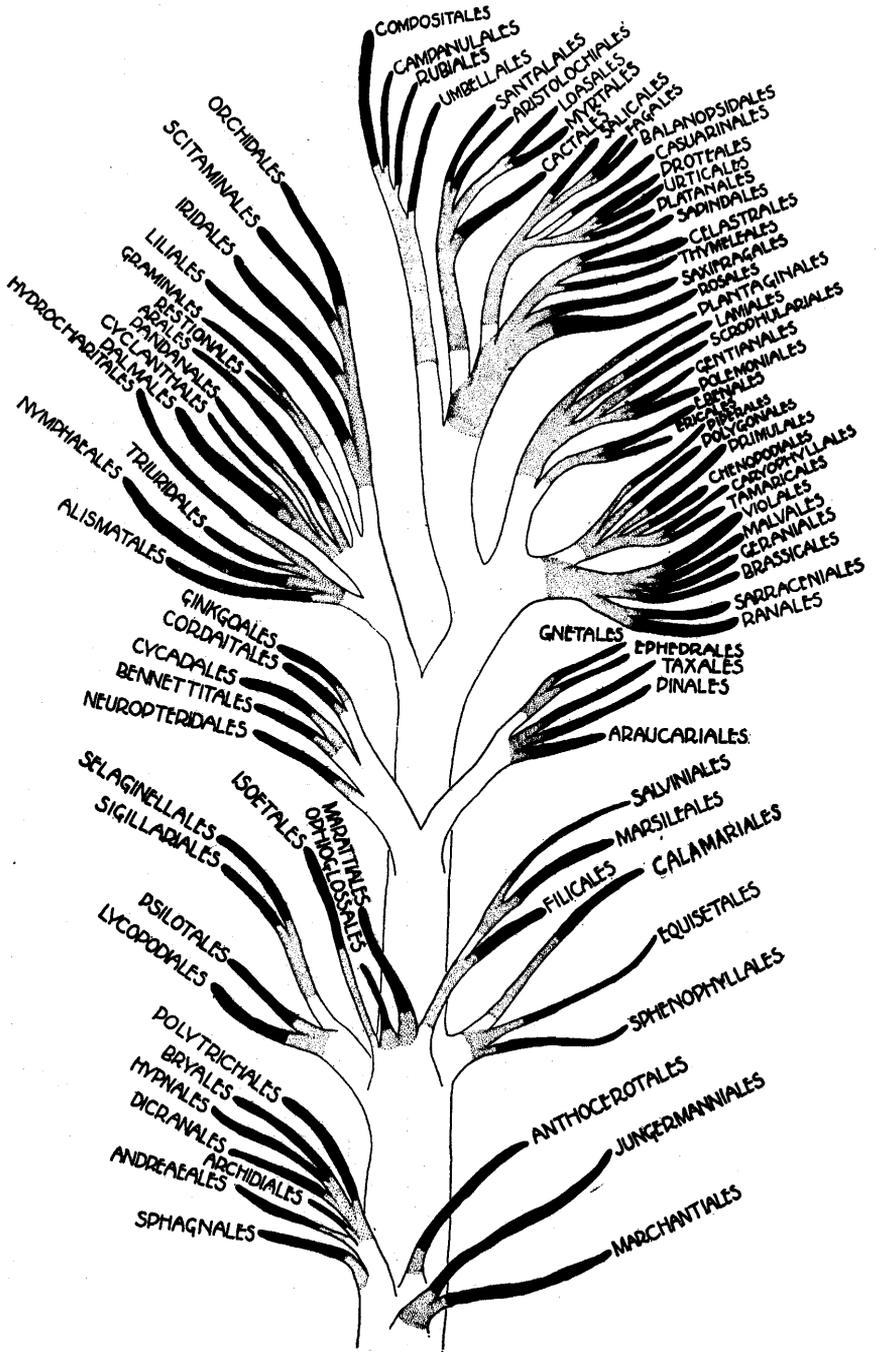


PRINCIPLES OF PLANT TAXONOMY, VII.*

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Having considered the progressive stages of evolution and the correct sequence of the orthogenetic series, it becomes necessary to dispose of the fact of segregative characters through which the present complex system of plant groups was brought about. It is evident that evolutionary progress is through individuals. If this were not the case, if the entire race evolved through a common property or impulse, then there would be no lower organisms left. For these would all have evolved to higher types long ago. The origin of the new individual or rather the new potentiality or group of potentialities does not alter the old which remain and perpetuate themselves just the same as before. This fundamental fact must be at the basis of any rational system of taxonomy. It must be recognized, however, that the same mutative change may take place many times in the same species or may also be repeated in any number of species or groups. Parallelism is very prominent in most plant groups. The progressions and parallelisms are easily discovered but the characters which are of a truly segregative value are often difficult to recognize. The true, phyletic system is, however, based on segregative movements, through which new and independent progressive lines are established. In the fourth paper of this series, the segregation into the great phyla was considered. The segregation will now be carried farther and the phyletic system of classification developed through to the orders. There are no criteria known for the delimitation of orders. They are simply the main phyletic branches of the classes and subclasses. In order to retain the "order" as a large branch or group an arbitrary numerical limit is set up and we thus say that ordinarily no class or subclass shall have more than seven, unless there is a very special reason for making more. This is a perfectly proper scientific procedure because it is the same kind of an exercise as the attempt to determine the number of large branches a tree may contain, or the number of large secondary branches in a still larger primary branch.



Since the plant kingdom falls very distinctly into Thallophyta and Metathallophyta, the two groups will be considered separately and the charts indicating the probable relationships and comparative levels will also be given in two separate plates. The writer is under obligation to Professor Floyd A. McClure, of Lingnan University, Canton, China, who made the final draft of the accompanying diagram of the phyletic relationships of the orders.

