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An Ordinal Classification for the Families of Flowering Plants

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Source: *Annals of the Missouri Botanical Garden*, Vol. 85, No. 4 (1998), pp. 531-553

Published by: Missouri Botanical Garden Press

Stable URL: <http://www.jstor.org/stable/2992015>

Accessed: 06/02/2009 10:46

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Volume 85
Number 4
1998

Annals
of the
Missouri
Botanical
Garden



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*The Angiosperm Phylogeny Group*¹

ABSTRACT

Recent cladistic analyses are revealing the phylogeny of flowering plants in increasing detail, and there is support for the monophyly of many major groups above the family level. With many elements of the major branching sequence of phylogeny established, a revised suprafamilial classification of flowering plants becomes both feasible and desirable. Here we present a classification of 462 flowering plant families in 40 putatively monophyletic orders and a small number of monophyletic, informal higher groups. The latter are the monocots, commelinoids, eudicots, core eudicots, rosids including eurosids I and II, and asterids including euasterids I and II. Under these informal groups there are also listed a number of families without assignment to order. At the end of the system is an additional list of families of uncertain position for which no firm data exist regarding placement anywhere within the system.

Why rearrange families, still less formalize orders? Higher-level classifications, the grouping of species into families, orders, etc., are needed as reference tools not only in systematics but also in many other branches of biology. Knowledge of phylogenetic relationships of major groups of organisms, that is, a phylogenetic perspective, is becoming increasingly important, and hence the need for a phylogenetic classification as a reference tool is also becoming imperative.

Our primary focus is on orders with a secondary emphasis on families of flowering plants. The family is central in flowering plant systematics. For example, in studying an unknown plant we usually first identify it to family. The orders, on the other hand, have until quite recently been of little importance, either being morphologically unrecognizable or in most cases lacking any evolutionary coherence (Heywood, 1977; Merxmüller, 1977). However, orders are useful in teaching, for studying

¹ Recommended citation, abbreviated as "APG, 1998." This paper was compiled by Kåre Bremer, Mark W. Chase, and Peter F. Stevens, equally responsible and listed here in alphabetical order only, with contributions from Arne A. Anderberg, Anders Backlund, Birgitta Bremer, Barbara G. Briggs, Peter K. Endress, Michael F. Fay, Peter Goldblatt, Mats H. G. Gustafsson, Sara B. Hoot, Walter S. Judd, Mari Källersjö, Elizabeth A. Kellogg, Kathleen A. Kron, Donald H. Les, Cynthia M. Morton, Daniel L. Nickrent, Richard G. Olmstead, Robert A. Price, Christopher J. Quinn, James E. Rodman, Paula J. Rudall, Vincent Savolainen, Douglas E. Soltis, Pamela S. Soltis, Kenneth J. Sytsma, and Mats Thulin (in alphabetical order). Addresses: K. Bremer, Department of Systematic Botany, Uppsala University, Villavägen 6, S-752 36 Uppsala, Sweden; M. W. Chase, Jodrell Laboratory, Royal Botanic Gardens, Kew, Richmond, Surrey, TW9 3DS, U.K.; P. F. Stevens, Harvard University Herbaria, 22 Divinity Avenue, Cambridge, Massachusetts 02138, U.S.A.

family relationships, and in positioning genera of doubtful affinity. The didactic value of suprafamilial groupings has been emphasized by various authors (e.g., Dahlgren, 1975; Thorne, 1976; Davis, 1978; Takhtajan, 1997). This value is even more evident now that the phylogeny of flowering plants is being disclosed in increasing detail. Many of the orders recognized by earlier authors are not monophyletic, yet there is a pressing need for names to communicate the knowledge of monophyletic groupings of families that are becoming evident. With the major branching sequence of flowering plant phylogeny becoming clearer, a revised familial and ordinal classification is feasible.

Flowering plant classification systems from the late 1970s seemed to be stable and show substantial agreement, but this stability has been rudely shattered as new kinds of data and new methods of analyzing conventional data have become firmly established (Stevens, 1986). Classifications such as those by Cronquist (1981) and Takhtajan (1980), although still in frequent use, have become outdated. Of more recent classifications, that by Goldberg (1986) of the dicotyledons predates the advent of molecular studies at higher levels, as does that by Dahlgren et al. (1985) of the monocotyledons. However, the latter incorporated much new data and provided synapomorphy schemes for many groups. The recent system of Takhtajan (1997), although extremely elaborate, is made less useful because his propensity for splitting often results in well-known families being dismembered, then reassembled as orders. Furthermore, the findings of recent molecular studies, despite being cited, have hardly influenced his classification.

We conclude that there is a great need for a new, phylogenetic classification of flowering plants, providing names for major monophyletic groups of families. Obviously, it is not possible, nor is it desirable, to name all clades in the entire phylogeny. Any such complete classification would be so cumbersome that it would be useless for general communication. Systematists need to come to some kind of agreement concerning which clades to recognize and name, so that a reference tool of broad utility can be formulated and used to discuss diversity. An ordinal classification of flowering plant families is here proposed for that purpose (pp. 538–542). It recognizes a selected number of monophyletic suprafamilial groups, that is, clades in the phylogeny of flowering plants that are supported by at least one, and often several, lines of evidence. These are clades to which we find it useful to refer when we communicate information about higher-level interrelationships of the flowering plants.

