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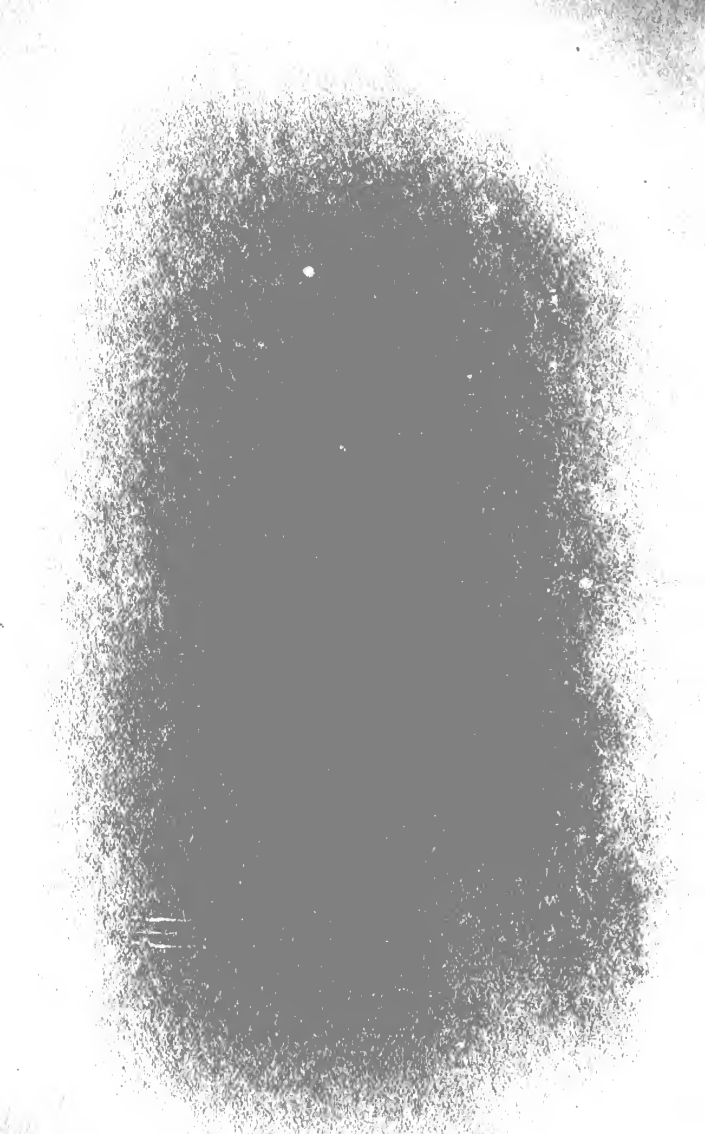
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THE FAMILIES OF BRITISH  
FLOWERING PLANTS

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A POCKET SYNOPSIS  
OF THE  
Families of  
British Flowering Plants

(Based Upon the System of Engler)

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## PREFACE.

This Synopsis is intended primarily to facilitate the determination of the families of British Plants by students, and only secondarily to exhibit a faint philosophic outline of the Evolution of Flowering Plants in general. Therefore the characters of the less important or less well-represented families are not always given in full. In some cases, also, the sections into which the larger groups are divided are fully applicable only to the British families. A few deviations have been made from Engler's plan, where it seemed likely that such a change would render the Synopsis more useful in this country. The foreign genera mentioned are those which should be known to students, or which are generally met with in gardens. Dr. Moss, of Cambridge, has kindly given permission for the use of the sectional names on pp. 11, 14, 16, 17.

W. B. G.

## ABBREVIATIONS AND SYMBOLS.

<p>Brit. = British.          cal. = calyx = K.          carp. = carpels = G.          cor. = corolla = C.          exc. = except.          flow. = flowers.          fr. = fruit.          gen. = genus.          incl. = including.          inflor. = inflorescence.          lea. = leaves.          per. = perianth or perianth-segments = P.</p>	<p>pet. = petals.          plac. = placentas or placentation.          sep. = sepals.          sp. = species.          sta. = stamens = A.          ♂ = male.          ♀ = female.          ♀ = hermaphrodite.          o = absent, none.          ∞ = several, many, or indefinite in number.          ± = more or less.</p>
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(3—5) = the whorl is composed of 3, 4 or 5 parts, ± cohering.

[ ] = foreign or introduced plants, or occasional statements referring to them.

Certain phrases are left to be understood, such as “imbricate” (in bud), “spiral” (in arrangement), etc.

## PHANEROGAMS.

(SEED PLANTS, SPERMATOPHYTES, FLOWERING PLANTS.)

Alternation of generations present, but obscured and difficult to recognise. Microsporophylls ( $\sigma$ , *stamens*) with microsporangia (*pollen-sacs*), producing microspores (*pollen-grains*) which germinate by the formation of a tube (siphonogamous). Megasporophylls ( $\rho$ , *carpels*) with megasporangia (*ovules*) which ripen to form seeds, the megaspore (*embryo-sac*) and the embryo remaining enclosed therein.

GYMNOSPERMS.

ANGIOSPERMS.

### Sub-Division I. GYMNOSPERMS.

Microsporophylls peltate (frequently) or flat, and bearing the microsporangia attached to their underside.\* Megasporophylls not formed into an enclosed chamber, *i.e.*, ovules naked: thus no stigma or style. Prothallus (often by analogy called *endosperm*) formed before fertilisation.

[Besides the Conifers, this subdivision GYMNOSPERMS also includes the non-British classes

GINKGOALES, CYCADALES, GNETALES,  
as well as the fossil

BENNETTITALES and CORDAITALES.

*Cycas*, *Zamia*, *Encephalartos*, *Ginkgo*, *Ephedra*,  
*Tumboa* (= *Welwitschia*), *Gnetum*, etc.]

\* Except in Gnetales, which belong rather to Angiosperms.

## Class. CONIFERÆ.

Trees or shrubs. Secondary wood containing no vessels. Lea. usually narrow, needle-like or linear (in a few exotic genera lanceolate or ovate). Flow. r-sexual. Per. o. Ovules orthotropous (anatropous only in *Podocarpus*). Cotyledons 2—15.

Family 1. TAXACEÆ. Lea. (in *Taxus*) without resin-canals. Flow. diœcious. Microsporophylls  $\infty$ . Ovule solitary, arising directly from the axis. Seed exerted and enveloped in a fleshy aril.

*Taxus*, [*Podocarpus*.]

Family 2. PINACEÆ. Lea. always containing resin-canals. Flow. diœcious or monœcious. Micro- and mega-sporophylls  $\infty$ , arranged in the form of cones (the ♀ cone in *Juniperus* assumes the likeness of a berry).

*Pinus*, *Juniperus*, [*Araucaria*, *Picea*, *Tsuga*, *Pseudotsuga*, *Abies*, *Larix*, *Cedrus*, *Sequoia*, *Cryptomeria*, *Taxodium*, *Thuja*, *Cupressus* (incl. *Retinospora* and *Chamæcypris*).]

## Sub-Division II. ANGIOSPERMS.

Microsporophylls  $\pm$  linear or short, bearing the pollen-sacs typically on their margin. Ovules completely enclosed in an ovary formed by the infolded megasporophyll; thus a stigma is required to receive the pollen. Endosperm formed after fertilisation.

MONOCOTYLEDONS, p. 3.      DICOTYLEDONS, p. 11.

## Class I. MONOCOTYLEDONS (cf. p. 11).

Vascular bundles (usually) closed and scattered. Venation of lea. almost always parallel. Embryo with 1 cotyledon; radicle remaining undeveloped or very short. Per. when well-marked usually 3-merous.

- A. *Sta. and carp. ± variable in number. Per. absent or, if present, consisting usually of a ± inconstant number of leaves (cf. p. 8).*

PANDANALES.

GLUMIFLORÆ.

ALISMATALES.

SPATHIFLORÆ.

### ORDER I. PANDANALES.

Marsh-loving herbs, with linear lea. Flow. 1-sexual, naked or with bract-like per. *Sta.* 1—∞. *Carp.* 1—∞. Seeds endospermous.

Family 1. TYPHACEÆ.\* Reed-like marsh or aquatic herbs, with 2-ranked linear sheathing lea. Flow. monœcious, in spikes or globular clusters, ♂ above, ♀ below. Per. of 3—6 scaly segments, or consisting of hairs, or 0. *Sta.* 2—6. *Carp.* 1 or (2), each with 1 pendulous anatropous ovule. Fr. an achene or drupe. *Typha, Sparganium.*

### ORDER 2. ALISMATALES (Helobiæ).

Water-loving herbs. Flow. cyclic or hemicyclic, with 0, 1 or 2 floral envelopes (3-merous in the higher forms), hypogynous or epigynous. *Sta.* 1—∞. *Carp.* 1—∞, ± apocarpous, if superior. Endosperm little or none.

\* This family is divided by Engler into two families, one for each genus.

☀ *Per.* 0 or simple and hypogynous (or, if double, not coloured). *Carp.* nearly or quite free.

Family 2. POTAMOGETONACEÆ.\* Submerged or floating. *Lea.* 2-ranked, with sheathing base. *Flow.* inconspicuous, solitary or spicate, ♀ or 1-sexual. *Per.* of 4 small segments or 0. *Sta.* 1—4. *Carp.* 1—4 (rarely more), each with 1 pendulous orthotropous ovule. *Fr.* a drupel or achene. *Seeds* exendospermous.

*Potamogeton, Ruppia, Zannichellia, Zostera*

Family 3. NAIADACEÆ.\* Submerged. *Stem* with central bundle. *Lea.* opposite, linear. *Flow.* 1-sexual; ♂ of 2 cup-shaped envelopes and 1 terminal anther; ♀ of 1 cup-shaped envelope or 0, with 1 *carp.* containing 1 basal anatropous ovule. *Fr.* a drupe. *Seeds* exendospermous. *Naias.*

[APONOGETONACEÆ.\* *Lea.* submerged or floating. *Flow.* ♀, spicate, enclosed in a deciduous spathe. *Per.* 1—3, petaloid. *Sta.* 6 or more. *Carp.* 3—6, with 3—6 styles; each *carp.* with 2—∞ erect anatropous ovules. *Aponogeton* (incl. *Ouvirandra*).]

Family 4. JUNCAGINACEÆ.\* Marsh herbs, with narrow *lea.* *Inflor.* a racemose scape. *Flow.* small, greenish, actinomorphic, ♀ or 1-sexual. *Per.* 6, herbaceous, in 2 similar whorls. *Sta.* 6. *Carp.* 6 or 3, each with 1 or 2 basal anatropous ovules. *Fr.* schizocarpous or of follicles. *Seeds* exendospermous. *Triglochin, Scheuchzeria.*

\* These four families are considered by Bentham and Hooker to form one family, Naiadeæ.

☀ ☀ Per. double, hypogynous (inner, at least, coloured). Carp  $\pm$  free.

Family 5. ALISMATACEÆ. Marsh herbs. Lea. chiefly radical (some submerged or floating). Inflor. usually much branched. Flow. mostly  $\text{\textcircled{X}}$ , or 1-sexual. Outer whorl of per. 3, sepaloid; inner 3, petaloid. Sta. 6— $\infty$ . Carp. 6— $\infty$ , free, each with 1 basal anatropous ovule (or in *Damasonium* more). Fr. of achenes or follicles. Seeds exendospermous.

*Alisma* (incl. *Elisma* and *Echinodorus*),  
*Damasonium*, *Sagittaria*.