SYNOPSIS OF THE CLASSES, SUBCLASSES, AND ORDERS
OF THE METATHALLOPHYTA

Phylum, BRVOPHYTA.

- I. Gametophyte with gametangia not imbedded in the thallus tissue; sporophyte not with intercalary growth between the sporangium and foot; sporangium not two-valved when a central columella is present.
 - A. Rhizoids unicellular; mature gametophyte thalloid or a stem-like frond with scales; sporangium without a central columella, without or with elaters. HEPATICÆ.
 1. Gametophyte a thalloid dorsiventral frond composed of several distinct tissue layers, mostly with air passages; sporangium rarely opening by 4-8 valves. *Marchantiales*.
 2. Gametophyte a frond with stem and scales, or if flat and thalloid not composed of several distinct tissue layers; never with air passages; sporangium nearly always opening by 4 valves. *Jungermanniales*.
 - B. Rhizoids multicellular or septate; mature gametophyte not thalloid; nearly always stem-like and covered with scales; sporangium nearly always with a central columella, if not, then without elaters.
 1. Gametophyte with a pseudopodium bearing the mature sporophyte; sporangium not with a complete columella, but with a dome-shaped cavity.
 - a. Gametophyte gray-green, with two kinds of cells in the scales, narrow ones with chlorophyll and large ones without, but commonly with spiral fibrils; sporangium with an operculum. SPHAGNEÆ. *Sphagnales*.
 - b. Gametophyte dark colored, not with two distinct kinds of cells in the scales; sporangium splitting into 4 or more valves. SCHIZOCARPÆ. *Andreaeales*.
 2. Gametophyte without a pseudopodium; sporangium nearly always with a complete columella, usually with an operculum and a well developed peristome of teeth. ODONTOCARPÆ.
 - (1). Sporangium without a columella, the sporogenous and vegetative cells commingled. *Archidiales*.
 - (2). Sporangium with a definite central columella, which may, however, in rare cases be absorbed.
- a. Peristome teeth thin, developed in the amphithecium and derived from the cell walls of a single layer of cells, always transversely barred; sometimes entirely wanting.
 - (a). Peristome single, composed of two layers of plates made by a deposit on the inner and outer sides of the original cell wall, rarely wanting; usually acrocarpous. *Dicranales*.
 - (b). Peristome double or sometimes wanting, the plates of the outer side of the teeth mostly in two rows by a zigzag median line, the inner side of the teeth of a single row of plates; endostome thin and membranous, sometimes lacking.