We note that the selection of clades to be represented in a formal classification is different from the procedure of naming these clades. The latter issue of biological nomenclature in phylogenetics is currently much debated (e.g., Cantino et al., 1997; de Queiroz, 1997; Lidén et al., 1997), but we have not adopted any “phylogenetic naming” sensu de Queiroz and Gauthier (1994). We operate under the current *International Code of Botanical Nomenclature* (Greuter et al., 1994) and choose to emphasize the ranks of family and order. The Linnaean categories serve as a convenient mnemonic device for remembering hierarchical relationships, but it should of course be realized that groups of the same rank are evolutionarily non-comparable units unless they are sister groups.

There are noteworthy problems when establishing the names for taxa at ordinal and other higher taxonomic levels. Until recently, little attention has been paid to the nomenclature at these levels, and our knowledge of the early literature in which such names were used is imperfect. This situation has in considerable part been rectified by Reveal's (1998) Herculean labors. The principle of priority is not mandatory for taxa above the rank of family, although authors are exhorted “generally” to follow this principle (Greuter et al., 1994). We have tried to balance priority with general usage when assigning names to orders, but even if future bibliographic work discloses earlier ordinal names, changes are not mandated.

Which clades should be recognized in classification, or in our case, how should the orders be circumscribed? Given the primary principle of monophyly, that of recognizing clades and not grades in classification, there are nevertheless many considerations to be taken into account when circumscribing taxa at ordinal as well as all other hierarchical levels above that of species. Classification is not only a matter of grouping according to the principle of monophyly, but it is also a matter of communication (note that whatever philosophy of naming is adopted, there has to be some consensus as to the clades we are going to use in general botanical communication). For us, this raises the question of ranking, that is, after having selected clades in the phylogeny to be named, they have to be assigned an appropriate place in the hierarchy, in our case, family and order (e.g., Backlund & K. Bremer, 1998; Stevens, 1998). In choosing between alternative circumscriptions it is desirable to recognize groups that are well supported. It is also useful to select groups that have some kind of easily observed morphological synapomorphies, although this may be difficult at the ordinal level and

even sometimes at the family level. Synapomorphies also often include (sometimes exclusively) anatomical, biochemical, and developmental characters.

Many of our ordinal names are already well established and used in earlier classifications and systematic treatments. So far as they represent monophyletic groups, we retain well-known orders in the interest of preserving stability. In other cases, the size of the orders comes into consideration. However, what is reasonably broad circumscription? From the point of view of memorization of names, groups of 2–6 or a few more would seem to be ideal, and there is evidence that systematists in the past have commonly recognized groups of this size (Stevens, 1997). However, with the discoveries of new species, genera, and families, the sizes of genera, families, and orders have increased, and many orders now comprise 10–20 families, or even more. Other orders contain a few families only, and if there are only two or three families in an order, “one is not far from leaving the families unplaced” (Copeland, 1957). Concerns about the doubtful value of recognizing similarly small groups have also been expressed by others (e.g., Burt, 1977). Nevertheless, we have chosen to recognize a number of small orders because these represent clades for which monophyly and relationships are well supported, and this better conveys the interrelationships of the families included rather than leaving them unclassified to order.

In general, we adopt a broad circumscription of the orders. We recognize 462 families and 40 orders of flowering plants. Cronquist (1981) recognized 321 families and 64 orders, Thorne (1992) 440 families and 69 orders, and Takhtajan (1997) no less than 589 families in 232 orders. Our wider ordinal circumscription is not because finer details of the phylogeny within the orders are as yet unclear, but because we think the classification will be more useful with a limited number of larger orders. As we develop more firmly supported phylogenies within and among orders, groups at the infraordinal and supraordinal levels can be recognized. Hence we anticipate that there will be little need to change the circumscription of the orders recognized here, except for inclusion of yet unassigned families of unknown systematic position and the transfer of misplaced families. Additional orders may have to be recognized as the phylogenetic relationships of families that are not yet placed are clarified. Discussion as to whether a widely accepted monophyletic group should be a superorder, order, suborder, or family is largely vac-

uous because this will always be an arbitrary decision.

Takhtajan (1997) opted in favor of “smaller, more natural families and orders, which are more coherent and better-defined, where characters are easily grasped, and which are more suitable for information retrieval and phylogenetic studies, including cladistic analyses (e.g., because it reduces polymorphic codings).” However, the size of a group has nothing to do with its “naturalness.” For a smaller group, one will often be able to say more about all of its constituent members, and so the characters may be more easily grasped. However, segregates of well established monophyletic families like Rubiaceae (Gentianales) or Asteraceae (Asterales) would by Takhtajan’s generalization also be more natural; by this criterion, the smaller the group, the more natural it will necessarily be, so there is no ranking criterion to be derived from “naturalness.” If by “more natural” is meant “has more synapomorphies” then this, too, is incorrect; the number of synapomorphies is not connected to the size of the group or the hierarchical level at which it is recognized.

In our classification, these considerations have had little impact. The principle of monophyly in combination with the desirability of maintaining already well established and familiar entities has largely formed the ordinal classification. Monofamilial orders (and monogeneric families) are avoided as much as possible, minimizing redundancy in classification. In a few cases we have, however, recognized some monofamilial orders (Ceratophyllales, Acorales, Arecales) because these are sister groups of more than one other order. Hence, the families of these monofamilial orders cannot be included in any other order without violating monophyly.