Family 6. BUTOMACEÆ.\* Marsh herbs, with conspicuous flow. Inflor. usually a cymose umbel. Flow.  $\text{\textcircled{X}}$ , 3-merous (sep. and pet. similar and petaloid in the Brit. sp.). Sta. 9— $\infty$  (9 in Brit. sp.). Carp. 6— $\infty$ , often united at the base (6 in Brit. sp.); ovules  $\infty$ , anatropous, scattered over the inner surface of the ovary. Fr. of follicles. Seeds exendospermous.

*Butomus*.

☀ ☀ ☀ Per. double, epigynous. Carp. united.

Family 7. HYDROCHARITACEÆ. Aquatic herbs. Lea. submerged, floating or emergent. Flow. solitary or cymose, at first enclosed in bracts, usually 1-sexual, 3-merous (outer sepaloid, inner petaloid). Sta. 3 or more, in whorls of 3's. Carp. (2—15); ovary usually 1-celled; ovules  $\infty$ , orthotropous to anatropous, arranged on projecting parietal plac. Fr. irregularly dehiscent or somewhat succulent. Seeds exendospermous.

*Stratiotes*, *Hydrocharis*, [*Elodea*, *Vallisneria*.]

\* This family might better be included as a subfamily of Alismataceæ, as in Hooker's Student's Flora. It differs almost solely in its placentation,

### ORDER 3. GLUMIFLORÆ.

Rush or grass-like herbs, with narrow sheathing lea. Flow. without a perianth or with a few hypogynous scales or bristles, subtended by imbricate membranous bracts (glumes). Pistil always superior and 1-celled, with 1 basal erect anatropous ovule. Endosperm starchy.

Family 8. GRAMINEÆ. Herbs, with  $\pm$  roundish stems; internodes usually hollow. Lea. often 2-ranked, furnished with a ligule (or hairs) at the junction of sheath and lamina; sheath usually split to the base. Flowers arranged in spikelets, usually  $\text{\textcircled{f}}$ , mostly with a 2-nerved (inner) palea opposite to the flowering glume, without a perianth (unless the lodicules are considered as such). Sta. 3 (2 in *Anthoxanthum*, 6 in *Bambusa*), anthers versatile. Stigmas usually 2,  $\pm$  feathery. Fr. a caryopsis; embryo provided with a scutellum and placed laterally at the base of the endosperm; radicle surrounded by a sheath (coleorhiza).

*Panicum*, *Setaria*, *Leersia*, *Phalaris* (incl. *Digraphis*), *Anthoxanthum*, *Hierochloë*, *Milium*, *Phleum*, *Alopecurus*, *Polypogon*, *Agrostis*, *Calamagrostis*, *Ammophila*, *Holcus*, *Aira*, *Deschampsia*, *Corynephorus*, *Trisetum*, *Avena*, *Arrhenatherum*, *Sesleria*, *Phragmites*, *Molinia*, *Koeleria*, *Catabrosa*, *Melica*, *Briza*, *Dactylis*, *Cynosurus*, *Poa*, *Glyceria*, *Festuca*, *Bromus*, *Brachypodium*, *Spartina*, *Cynodon*, *Nardus*, *Lolium*, *Agropyrum*, *Triticum*, *Hordeum*, *Elymus*, [*Zea*, *Saccharum*, *Oryza*, *Stipa*, *Lagurus*, *Gynerium*, *Secale*, *Bambusa*.]



Family 9. CYPERACEÆ. Herbs with generally solid stems, often triangular. Lea. usually 3-ranked, with unsplit sheaths; ligule 0. Flow. in spikes or cymes, ♂ or 1-sexual, each in the axil of a single bract. Per. bristly, scaly or 0. Sta. 1—3; anthers basifixed. Carp. (2) or (3), with two or three filiform stigmas. Fr. an achene; seed free from pericarp; embryo minute, surrounded by the endosperm.

*Cyperus*, *Eriophorum*, *Scirpus* (incl. *Isolepis* and *Blysmus*), *Heleocharis*, *Schoenus*, *Cladium*, *Rhynchospora*, *Kobresia*, *Carex*.

#### ORDER 4. SPATHIFLORÆ.

Flow. cyclic, 2- or 3-merous, ♂ or 1-sexual, often much reduced, inserted on a spadix and  $\pm$  enveloped in a spathe. Bracts absent. Per. often 0. Ovules varying from orthotropous to anatropous.

Family 10. ARACEÆ. Mostly herbs. Rhizome often tuberous. Lea. various, often broad, petioled and net-veined. Spathe often large and coloured. Flow. ♂ or monœcious, rarely diœcious, sometimes reduced to a single sta. or carp. Per. membranous or 0. Ovary 1- or more-celled; cells 1- or more-ovuled. Fr. usually a berry. Seeds endospermous.

*Acorus*, *Arum*, [*Anthurium*, *Monstera*, *Calla*, *Richardia*, *Caladium*, *Sauromatum*.]

Family 11. LEMNACEÆ. Small free floating plants, not differentiated into stem and leaves (quasi-cladodes). Spathe minute or 0. Flowers monœcious, very rare. Per. 0. ♂ of 1 sta.; ♀ of 1 carp., with a few basal erect ovules. Endosperm scanty or 0.

*Lemna* (incl. *Spirodela*), *Wolffia*.

**B.** *Flow. typically pentacyclic, with isomerous, usually 3-merous whorls.*

FARINOSÆ.

LILIIFLORÆ.

MICROSPERMÆ.

#### ORDER 5. FARINOSÆ.

Mostly herbs. Stem  $\pm$  undeveloped. Flow. cyclic, 2- or 3-merous, but sta. often reduced or imperfect. Seeds with a mealy endosperm.

Family 12. ERIOCAULACEÆ. Perennial scapigerous herbs. Lea. narrow, mostly radical. Flow. usually monœcious, in involucrate heads. Per. membranous, in 2 whorls. Sta. 4—6 (or 2—3). Carp (2—3), with 2—3 styles; ovary 2—3-celled, with 1 pendulous orthotropous ovule in each cell. Fr. a loculicidal capsule. *Eriocaulon*.

#### ORDER 6. LILIIFLORÆ.

Mostly herbs. Flow. cyclic, almost always 3-merous (rarely 4-merous). Ovules anatropous. Seeds usually with horny or fleshy endosperm.

General formula :  $P_3 + 3$  (or  $K_3, C_3$ ),  $A_3 + 3, G(3)$ .

☼ *Ovary superior.*

Family 13. JUNCACEÆ. Herbs, annual or with perennial rhizomes. Lea. rather narrow or o. Inflor. crowded, cymose. Flow. mostly  $\sigma$ , actinomorphic. Per. of 6 similar dry membranous segments. Sta.  $3 + 3$ , or  $3 + 0$ . Carp. (3), with 3 filiform stigmas. Ovary superior, 1- or 3-celled, with  $1 - \infty$  ovules in each cell. Capsule loculicidal. Endosperm starchy.

*Juncus, Luzula.*

Family 14. LILIACEÆ. Herbs (except *Ruscus*) in Brit. sp., usually perennating by bulbs or rhizomes (corm in *Colchicum*). Lea. various. Per.

usually petaloid; segments free or united. Sta. 3+3 (3+0 in *Ruscus*), hypogynous or slightly epiphyllous. Ovary superior, almost always 3-celled; ovules 2—∞ in each cell; plac. axile. Fr. a capsule or berry. Endosperm not starchy.

*Narthecium*, *Tofieldia*, *Colchicum*, *Simethis*, *Gagea*, *Allium*, *Fritillaria*, *Tulipa*, *Lloydia*, *Scilla* (incl. *Endymion*), *Ornithogalum*, *Muscari*, *Asparagus*, *Ruscus*, *Polygonatum*, *Maianthemum* (= *Smilacina*), *Convallaria*, *Paris* (parts in 4's), [*Veratrum*, *Asphodelus*, *Anthericum*, *Phormium*, *Funkia*, *Kniphofia*, *Agapanthus*, *Lilium*, *Hyacinthus*, *Aspidistra*, *Trillium*; *Gloriosa*, *Smilax*, *Myrsiphyllum* (= *Medeola*) are climbers; *Aloë*, *Yucca*, *Dracæna*, *Cordyline* are arborescent.]

☀ ☀ *Ovary inferior.*

Family 15. AMARYLLIDACEÆ. Herbs (mostly bulbous), resembling LILIACEÆ, but with inferior ovary. Lea. radical. Flow. cymose, ♀, occasionally with a corona. Sta. 3+3, epiphyllous or epigynous. Fr. usually a capsule.

*Narcissus*, *Galanthus*, *Leucojum*, [*Amaryllis*, *Crinum*, *Eucharis*, *Alstrœmeria*; *Agave* is sub-arborescent].

Family 16. DIOSCOREACEÆ. Climbing plants, with starchy tuberous rhizomes. Lea. (in Brit. sp.) spiral, net-veined. Flow. in racemes, mostly 1-sexual and dioecious. Per. sepaloid, with a short tube, superior in the ♀ flow. Sta. 3+3, epiphyllous. Carp. 3; styles 3; ovules 2 on each plac. Fr. usually a capsule, but an imperfectly 3-celled berry in *Tamus*.

*Tamus*, [*Dioscorea*.]

Family 17. IRIDACEÆ. Herbs, with radical or equitant lea., perennating by rhizomes or corms. Flow. ♂, actinomorphic or ± zygomorphic, terminal or cymose. Resembling AMARYLLIDACEÆ in their inferior ovary, but sta. always 3+0, epiphylous. Styles often divided or ± leaf-like. Fr. a loculicidal capsule.

*Crocus*, *Romulea* (= *Trichonema*), *Iris*, *Sisyrinchium*, *Gladiolus*, [*Tritonia* (= *Montbretia*), *Ixia*, *Freesia*, *Tigridia*, *Sparaxis*.]

#### ORDER 7. MICROSPERMÆ.

Flow. cyclic. Per. 3+3. Sta. usually much reduced. Ovary inferior, 3- or 1-celled, with ∞ very minute ovules. (In the only British suborder, *Gynandræ*, the flow. are always zygomorphic and the seeds exendospermous.)

Family 18. ORCHIDACEÆ. Perennial herbs. Flow. ♂, usually twisted through 180° (resupinate). Per. petaloid. Sta. 1 or 2, gynandrous; pollen usually cohering in masses (pollinia). Ovary 1-celled; ovules on projecting parietal plac. Fr. a capsule.

Floral formula :  $P_{3+3}, A_{0+2}$  or  $1+0, G(\bar{3})$ .

(Diandrous) *Cypripedium*; (Monandrous) *Orchis*, *Ophrys*, *Aceras*, *Herminium*, *Habenaria*, *Epipactis*, *Cephalanthera*, *Epipogon*, *Spiranthes*, *Listera*, *Neottia*, *Goodyera*, *Malaxis*, *Liparis*, *Corallorhiza*, [*Vanilla*, *Cattleya*, *Lælia*, *Dendrobium*, *Odontoglossum*, etc.]

## Class 2. DICOTYLEDONS.

Vascular bundles open and arranged  $\pm$  in circles. Venation reticulate. Embryo (almost always) with 2 cotyledons. Radicle prolonged (at least at first) into a tap-root. Flow. predominantly 4—5-merous.

### Sub-Class I. ARCHICHLAMYDEÆ (cf. p. 35).

Per. double, single or o. Cor. when present, polypetalous (exc. in *Cotyledon*), but the pet. may be frequently suppressed.