- ((a)). Archegonia situated on top of short, special, lateral branches; outer set of teeth usually alternating with the inner; frond usually of creeping habit; the so-called pleurocarpous mosses. *Hypnales*.
- ((b)). Archegonia situated at the tip of the main stem and of ordinary branches; frond usually of erect habit; usually acrocarpous mosses. *Bryales*.
- b. Peristome teeth solid single or double, or rarely absent, developed from two tissue layers of the sporangium; consisting of entire cells, not transversely barred; or if developed from thickened parts of cell walls then the sporangium decidedly dorsiventral and zygomorphic; acrocarpous mosses. *Polytrichales*.
- II. Venter of the archegonium sunken in the body of the gametophyte; rhizoids unicellular; sporophyte with prominent intercalary growth between the sporangium and foot; sporangium 2-valved, with a central columella. ANTHOCEROTÆ. *Anthocerotales*.

Phylum, PTENOPHYTA.

- I. Sporophyte homosporous; gametophytes usually comparatively large and mostly hermaphroditic except in extreme forms. PHYLLOPTERIDÆ.
 - A. Sporangia eusporangiate in origin. Subclass, EUSPORANGIATÆ.
 - 1. Sporangia on a sporangiophore distinct from the leaf blade and born on the morphologically upper side of the leaf; gametophyte subterranean, without chlorophyll. *Ophioglossales*.
 - 2. Sporangia borne on the under side of the leaf blade, mostly forming synangia; leaves with 2 stipules; gametophyte with chlorophyll. *Marattiales*.
 - B. Sporangia leptosporangiate in origin. Subclass, LEPTOSPORANGIATÆ. *Filicales*.
- II. Sporophyte heterosporous; gametophytes minute, unisexual; leaves not with ligules; sporangia in sori inclosed in a modified leaflet (sporocarp) or in the modified indusium; leptosporangiate. HYDROPTERIDÆ.
 - A. Sporangia in sporocarps; with creeping rhizomes; terminal bud with a 3-sided apical cell. *Marsieales*.
 - B. Sporangia in specialized indusia; small floating plants; terminal bud with a 2-sided apical cell. *Salviniales*.
- III. Sporophyte heterosporous; gametophytes minute, unisexual; leaves with ligules and with sporangia borne singly, imbedded on the upper side near the base; eusporangiate. ISOETÆ. *Isoetales*.

Phylum, CALAMOPHYTA.

- 1. Sporophyte homosporous; gametophytes hermaphroditic or unisexual.
 - A. Leaves not fused into a sheath; sporangia stalked, on the upper side of the sporophyll; stem with a central triarch vascular bundle; paleozoic fossils. SPHENOPHYLLÆ. *Sphenophyllales*.
 - B. Leaves united into a sheath with teeth, sporophylls shield-shaped, with sack-like sporangia on the inner side; stem with a ring of vascular bundles and a central pith which is usually hollow. EQUISETÆ. *Equisetales*.
- II. Sporophyte heterosporous; gametophytes unisexual; paleozoic fossils. CALAMARIÆ. *Calamariales*.

Phylum, LEPIDOPHYTA.

- I. Sporophyte homosporous; leaves without a ligule; gametophytes usually hermaphroditic. LYCOPODIÆ.
 - A. Sporangia unilocular, Sporophylls undivided. *Lycopodiales*.
 - B. Sporangia bilocular or trilocular; sporophylls 2-parted. *Psilotales*.

- II. Sporophyte heterosporous; leaves with a ligule; gametophytes unisexual. SELAGINELLEÆ.
- A. With increase in thickness of stem by means of a cambium; paleozoic fossil trees. Subclass, SIGILLARIEÆ. *Sigillariales*.
 - B. Without increase in thickness of stem; present day herbs. Subclass, EUSELAGINELLEÆ. *Selaginellales*.

Phylum, CYCADOPHYTA.

- I. Leaves usually compound; stem an unbranched shaft or with few branches.
 - A. Megasporophylls only moderately or slightly differentiated from the foliage leaves; leaves fern-like, often very much compounded; no cones known; paleozoic fossils. PTERIDOSPERMÆ, *Neuropteridales*, and other imperfectly understood orders.
 - B. Megasporophylls (carpels) highly specialized, usually very different from the foliage leaves; at least one kind of sporophylls in cones, the cones bisporangiate or monosporangiate. CYCADEÆ.
 1. Microsporophylls leaf-like; flowers probably all bisporangiate; fossil mesozoic plants with pinnate leaves. *Bennettitales*.
 2. Microsporophylls not leaf-like, arranged in compact monosporangiate cones; dioecious, present day plants. *Cycadales*.
- II. Leaves usually simple or lobed; venation dichotomous or parallel; stems with several or numerous branches, forming a crown.
 - A. Without dwarf branches; leaves usually elongated, with parallel veins; fossil trees. CORDAITEÆ. *Cordaitales*.
 - B. With thick wart-like dwarf branches and ordinary branches having well-developed internodes; leaves fan-shaped, dichotomously veined; sporophylls not in cones, the plant entirely flowerless; one surviving, living species. GINKGOÆ. *Ginkgoales*.