The principle of monophyly in combination with the mandatory usage of the family category (Greuter et al., 1994) may lead to the recognition of many small families. For example, in Dipsacales, if Dipsacaceae and Valerianaceae are to be retained as families separate from Caprifoliaceae, the principle of monophyly requires the recognition also of Dieraviaceae, Linnaeaceae, and Morinaceae (Backlund & K. Bremer, 1998; Backlund & Pyck, 1998). This is because each of these latter families is the sister group of more than one family so they cannot be merged with any other family without violating monophyly. Similar considerations apply at the ordinal level. Unfortunately, no absolute guidelines as to reasonable practice can be offered, but we simply observe that caution is always in order.

In other cases there are small families that may be reduced to synonymy of their sister group if the

latter consists of a single family. Examples are *Cambaceae*, which may be merged with *Nymphaeaceae*, and *Kingdoniaceae*, which may be merged with *Circaeasteraceae* (*Ranunculales*). Such commonly recognized families that nevertheless may be merged with their sister family are in our classification placed within square brackets below the family with which they may be merged (in *Ranunculales* either *Fumariaceae* or both *Fumariaceae* and *Pteridophyllaceae* may be merged with *Papaveraceae*; alternatively, either *Pteridophyllaceae* or both *Fumariaceae* and *Pteridophyllaceae* may be retained as distinct).

We do not attempt to thoroughly revise family circumscriptions. In general we follow recent authors and attempt to recognize as many monophyletic families as possible. It should be emphasized, however, that following additional investigation some families listed below may be shown to be non-monophyletic; revised circumscriptions, either by merging or splitting, into monophyletic taxa are not yet possible given our current knowledge. Examples are *Euphorbiaceae* and *Flacourtiaceae* of *Malpighiales* (Källersjö et al., 1998) and several families of *Myrtales* (Conti et al., 1996; Gadek et al., 1996) and core *Caryophyllales* (which comprise *Achatocarpaceae*, *Aizoaceae*, *Amaranthaceae*, *Basellaceae*, *Cactaceae*, *Caryophyllaceae*, *Didiereaceae*, *Molluginaceae*, *Nyctaginaceae*, *Phytolaccaceae*, *Portulacaceae*, *Sarcobataceae*, and *Stegnospermataceae*; Hershkovitz & Zimmer, 1997). Other probably non-monophyletic families that cannot yet be recircumscribed are *Boraginaceae* (euasterids I; Chase et al., 1993), *Scrophulariaceae* (*Lamiales*; Olmstead & Reeves, 1995), and *Santalaceae* (*Santalales*; Nickrent & Duff, 1996; Nickrent et al., 1998). *Brassicaceae* (*Brassicales*) include also the former, paraphyletic *Capparaceae* (*Brassicaceae sensu stricto* being nested inside *Capparaceae*; Judd et al., 1994; Rodman et al., 1996). A supposedly parallel case comprises *Apiaceae* and *Araliaceae* (*Apiales*), since the former have been assumed to be nested inside the latter (Plunkett et al., 1996). However, with a transfer of *Hydrocotyloideae* from *Apiaceae* to *Araliaceae*, it seems that two monophyletic families can be recognized, only a few genera remaining unplaced (Plunkett et al., 1997). Delimitation of *Bombacaceae*, *Malvaceae*, *Sterculiaceae*, and *Tiliaceae* (*Malvales*) is problematical, and only *Malvaceae* are monophyletic (Alverson et al., 1998; Bayer et al., 1999). Here all four are treated together as a single monophyletic family, *Malvaceae sensu lato* (Judd & Manchester, 1997).

Our proposed classification is a modification of

that conceived by Bremer et al. (1995, 1996, 1997) and since 1996 available on the Internet (Bremer et al., 1998). This classification is based on various recently published mostly molecular phylogenetic analyses (e.g., Chase et al., 1993; Chase et al., 1995; Bremer et al., 1994; Struwe et al., 1994; Nadot et al., 1995; Nickrent & Soltis, 1995; Soltis et al., 1995; Gadek et al., 1996; Gustafsson et al., 1996; Morton et al., 1996; Soltis & Soltis, 1997; Soltis et al., 1997; Anderberg et al., 1998; Backlund & B. Bremer, 1998; Bakker et al., 1998; Källersjö et al., 1998; Soltis et al., 1998; Thulin et al., 1998; further references above). The major differences are in the expansion of *Alismatales* (including also *Araceae*), *Caryophyllales* (including *Droseraceae*, *Nepenthaceae*, *Polygonaceae*, *Plumbaginaceae*, and several other families outside the traditional, core *Caryophyllales*), the recognition of a comparatively widely circumscribed *Rosales* (including *Rhamnaceae*, *Urticaceae*, *Moraceae*, and their allies), in the addition of a number of smaller orders (*Ceratophyllales*, *Acorales*, *Arecales*, *Proteales*, *Garryales*, *Aquifoliales*), and in the deletion of a few others (*Aristolochiales*, *Nymphaeales*, *Bromeliales*, *Trochodendrales*, *Zygophyllales*). *Monocots* and *eudicots* are not formally ranked and named because it is not yet clear at which level they should be recognized. The same problems occur with *commelinoids* (a phylogenetically derived subgroup of *monocots*) and with *rosids* and *asterids* (subgroups of *eudicots*), although these are commonly known as subclasses *Commelinidae*, *Rosidae*, and *Asteridae*, respectively.

