or not; midrib 0; upper capsuliferous sometimes yellower.—**Distrib.** Temp. and cold N. and S. regions.

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**Order XCIII. — Selaginella'ceæ.**

Land- or water-plants, stemless, or with branched, slender stems. *Leaves* small, imbricate all round the stem, or distichous and of 2 forms, long and slender in the stemless species. *Capsules* of 2 forms, the larger 2–4-valved, containing macrospores; the smaller containing microspores.—**Distrib.** All temp. and warm climates; genera 2; species about 100.—**Affinities.** Between *Marsileaceae* and *Lycopodiaceae*.

In germination, the macrospores of *Selaginella* and *Isoetes* develop a cellular prothallus under the integuments, in the position of three radiating lines; this is extruded, and upon its surface are developed many archegonia along the above lines, one only of which is fertilized. The microspores burst, and emit cells containing each an antherozoid, which, entering the archegonia, fertilize their germ-cell, as in *Filices.*

1. **Selaginella, Beauv.**

Terrestrial plants. *Leaves* small, uniform and imbricate all round the stem, or of 2 forms, one large and distichous, and the other smaller unilateral on the stem. *Capsules* of 2 kinds, in terminal cones: 1, minute, oblong or globose, containing microspores; 2, larger, 2–4-valved containing 1–6 macrospores.—**Distrib.** Chiefly trop.; species about 150.—**Etym.** Diminutive of *Selago*, an old name for *Lycopodium*.

*S. selaginoides*, Gray; decumbent, leaves lax lanceolate and ovate, scales of cone spinulose-ciliate. *S. spinosa*, Beauv.

Bogs and marshes, from Shetland to Lincoln, Derby, Chester, and Wales; Ireland; ascends to 3,500 ft. in the Highlands; frt. July–Aug.—*Stems* 2–6 in., slender, sparsingly branched; branches ascending. *Leaves* inserted all round, ¼–⅓ in., incurved or squarrose, pale yellow-green, acuminate, midrib obscure. *Cones* on elongate erect branches, 1–3 in., terete, rather stouter
than the branch; scales erect or spreading, broader and longer than the leaves, with long spinulose teeth. *Microspores* echinate, in 2-valved reniform capsules. *Macrospores* globose, in 3–4-valved and lobed capsules.—*Distrib.* N. and W. Europe, Siberia, Himalaya, N. America.

2. **ISOÉTES**, L. Quillwort.

Aquatic or terrestrial stemless plants. *Corm* depressed. *Leaves* long, subulate or filiform, often tubular and sepalate, base sheathing. *Capsules* sessile in the axils of the leaves, partially enclosed by and adnate to their sheathing bases, traversed by cellular threads; those of the outer leaves contain globose macrospores, those of the inner contain oblong 3-gonous microspores. *Macrospores* with a crustaceous coat, marked on the upper hemisphere with 3 radiating lines, and bursting by 3 valves.—*Distrib.* Chiefly N. temp. and warm regions; species 6 or 8.—*Etym.* ἴσος and ἐτός, ever-green; of obscure application.

1. **I. lacus'tris**, L.; aquatic, leaves subulate, macrospores covered with crested ridges or tubercled.

Bottoms of alpine and subalpine lakes, from Caithness to Salop and N. Wales; ascends to 2,000 ft. in the Highlands; Ireland; frt. May–July.—*Corm* often as big as a hazel-nut. *Leaves* 10–20, 2–6 in., rigid, obscurely 4-gonous, dark green, of 4 septate tubes. *Capsule* ovoid or globose, partially covered by the inflexed edges of the sheath. *Macrospores* tubercled by the protrusion of the inner wall through perforations of the outer. *Microspores* granular.—*Distrib.* Europe (Arctic) N. of the Alps, W. Siberia, N. America.