#### § I. *Amentifloræ* (Moss) (cf. p. 14).

Mostly trees or shrubs. Lea. generally deciduous. Flow. often 1-sexual; ♂ generally, and ♀ often, in catkins; each flow. mostly with bract and 2 bracteoles. Per. sepaloid or o. Endosperm o (exc. in CANNABACEÆ and URTICACEÆ).

SALICALES.	JUGLANDALES.	URTICALES.
MYRICALES.	FAGALES.	

### ORDER I. SALICALES.

Trees or shrubs. Lea. spiral, simple, stipulate (but stipules frequently deciduous). Flow. in catkins, dioecious. Per. (or disc) cup-shaped or o. Sta. 2—∞. Carp. (2), with 2 styles; ovary 1-celled; plac. parietal; ovules ∞, anatropous. Fr. a loculicidal capsule. Seeds with a basal tuft of hairs.

Family 19. SALICACEÆ. Characters of the order.  
*Salix, Populus.*

## ORDER 2. MYRICALES.

Trees or shrubs. Lea. spiral, simple, exstipulate, sweet-scented. Flow. diœcious. Per. o. Sta. usually 4. Carp. (2), with 2 styles; ovary 1-celled, with 1 basal orthotropous ovule. Fr. a waxy drupe-like nut, adnate to the persistent bracteoles.

Family 20. MYRICACEÆ. Characters of the order. *Myrica.*

## ORDER 3. JUGLANDALES.

Trees, with spiral, pinnate, aromatic, exstipulate lea. Flow. in catkin-like spikes, 1-sexual, monœcious. Per. single, variable or o. Sta. 3—40. Carp. (2), with 2 styles; ovary inferior, 1-celled, with 1 erect orthotropous ovule. Fr. a drupe or nut. Seeds exendospermous.

[JUGLANDACEÆ. Characters of the order. The per. of the ♀ flow. is fused with the ovary and also with the bract and bracteoles. *Juglans, Carya.*]

## ORDER 4. FAGALES.

Trees or shrubs. Lea. spiral or 2-ranked, simple, with deciduous stipules. Flow. 1-sexual, monœcious; ♂ in catkins, ♀ in catkins or short spikes, or a few surrounded by an involucre of free or connate bracts and bracteoles. Per. simple, sepaloïd, or o. Sta. 2—∞. Carp. (2—6); ovary ± inferior, after fertilisation ± completely 2—3-celled, with 1 or 2 pendulous anatropous ovules in each cell. Fr. nut-like, with 1 (or rarely more) exendospermous seeds.

Family 21. BETULACEÆ. Inflor. appearing before the lea. Per. sometimes o. ♂ catkins pendulous, ♂ flow. adherent to the bracts; sta. 2—10,

but filaments often 2-cleft. ♀ flow. less conspicuous; carp. (2), with 2 stigmas; cells 1-ovuled. Fr. with an involucre. *Carpinus, Corylus, Betula, Alnus.*

Family 22. FAGACEÆ (Cupuliferæ). Inflor. not appearing before the lea. ♂ and ♀ flow. with a per. ♂ flow. in catkins; sta. 4—12. ♀ flow. solitary or 2—3 in a dichasial cyme; carp. usually (3—4), with 3—4 stigmas; cells 2-ovuled. Fr. surrounded by a cupule (involucre of connate bracts?).

*Fagus, Quercus, [Castanea.]*

## ORDER 5. URTICALES.

Herbs, shrubs or trees, without latex (except in the non-Brit. MORACEÆ). Lea. stipulate, often with harsh or stinging hairs. Inflor. cymose. Flow. cyclic, small, ♀, or 1-sexual by suppression. Per. simple, sepaloid (rarely 0), with 1 sta. opposite to each segment. Carpels 1 or 2, superior. Ovary usually 1-celled, with 1 ovule. Fr. a nut (in the Brit. sp.).

Family 23. ULMACEÆ. Trees or shrubs. Lea. 2-ranked, simple, asymmetrical at base, with well-marked pinnate venation, serrate, usually roughly hairy; stipules caducous. Flow. in clusters, ♀ or 1-sexual. Per. 4—6-lobed. Sta. straight in the bud. Carp. (2), with 2 styles; ovule solitary, pendulous, anatropous. Fr. winged (in the Brit. genus). Seeds exendospermous. *Ulmus.*

Family 24. CANNABACEÆ. Aromatic herbs. Lea. palmately veined and lobed; stipules persistent. Flow. dioecious; ♂ per. segments 5, sta. straight in the bud; ♀ with a small entire cup-shaped perianth, carp. (2), with 2 papillose stigmas. Ovary

1-celled, with 1 pendulous anatropous ovule. Seeds with scanty endosperm. *Humulus*, [*Cannabis*.]

Family 25. URTICACEÆ. Mostly herbs, often with stinging hairs. Lea. simple; stipules persistent. Flow. often 1-sexual. Per. 4. Sta. incurved in bud, straightening elastically. Carp. 1, with 1 style and 1 erect basal orthotropous ovule. Fr. an achene with adherent per. Seeds usually with a rich oily endosperm.

*Urtica*, *Parietaria*, [*Laportea*, *Pilea*, *Boehmeria*.]

§ 2. *Petaloidæ* (Moss) (cf. p. 16).

Per. single, rarely double, occasionally petaloid. Ovules not campylotropous.

SANTALALES.      ARISTOLOCHIALES.      POLYGONALES.

## ORDER 6. SANTALALES.

Partially or wholly parasitic. Lea. entire, exstipulate. Flow. cyclic. Per. single; sta. opposite the segments and equalling them in number. Carp. (2—3), rarely 1; ovules one in each carpel, variable.

Family 26. SANTALACEÆ. Chlorophyllose semiparasites on roots. Lea. usually spiral. Flow. minute, cymose, ♂ or 1-sexual. Per. 4—5, valvate, united below (in the Brit. sp. epigynous). Sta. adhering to the perianth. Carp. (2—3); ovary inferior, 1-celled; ovules 1—3, pendulous from a free-central plac., reduced to a naked nucellus without integument. Fr. a small nut. Seed 1, with much endosperm. *Thesium*, [*Santalum*.]

Family 27. LORANTHACEÆ. Mostly undershrubs, chlorophyllose and evergreen, semiparasitic on trees. Lea. fleshy-coriaceous, usually opposite



and exstipulate. Flow. inconspicuous, dioecious, perigynous. Per. 4-cleft, valvate, fleshy. Sta. 4, adhering to the per. Ovary 1-celled, sunk in the receptacle; ovule solitary, erect, much reduced. Fr. a (false) berry. Seeds  $\pm$  endospermous.

*Viscum*, [*Loranthus*.]

#### ORDER 7. ARISTOLOCHIALES.

Flow. cyclic, epigynous, actinomorphic or zygomorphic. Per. petaloid. Ovary inferior, usually 3—6-celled. Ovules  $\infty$ . [Incl. *Rafflesia*.]

Family 28. ARISTOLOCHIACEÆ. Herbs, sometimes climbers. Lea. spiral, simple, stalked, cordate, exstipulate. Flow. ♀. Per. 3-lobed or irregular. Sta. 6 or 12 (in Brit. sp.), free, epigynous, or  $\pm$  connate with the style (gynandrous). Carp. (4—6); ovules anatropous; plac. axile. Fr. a capsule. Seeds endospermous.

*Asarum*, [*Aristolochia*.]

#### ORDER 8. POLYGONALES.

Lea. spiral, with sheathing base. Flow. actinomorphic. Per. single or double. Ovary superior, 1-celled, with 1 basal orthotropous ovule.

Family 29. POLYGONACEÆ. Herbs (usually), not mealy. Lea. simple, entire, with ochreate stipules; margin revolute in bud. Flow. small, cyclic or acyclic, usually ♂. Per. 3—6, free, reddish or greenish. Sta. 5—9, perigynous or (more rarely) hypogynous. Carp. (2) or (3), with 2 or 3 styles. Fr. a nut, triangular, enclosed in some of the enlarged per. segments. Seeds endospermous.

*Rumex*, *Oxyria*, *Polygonum*, [*Rheum*,  
*Fagopyrum*, *Coccoloba*.]

§ 3. *Centrospermæ* (Moss) (cf. p. 17).

Per. single or double, sepaloïd or inner whorl often petaloïd. Seeds usually campylotropous.

ORDER 9. **CENTROSPERMÆ.**

Mostly herbs. Lea. usually exstipulate or stipules (if present) scarious. Sta. 1—∞ or (if isomerous) opposite to the per. segments. Carp. 1—∞, generally united. Ovary superior, ± 1-celled; ovules 1—∞; plac. basal or central. Seeds with perisperm, round which embryo is curved.

Family 30. **CHENOPODIACEÆ.** Herbs, frequently xerophytic, often mealy. Lea. spiral, ± fleshy, entire or lobed, exstipulate, sometimes much reduced. Flow. spiral, small, greenish, actinomorphic, occasionally 1-sexual by suppression. Per. single, sepaloïd; segments 1—5, imbricate. Sta. as many or fewer, ± hypogynous, incurved in bud. Carp. (2), rarely (3—5); ovary 1-celled, with 1 basal campylotropous ovule. Fr. a nut, enclosed in the persistent perianth.

*Beta, Chenopodium, Atriplex, Salicornia, Suaeda, Salsola, [Spinacia, Kochia.]*

[**AMARANTHACEÆ.** Differs from the preceding family in being less xerophytic, having a membranous coloured perianth, and sometimes more than 1 seed. *Amaranthus, Celosia, Iresine.*]

[**AIZOACEÆ.** Herbs (generally). Lea. fleshy. Per. 5, sepaloïd. Sta. 5 or more, outer sometimes changed into petaloïd staminodes. Carp. 2—∞; ovules ∞, campylotropous (plac. parietal and ovary inferior in the genus mentioned).

*Mesembryanthemum.*]

Family 31. PORTULACACEÆ. Herbs. Lea. usually opposite, fleshy, entire; stipules scarious (0 in *Claytonia*). Flow. small, cymose. Sep. (or bracteoles) 2. Pet. 4—5, free or connate at base, deciduous. Sta. 5—∞. Carp. (3—5); ovary 1-celled, with 2—∞ campylotropous ovules on a central basal plac. Fr. a capsule.

*Montia*, [*Claytonia*, *Portulaca*.]

Family 32. CARYOPHYLLACEÆ. Herbs, very rarely undershrubs, with  $\pm$  thickened nodes. Lea. simple, entire, opposite (except in *Corrigiola*). Stipules 0 or scarious. Flow. cyclic, actinomorphic, usually in dichasial cymes. Per. double, 5- (rarely 4-) merous. Sep. free or united. Pet. free, often bifid, occasionally with ligules, sometimes reduced or 0. Sta. usually 5+5 (obdiplostemonous) or 5+0, occasionally in 4's, hypogynous. Carp. (2—5), with 2—5 styles; ovary 1-celled, often incompletely septate in basal portion; ovules 1—∞, campylotropous; plac. basal or central. Fr. a capsule (or, in *Cucubalus*, a berry).

*Stellaria*, *Cerastium* (incl. *Mœnchia*), *Holosteum*, *Arenaria*, *Sagina*, *Spergula*, *Spergularia*, *Polycarpon*, *Corrigiola*, *Herniaria*, *Illecebrum*, *Scleranthus*, *Agrostemma*, *Viscaria*, *Silene*, *Lychnis* (incl. *Melandryum*), *Dianthus*, *Saponaria*, [*Cucubalus*, *Gypsophila*.]

#### § 4. *Heterochlamydeæ* (Moss).

Flow. usually with a double per., sep. and pet.  $\pm$  unlike. Seeds usually not campylotropous (except in some RHŒADALES, especially CRUCIFERÆ).