Phylum, STROBILOPHYTA.

- I. No vessels (enlarged tracheids) in the secondary wood; wood frequently with resin ducts or cells; leaves mostly spiral, sometimes opposite or whorled; cotyledons 2-15. CONIFERÆ.
 - A. Carpels usually numerous in ample or reduced strobili (cones); seeds covered by the carpel tips or by ovuliferous scales; cones rarely becoming fleshy when mature; seeds dry, the testa woody or leathery.
 1. Ovules single on the carpel; staminate cones large; sperms very large. *Araucariales*.
 2. Ovules 2 or more; staminate cones small; sperms not large. *Pinales*.
 - B. Carpels of the cone few or one; seeds with fleshy testa or covered by a fleshy aril. *Taxales*.
- II. Vessels present in the secondary wood; wood without resin ducts; embryo with 2 cotyledons; reduced strobili in specialized inflorescences; leaves opposite or in threes. GNETEÆ.
 - A. Archegonia well developed; primary cambium persistent; leaves scale-like; stem green and fluted. *Ephedrales*.
 - B. Archegonia reduced; concentric cortical series of vascular bundles produced; leaves ribbon-like or broad. *Gnetales*.

Phylum, ANTHOPHYTA.

- I. Stems with closed, usually scattered vascular bundles; embryo usually with one terminal cotyledon and a lateral plumule; flowers mostly in threes, all except the lowest being of the pentacyclic trimerous type or a modification of this. MONOCOTYLÆ.
- II. Stems with open vascular bundles, usually in a circle, with a cambium cylinder; embryo usually with 2 cotyledons and a terminal plumule; flowers mostly pentamerous or tetramerous, of many diverse types from low to high. DICOTYLÆ.

SYNOPSIS OF THE SUBCLASSES AND ORDERS OF
MONOCOTYLÆ

- I. Flowers with many to few free carpels, or the carpels united, in which case they are numerous, or if three, two, or apparently one, then the flowers in a spadix, usually with a spathe or the leaves segmented and fan-like or feather-like; a few with reduced flowers in glomerules and some aquatic plants extremely modified and without a perianth.
 - A. Aquatic or mud plants, or rarely non-green phagophytes, with primitive or highly specialized flowers, but not in a spadix or dense glomerule; hypogynous or epigynous herbs. *HELOBIÆ*.
 1. Flowers hypogynous or somewhat perigynous or epigynous; carpels free or united, spiral or cyclic.
 - a. Plants normal, with chlorophyll.
 - (a). Hypocotyledonary expansion, if present, not lobed or only slightly notched; ovules usually anatropous or campylotropous leaves often narrow, not peltate and not with a narrow basal sinus but sometimes sagittate or deeply cordate; hypogynous. *Alismatales*.
 - (b). Hypocotyledonary expansion parted into two lobes or deeply notched; ovules orthotropous; aerial or floating leaves peltate or with a deep basal sinus, or if somewhat sagittate then the carpels numerous and united; hypogynous to epigynous. *Nymphaeales*.
 - b. Small yellowish or reddish phagophytes without chlorophyll; tropical plants growing in forests. *Triuridales*.
 2. Flowers epigynous; carpels united, cyclic. *Hydrocharitales*.
 - B. Usually terrestrial plants, but sometimes aquatic; trees, shrubs, or herbs with segmented leaf-blades, or plants with the flowers in spadixes or dense glomerules, usually with spathes; or minute free-floating plants without leaves and with extremely reduced flowers; hypogynous, chori-petalous, sympetalous or apetalous. *SPADICIFLORÆ*.
 1. Inflorescence not a typical spadix; leaves frequently plicate and more or less split at maturity.
 - a. Leaves usually plicate and more or less split.
 - (a). Carpels free or united, usually 3, forming a unilocular or plurilocular ovary with one ovule for each carpel. *Palmales*.
 - (b). Carpels united; ovary unilocular, with numerous seeds on 2 or 4 parietal placentæ. *Cyclanthales*.
 - b. Leaves linear or sword-shaped, not plicate and not splitting at maturity; flowers monocious, spicate or capitate. *Pendanales*.
 2. Inflorescence usually a fleshy spadix with or without a spathe; or minute plants without leaves, floating free, the flowers few or solitary, on the modified stem. *Arales*.
- II. Flowers with united carpels, normally pentacyclic and trimerous or a modification or reduction of this type, often covered with glumes and then having a vestigial perianth or none whatever; if trees with pentacyclic trimerous flowers, then not in spadixes and the leaf blade not segmented.
 - A. Flowers reduced, in spikelets covered with glumes, the ovary nearly always unilocular; leaves narrow and usually elongated; usually with one or all the internodes elongated; always hypogynous. *GLUMIFLORÆ*.
 1. Ovary 3-1-locular; ovules solitary in the cavities, orthotropous, pendulous. *Restionales*.
 2. Ovary unilocular, one-ovuled; ovules anatropous, erect or ascending. *Graminales*.
 - B. Flowers mostly showy and normally pentacyclic, or of a somewhat modified pentacyclic, trimerous type, rarely covered with glume-like structures; hypogynous or epigynous trees, shrubs, vines, and herbs of many types. *LILLIFLORÆ*.