**I. lacus'tris** proper; leaves erect green, capsules ¼ covered by the edges of the leaf-sheath, tubercles of macrospore short.—*Var.* I. *More'i*, Moore; leaves 18 in. long. In deep water, Wicklow.

**I. echinospo'ra**, Durieu; leaves spreading paler, capsules almost enclosed in the leaf-sheath, tubercles of macrospore longer more acute.—N. Wales, Aberdeen, Dumbarton, Kerry.


Sandy soil, inundated at times, Guernsey; frt. May–June.—*Corm* short, stout, subglobose, 1 in. diam., clothed with the old spinescent dark horny leaf-bases, which consist of lateral subulate processes, and an intermediate tooth. *Leaves* 1–2 in., slender, plano-convex, obscurely tubular, sheath enveloping the capsule. *Macrospores* white.—*Distrib.* S. Europe, N. Africa.

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**Order XCIV.**—**MARSILEA'CEÆ.**

Aquatic plants of various habit. *Rootstock* or stem creeping. *Leaves* filiform or bearing 4 obovate leaflets; vernation circinate. *Fructification* of 2- or more-celled coriaceous oblong or globose capsules (formed of a metamorphosed leaf) placed near or on the rootstock, and containing on parietal
Pilularia.

PILULARIA.]

Placentas many membranous sacs, enclosing macrospores and microspores.

—Distrìb. Temp. and trop. regions; genera 2; species 40.—Affìnities. With Selaginellaceæ.

1. PILULARIA, L. Pillwort.

Rootstock filiform, creeping. Leaves subsolitary, erect, setaceous. Capsule globose, 2-4-celled, 2-4-valved at the top; cells each with a longitudinal parietal placenta, on which are inserted many pyriform membranous sacs; sacs in the upper part of the cell full of microspores immersed in mucilage; those in the lower part contain each one macrospore. Microspores globular, full of antherozoids. Macrospores ovoid, with an outer coat of prismatic cells, pierced by a funnel-shaped opening, through which an inner glassy coat finally protrudes.—Distrìb. N. and S. temp. and cold regions; species 3.—Etym. pilula, from the form of the capsule.

In germination a prothallus is developed at the top of the protruded portion of the inner coat of the macrospore, which bursts and frees it. After expulsion an archegonium is formed on the prothallus, and fertilization takes place by the contents of the microspore.

P. globull'era, L.; leaves setaceous, capsules pubescent.

Edges of lakes and ponds, from Skye and Sutherland to Cornwall and Hants; N.E. and W. of Ireland, very rare; frt. June-Aug.—Rootstock or stem 2-6 in., glabrous, cylindric. Leaves 2-4 in., green. Capsules ¼ in. diam., ovoid or globose, shortly pedicelled, in the axils of the leaves or on the rootstock pubescent, brown, 4-celled.—Distrìb. Europe N. of the Alps.
APPENDIX.

EXCLUDED SPECIES

DICOTYLEDONES.

RANUNCULACEÆ.

Anemone ranunculoides, L. In plantations only.
   "apennina, L.
   Thalictrum majus, Jacq. Confounded with T. flexuosum.
   " nulas, Desf. A S. European species, not known as British.
   Ranunculus alpestris, L. Clova Mts., G. Don; never confirmed.
   "gramineus, L. Said to have been found in Wales a century ago, but not confirmed.
   Pæonia corallina, Retz. Steep holmes, introduced.

BERBERIDEÆ.

Epimedium alpinum, L. On rock-works, old castle gardens, &c.

PAPAVERACEÆ.

Papaver nudicaule, L. W. of Ireland, Giesecke; never confirmed.
   "setigerum, DC. A garden escape in the Fens.
   Glaucium phænecium, Crantz. Casually introduced into Norfolk.

FUMARIACEÆ.

Fumaria spicata, L. Authority unknown to me.
   " agraria, Læg. Confounded with a form of F. capreolata.

CRUCIFERÆ.