A. Pistil mostly apocarpous. Sta. usually hypogynous (cf. p. 19).

#### ORDER 10. RANALES.

Flow. spiral, hemicyclic or cyclic. Per. single or double. Sta. usually  $\infty$ , hypogynous, rarely epigynous. Flow. generally actinomorphic, rarely  $\pm$  zygomorphic. Carp. 1— $\infty$ , usually free.

Family 33. NYMPHÆACEÆ. Aquatic herbs. Lea. floating, or emergent (*Nelumbium*), simple, sometimes peltate; margin involute in bud. Flow. large, solitary, spiral to cyclic,  $\text{♀}$ , actinomorphic, (3-merous in *Cabomba*). Receptacle convex or hollow. Per. 6— $\infty$ , double, but sep. scarcely distinct from pet. which again sometimes merge gradually into the sta. Sta. 6— $\infty$ . Carp. 3— $\infty$ , superior to inferior, united, or embedded in the receptacle (*Nelumbium*), or free (*Cabomba*), each with 1— $\infty$ , usually anatropous, ovules scattered over the whole inner surface. Fr. berry-like or dry. Seeds having both endosperm and perisperm (neither in *Nelumbium*), sometimes with an aril.

*Nuphar*, *Nymphæa*, [*Victoria*, *Nelumbium*,  
*Cabomba*.]

Family 34. CERATOPHYLLACEÆ. Aquatic herbs. Lea. submerged, whorled, forked, horny. Flow. acyclic, solitary, axillary, monoëcious. Per. hypogynous, sepaloid; in  $\text{♂}$ , per. about 12, sta. 12—16; in  $\text{♀}$ , per. 9—10, carp. 1, with 1 orthotropous pendulous ovule. Fr. a nut. Seeds with scanty endosperm. *Ceratophyllum*.

Family 35. RANUNCULACEÆ. Herbs (except *Clematis*), often with acrid or poisonous juice. Lea. often much divided, spiral (opposite in *Clematis*),

exstipulate. Inflor. cymose, less often racemose. Flow. chiefly spiral, ♂, actinomorphic, rarely zygomorphic. Per. often 5-merous, single or double; in former case, sep. are petaloid and pet. (or, in other cases, some of the sta.) may be transformed into nectaries. Sta. usually  $\infty$ , free. Carp. 1— $\infty$ , usually free, each with 1— $\infty$  anatropous ovules; plac. basal or sutural. Fr. of achenes or follicles (capsule in *Nigella*, berry in *Actæa*). Seeds with oily endosperm.

*Caltha*, *Trollius*, *Helleborus*, *Actæa*, *Aquilegia*,  
*Delphinium*, *Aconitum*, *Clematis*, *Thalictrum*,  
*Anemone*, *Myosurus*, *Ranunculus*, [*Pæonia*,  
*Eranthis*, *Nigella*, *Cimicifuga*, *Adonis*.]

Family 36. BERBERIDACEÆ. Shrubs or herbs. Lea. spiral, simple (apparently) or compound, exstipulate. Flow. solitary or racemose, usually cyclic, ♂, actinomorphic, 2- or 3-merous. Per. in 2—4 whorls. Sta. in 2 whorls; anthers opening by lids. Carp. 1, with 1— $\infty$  anatropous ovules; plac. basal or sutural. Fr. usually a berry. Seeds endospermous.

*Berberis* (incl. *Mahonia*), [*Epimedium*,  
*Podophyllum*.]

**B.** *Pistil syncarpous*. *Sta. hypogynous* (cf. p. 21).

RHOEADALES.

SARRACENIALES.

## ORDER II. RHOEADALES.

Herbs (usually). Lea. spiral, exstipulate. Flow. solitary or racemose,  $\pm$  cyclic, ♂, hypogynous, actinomorphic or zygomorphic. Per. double. Carp. (2— $\infty$ ), superior.

Family 37. PAPAVERACEÆ. Herbs, often with white or coloured latex. Lea. lobed or much divided, exstipulate. Sep. 2, usually caducous.

Pet. generally 4,  $\pm$  deciduous. Sta.  $\infty$ , or 4 (or apparently 6). Carp. (2—16); ovary 1-celled, or falsely 2—4-celled; ovules  $\infty$ , anatropous, on  $\pm$  projecting parietal plac., or solitary and basal. Fr. a capsule or nut. Seeds endospermous.

In Britain, this is more commonly arranged as two families—PAPAVERACEÆ, with abundant latex, actinomorphic flow., usually nodding in bud, and crumpled pet.; sta.  $\infty$ ; carp. mostly  $\infty$ ; plac. parietal; fr. a capsule; endosperm oily—and FUMARIACEÆ, sometimes climbers, without latex; flow. mostly transversely zygomorphic; sta. definite; carp. (2); fr. a nut with solitary and basal seed, or a capsule with  $\infty$  parietal seeds.

PAPAV. *Chelidonium*, *Glaucium*, *Meconopsis*, *Papaver*, [*Eschscholtzia*, *Sanguinaria*, *Roemeria*, *Bocconia*]; and FUMAR. *Corydalis*, *Fumaria*, [*Dicentra* (= *Dielytra*), *Hypocoum*.]

Family 38. CRUCIFERÆ. Herbs. Lea. spiral, simple, exstipulate. Flow. racemose, without bracts (except in *Erucastrum*),  $\delta$ , actinomorphic. Sep. 2+2. Pet. 4. Sta. 2 (short)+4 (long), i.e., tetradynamous. Carp. (2); plac. parietal, with false partition. Fr. a capsule (silique, silicule or lomentum). Seeds nearly or quite exendospermous, often oily and containing much sulphur.

*Matthiola*, *Cheiranthus*, *Nasturtium* (= *Radicula*), *Barbarea*, *Arabis*, *Cardamine*, *Dentaria*, *Sisymbrium*, *Alliaria*, *Erysimum*, *Brassica* (incl. *Erucastrum*), *Sinapis*, *Diplotaxis*, *Draba* (incl. *Erophila*), *Cochlearia* (incl. *Armoracia*), *Thlaspi*, *Hutchinsia*, *Teesdalia*, *Iberis*, *Lepidium*, *Cap-sella*, *Subularia*, *Senebiera* (= *Coronopus*), *Isatis*, *Crambe*, *Cakile*, *Raphanus*, [*Malcolmia*, *Hesperis*, *Alyssum*, *Lunaria*, *Camelina*.]

Family 39. RESEDACEÆ. Herbs. Lea. with minute stipules or none. Flow. greenish, racemose, bracteate, ♂, zygomorphic. Sep. 4—8. Pet. 0—8, some divided. Disc present. Sta. 3—40. Carp. (2—6); ovary 1-celled; ovules ∞; plac. parietal. Fr. a capsule, opening above before it is ripe. Seeds exendospermous. *Reseda*.

## ORDER 12. SARRACENIALES.

Insect-catching herbs. Lea. entire. Flow. hypogynous, actinomorphic. Carp. (3—5); ovules ∞; seeds endospermous. [Incl. *Sarracenia*, *Nepenthes*.]

Family 40. DROSERACEÆ. Herbs. Lea. often in rosettes, stipulate, with tentacles and digestive glands. Flow. cyclic, ♂, actinomorphic. Sep. 4—5. Pet. 4—5. Sta. 4—∞, generally 5. Carp. (3—5), usually with 3—5 styles; ovary 1-celled; ovules 3—∞, anatropous; plac. parietal or basal. Fr. a loculicidal capsule. *Drosera*, [*Dionæa*.]

C. *Pistil apocarpous* or  $\pm$  *syncarpous*. Sta. usually *peri-* or *epi-gynous* (cf. p. 24).

## ORDER 13. ROSALES.

Flow. cyclic or partly spiral, actinomorphic (exc. in LEGUMINOSÆ). Per. generally double. Pistil often apocarpous. Ovules few or ∞.

Family 41. CRASSULACEÆ. Mostly succulent and xerophytic herbs. Lea. simple, exstipulate. Inflor. cymose. Flow. cyclic, ♂, actinomorphic. Per. double, numbers very variable, often 5. Sep. 3—30. Pet. as many, free or rarely united, imbricate. Sta. as many, or twice as many and obdiplostemonous, perigynous. Carp. 3—5, rarely more,

free or slightly united below, generally with an hypogynous scale (nectary) at the base of each. Ovules usually  $\infty$ ; plac. sutural. Fr. a group of follicles. Seeds with little endosperm.

*Tillæa*, *Sedum*, *Sempervivum*, *Cotyledon*, [*Cras-sula*, *Bryophyllum*, *Echeveria*.]

Family 42. SAXIFRAGACEÆ. Herbs or shrubs. Lea. usually spiral, rarely stipulate. Inflor. cymose or racemose. Flow. cyclic,  $\text{♂}$ , actinomorphic, peri- to epi-gynous. Per. usually double. Sep. 4—5. Pet. 4—5, usually imbricate, rarely 0. Sta. 8 or 10, generally obdiplostemonous, occasionally 5. Carp. usually 2,  $\pm$  united, rarely (3—5), with the same number of styles; ovary with 1 or 2 cells, rarely more (inferior in *Ribes*,  $\pm$  inferior in some other sp.); ovules  $\infty$ , anatropous; plac. parietal or axile. Fr. of follicles, or a capsule or berry. Seeds endospermous.

*Saxifraga*, *Chrysosplenium*, *Parnassia*, *Ribes*, [*Astilbe*, *Tiarella*, *Heuchera*, *Tolmiea*, *Escal-lonia*, *Philadelphus*, *Deutzia*, *Hydrangea*.]

[PLATANACEÆ. Trees, with bark scaling off every year in large patches. Lea. spiral, lobed, with large connate stipules, base of petiole forming a cap for the bud. Flow. cyclic, 1-sexual, monœcious, in small spherical pendulous heads. Per. inconspicuous. Sta. 3—4. Carp. 4, free, each with 1 or 2 almost orthotropous pendulous ovules. Fr. a group of caryopses. Seeds almost exendospermous.

*Platanus*.]

Family 43. ROSACEÆ. Herbs, shrubs or trees. Lea. spiral, stipulate. Inflor. cymose or racemose. Flow. cyclic, nearly always  $\text{♂}$  and actinomorphic, peri- to epi-gynous. Per. usually double. Sep.



4—5, occasionally with epicalyx. Pet. 4—5 or more, rarely 0. Sta. 10—∞, rarely fewer. Carp. 1—∞, varying from apocarpous to syncarpous and from superior to inferior; ovules 2 in each (rarely more), anatropous. Fr. of achenes, follicles or drupes, sometimes a pome. Seeds exendospermous.

(POMOIDEÆ) *Cotoneaster*, *Pyrus*, *Cratægus*, *Mespilus*; (ROSOIDEÆ) *Rubus*, *Fragaria*, *Potentilla*, *Dryas*, *Geum*, *Ulmaria* (= Brit. "*Spiræa*"), *Agrimonia*, *Alchemilla*, *Poterium* (incl. *Sanguisorba*), *Rosa*; (PRUNOIDEÆ) *Prunus* (incl. *Cerasus* and *Amygdalus*); [(SPIRÆOIDEÆ) *Spiræa*; (POM.) *Cydonia*, *Amelanchier*; (ROS.) *Kerria*.]