1. Flowers hypogynous; seeds with endosperm. *Liliales*.
2. Flowers mostly partly or completely epigynous.
 - a. Seeds with endosperm.
 - (a). Flowers mostly regular, or only slightly zygomorphic. *Iridales*.
 - (b). Flowers very irregular, usually zygomorphic. *Scitaminales*.
 - b. Seeds without apparent endosperm, very numerous and usually minute; flowers mostly irregular and zygomorphic. *Orchidales*.

SYNOPSIS OF THE SUBCLASSES OF DICOTYLÆ

- I. Flowers normally choripetalous or apetalous, some sympetalous but then mostly with central placenta; usually not epigynous and at the same time in umbels.
 - A. Flowers hypogynous or perigynous, rarely epigynous.
 1. Floral organs usually inserted directly on the floral axis.
 - a. Flowers with distinct carpels, or if the carpels are united usually with a plurilocular ovulary, if with a unilocular ovulary then usually with parietal placenta; mostly with petals. *THALAMIFLORÆ*.
 - b. Flowers usually with united carpels, the ovulary with a central ovule or placenta, often apetalous but sometimes choripetalous or sympetalous. *CENTROSPERMÆ*.
 2. Floral organs usually on a hypanthium which may be extremely reduced, in which case the flowers are commonly in aments or ament-like clusters; occasionally apparently epigynous.
 - a. Petals commonly present; flowers not in ament-like clusters. *CALYCIFLORÆ*.
 - b. Petals usually absent or much reduced; flowers commonly in aments or ament-like clusters. *AMENTIFERÆ*.
 - B. Flowers usually epigynous, with or without a hypanthium, sometimes sympetalous. *MYRTIFLORÆ*.
- II. Flowers typically sympetalous, rarely apetalous, but sometimes choripetalous and then commonly in umbels and epigynous.
 - A. Flowers mostly hypogynous, if epigynous then the stamens opposite the lobes of the corolla or twice as many; occasionally the flowers are epigynous with alternate stamens.
 1. Flowers pentacyclic, or with as many carpels as petals, or if tetracyclic then the stamens mostly free from the corolla, if the stamens are united with the corolla then usually opposite its lobes. *HETEROMERÆ*.
 2. Flowers tetracyclic; carpels usually 3 or 2; stamens united with the corolla, as many as or fewer than its lobes and alternate with them; corolla mostly tubular. *TUBIFLORÆ*.
 - B. Flowers epigynous, tetracyclic or less, with the stamens alternate with the corolla lobes, often in dense heads, if choripetalous then usually in umbels; calyx frequently minute or absent or replaced by a specialized pappus. *INFERÆ*.