Cardamine bellidifolia, L. Confounded with a form of C. hirsuta.
   Malcolmia maritima, Br. Shores of Kent; not native.
   Sisymbrium pannonicum, Jacq. An escape; established at Crosby in Lancashire.
   Erysimum virgatum, Roth. A garden escape.
   "orientale, Br. An alien, casual in various localities.
   Erucastrum Pollichii, Schimp. and Spenn. Almost naturalized in Essex.
   Diplotaxis vimea, DC. Has been reported from Guernsey.
   Vella annua, L. Reported from Salisbury Plain long ago never verified.
   Alyssum incaicum, L. A casual in several localities.
   Lepidium hirtum, L. Confounded with L. Smithii.
   " sativum, L. A garden escape.
   Hutchinsia alpina, Br. Reported from Ingleborough; never verified.
   Clypeola Jonthlaspi, L. Authority unknown to me.

RESEDACEÆ.

Reseda Phyteuma, L. A casual on ballast heaps, Yorkshire.

CISTINEÆ.

Helianthemum ledifolium, L. Brean Downs; never confirmed.
APPENDIX.

VIOLACEAE.

Viola epipsila, Led. Confounded with V. palustris.

" stricta, Hornem. Confounded with V. stagnina.

FRANKENIACEAE.

Frankenia pulverulenta, L. Reported from Sussex; never confirmed.

CARYOPHYLLACEAE.

Silene annulata, Thore. Occurs in flax-fields.

" alpestris, Jacq. One of G. Don’s discoveries; unconfirmed.

" Armeria, L. A casual.


Saponaria Vaccaria, L. A casual in corn-fields.

Cucubalus bacciferus, L. Isle of Dogs; introduced.

Arenaria fastigiata, Sm. Scotch Mts., G. Don; never confirmed.

Spergula pentandra, L. Reported to have been found in Ireland; probably confounded with a Spergularia.

" pilifera, DC. Authority unknown to me.

Buffonia tenuifolia, Sm. Hounslow Heath, Dillenius; never confirmed.

HYPERICACEAE.

Hypericum hircinum, L. A shrubbery plant.

" elatum, Ait.

" barbatum, Jacq. Perthshire, G. Don; never confirmed.

MALVACEAE.

Malva borealis, Wallm. Reported from Kent; but never confirmed.

" verticillata, L. Corn-fields in Wales.

" parviflora, L. Introduced with ballast.

Lavatera sylvestris, Brot. Near Wareham, Scilly, Cornwall; an escape.

GERANIACEAE.

Geranium nodosum, L. Garden stray in shrubberies, &c.

" angulatum, Curt.

" striatum, L.

CELASTRACEAE.

Staphylea pinnata, L. Shrubberies.

LEGUMINOSAE.

Coronilla varia, L. Confounded with Hippocrepis, and other plants.

Medicago muricata, Willd. Confounded with M. denticulata.

Melilotus parviflorus, Lamk. A casual on ballast heaps, &c.

Trifolium parviflorum, Ehr. A casual, near Dublin.

" stellatum, L. A casual, Shoreham.

" resupinatum, L. A casual, near Liverpool and elsewhere.

" tomentosum, L. Authority unknown to me.

" agrarium, L. Perth and Aberdeen, possibly native

Lathyrus latifolius, L. A garden escape.

" sphaericus, Retz. Hertfordshire, an escape.

ROSACEAE.

Aremonia agrimonioides, DC. A garden escape.

Potentilla alba, L. Reported by Hudson from Wales.

" tridentata, Sm. Clova Mts., G. Don; never confirmed.

" opaca, Sm. Ditto ditto; but the specimens are P. intermedia.

Rosa Dicksoni, Lindl. Reported from the S. of Ireland; not confirmed.

" provincialis, Ehr. A garden escape.
Rosaceæ (continued)

*Rosa cinnamomea*, L. A garden escape.

" *austriaca*, Crantz.

" *lucida*, Ehr.