Family 44. PAPILIONATÆ (a sub-family of LEGUMINOSÆ). Herbs, shrubs or trees, sometimes climbers. Lea. spiral, stipulate, mostly compound and pinnate. Inflor. usually racemose. Flow. cyclic, ♂, zygomorphic, typically 5-merous. Per. double. Cal. ± gamosepalous, often 2-lipped; odd sepal anterior. Pet. 5, papilionaceous, with descending vexillary æstivation. Sta. 10 or 9+1, mon- or di-adelphous, very slightly perigynous. Carp. 1; ovules 1—∞, ± anatropous; plac. sutural. Fr. a legume or lomentum. Seeds exendospermous.

*Genista*, *Ulex*, *Cytisus*, *Ononis*, *Medicago*, *Melilotus*, *Trigonella*, *Trifolium*, *Anthyllis*, *Lotus*, *Astragalus*, *Oxytropis*, *Hippocrepis*, *Ornithopus*, *Vicia*, *Lathyrus*, [*Lupinus*, *Galega*, *Wistaria*, *Robinia*, *Colutea*, *Coronilla*, *Onobrychis*, *Arachis*, *Desmodium*, *Phaseolus*.]

[MIMOSEÆ, flow. actinomorphic, *Mimosa*, *Acacia*; and CÆSALPINIÆÆ, flow. ± zygomorphic but not papilionaceous, *Tamarindus*, *Cassia*, *Gleditschia*—are the two other sub-families of LEGUMINOSÆ.]

D. Pistil (in Brit. sp.) always syncarpous and superior, often separating into mericarps when ripe. Plac. axile. Sta. hypogynous, less often perigynous (e.g., especially in *Rhamnus*) (cf. p. 30).

☀ Sep. imbricate. Sta. mostly in 2 whorls; or if in 1, the outer only, the inner often represented by staminodes (cf. p. 28).

GERANIALES.

SAPINDALES.

#### ORDER 14. GERANIALES.

Herbs or shrubs. Flow. cyclic, ♂, usually 5-merous. Per. double. Sta. 5, 10 or more. Carp. (2—5), often schizocarpous; ovules 1 or 2 in each (rarely ∞), pendulous, anatropous, with ventral raphe and micropyle directed upwards.\*

Family 45. GERANIACEÆ. Herbs, occasionally ± shrubby. Lea. usually stipulate. Flow. actinomorphic (zygomorphic in *Pelargonium*), often obdiplostemonous. Sep. 5. Pet. 5, imbricate or twisted, rather deciduous. Sta. 10 (or 15), 5 or fewer occasionally reduced to staminodes, free or connate at base. Carp. (5), each with usually 1 or 2 (rarely more) ovules. Fr. splitting into mericarps (cocci). Endosperm little or 0.

*Geranium, Erodium, [Pelargonium.]*

Family 46. OXALIDACEÆ. Herbs. Lea. usually 3-foliolate, exstipulate. Flow. actinomorphic. Sep. 5. Pet. 5, twisted. Sta. 10, united at base, obdiplostemonous. Carp. (5), with a few anatropous ovules in each. Fr. a capsule (or berry). Seeds ± endospermous. *Oxalis.*

\* If there are several ovules in a cell, an occasional one may have a dorsal raphe and micropyle directed downwards.

[TROPÆOLACEÆ are closely allied, but have zygomorphic flow., 8 sta., 3 separating carp., each with 1 exendospermous seed. *Tropæolum.*]

Family 47. LINACEÆ. Herbs (in Brit. sp.). Lea. spiral, simple, entire, sometimes stipulate. Inflor. a mono- or di-chasial cyme. Flow. actinomorphic. Sep. 4—5. Pet. 4—5. Sta. 4—5, or more,  $\pm$  united at base, some generally converted into staminodes. Carp. (2—5), with usually 2 ovules in each; ovary divided by false partitions. Fr. a septicidal capsule. Seeds with scanty endosperm. *Linum, Radiola.*

Family 48. POLYGALACEÆ. Herbs (in Brit. sp.). Lea. spiral, simple, entire, exstipulate. Inflor. racemose; pedicels with bract and bracteoles. Flow. medianly zygomorphic. Sep. 5 (2 inner petaloid). Pet. 3 (+ 2 others aborted). Sta. 4 + 4, united below into a tube adnate to the pet. Carp. (2), with 1 style; ovary 2-celled, with 1 ovule in each cell. Fr. a capsule. Seeds endospermous. *Polygala.*

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*Reduced forms (TRICOCCEÆ), but still showing the same character in the ovules.*

Family 49. EUPHORBIACEÆ. Herbs, shrubs or trees, often with white latex. Lea. usually spiral, often stipulate (frequently dropping off early in foreign xerophytic sp. with assimilating stems). Inflor. a compound spike or a cyathium (cymose). Flow. actinomorphic, 1-sexual, often much reduced. (Per. 3 or 0 and sta. 1 or 9—12, in Brit. sp.) Carp. (3) or (2). Fr. splitting into 3 or 2 mericarps. Seeds endospermous, often with a caruncle over the micropyle.

*Mercurialis, Euphorbia, [Croton, Ricinus, Hevea, Manihot, Codicæum, Poinsettia.]*

Family 50. CALLITRICHACEÆ.\* Herbs, ± submerged. Lea. opposite, entire. Flow. axillary, monœcious, naked; ♂ of 1 terminal sta., ♀ of (2) carp., with 2 styles, divided by false partitions into 4 cells, each with 1 ovule. Fr. separating into 4 mericarps. Seeds endospermous. *Callitriche.*

## ORDER 15. SAPINDALES.

Trees or shrubs (exc. *Impatiens*). Characters as of *Geraniales*, but ovule with dorsal raphe (or, if with ventral raphe, ascending with the micropyle directed downwards).†

Family 51. BUXACEÆ. Evergreen shrubs. Lea. entire, leathery, exstipulate. Flow. monœcious, actinomorphic. Per. single, generally 4; sta. 4 (in Brit. sp.). Carp. usually (3), with 3 styles; each carp. with 1 or 2 pendulous anatropous ovules. Fr. a loculicidal capsule [or drupe]. Seeds endospermous. *Buxus.*

Family 52. EMPETRACEÆ. Small heath-like shrubs. Lea. linear, evergreen, exstipulate, with strongly recurved margins. Flow. small, axillary, 1-sexual, diœcious (occasionally ♂), actinomorphic. Per. double. Sep. 2—3. Pet. 2—3. Sta. 2—3. Carp. (2—9), each with 1 ascending anatropous ovule with ventral raphe. Fr. a drupe. Seeds endospermous. *Empetrum.*

\* The position of this family is quite uncertain.

† In other words, if an ovule is looked at on the right of the plac., the direction of the axis of raphe and ovule is always curved clockwise in Sapindales and anti-clockwise in Geraniales.

Family 53. AQUIFOLIACEÆ. Trees or shrubs. Lea. spiral, mostly evergreen, simple; stipules minute or 0. Inflor. cymose. Flow. polygamous or dioecious, actinomorphic, 4—5-merous. Pet. usually united at base. Sta. 4—5, alternating with and slightly adnate to pet. Carp. (4—6), seldom more, with 1 or 2 pendulous anatropous ovules in each. Fr. a drupe. Seeds endospermous. *Ilex*.

Family 54. CELASTRACEÆ. Trees or shrubs. Lea. opposite or spiral, simple; stipules minute, caducous, or 0. Flow. small, greenish, ♂ or polygamous, actinomorphic, 4—5-merous. Per. double, imbricate. Cal. 4—5-lobed. Pet. 4—5. Sta. usually 4—5, inserted on the edge of a broad disc. Carp. (2—5), each with 1 or 2 (rarely more) basal ascending ovules. Fr. a loculicidal capsule (in Brit. genus). Seeds usually endospermous, often with brightly coloured aril. *Euonymus*, [*Celastrus*.]

[STAPHYLEACEÆ. Trees or shrubs. Lea. opposite, pinnate, stipulate. Inflor. racemose. Flow. 5-merous, actinomorphic. Sta. 5, inserted outside the disc. Carp. (2—3), with few or many ovules, partly free above; plac. sutural. Fr. a bladderly capsule, 2—3-celled, each cell with several endospermous seeds. *Staphylea*.]


Family 55. ACERACEÆ. Trees or shrubs. Lea. opposite, petioled, simple, palmately veined and lobed (or pinnate in *Negundo*), exstipulate. Inflor. racemose. Flow. polygamous, actinomorphic. Per. double, 4—10-merous. Sta. 4—10, usually 8, inserted on a thick-lobed disc. Carp. (2), rarely (3), each with 2 nearly orthotropous ovules. Fr. a double (or treble) samara, at length separating when ripe. Seeds exendospermous.

*Acer* (incl. *Negundo*).

[HIPPOCASTANACEÆ. Trees, with large resinous winter buds. Lea. opposite, palmate, exstipulate. Inflor. a raceme of cymes. Flow. polygamous, obliquely zygomorphic. Sep. 5. Pet. 4—5. Sta. 5—8, inserted within the disc. Carp. (3), each with 2 ovules. Fr. a 3-valved capsule, with usually only 1 large exendospermous seed when ripe. *Æsculus*.]

Family 56. BALSAMINACEÆ. Herbs, with  $\pm$  translucent stems (occasionally shrubby). Lea. spiral, usually exstipulate. Flow  $\text{\textcircled{X}}$ , zygomorphic. Sep. 3, petaloid, posterior spurred, sometimes 2 other minute ones. Pet. 5 (apparently 3, the lateral ones being united in pairs). Sta. 5, anthers at first cohering. Carp. (5), each cell with  $\infty$  pendulous anatropous ovules. Fr. a loculicidal capsule, bursting elastically. Seeds exendospermous.

*Impatiens*.

 Sep. valvate. Sta. often in 1 (the inner) whorl only.

RHAMNALES.

MALVALES.

#### ORDER 16. RHAMNALES.

Flow. cyclic, actinomorphic. Per. double, pet. occasionally wanting. Sta. opposite the pet. Carp. (2—5), each cell with 1 or 2 basal ascending anatropous ovules.

Family 57. RHAMNACEÆ. Trees or shrubs, [rarely herbs, often climbing]. Lea. spiral or opposite, simple, often 3—5-nerved, with minute stipules. Inflor. cymose. Flow. small, greenish or yellowish [or blue],  $\text{\textcircled{X}}$  or polygamous, 4- or 5-merous. Cal. 4 or 5. Pet. 4 or 5, minute, or 0. Sta. 4 or 5, perigynous, inserted round a cup-shaped disc. Ovary 2—5-celled, with 1 erect basal ovule in each cell. Fr. a

2—4-, usually 3-, stoned drupe (in Brit. sp.). Seeds with little endosperm. *Rhamnus*, [*Ceanothus*.]

## ORDER 17. MALVALES.

Flow. cyclic (exc. sometimes the stamens), ♂, rarely zygomorphic. Per. double, usually 5-merous; sep. mostly valvate. Sta.  $\infty$ , or in two whorls, inner branched, outer staminodial or 0. Carp. (2— $\infty$ ), each with 1— $\infty$  anatropous ovules.

Family 58. TILIACEÆ. Trees, [rarely shrubs or herbs]. Lea. spiral, or seemingly 2-ranked, simple, frequently asymmetric at base, with caducous stipules. Inflor. cymose, with adhering bract in *Tilia*. Flow. ♂, actinomorphic. Sep. 5. Pet. 5, sometimes absent. Sta. usu.  $\infty$ , free or shortly united in 5—10 bundles. Carp. (2— $\infty$ ), (5) in Brit. sp., each with several ascending,  $\pm$  anatropous ovules in inner angle of cell (2 in *Tilia*); style 1. Fr., by abortion, usually 1-celled, 1-seeded, and nut-like. Seeds endospermous. *Tilia*, [*Corchorus*, *Sparmannia*.]