The preceding synopsis of the subclasses of Dicotylæ probably does not give an entirely correct picture of the fundamental segregative movements. These are, in our present state of knowledge, difficult to discover in the enormous mass of more than 125,000 known species. The accompanying chart of the phyletic relationships is constructed on a somewhat different basis and indicates the evolutionary segregation to be about as follows:

- I. Mostly hypogynous.
 - A. Mostly choripetalous or apetalous.
 1. Mostly choripetalous and mostly not with central placentation. *THALAMIFLORÆ*.
 2. Typically apetalous but some choripetalous or sympetalous; mostly with central placentation. *CENTROSPERMÆ*.

- B. Mostly sympetalous.
 1. Flowers pentacyclic or some reduction from this type; carpels commonly 5. *HETEROMERÆ*.
 2. Flowers tetracyclic or less; carpels mostly 2, occasionally 3. *TUBIFLORÆ*.
- II. Mostly perigynous or epigynous, or with a reduced perigynous condition.
 - A. Mostly perigynous and mostly choripetalous or apetalous.
 1. Petals commonly present; flowers usually not in ament-like clusters; hypanthium mostly prominent. *CALYCIFLORÆ*.
 2. Mostly apetalous; flowers at least the staminate commonly in aments or ament-like clusters; hypanthium mostly inconspicuous or reduced. *AMENTIFERÆ*.
 - B. Epigynous, with or without a hypanthium; mostly choripetalous or sympetalous, occasionally apetalous.
 1. Mostly choripetalous and not in umbels; epigynous hypanthium frequent. *MYRTIFLORÆ*.
 2. Typically sympetalous, the choripetalous groups mostly in umbels; epigynous hypanthium rare; calyx often reduced or replaced by a specialized pappus; flower frequently in disks and heads. *INFERÆ*.

Subclass, *THALAMIFLORÆ*.

- I. Carpels many to one, spiral or cyclic, usually free or only slightly united; stamens usually numerous. *Ranales*.
- II. Carpels usually more or less united, cyclic.
 - A. Herbs with insectivorous leaves; carpels 6-3. *Sarraceniales*.
 - B. Herbs or woody plants with normal leaves, not insectivorous.
 1. Carpels 2 or more with parietal placentæ; perianth usually with an even number of segments, the flowers commonly partially or completely isobilateral. *Brassicales*.
 2. Carpels mostly 5 or 3; stamens mostly 10 or 5, or a reduction from 10; ovules mostly pendulous; flowers commonly of the hexacyclic type, one cycle being represented by glands. *Geraniales*.
 3. Carpels many to 3, ovules few; stamens indefinite, monadelphous, branched or clustered, or by reduction separate and few; sepals valvate. *Malvales*.
 4. Carpels 2 or more, commonly with parietal placentæ; stamens numerous to few; sepals and petals usually 5, sepals imbricated or convolute. *Violales*.

Subclass, *CENTROSPERMÆ*.

- I. Perianth present, consisting of a calyx and corolla, or of a calyx only.
 - A. Fruit not an achene or rarely so.
 1. Corolla usually choripetalous or none.
 - a. Embryo straight; fruit a capsule. *Tamaricales*.
 - b. Embryo curved, coiled, or annular.
 - (a). Fruit a capsule, berry or anthocarp; calyx present; corolla present or absent. *Caryophyllales*.
 - (b). Fruit a utricle; calyx present; corolla usually none. *Chenopodiales*.
 2. Corolla mostly sympetalous; fruit fleshy, or a dry capsule, utricle, or achene. *Primulales*.
 - B. Fruit an achene; embryo straight or nearly so; stipules commonly ocreæ. *Polygonales*.
- II. Perianth none or vestigial; ovules usually orthotropous. *Piperales*.

Subclass, *CALYCIFLORÆ*.

- I. Carpels free or united, spiral or cyclic.

- A. Endosperm usually little or none; leaves mostly with stipules; carpels spiral or cyclic, often reduced to one, usually free or only slightly united, with a few evident exceptions. *Rosales*.
 - B. Endosperm present and usually copious; leaves usually without stipules; carpels cyclic, free or united, sometimes slightly epigynous. *Saxifragales*.
- II. Carpels united, cyclic.
- A. Hypanthium tubular or urn-shaped, often constricted above and enclosing the ripe fruit; endosperm commonly little or none. *Thymelales*.
 - B. Receptacle developing a glandular, annular or turgid disk which is somewhat united with the perianth or ovulary, endosperm present or none. *Celastrales*.
 - C. Disk tumid, united with the perianth, sometimes reduced; endosperm usually none. *Sapindales*.