Well supported ordinal interrelationships are shown in Figure 1. Interrelationships among the basal branches of the tree and the position of the root of the flowering plant phylogeny remain elusive. Within the *eudicots* there is increasing support for a large subgroup with predominantly pentamerous and isomerous flowers, the core *eudicots*, mainly comprising *Caryophyllales*, *Santalales*, *Saxifragales*, *rosids*, and *asterids*. *Rosids* and *asterids* each comprise two large subgroups, *eurosid* I and II and *euasterid* I and II, also receiving increasing support as monophyletic. These correspond to the similarly numbered *rosid* and *asterid* clades of Chase et al. (1993).

Under each of the supraordinal groups of *monocots*, *commelinoids*, *core eudicots*, *rosids*, etc., there are a number of families listed without assignment to order. These families are known to belong within the major group under which they are listed, but their ordinal position is still uncertain. Similarly, *Amborellaceae*, *Austrobaileyaceae*, *Cannellaceae*, etc., are listed at the beginning because

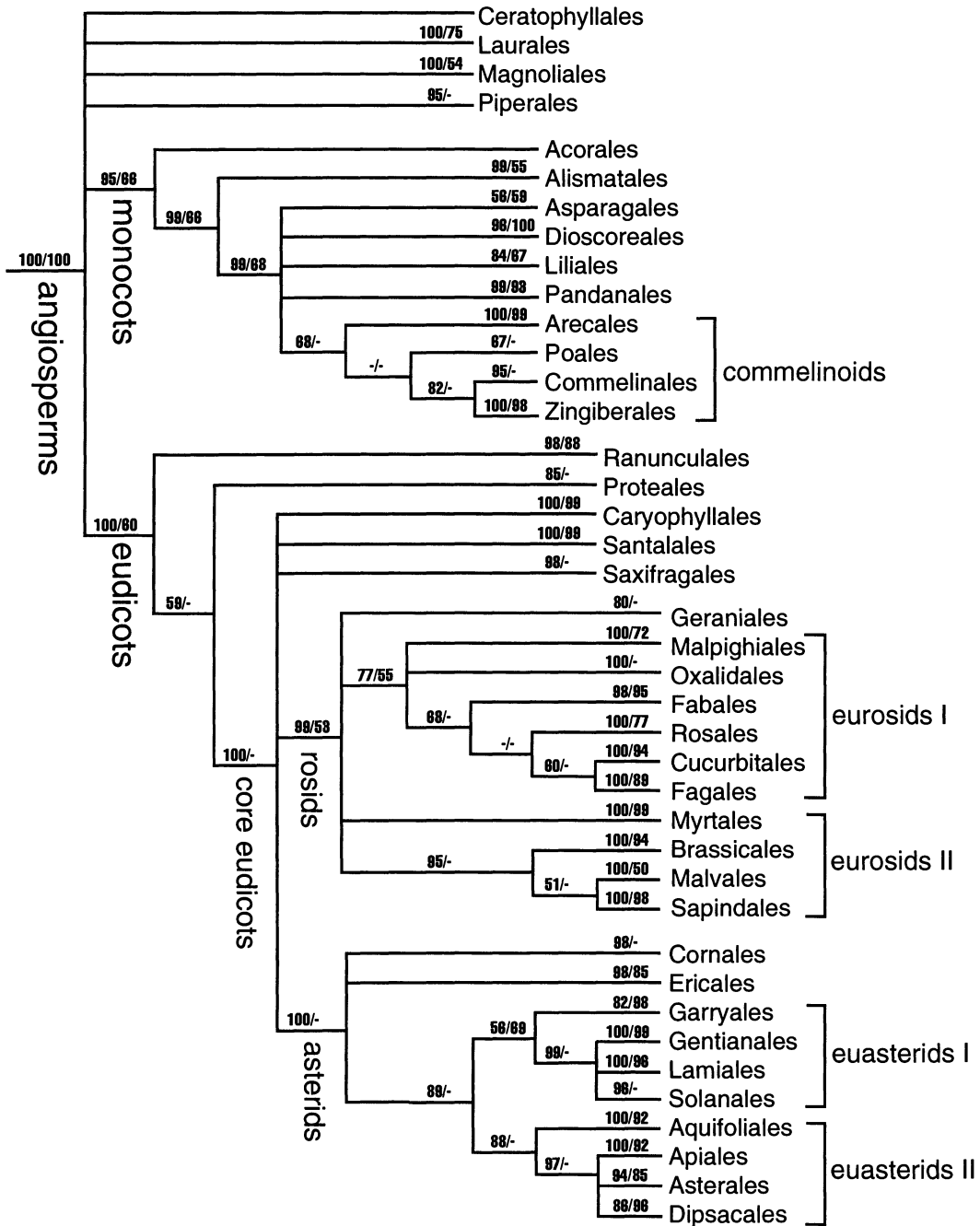


Figure 1. Phylogenetic interrelationships of the orders of flowering plants, compiled from recent cladistic analyses cited in the text. Jackknife support is given on the branches (a dash for values < 50%), first jackknife values from analysis of 545 sequences of the *rbcL*, *atpB*, and 18S rDNA genes (D. E. Soltis, M. W. Chase, P. S. Soltis, D. Albach, M. E. Mort, V. Savolainen, M. Zanis & J. S. Farris, unpublished, in prep.) and second jackknife values from analysis of 2538 *rbcL* sequences (Källersjö et al., 1998).

they belong neither in any of the phylogenetically "basal" orders at the beginning nor in the monocots or eudicots. Furthermore, families listed directly under monocots without an order are monocots but not commelinoids, and families similarly listed directly under eudicots and core eudicots are eudicots or core eudicots, respectively, but neither rosids nor asterids. At the end of the system is an additional list of families of uncertain position. Most of these are probably eudicots (including core eudicots, rosids, and asterids), but so far there are no firm data supporting their placement anywhere within the eudicots.