Family 59. MALVACEÆ. Herbs, shrubs or trees. Lea. spiral, palmately veined, simple or lobed, with deciduous stipules. Inflor. solitary or cymose. Flow. conspicuous, ♂, actinomorphic. Per. 5-merous. Sep. often with epicalyx. Pet. twisted, adhering to the staminal tube. Sta. (inner whorl) usually  $\infty$ , cohering by their filaments, *i.e.*, monadelphous; anthers 1-celled; pollen-grains large, spiny. Carp. (5— $\infty$ ), each with 1— $\infty$  anatropous ovules (1 in Brit. sp.) in inner angle of cell. Fr. a capsule or schizocarp. Seeds endospermous.

*Lavatera*, *Althæa*, *Malva*, [*Malope*, *Kitaibelia*, *Abutilon*, *Hibiscus*, *Gossypium*.]

E. *Pistil syncarpous, superior. Plac. ± parietal, or basal. Sta. hypogynous* (cf. p. 32).

#### ORDER 18. PARIETALES.

Flow. hemicyclic or cyclic. Per. double (pet. rarely wanting), mostly 5-merous. Sta. usually  $\infty$ , occasionally few. Carp. 5 or fewer, rarely more,  $\pm$  united; plac. seldom basal, most often  $\pm$  parietal, *i.e.*, though the edges of the carpellary leaves may be bent far inwards, they usually do not meet completely in the middle.

Family 60. HYPERICINEÆ (a sub-family of GUTTIFERÆ). The British sp. are all herbs or undershrubs. Lea. opposite, simple, entire, exstipulate, mostly with pellucid oil-glands (dots). Flow. partly cyclic, usually cymose,  $\text{♂}$ , actinomorphic. Per. 4—5-merous; sep. imbricate; pet. usually twisted. Sta.  $\infty$ , united in 3 or 5 bundles, opposite the pet. Carp. 3 or 5, with 3 or 5 styles; ovary  $\pm$  3—5-celled; ovules 1— $\infty$ , anatropous; plac. varying from parietal, with  $\pm$  projecting plac., to axile. Fr. a septicidal capsule. Seeds exendospermous.

*Hypericum.*

Family 61. ELATINACEÆ. The Brit. sp. are small water plants. Lea. opposite, simple; stipules minute. Flow. small, cyclic,  $\text{♂}$ , actinomorphic, 3—4-merous, solitary, axillary. Sep. and pet. free, imbricate. Sta. twice as many as pet., or as many (inner aborted). Carp. (3—4); ovary 3—4-celled; ovules  $\infty$ , anatropous; plac. axile. Fr. a septifragal capsule. Endosperm little or none. *Elatine.*

Family 62. FRANKENIACEÆ. Salt-loving shrubs or undershrubs, with jointed stems. Lea. small, opposite or clustered, exstipulate. Inflor. cymose, in the upper axils. Flow. sessile,  $\text{♂}$ ,



actinomorphic, 4—6-merous. Sep. united, valvate. Pet. free, imbricate, with ligules. Sta. 4—8. Carp. (2—4), with divided style; ovules  $\infty$ , ascending,  $\pm$  anatropous; ovary 1-celled; plac. parietal. Fr. a loculicidal capsule. Seeds endospermous.

*Frankenia.*

[TAMARICACEÆ. Xerophytic herbs or shrubs. Lea. very small, crowded, spiral, entire, exstipulate. Flow. in spikes,  $\delta$ , actinomorphic, mostly 4—5-merous. Sep. and pet. imbricate. Sta. 4—5 or 8—10. Carp. (2—5); style usually divided; ovary 1-celled or incompletely divided; ovules  $\infty$ , ascending, anatropous; plac. basal or  $\pm$  parietal. Fr. a capsule. Seeds with a tuft of hairs, endospermous or not.

*Tamarix.*]

Family 63. CISTACEÆ. Herbs or shrubs, often glandular. Lea. (in the Brit. sp.) opposite, simple, entire. Flow. cymose or solitary,  $\delta$ , actinomorphic. Sep. 3 (2 others smaller or 0). Pet. 3—5 or 0 (usually 5), twisted, caducous. Sta.  $\infty$ . Carp. 3, 5 or 10, with 1 style; ovary 1-celled; plac. parietal, often projecting inward; ovules 2— $\infty$  on each plac., ascending,  $\pm$  orthotropous. Fr. a loculicidal capsule. Seeds endospermous.

*Helianthemum*, [*Cistus*.]

Family 64. VIOLACEÆ. Herbs or shrubs. Lea. spiral, usually undivided, stipulate, with involute vernation. Flow. axillary,  $\delta$ , bracteolate, usually zygomorphic. Per. 5-merous. Sep. persistent, prolonged backwards; pet. free, with ascending vexillary æstivation. Sta. 5; anthers sometimes cohering slightly. Carp. (3), with 1 style; ovary 1-celled; plac. parietal; ovules anatropous, 1— $\infty$  on each plac. Fr. (in Brit. sp.) a loculicidal capsule. Seeds endospermous.

*Viola.*

**F.** *Flow. cyclic. Carp. ± sunk in the receptacle-tube and united with it, i.e., inferior. Sta. varying from hypogynous to epigynous.*

MYRTIFLORÆ.

UMBELLIFLORÆ.

## ORDER 19. MYRTIFLORÆ.

Herbs, shrubs or trees, often with bicollateral bundles. Lea. (in Brit. sp.) simple, entire, exstipulate. Flow. cyclic, usually actinomorphic. Per. double, or pet. rarely wanting. Sta. perigynous, tending to become epigynous. Pistil syncarpous, free or ± inferior.

Family 65. THYMELÆACEÆ. Shrubs or trees (rarely herbs), with acrid poisonous juice. Lea. usually spiral, simple, entire, exstipulate. Flow. actinomorphic, ♂ or occasionally 1-sexual. Per. double, 4—5-merous, or pet. scale-like or o. Receptacle-tube and cal. green or often coloured; lobes imbricate. Sta. 2, 4, 8 or 10 (8 in Brit. sp.), distinctly perigynous. Carp. usually 1, free, with 1 style and 1 pendulous, anatropous ovule. Fr. a drupe [or various]. Seeds with little or generally no endosperm. *Daphne.*

Family 66. ELÆAGNACEÆ. Shrubs or trees, with numerous silvery or brown scurfy scales. Lea. simple, entire, exstipulate. Flow. small, actinomorphic, 2—4-merous, polygamous or mostly 1-sexual. Per. in ♂ of 2 or 4 sep.; in ♀ or ♂, receptacle tubular, with margin 2—6 cleft; pet. o. Sta. 4 (in Brit. sp.), distinctly perigynous in ♂ flow. Carp. 1, free, with 1 erect anatropous ovule. Fr. a nut, enclosed in the fleshy receptacle-tube. Endosperm little or o. *Hippophaë, [Elæagnus.]*

Family 67. LYTHRACEÆ. Herbs (in Brit. sp.).  
 Lea. opposite or whorled, simple, entire; stipules  
 minute or o. Flow ♂, actinomorphic or zygomor-  
 phic, mostly 4—6-merous. Receptacle tubular. Per.  
 double, pet. rarely small or wanting. Sep. 4—6,  
 valvate, with epicalyx of combined stipules. Pet.  
 4—6, rarely o, perigynous. Sta. as many or twice  
 as many or indefinite, inserted on receptacle-tube.  
 Carp. (2—6), free, each with 2—∞ ascending ana-  
 tropous ovules; style 1; ovary with 2—6 cells, ±  
 imperfectly separated; plac. ± axile. Fr. a capsule.  
 Seeds exendospermous. *Lythrum, Peplis.*

Family 68. EPILOBIACEÆ (= ONAGRACEÆ).  
 Herbs, occasionally shrubby. Lea. simple, exstipu-  
 late. Flow. solitary or racemose, usually ♂ and  
 actinomorphic. Receptacle tubular. Sep. 2—4, val-  
 vate. Pet. 2—4, twisted, perigynous. Sta. usually  
 4—8 and obdiplostemonous, or 2, perigynous but  
 often appearing to be epigynous. Carp. (4), rarely  
 (1—6), inferior, each cell with 1—∞ anatropous  
 ovules; plac. axile; style 1. Fr. a capsule, nut or  
 berry. Seeds nearly exendospermous.

*Ludwigia, Epilobium, Circæa, Œnothera, [Fuch-  
 sia, Clarkia, Godetia, Trapa.]*

Family 69. HALORRHAGACEÆ.\* Herbs, often  
 marsh or aquatic. Lea. whorled (in Brit. sp.).  
 Flow. minute, actinomorphic, often 1-sexual. Sep.  
 2—4 or o. Pet. 2—4 or o. Sta. 1—8, epigynous in  
 ♂ flow. Carp. (1—4), with as many styles; ovary  
 1—4-celled, inferior, each cell with 1 pendulous  
 anatropous ovule. Fr. drupe-like. Seeds ± endo-  
 spermous. *Myriophyllum, Hippuris, [Gunnera.]*

\* By Engler this family is divided into two, Halorrhagi-  
 daceæ and Hippuridaceæ.

## ORDER 20. UMBELLIFLORÆ.

Flow. cyclic, mostly in umbels, 4—5-merous, usually actinomorphic. Per. double, but cal. often much reduced. Sta. isomerous, epigynous, on the margin of an epigynous disc (nectary). Carp. usually (1—5), inferior, each with 1 pendulous anatropous ovule. Seeds endospermous.

Family 70. ARALIACEÆ. Trees, shrubs or climbers. Lea. usually spiral, sometimes with small adnate stipules. Per. 5-merous; cal. often reduced to a mere limb. Sta. 5. Carp. 1 or more (5 in *Hedera* and ovary 5-celled). Fr. usually a drupe.

*Hedera*, [*Aralia*.]

Family 71. UMBELLIFERÆ. Herbs, with hollow internodes. Lea. spiral, exstipulate, generally  $\pm$  compound, often much divided, rarely simple, usually with a conspicuous sheath. Flow. in umbels,  $\pm$  actinomorphic, 5-merous, occasionally 1-sexual. Cal. 5-toothed or inconspicuous. Pet. 5, often with inflexed tip. Sta. 5, incurved in bud. Disc usually swollen and conspicuous. Carp. (2), median, with 2 styles. Fr. separating into 2 mericarps,  $\pm$  ribbed, often with oil-canals (vittæ). Seeds with rich oily endosperm.

*Hydrocotyle*, *Sanicula*, *Astrantia*, *Eryngium*, *Conopodium* (= *Bunium*), *Scandix*, *Myrrhis*, *Chærophyllum* (incl. *Anthriscus*), *Caucalis* (incl. *Torilis*), *Physospermum*, *Conium*, *Smyrnum*, *Bupleurum*, *Trinia*, *Apium*, *Carum*, *Sison*, *Cicuta*, *Sium*, *Ægopodium*, *Pimpinella*, *Seseli*, *Fœniculum*, *Crithmum*, *Ænanthe*, *Æthusa*, *Silaüs*, *Meüm*, *Ligusticum*, *Selinum*, *Angelica* (incl. *Archangelica*), *Peucedanum*, *Heracleum*, *Tordylium*, *Daucus*.

Family 72. CORNACEÆ. Trees or shrubs (rarely herbs). Lea. usually opposite, simple, entire, exstipulate. Inflor. cymose. Flow. small, ♂, actinomorphic, usually 4—5-merous; (sep., pet. and sta. 4, carp. (2) in Brit. sp.). Style 1. Fr. a drupe or berry. *Cornus*, [*Aucuba*, *Garrya*.]