" *rubella*, Sm. Reported from Shields; not confirmed.

*Sanguisorba officinalis*, L. One of G. Don's discoveries; unconfirmed.

*Rubus arcticus*, L. Reported long ago from the Highlands; not confirmed.


*Pyrus domestica*, Sm. The Sorb or Service-tree. An introduced tree in Wyre forest.

Saxifrageæ.

*Saxifraga Sibthorpii*, Boiss. Argyllshire; a garden escape.

" *Andrewsii*, Harv. (*S. Guthriana*, Hort.). A hybrid between *S. umbrosa* and one of the Aizoon group, is stated to have been found in Kerry, but never confirmed.

" *Cotyledon*, L. Reported from the Lake District; never confirmed.

" *rotundifolia*, L.

" *leucanthemifolia*, Scop. Authority unknown to me.

" *muscooides*, Wulf. One of Don's reputed discoveries; and reported from Westmoreland by Hudson.


" *pedatifida*, Sm. One of Don's reputed discoveries; also reported from Achil Island, but the specimens are *S. trifurcata*, a garden plant.

Crassulaceæ.

*Sedum Cepæa*, L. A garden escape in Bucks.

" *stellatum*, L. in Sussex.

Onagraceæ.

*Epilobium rosmarinifolium*, Hænke. Said to have been found in Glen Tilt, but never confirmed.

Umbellifereæ.

*Echinophora spinosa*, L. Reported from Dorset, &c.; not confirmed.

*Bupleurum prostratum*, Link. A corn-field casual.

*Trinia Kitaibelii*, Bieb. Confounded with *T. vulgaris*.

*Ammi majus*, L. An alien weed by the Severn.

*Cherophyllum aureum*, L. Scotland, G. Don; not confirmed.

*aromaticum*, L.

*Siler trilobum*, Scop. Naturalized at "Cherry Hinton".

*Angelica Archangelica*, L. A garden relic.

*Tordylium officinale*, L. Recorded from near London; but confounded with *T. maximum*.

Caprifoliaceæ.

*Diervilla canadensis*, Willd. In shrubberies only.

Rubiacæ.

*Asperula arvensis*, L. A casual in corn-fields.

" *taurina*, L. In shrubberies only.

*Galium spurium*, L. A casual flax-field plant.

" *saccharatum*, All. One of G. Don's reputed discoveries.

" *cinereum*, Sm.
APPENDIX.

Rubiaceae (continued).

**Crucianella stylosa**, DC. A garden escape.

Valerianaceae.


Dipsaceae.

**Dipsacus Fullonum**, Mill. An escape from cultivation.

**Scabiosa maritima**, L. A S. European species, has been gathered in Jersey.

Compositae.


**A. longifolius**, Lamk. An American species, found near Perth.

**Xanthium strumarium**, L. A casual weed.

**Scabiosa longifolia**, Lamk. An American species, found near Perth.

**Xanthium strumarium**, L. A casual weed.

**Solidago lutea**, L. A garden escape (American).


**Anthemis montana**, L. A garden escape. Reported by Gerard, from Lincolnshire, Kent, &c.

**Achillea millefolium**, All. A garden escape near Sheffield.

**Tussilago farfara**, L. One of G. Don’s reputed discoveries.


**Petasites albus**, Gaertn. In shrubberies.

**Tussilago farfara**, Frayrans, Presl. Waste ground, fences, railway banks. Probably the H. Auricula, L., stated to be found in Westmoreland by Hudson (H. dubium, Fr. Dan., t. 1044).

**Hieracium amplexicaule**, L. Old castle walls.

**Hieracium amplexicaule**, Fries (pratense, Fries). Waste ground, fences, railway banks. Probably the H. Auricula, L., stated to be found in Westmoreland by Hudson (H. dubium, Fl. Dan., t. 1044).