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CLASSIFICATION OF FLOWERING PLANTS

- Amborellaceae
 Austrobaileyaceae
 Canellaceae
 Chloranthaceae
 Hydnoraceae
 Illiciaceae
 Nymphaeaceae
 [+ Cabombaceae]
 Rafflesiaceae
 Schisandraceae
 Trimeniaceae
 Winteraceae
- Ceratophyllales Bisch.
 Ceratophyllaceae
- Laurales Perleb
 Atherospermataceae
 Calycanthaceae
 Gomortegaceae
 Hernandiaceae
 Lauraceae
 Monimiaceae
 Siparunaceae
- Magnoliales Bromhead
 Annonaceae
 Degeneriaceae
 Eupomatiaceae
 Himantandraceae
 Magnoliaceae
 Myristicaceae
- Piperales Dumort.
 Aristolochiaceae
 Lactoridaceae
 Piperaceae
 Saururaceae
- MONOCOTS
- Corsiaceae
 Japonoliriaceae
 Nartheciaceae
 Petrosaviaceae
 Triuridaceae
- Acorales Reveal
 Acoraceae
- Alismatales Dumort.
 Alismataceae
 Aponogetonaceae
 Araceae
 Butomaceae
 Cymodoceaceae
 Hydrocharitaceae
 Juncaginaceae
- Limnocharitaceae
 Posidoniaceae
 Potamogetonaceae
 Ruppiaceae
 Scheuchzeriaceae
 Tofieldiaceae
 Zosteraceae
- Asparagales Bromhead
 Agapanthaceae
 Agavaceae
 Alliaceae
 Amaryllidaceae
 Anemarrhenaceae
 Anthericaceae
 Aphyllanthaceae
 Asparagaceae
 Asphodelaceae
 Asteliaceae
 Behniaceae
 Blandfordiaceae
 Boryaceae
 Convallariaceae
 Doryanthaceae
 Hemerocallidaceae
 Herreriaceae
 Hesperocallidaceae
 Hyacinthaceae
 Hypoxidaceae
 Iridaceae
 Ixioliriaceae
 Lanariaceae
 Laxmanniaceae
 Orchidaceae
 Tecophilaeaceae
 Themidaceae
 Xanthorrhoeaceae
 Xeronemataceae
- Dioscoreales Hook. f.
 Burmanniaceae
 Dioscoreaceae
 Taccaceae
 Thismiaceae
 Trichopodaceae
- Liliales Perleb
 Alstroemeriaceae
 Campynemataceae
 Colchicaceae
 Liliaceae
 Luzuriagaceae
 Melanthiaceae
 Philesiaceae
 Ripogonaceae
 Smilacaceae

CLASSIFICATION OF FLOWERING PLANTS
(cont'd.)

Pandanales Lindl.
Cyclanthaceae
Pandanaeae
Stemonaceae
Velloziaceae

COMMELINOIDS

Abolbodaceae
Bromeliaceae
Dasypogonaceae
Hanguanaceae
Mayaceae
Rapateaceae

Arecales Bromhead
Arecaceae

Commelinales Dumort.

Commelinaceae
Haemodoraceae
Philydraceae
Pontederiaceae

Poales Small

Anarthriaceae
Centrolepidaceae
Cyperaceae
Ecdeiocolaceae
Eriocaulaceae
Flagellariaceae
Hydatellaceae
Joinvilleaceae
Juncaceae
Poaceae
Prioniaceae
Restionaceae
Sparganiaceae
Thurniaceae
Typhaceae
Xyridaceae

Zingiberales Griseb.

Cannaceae
Costaceae
Heliconiaceae
Lowiaceae
Marantaceae
Musaceae
Strelitziaceae
Zingiberaceae

EUDICOTS

Buxaceae
Didymelaceae
Sabiaceae
Trochodendraceae
[+Tetracentraceae]

Proteales Dumort.
Nelumbonaceae
Platanaceae
Proteaceae

Ranunculales Dumort.

Berberidaceae
Circaeasteraceae
[+Kingdoniaceae]
Eupteleaceae
Lardizabalaceae
Menispermaceae
Papaveraceae
[+Fumariaceae]
[+Pteridophyllaceae]
Ranunculaceae

CORE EUDICOTS

Aextoxicaceae
Berberidopsidaceae
Dilleniaceae
Gunneraceae
Myrothamnaceae
Vitaceae

Caryophyllales Perleb

Achatocarpaceae
Aizoaceae
Amaranthaceae
Ancistrocladaceae
Asteropeiaceae
Basellaceae
Cactaceae
Caryophyllaceae
Didiereaceae
Dioncophyllaceae
Droseraceae
Drosophyllaceae
Frankeniaceae
Molluginaceae
Nepenthaceae
Nyctaginaceae
Physenaceae
Phytolaccaceae
Plumbaginaceae
Polygonaceae
Portulacaceae
Rhabdodendraceae
Sarcobataceae
Simmondsiaceae
Stegnospermataceae
Tamaricaceae

Santalales Dumort.

Olacaceae
Opiliaceae

CLASSIFICATION OF FLOWERING PLANTS
(cont'd.)