Subclass, AMENTIFERÆ.

- I. Flowers not in typical aments, often in pendent heads or ament-like spikes or clusters; usually monosporangiate.
 - A. Leaves alternate or rarely opposite.
 - 1. Stamens alternate with the petals (when present), or numerous; perianth sometimes none. *Platanales*.
 - 2. Stamens mostly 4, opposite the usually 4 sepals.
 - a. Calyx not petaloid. *Urticales*.
 - b. Calyx petaloid, stamens usually united with the sepals. *Proteales*.
 - B. Leaves whorled, reduced to scales; ovulary unilocular, with 2 ovules. *Casuarinales*.
- II. Flowers, at least the staminate ones, in aments; monosporangiate.
 - A. Seeds not with a tuft of hairs, fruit a typical or modified nut, achene, or samara; plants monecious or diecious.
 - 1. Fruit two- or several-seeded; ovules with one integument; diecious trees or shrubs. *Balanopsidales*.
 - 2. Fruit usually one-seeded. *Fagales*.
 - B. Seeds with a tuft of hairs at one end; several in the capsule; flowers normally diecious, without perianth; leaves usually alternate. *Salicales*.

Subclass, MYRTIFLORÆ.

- I. Petals usually numerous, rarely wanting; mostly fleshy, usually prickly and spiny plants with jointed stems and reduced leaves or the stem not jointed but the leaves fleshy. *Cactales*.
- II. Petals usually not more than 5 or often none; trees, shrubs, or herbs not spiny like the preceding; calyx segments rarely more than 5.
 - A. Petals usually present, choripetalous; sometimes apetalous or sympetalous.
 - 1. Flowers usually bisporangiate; placentæ usually axile or apical, rarely basal or parietal. *Myrtales*.
 - 2. Flowers bisporangiate or monosporangiate; placentæ usually parietal; mostly herbs or herbaceous vines. *Loasales*.
 - B. Petals usually absent, if present either choripetalous or sympetalous.
 - 1. Ovulary usually with several cavities, usually 6-locular; herbs or vines, sometimes parasitic. *Aristolochiales*.
 - 2. Ovulary unilocular; mostly parasitic shrubs or herbs. *Santalales*.

Subclass, HETEROMERÆ.

- I. Stamens mostly free from the corolla, alternate with its lobes or twice as many; seeds minute; flowers mostly bisporangiate, hypogynous or epigynous, sometimes choripetalous. *Ericales*.
- II. Stamens united with the corolla and opposite its lobes or twice as many or more; seeds usually one or few in the cavities, usually large; flowers hypogynous or sometimes epigynous, sometimes choripetalous. *Ebenales*.

Subclass, TUBIFLORÆ.

- I. Corolla not scarious, nerved.
 - A. Fruit usually a capsule berry, drupe, or samara; carpels commonly severed- to many seeded.
 - 1. Corolla regular; stamens usually of the same number as the corolla lobes.
 - a. Leaves alternate or opposite; ovaries not separating. *Polemoniales*.
 - b. Leaves usually opposite, ovaries frequently separating below, with a common style; if not separating, then usually with 2 cavities or 2 placenta. *Gentianales*.
 - 2. Corolla mostly irregular or oblique; fertile stamens commonly fewer than the corolla lobes except in the lower species. *Scrophulariales*.
 - B. Fruit indehiscent but usually splitting and forming 4 nutlets around the style, rarely fleshy; carpels 1-2-seeded. *Lamiales*.
- II. Corolla usually scarious, nerveless; calyx and corolla 4-lobed. *Plantaginales*.

Subclass, INFERÆ.

- I. Anthers separate.
 - A. Corolla choripetalous; flowers usually in umbels or cymes. *Umbellales*.
 - B. Corolla sympetalous. *Rubiales*.
- II. Anthers with few exceptions united; corolla sympetalous, sometimes absent.
 - A. Flowers not in involucrate heads. *Campanulales*.
 - B. Flowers in dense involucrate heads; gynecium of 2, or rarely 3, united carpels, unilocular; seed one. *Compositales*.