**Hieracium amplexicaule**, Vill. A Southern species; occurs as an escape.


**Hieracium amplexicaule**, W. & K. A Southern species; occurs as an escape.

**Hieracium amplexicaule**, Jord. One of G. Don’s reputed discoveries.

**Hieracium amplexicaule**, Jord. Reported from the Highlands.


Ericaceae.

**Erica multiflora**, L. Authority unknown.
ERICACEÆ (continued).

   Ledum palustre, L. N.W. Ireland; never confirmed.

   Vaccinium macrocarpon, Ait. Flintshire; introduced.

PRIMULACEÆ.

   Lysimachia ciliata, L. An American plant, introduced into Cumberland.

   punctata, L. Introd. near Newcastle.

GENTIANEÆ.

   Gentiana acaulis, L. Reported from Wales; not confirmed.

   Sweertia perennis, L. "

BORAGINEÆ.

   Echinospermum Lappula, Lehm. An alien on ballast.

   deflexum, Lehm. "

   Mertensia virginica, DC. A garden escape.

   Omphalodes verna, Ménch. "

   Symphytum peregrinum, Ledeb. Derbyshire. Shrubberies only.

   asperum, Bieb. Shrubberies and cultivated fields.

   tauricum, Willd. A garden escape.

   orientale, L. "

CONVOLVULACEÆ.

   Cuscuta approximata, Bab. A casual on Bokhara clover.

   hassiac, Pfeiff. A casual on Lucerne.

SOLANEÆ.

   Nicandra physaloides, Gärtn. A garden escape.

   Datura Stramonium, L. A casual weed.

   Physalis Alkekengi, L. A casual.

   Lycium barbarum, L. A cottage ornament.

   Hyoscyamus albus, L. Ballast hills, Sunderland.

PLANTAGINÆ.

   Plantago Psyllium, L. Ballast hills, Jersey.

   argentea, L. A casual, Ireland.

   arenaria, L. A casual, sandhills, Somerset and Jersey.

SCROPHULARINEÆ.

   Verb ascum thapsiforme, Schrad. Reported by Hudson; not confirmed.

   phlomoides, L. An alien on Clapham Common.

   phantocum, L. Reported in 1803 from Wales.

   Linaria supina, Desf. A casual on ballast, Devon and Cornwall.

   purpurea, L. A garden escape, old walls, &c.

   spartea, Hoffm. Walton Heath, a casual.

   Erinus alpinus, L. A S. European plant, has been found in Yorkshire, Cheshire, and elsewhere.

   Veronica peregrina, L. A casual weed of cultivation.

   fruticulosa, L. Reported from Scotland; never confirmed.

OROBLANCHEÆ.

   Orobanche lucorum, Koch. Confounded with O. elatior.

   ramosa, L. A casual on hemp.

ACANTHACEÆ.

   Acanthus mollis, L. Scilly Is. and Cornwall, an escape.

LABIATÆ.

   Origanum Onites, L. Confounded with O. vulgare.

   virens, Link. "
APPENDIX.

LABIATÆ (continued).

_Teucrium reyium_, Schreb. Reported from Wales by mistake.
_Stackys annua_, L. An alien in corn-fields in Kent.

AMARANTHACEÆ.

_Amaranthus retroflexus_, L. A casual weed.
_Blitum_, L.  

CHENOPODIACEÆ.

_Atriplex hortensis_, L. A garden escape.
_nitens_, Reb.  
_Chenopodium ambrosioides_, L. A casual weed.

MULTIFIDUM, L.  

POLYGONEÆ.

_Polygonum Fagopyrum_, L. An escape from cultivation.
_Rumex scutatus_, L. Naturalized near Edinburgh.

EUPHORBIACEÆ.

_Euphorbia dulcis_, L. An escape from cultivation.
_salicifolia_, Host. An alien in Forfarshire.
_Characias_, L. Mistaken for _E. amygdaloides._
_coralloides_, L. Slinfold, Sussex.

SANTALACEÆ.