- Loranthaceae
 Misodendraceae
 Santalaceae
- Saxifragales Dumort.
 Altingiaceae
 Cercidiphyllaceae
 Crassulaceae
 Daphniphyllaceae
 Grossulariaceae
 Haloragaceae
 Hamamelidaceae
 Iteaceae
 Paeoniaceae
 Penthoraceae
 Pterostemonaceae
 Saxifragaceae
 Tetracarpaeaceae
- ROSIDS
- Aphloiaceae
 Crossosomataceae
 Ixerbaceae
 Krameriaceae
 Picramniaceae
 Podostemaceae
 Stachyuraceae
 Staphyleaceae
 Tristichaceae
 Zygophyllaceae
- Geraniales Dumort.
 Francoaceae
 Geraniaceae
 [+Hypseocharitaceae]
 Greyiaceae
 Ledocarpaceae
 Melianthaceae
 Vivianiaceae
- EUROSIDS I
- Celastraceae
 Huaceae
 Parnassiaceae
 [+Lepuropetalaceae]
 Stackhousiaceae
- Cucurbitales Dumort.
 Anisophylleaceae
 Begoniaceae
 Coriariaceae
 Corynocarpaceae
 Cucurbitaceae
 Datisceae
 Tetramelaceae
- Fabales Bromhead
 Fabaceae
 Polygalaceae
 Quillajaceae
 Surianaceae
- Fagales Engl.
 Betulaceae
 Casuarinaceae
 Fagaceae
 Juglandaceae
 Myricaceae
 Nothofagaceae
 Rhoipteleaceae
 Ticodendraceae
- Malpighiales Mart.
 Achariaceae
 Balanopaceae
 Caryocaraceae
 Chrysobalanaceae
 Clusiaceae
 Dichapetalaceae
 Erythroxylaceae
 Euphorbiaceae
 Euphroniaceae
 Flacourtiaceae
 Goupiaceae
 Hugoniaceae
 Humiriaceae
 Irvingiaceae
 Ixonanthaceae
 Lacistemataceae
 Linaceae
 Malesherbiaceae
 Malpighiaceae
 Medusagynaceae
 Ochnaceae
 Pandaceae
 Passifloraceae
 Putranjivaceae
 Quiinaceae
 Rhizophoraceae
 Salicaceae
 Scyphostegiaceae
 Trigonaceae
 Turneraceae
 Violaceae
- Oxalidales Heintze
 Cephalotaceae
 Connaraceae
 Cunoniaceae
 Elaeocarpaceae
 Oxalidaceae
 Tremandraceae

CLASSIFICATION OF FLOWERING PLANTS
(cont'd.)

Rosales Perleb
Barbeyaceae
Cannabaceae
Cecropiaceae
Celtidaceae
Dirachmaceae
Elaeagnaceae
Moraceae
Rhamnaceae
Rosaceae
Ulmaceae
Urticaceae

EUROSIDS II

Tapisciaceae

Brassicales Bromhead

Akaniaceae
[+Bretschneideraceae]
Bataceae
Brassicaceae
Caricaceae
Emblingiaceae
Gyrostemonaceae
Koeberliniaceae
Limnanthaceae
Moringaceae
Pentadiplandraceae
Resedaceae
Salvadoraceae
Setchellanthaceae
Tovariaceae
Tropaeolaceae

Malvales Dumort.

Bixaceae
[+Diegodendraceae]
Cistaceae
Cochlospermaceae
Dipterocarpaceae
Malvaceae
Muntingiaceae
Neuradaceae
Sarcolaenaceae
Sphaerosepalaceae
Thymelaeaceae

Myrtales Rchb.

Alzateaceae
Combretaceae
Crypteroniaceae
Heteropyxidaceae
Lythraceae
Melastomataceae
Memecylaceae
Myrtaceae
Oliniaceae

Onagraceae
Penaeaceae
Psiloxylaceae
Rhynchocalycaceae
Vochysiaceae

Sapindales Dumort.

Anacardiaceae
Biebersteiniaceae
Bursereaceae
Kirkiaceae
Meliaceae
Nitrariaceae
[+Peganaceae]
Rutaceae
Sapindaceae
Simaroubaceae

ASTERIDS

Cornales Dumort.
Cornaceae
[+Nyssaceae]
Grubbiaceae
Hydrangeaceae
Hydrostachyaceae
Loasaceae

Ericales Dumort.

Actinidiaceae
Balsaminaceae
Clethraceae
Cyrillaceae
Diapensiaceae
Ebenaceae
Ericaceae
Fouquieriaceae
Halesiaceae
Lecythidaceae
Marcgraviaceae
Myrsinaceae
Pellicieraceae
Polemoniaceae
Primulaceae
Roridulaceae
Sapotaceae
Sarraceniaceae
Styracaceae
Symplocaceae
Ternstroemiaceae
Tetrameristaceae
Theaceae
Theophrastaceae

EUASTERIDS I

Boraginaceae
Plocospermataceae
Vahliaceae

CLASSIFICATION OF FLOWERING PLANTS
(cont'd.)