## Sub-Class II. METACHLAMYDEÆ.

(Sympetalæ, Gamopetalæ.)

Flow. always cyclic, predominantly 5-merous. Per. generally well-marked, typically double; pet. united, exc. sometimes in § A, rarely 0; sep. usually persistent, but in some families they are suppressed or modified. Carp. generally united.

- A. *Sta. mostly hypogynous or adhering ± to the pet., rarely epigynous, in 2 whorls or more rarely 1 (the inner one). Carp. usually (4—5). (Cf. p. 38.)*

ERICALES. PRIMULALES. PLUMBAGINALES.

### ORDER I. ERICALES.

Shrubs, rarely herbs or trees. Lea. simple, exstipulate. Flow. ♂, actinomorphic or nearly so, mostly 4—5-merous, obdiplostemonous or, if isostemonous, sta. alternate with the pet. Pet. united or free. Sta. hypogynous or epigynous, rarely adhering slightly to the pet.; anthers opening usually by terminal pores or short slits. Carp. (2—∞); ovary superior or rarely inferior.

Family 73. PYROLACEÆ. Herbs, evergreen, or saprophytic and  $\pm$  colourless. Lea. spiral. Flow. actinomorphic, in a terminal raceme or solitary, 4—5-merous, obdiplostemonous. Pet. free or united at base. Sta. hypogynous. Carp. (4—5), with 1 style; ovary imperfectly 4—5-celled; ovules  $\infty$ , very small, anatropous; plac. thick, fleshy. Fr. a loculicidal capsule. Seeds endospermous, with loose testa. *Pyrola, Monotropa.*

Family 74. ERICACEÆ. Undershrubs, shrubs or even small trees. Lea. (with few exceptions) evergreen, leathery, often narrow and xerophytic, spiral, opposite or whorled. Flow. solitary or racemose, 4—5-merous, actinomorphic or slightly zygomorphic, obdiplostemonous or isostemonous.\* Pet. generally united. Sta. on the edge of an hypogynous or epigynous disc; anthers often with appendages (horns); pollen in tetrads. Carp. (4—5), with 1 style; ovary superior (inferior in *Vaccinium*); ovules 1— $\infty$  in each carp., pendulous, anatropous; plac. axile. Fr. a capsule (loculicidal, septicidal or septifragal), berry or drupe. Seeds endospermous.

*Loiseleuria, Menziesia* (incl. *Phyllodoce* and *Dabeocia*), *Andromeda, Arbutus, Arctostaphylos, Erica, Calluna, Vaccinium* (incl. *Oxycoccus*), [*Ledum, Rhododendron* (incl. *Azalea*), *Kalmia, Gaultheria, Pernettya.*]

\* If these flow. are isostemonous, it is the inner whorl that is present; but, while this would in an ordinary way be antipetalous, yet in the Ericaceæ (which are typically obdiplostemonous) this inner whorl will alternate with the petals.

## ORDER 2. PRIMULALES.

Flow. actinomorphic and usually 5-merous (rarely 4—8-merous). Pet. united (0 in *Glaux*). Sta. isomerous, opposite the petals and adhering to them (hypogynous in *Glaux*), with rarely 5 staminodes forming an outer whorl. Ovary 1-celled, with 1—∞ ovules; plac. basal or free-central. Fr. a capsule.

Family 75. PRIMULACEÆ. Herbs. Lea. spiral or opposite (seldom whorled), exstipulate. Flow. ♂; pet sometimes reflexed. Ovary superior, with 1 style ( $\frac{1}{2}$  inferior in *Samolus*); ovules ∞, ± amphitropous, spirally arranged or in whorls; plac. free-central. Fr. a capsule or pyxidium. Seeds endospermous, ± sunk in cavities in the plac.

*Primula, Hottonia, Cyclamen, Trientalis, Lysimachia, Glaux, Centunculus, Anagallis, Samolus, [Androsace, Dodecatheon, Soldanella.]*

## ORDER 3. PLUMBAGINALES.

Pet. free or united. Sta. in 1 whorl, opposite the pet. Carp. (5), superior, with 5 styles or stigmas; ovary 1-celled, with 1 anatropous ovule suspended from a long basal funicle.

Family 76. PLUMBAGINACEÆ. Herbs, often maritime, (rarely shrubby). Lea. spiral, simple, entire, mostly radical, exstipulate. Flow (in Brit. sp.) in cymose heads or panicles, ♂, actinomorphic, 5-merous, with bracts and bracteoles. Sta. slightly adhering to the pet. Cal. often scarious and coloured, enclosing the nut-like fr. Seeds endospermous.

*Armeria, Statice, [Plumbago.]*

- B.** *Cor.* almost always gamopetalous and actinomorphic. *Sta.* reduced to 1 whorl (the outer), epipetalous or hypogynous. *Carp.* usually 2, sometimes imperfectly united. *Lea.* (in *Brit. sp.*) generally opposite (cf. p. 39).

#### ORDER 4. CONTORTÆ.

Herbs, shrubs or trees. *Lea.* usually opposite, mostly simple and exstipulate (exc. in a few genera). *Flow.* actinomorphic, mostly 5-merous (more rarely 2—6-merous). *Pet.* generally united, often twisted in bud. *Sta.* usually isomerous and epipetalous, sometimes 2. *Carp.* (2).

Family 77. OLEACEÆ. Mostly trees or shrubs. *Lea.* usually opposite, simple or pinnate, exstipulate. *Flow.* 2—6-merous, sometimes 1-sexual. *Pet.* 4—6 (rarely 0), valvate or imbricate, united or  $\pm$  free. *Sta.* 2 (hypogynous in *Fraxinus*). *Carp.* (2), with 1 style; ovary 2-celled, superior, each cell with usually 2 anatropous ovules (pendulous in *Brit. sp.*); plac. axile. *Fr.* a capsule, samara, berry or drupe. Seeds  $\pm$  endospermous.

*Fraxinus, Ligustrum, [Forsythia, Syringa, Phillyrea, Olea, Jasminum.]*

Family 78. GENTIANACEÆ. Herbs [rarely shrubs], mostly bitter. *Lea.* usually opposite, simple (exc. in *Menyanthes*), entire, exstipulate. *Flow.* cymose,  $\delta$ , actinomorphic, usually 4—5-merous. *Sep.* 4—8, united or free. *Pet.* (4—8), mostly (5), usually twisted (exc. in *Menyanthes* and *Limnanthemum*). *Sta.* 4—8, epipetalous. *Carp.* (2), with usually  $\infty \pm$  anatropous ovules; style 1 or very short; ovary 1- (or  $\pm$  incompletely 2-) celled, superior; plac. usually parietal. *Fr.* a 2-valved septical capsule. Seeds endospermous.



*Blackstonia* (= *Chlora*), *Cicendia* (incl. *Microcala*),  
*Centaurium* (= *Erythræa*), *Gentiana*, *Menyanthes*, *Limnanthemum* (= *Villarsia*).

Family 79. APOCYNACEÆ. Plants various (low shrubs in Brit. gen.), provided with abundant latex and bicollateral bundles. Lea. opposite, simple, entire, usually exstipulate. Flow. (in Brit. gen.) solitary. Per. 4—5-merous; pet. usually twisted. Sta. 4—5. Carp. usually 2, superior, free below but connate in the region of the style; ovules  $\infty$ , pendulous,  $\pm$  anatropous; plac. sutural. Fr. usually of 2 follicles. Seeds with or without endosperm.

*Vinca*, [*Apocynum*, *Nerium*, *Strophanthus*, *Allamanda*, as well as *Landolphia* and many other rubber-yielding tropical lianes.]

- C. Cor. always gamopetalous and often zygomorphic. Only 1 whorl of sta. (the outer) present. Carp. usually (2), occasionally more, sometimes apparently 1.

TUBIFLORÆ.

RUBIALES.

CUCURBITALES.

PLANTAGINALES.

CAMPANULATÆ.

§ 1. Ovary superior. Cor. hypogynous (cf. p. 44).

## ORDER 5. TUBIFLORÆ.

Mostly herbs or shrubs. Per. typically 5-merous, with petaloid cor. Sta. epipetalous, isomerous and alternating with pet., but often reduced in zygomorphic flow.

☼ Ovary 2—4-celled; plac. axile; ovules always few, mostly 3 or 4.

Family 80. CONVOLVULACEÆ. Often twiners (usually to the left), rarely shrubby, frequently

with latex. Lea. spiral, exstipulate (o in *Cuscuta*). Flow. 4—5-merous, usually ♂ and actinomorphic. Cor. frequently very conspicuous, often plaited. Sta. 4—5. Carp. (2), each with 2 basal, erect, ± anatropous ovules; ovary 2—4-, rarely 1-celled. Fr. a capsule (in Brit. sp.). Seeds with scanty endosperm.

*Convolvulus, Calystegia, Cuscuta, [Ipomœa.]*

Family 81. POLEMONIACEÆ. Herbs (rarely shrubs). Lea. spiral or opposite, exstipulate (pinnate in Brit. sp.). Flow. ♀, 5-merous, usually actinomorphic. Cor. twisted. Carp. (3), with 1 style and 3 stigmas; each carp. with 1 or more ascending anatropous ovules; plac. axile. Fr. a capsule. Seeds endospermous.

*Polemonium, [Cobœa, Phlox, Gilia (incl. Leptosiphon).]*

Family 82. BORAGINACEÆ. Herbs or low shrubs, mostly with coarse stiff hairs. Lea. mostly spiral, simple, entire, exstipulate. Flow. in cinnal cymes, 5-merous, ♀, actinomorphic or occasionally zygomorphic. Cor. often with scaly appendages at the throat. Sta. 5. Carp. (2), median, each with 2 anatropous ± suspended ovules, but ovary (usually) becoming very soon deeply 4-lobed and 4-celled by false partitions; style generally arising from between the lobes; often there is a small hypogynous lobed disc (nectary). Fr. separating into 4 1-seeded nutlets [a drupe in *Heliotropium*]. Seeds almost or quite exendospermous.

*Cynoglossum, Symphytum, Borago, Anchusa (incl. Lycopsis), Pulmonaria, Myosotis, Lithospermum, Mertensia, Echium, [Asperugo, Echinospermum (=Lappula), Omphalodes, Heliotropium.]*

Family 83. VERBENACEÆ. Herbs or shrubs (rarely trees). Lea. mostly opposite, exstipulate. Flow. usually ♂, zygomorphic, generally 5-merous. Cal. tubular. Cor. ± 2-lipped. Sta. usually 4, didynamous. Carp. mostly (2), each with 2 ovules; ovary usually 4-celled by false partitions, but scarcely 4-lobed, each cell with 1 ovule; style simple, terminal. Fr. of 4 nutlets (in the Brit. sp.) or drupaceous. Seeds exendospermous.

*Verbena*, [*Lantana*, *Tectona*, *Clerodendron*.]

Family 84. LABIATÆ. Herbs or shrubs, usually aromatic. Stem square. Lea. opposite (or whorled), simple, exstipulate. Flow. ± zygomorphic, in axillary cymes (verticillasters). Cal. 5-cleft, often 2-lipped. Cor. (5), generally 2-lipped. Sta. 4, didynamous, occasionally reduced to 2 (in *Salvia*, *Rosmarinus*, etc.); sometimes there are 1 or 2 staminodes. Carp. (2), median, each with 2 anatropous ascending (erect) ovules; but ovary ± 4-lobed, and soon divided by false partitions into 4 cells, each with 1 ovule. Style springing from between the lobes (gynobasic). Fr. separating into 4 nutlets. Seeds mostly exendospermous.