_Thesium humile_, Vahl. Devonshire; not indigenous.
_intermedium_, Schrad. No authority for Britain.

CUPULIFERÆ.

_Castanea vulgaris_, Lamk. Parks, plantations, &c., only.

SALICINÆ.

_Salix dasyclados_, Wimm. See _S. acuminata_, Sm.
_grandifolia_, Ser. Authority doubtful.
_hastata_, L. Reported from sands of Barrie; never confirmed.
_petiolaris_, Sm. An American willow.
_plicata_, Fries. Authority doubtful.
_serpyllifolia_, Scop. Inserted by error.

MONOCOTYLEDONES.

ORCHIDÆ.

_Gymnadenia odoratissima_, Reichb. Authority doubtful.

IRIDÆ.

_Crocus sativus_, L. Cultivated at Saffron Walden.
_aureus_, Sibth. Parks only.
_biflorus_, Mill.
_Iris tuberosa_, L. Penzance and Cork; introduced only.
_Xiphium_, L. Reported by error from Worcestershire.
_pumila_, L. Reported from Leicestershire; no doubt introduced.
_germanica_, L. Reported from Staffordshire;  

AMARYLLIDÆ.

_Narcissus poeticus_, L. Shrubberies, parks, and sites of old gardens.
_conspicuus_, Don.  
_minor_, L.  
_incomparabilis_, Curt.  

APPENDIX.

LILIACEAE.
Lilium pyrenaicum, Gouan. A garden escape in Devonshire.
Allium roseum, L. A garden escape, Rochester and Suffolk.

paradoxa, Don. Linlithgow.

JUNCEAE.
Luzula nivea, Desv. A garden escape in Forfarshire, &c.
albida, DC. A casual in Surrey.

TYLACEAE.
Typha minor, Sm. Reported by Dillenius from Hounslow Heath.

NAJADAE.
Potamogeton gracilis, Fries. Confounded with pusillus.

Kirkii, Syme (accidentally omitted in the body of this work), from Maam (Galway), is an obscure plant, referred (in MSS.) by Tiselius to heterophyllus, but by Babington apparently correctly to sparganifolius, Læstd., of Sweden. It is probably a form of P. polygonifolius, with (when present) very long subcoriaceous floating leaves, and long linear submerged ones like those of lanceolatus without their square reticulations.

CYPERACEAE.
Eriophorum capitatum, Host. One of G. Don’s reputed discoveries.
Carex brizoides, L. Reported from Yorkshire; no doubt introduced.

ustulata, Wahl. One of G. Don’s reputed discoveries.

hordeiformis, Wahl. " "

Mænchiana, Wendl. A form of C. acuta. " "


GRAMINEAE.
Panicum sanguinale, Scop. A corn-field casual.
Setaria glauca, Beauv.

Phalaris paradoxa, L. Casual. " "

Stipa pennata, L. Reported last century; never confirmed.
Phleum asperum, Jacq. A casual, not found lately.

Michelii, All. One of G. Don’s reputed discoveries.
Avena planiculmis, Schrad. Arran Is. (Scotland); never confirmed.
Trisetum subspicatum, Link. No authority.
Briza maxima, L. Becoming naturalized in Jersey.
Poa sylvatica, Chaix (sudetica, Hænke). Found near Kelso.
Bromus patulus, Reich.

scaurrosus, L. } Ballast or corn-field casuals.
tectorum, L. 

Agropyrum cristatum, Gærtn. One of G. Don’s reputed discoveries.
Ægilops ovata, L. No authority.

Elymus geniculatus, Curt. Gravesend; never confirmed.

ACOTYLEDONES.

FILICES.
Asplenium fontanum, Presl. On old walls; only where planted.
Onoclea sensibilis, Willd. Near Warrington; no doubt an escape.

EQUISETACEAE.
Equisetum ramosum, Schkuhr. Wales, Schkuhr; no authority given.
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