- | | |
|----------------------|--------------------------------|
| Garryales Lindl. | Apiales Nakai |
| Aucubaceae | Apiaceae |
| Eucommiaceae | Araliaceae |
| Garryaceae | Aralidiaceae |
| Oncothecaceae | Griselinaceae |
| | Melanophyllaceae |
| Gentianales Lindl. | Pittosporaceae |
| Apocynaceae | Torricelliaceae |
| Gelsemiaceae | |
| Gentianaceae | Aquifoliales Senft |
| Loganiaceae | Aquifoliaceae |
| Rubiaceae | Helwingiaceae |
| | Phyllonomaceae |
| Lamiales Bromhead | |
| Acanthaceae | Asterales Lindl. |
| Avicenniaceae | Alseuosmiaceae |
| Bignoniaceae | Argophyllaceae |
| Buddlejaceae | Asteraceae |
| Byblidaceae | Calyceraceae |
| Cyclocheilaceae | Campanulaceae |
| Gesneriaceae | [+ Lobeliaceae] |
| Lamiaceae | Carpodetaceae |
| Lentibulariaceae | Donatiaceae |
| Myoporaceae | Goodeniaceae |
| Oleaceae | Menyanthaceae |
| Orobanchaceae | Pentaphragmataceae |
| Paulowniaceae | Phellinaceae |
| Pedaliaceae | Rousseaceae |
| [+ Martyniaceae] | Stylidiaceae |
| Phrymaceae | |
| Plantaginaceae | Dipsacales Dumort. |
| Schlegeliaceae | Caprifoliaceae |
| Scrophulariaceae | Diervillaceae |
| Stilbaceae | Dipsacaceae |
| Tetrachondraceae | Linnaeaceae |
| Verbenaceae | Morinaceae |
| | Valerianaceae |
| Solanales Dumort. | |
| Convolvulaceae | FAMILIES OF UNCERTAIN POSITION |
| Hydroleaceae | Balanophoraceae |
| Montiniaceae | Bonnetiaceae |
| Solanaceae | Cardiopteridaceae |
| Sphenocleaceae | Ctenolophonaceae |
| | Cynomoriaceae |
| EUASTERIDS II | Cytinaceae |
| Adoxaceae | Dipentodontaceae |
| Bruniaceae | Elatinaceae |
| Carlemanniaceae | Geissolomataceae |
| Columelliaceae | Hoplestigmataceae |
| [+ Desfontainiaceae] | Kaliphoraceae |
| Eremosynaceae | Lepidobotryaceae |
| Escalloniaceae | Lissocarpaceae |
| Icacinaceae | Lophopyxidaceae |
| Polyosmaceae | Medusandraceae |
| Sphenostemonaceae | Metteniusaceae |
| Tribelaceae | Mitrastemonaceae |
| | Paracryphiaceae |

CLASSIFICATION OF FLOWERING PLANTS
(cont'd.)

- | | |
|-------------------------------|-------------------------------------|
| Pentaphragaceae | Asarales Horan. |
| Peridiscaceae | = Piperales |
| Plagiopteraceae | Asclepiadales Dumort. |
| Pottingeriaceae | = Gentianales |
| Sladeniaceae | Asteliales Dumort. |
| Strasburgeriaceae | = Asparagales |
| Tepuianthaceae | Atriplicales Horan. |
| | = Caryophyllales |
| ORDINAL SYNONYMS | Aucubales Takht. |
| Acanthales Lindl. | = Garryales |
| = Lamiales | Austrobaileyales Takht. ex Reveal |
| Acerales Lindl. | - not accepted, family at beginning |
| = Sapindales | of system |
| Actinidiales Takht. ex Reveal | Avenales Bromhead |
| = Ericales | = Poales |
| Adoxales Nakai | Balanopales Engl. |
| - not accepted, family under | = Malpighiales |
| euasterids II | Balanophorales Dumort. |
| Aesculales Bromhead | - not accepted, family unplaced |
| = Sapindales | Balsaminales Lindl. |
| Agavales Hutch. | = Ericales |
| = Asparagales | Barbeyales Takht. & Reveal |
| Alliales Traub | = Rosales |
| = Asparagales | Batales Engl. |
| Alstroemeriales Hutch. | = Brassicales |
| = Liliales | Begoniales Dumort. |
| Altingiales Doweld | = Cucurbitales |
| = Saxifragales | Berberidales Dumort. |
| Amaranthales Dumort. | = Ranunculales |
| = Caryophyllales | Betulales Bromhead |
| Amaryllidales Bromhead | = Fagales |
| = Asparagales | Biebersteiniales Takht. |
| Ambrosiales Dumort. | = Sapindales |
| = Asterales | Bignoniales Lindl. |
| Ammiales Small | = Lamiales |
| = Apiales | Bixales Lindl. |
| Amomales Lindl. | = Malvales |
| = Zingiberales | Boraginales Dumort. |
| Ancistrocladales Takht. | - not accepted, family under |
| = Caryophyllales | euasterids I |
| Annonales Lindl. | Brexiales Lindl. |
| = Magnoliales | - not accepted, family under |
| Anthobolales Dumort. | eurosids I |
| = Santalales | Bromeliales Dumort. |
| Apocynales Bromhead | - not accepted, family under |
| = Gentianales | commelinoids |
| Aponogetonales Hutch. | Bruniales Dumort. |
| = Alismatales | - not accepted, family under |
| Arales Dumort. | euasterids II |
| = Alismatales | Brunoniales Lindl. |
| Araliales Reveal | = Asterales |
| = Apiales | Burmnniales Heintze |
| Aralidiales Takht. ex Reveal | = Dioscoreales |
| = Apiales | Burserales Baskerville |
| Aristolochiales Dumort. | = Sapindales |
| = Piperales | Butomales Hutch. |
| | = Alismatales |
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CLASSIFICATION OF FLOWERING PLANTS
(cont'd.)