*Ajuga*, *Teucrium*, *Scutellaria*, *Marrubium*, *Nepeta*, *Prunella*, *Melittis*, *Galeopsis*, *Lamium*, *Ballota*, *Stachys*, *Salvia*, *Melissa*, *Calamintha* (= *Satureia*), *Origanum*, *Thymus*, *Mentha*, *Lycopus*, [*Rosmarinus*, *Lavandula*, *Phlomis*, *Leonurus*, *Monarda*, *Coleus*, *Dracocephalum*.]

☼☼ Ovary 2-celled : plac. axile : ovules ∞.

Family 85. SOLANACEÆ. Herbs or shrubs, usually with poisonous juices. Vascular bundles bicollateral. Lea. spiral or displaced by adnation,

exstipulate. Flow. various, often apparently non-axillary, mostly 5-merous, ♂, actinomorphic or occasionally zygomorphic. Sta. 5 (1 or 3 sometimes represented by staminodes); anthers sometimes  $\pm$  cohering, opening by pores or slits. Carp. (2), obliquely placed; style terminal; ovules usually  $\infty$ , anatropous or amphitropous, on a swollen axile plac. Fr. a berry or capsule. Seeds endospermous.

*Atropa, Hyoscyamus, Solanum* (incl. *Lycopersicum*), [*Lycium, Physalis, Capsicum, Datura, Nicotiana, Salpiglossis, Petunia, Schizanthus.*]

Family 86. SCROPHULARIACEÆ. Herbs or undershrubs (rarely shrubs or trees), mostly with poisonous juices. Lea. spiral or opposite, exstipulate. Flow ♂,  $\pm$  zygomorphic. Parts of the per. usually in 5's, more rarely appearing in 4's; cor. often 2-lipped. Sta. 4 (mostly didynamous) or 2; occasionally there is a rudimentary or rarely a perfect fifth. Carp. (2), median, each with few or  $\infty$  anatropous or amphitropous ovules on a  $\pm$  swollen axile plac.; style terminal. Fr. a capsule [or berry]. Seeds endospermous.

*Verbascum, Antirrhinum, Linaria* (incl. *Cymbalaria* and *Elatinoides*), *Scrophularia, Limosella, Sibthorpia, Veronica, Digitalis, Melampyrum, Bartsia, Euphrasia, Rhinanthus, Pedicularis*, [*Mimulus, Erinus, Alonsoa, Calceolaria, Collinsia, Pentstemon, Nemesia, Paulownia.*]

☼ ☼ ☼ Ovary 1-celled: plac.  $\pm$  parietal: ovules  $\infty$ .

Family 87. OROBANCHACEÆ. Whitish or brownish parasitic herbs. Lea. reduced to scales. Flow. ♂, zygomorphic. Sep. 2 or 4, free or united.

Cor. (5), 2-lipped. Sta. 4, didynamous. Carp. (2), median, each with  $\infty$  anatropous ovules; ovary 1-celled; plac. parietal, projecting inwards; style 1. Fr. a loculicidal capsule. Seeds with oily endosperm. *Lathræa, Orobanche.*

☼ ☼ ☼ ☼ Ovary 1-celled : plac. free-central :  
ovules  $\infty$ .

Family 88. LENTIBULARIACEÆ (Brit. sp.). Marsh or aquatic herbs, usually without roots. Lea. in a radical rosette or much divided, exstipulate. Flow. solitary or racemose,  $\delta$ , zygomorphic, 5-merous. Cal. 2-lipped or 4—5-partite. Cor.  $\pm$  2-lipped, lower lip spurred. Sta. usually 2 (hypogynous in *Pinguicula*, epipetalous in *Utricularia*). Carp. (2), median; ovules  $\infty$ , anatropous; plac. free-central. Fr. a capsule. Seeds exendospermous. *Pinguicula, Utricularia.*

## ORDER 6. PLANTAGINALES.

Mostly herbs. Lea. usually spiral. Flow. actinomorphic, 4-merous, with scarious corolla. Carp. usually (2).

Family 89. PLANTAGINACEÆ. Scapigerous herbs. Lea. simple, mostly radical, exstipulate, with  $\pm$  parallel ribs. Flow. small, spicate (1-sexual and monœcious in *Littorella*). Sep. 4. Pet. 4, scarious. Sta. 4, epipetalous (hypogynous in *Littorella*). Ovary 2- (or by false partitions 4-) celled; ovules  $\infty$ ,  $\pm$  anatropous (ovary 1-celled and 1-ovuled in *Littorella*); plac. axile. Fr. a capsule (pyxidium) or nut (in *Littorella*). Seeds endospermous. *Plantago, Littorella.*

- § 2. Ovary inferior. Cor. epigynous.  
a. Sta. epipetalous; anthers not at all cohering.

### ORDER 7. RUBIALES.

Herbs, shrubs or trees. Lea. opposite or (apparently) whorled, simple, occasionally compound. Flow. 4—5-merous, mostly actinomorphic. Ovary with 1—several cells, each with 1—∞ anatropous ovules.

☼ *Sta. isomerous with cor.-lobes.*

Family 90. GALIÆ or STELLATÆ (a tribe of RUBIACEÆ). Herbs. Stem 4-angled. Lea. apparently whorled and exstipulate (really opposite and with leaf-like stipules), entire. Flow. small, actinomorphic, cymose. Sep. inconspicuous, valvate, or 0. Carp. (2), median; ovary 2-celled; style 2-cleft; ovules 1 in each cell, pendulous; plac. axile. Fr. fleshy, or dry and separating into 2 seed-like mericarps. Seeds endospermous.

*Sherardia, Asperula, Rubia, Galium*; [*Cinchona, Bouvardia, Gardenia, Coffea, Uragoga*, belong to other tribes of the RUBIACEÆ.]

Family 91. CAPRIFOLIACEÆ. Shrubs or small trees, rarely herbs. Lea. opposite, exstipulate (exc. in *Sambucus*). Flow. ♂, actinomorphic or zygomorphic, cymose. Cal. 2—5-lobed. Cor. 4—5-lobed, sometimes 2-lipped. Sta. 4 or 5 (8 or 10 in *Adoxa*). Carp. (2—5), each with 1—several pendulous anatropous ovules; plac. axile; style simple or divided. Fr. a berry or drupe (rarely a capsule). Seeds endospermous.

*Sambucus, Viburnum, Linnæa, Lonicera, Adoxa*,\*  
[*Symphoricarpus, Diervilla (= Weigelia), Leycesteria*.]

\* Placed by Engler in a separate family Adoxaceæ.

☼☼ *Sta. fewer than cor.-lobes.*

Family 92. VALERIANACEÆ. Herbs (rarely woody below). Lea. opposite, exstipulate. Inflor. cymose. Flow. small,  $\pm$  irregular,  $\text{\textcircled{f}}$  or 1-sexual. Cal. a toothed rim, or involute at first, then expanding into a feathery pappus. Cor. 5 (in Brit. sp.), sometimes spurred. Sta. 1 or 3 (in Brit. sp.). Carp. 3, of which in the fruit 2 are empty, the third has 1 pendulous ovule. Fr. small, dry, indehiscent. Seeds exendospermous.

*Valerianella, Valeriana, Centranthus.*

Family 93. DIPSACACEÆ. Herbs. Lea. opposite, exstipulate. Flow. usually in involucrate heads,  $\text{\textcircled{f}}$ ,  $\pm$  zygomorphic. Cal. represented by a border only. Pet. 4—5, imbricate. Sta. 4 (in Brit. sp.). Carp. (2); ovary 1-celled, with 1 pendulous ovule. Fr. small, dry, indehiscent, enclosed in the "epicalyx" (an involucl of bracteoles). Seeds endospermous.

*Dipsacus, Scabiosa* (incl. *Knautia* and *Succisa*).

b. Anthers often  $\pm$  cohering.

#### ORDER 8. CUCURBITALES.

Herbs, mostly climbing. Vascular bundles bi-collateral. Per. 5-merous. Sta. 5, often  $\pm$  united and thus appearing as 3; anthers often  $\infty$ -shaped.

Family 94. CUCURBITACEÆ. Herbs, prostrate or climbing by tendrils. Lea. spiral,  $\pm$  palmately lobed, exstipulate. Flow. actinomorphic, mostly 1-sexual. Carp. usually (3); style 3-fid; ovary 3-celled; ovules  $\infty$ , anatropous; plac. axile, but turned outward. Fr. a berry (pepo). Seeds exendospermous.

*Bryonia*, [*Luffa, Ecballium, Citrullus, Cucumis, Cucurbita.*]

## ORDER 9. CAMPANULATÆ.

Mostly herbs. Vascular bundles usually collateral. Flow. 5-merous. Anthers frequently touching and  $\pm$  cohering by their edges, with free filaments.

Family 95. CAMPANULACEÆ. Mostly herbs, usually with latex. Lea. spiral, simple, exstipulate. Flow.  $\text{\textcircled{f}}$ , actinomorphic or  $\pm$  zygomorphic. Sta. 5, epigynous or slightly epipetalous; anthers free or mostly cohering. Carp. (2—5), with 1 style; ovary 2—5-celled, sometimes partly superior; ovules  $\infty$ , anatropous; plac. axile. Fr. a capsule. Seeds endospermous.

*Phyteuma, Campanula, Specularia, Wahlenbergia, Jasione, Lobelia, [Trachelium.]*

Family 96. COMPOSITÆ. Herbs, rarely shrubs, (provided with latex in § Ligulifloræ). Lea. spiral, rarely opposite, generally simple, exstipulate. Flow. in involucrate racemose heads, sometimes 1-sexual and monœcious, actinomorphic or zygomorphic. Cal. usually represented by scales or pappus, occasionally by a 5-pointed ridge or o. Cor. tubular or ligulate (in the exotic tribe Mutisieæ, e.g., *Gerbera*, 2-lipped). Sta. 5, epipetalous, synergensious. Carp. (2), median; style 1, with 2 stigmas; ovary 1-celled, with 1 basal ascending anatropous ovule. Fr. small, dry, indehiscent, nut-like (cypsela). Seeds exendospermous.

TUBULIFLORÆ.—*Eupatorium, Solidago, Bellis, Aster, Erigeron, Filago, Antennaria, Gnaphalium, Inula, Pulicaria, Bidens, Anthemis, Achillea, Diotis, Matricaria, Chrysanthemum, Tanacetum, Artemisia, Petasites, Tussilago,*



*Doronicum*, *Senecio*, *Carlina*, *Arctium*, *Carduus*,  
*Cirsium* (= *Cnicus*), *Onopordon*, *Silybum*, *Saus-  
surea*, *Serratula*, *Centaurea*; LIGULIFLORÆ—  
*Cichorium*, *Arnoseris*, *Lapsana*, *Picris* (incl.  
*Helminthia*), *Crepis*, *Hieracium*, *Hypochæris*,  
*Leontodon*, *Taraxacum*, *Sonchus*, *Lactuca*, *Tra-  
gopogon*; [TUB.—*Ageratum*, *Callistephus*, *Olea-  
ria*, *Leontopodium*, *Helichrysum*, *Xanthium*,  
*Zinnia*, *Rudbeckia*, *Helianthus*, *Coreopsis*,  
*Dahlia*, *Galinsoga*, *Helenium*, *Tagetes*, *Cotula*,  
*Dimorphotheca*, *Calendula*, *Gazania*, *Echinops*,  
*Cynara*, *Gerbera*; LIG.—*Prenanthes*, *Scorzonera*.]

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