- Buxales Takht. ex Reveal
 - not accepted, family under eudicots
 Byblidales Nakai ex Reveal
 = Lamiales
 Cactales Dumort.
 = Caryophyllales
 Callitrichales Dumort.
 = Lamiales
 Calycanthales Mart.
 = Laurales
 Calycerales Takht. ex Reveal
 = Asterales
 Campanulales Rechb.
 = Asterales
 Canellales Cronquist
 - not accepted, family at beginning of system
 Cannales Dumort.
 = Zingiberales
 Capparales Hutch.
 = Brassicales
 Caprifoliales Lindl.
 = Dipsacales
 Cardiopteridales Takht.
 - not accepted, family under euasterids II
 Carduales Small
 = Asterales
 Caricales L. D. Benson
 = Brassicales
 Cassiales Horan.
 = Fabales
 Casuarinales Lindl.
 = Fagales
 Celastrales Baskerville
 - not accepted, family under eurosids I
 Centrolepidales Takht.
 = Poales
 Cephalotales Nakai
 = Oxalidales
 Cercidiphyllales Hu ex Reveal
 = Saxifragales
 Chenopodiales Dumort.
 = Caryophyllales
 Chironiales Griseb.
 = Gentianales
 Chloranthales A. C. Sm. ex J. -F. Leroy
 - not accepted, family at beginning of system
 Cinchonales Lindl.
 = Gentianales
 Circaeasterales Takht.
 = Ranunculales
 Cistales Rechb.
 = Malvales
 Citrales Dumort.
 = Sapindales
 Cocosaes Nakai
 = Arecales
 Colchicales Dumort.
 = Liliales
 Combretales Baskerville
 = Myrtales
 Connarales Takht. ex Reveal
 = Cunoniales
 Convolvulales Dumort.
 = Solanales
 Coriariales Lindl.
 = Cucurbitales
 Corylales Dumort.
 = Fagales
 Corynocarpales Takht.
 = Cucurbitales
 Crassulales Lindl.
 = Saxifragales
 Crossosomatales Takht. ex Reveal
 - not accepted, family under rosids
 Cunoniales Hutch.
 = Oxalidales
 Cyclanthales J. H. Schaffn.
 = Pandanales
 Cymodoceales Nakai
 = Alismatales
 Cynomoriales Burnett
 - not accepted, family unplaced
 Cyperales Hutch.
 = Poales
 Cytinales Dumort.
 - not accepted, family unplaced
 Daphnales Lindl.
 = Malvales
 Daphniphyllales Pulle ex Cronquist
 = Saxifragales
 Datiscales Dumort.
 = Cucurbitales
 Desfontainiales Takht.
 - not accepted, family under euasterids II
 Diapensiales Engl. & Gilg
 = Ericales
 Didymelales Takht.
 - not accepted, family under eudicots
 Dilleniales Hutch.
 - not accepted, family under core eudicots
 Dioncophyllales Takht. ex Reveal
 = Caryophyllales
 Diospyrales Prantl
 = Ericales
 Droserales Griseb.
 = Caryophyllales

CLASSIFICATION OF FLOWERING PLANTS
(cont'd.)

- Ebenales Engl.
 - = Ericales
- Elaeagnales Bromhead
 - = Rosales
- Elaeocarpaceae Takht.
 - = Oxalidales
- Elatiniales Nakai
 - not accepted, family unplaced
- Elodeales Nakai
 - = Alismatales
- Empetrales Raf.
 - = Ericales
- Eriocaulales Nakai
 - = Poales
- Eucommiales Nemejc ex Cronquist
 - = Garryales
- Euphorbiales Lindl.
 - = Malpighiales
- Eupomatiales Takht. ex Reveal
 - = Magnoliales
- Eupteleales Hu ex Reveal
 - = Ranunculales
- Euryalales H.L.Li
 - not accepted, family at beginning of system
- Ficales Dumort.
 - = Rosales
- Flacourtiiales Heintze
 - = Malpighiales
- Fouquieriales Takht. ex Reveal
 - = Ericales
- Francoales Takht.
 - = Geraniales
- Frangulales Wirtg.
 - = Rosales
- Galiales Bromhead
 - = Gentianales
- Geissolomatales Takht. ex Reveal
 - not accepted, family unplaced
- Gesneriales Dumort.
 - = Lamiales
- Glaucidiales Takht. ex Reveal
 - = Ranunculales
- Globulariales Dumort.
 - = Lamiales
- Goodeniales Lindl.
 - = Asterales
- Greyiales Takht.
 - = Geraniales
- Grossulariales Lindl.
 - = Saxifragales
- Gunnerales Takht. ex Reveal
 - not accepted, family under core eudicots
- Gyrocarpales Dumort.
 - = Laurales
- Gyrostemonales Takht.
 - = Brassicales
- Haemodorales Hutch.
 - = Commelinales
- Haloragales Bromhead
 - = Saxifragales
- Hamamelidales Griseb.
 - = Saxifragales
- Hanguanales R. Dahlgren ex Reveal
 - = not accepted, family under commelinoids
- Helleborales Nakai
 - = Ranunculales
- Helwingiales Takht.
 - = Aquifoliales
- Himantandrales Doweld & Shevryyova
 - = Magnoliales
- Hippuridiales Pulle ex Reveal
 - = Lamiales
- Homaliales Bromhead
 - = Malpighiales
- Hortensiales Griseb.
 - = Cornales
- Hydatellales Cronquist
 - = Poales
- Hydnorales Takht. ex Reveal
 - not accepted, family at beginning of system
- Hydrangeales Nakai
 - = Cornales
- Hydrastidiales Takht.
 - = Ranunculales
- Hydropeltidiales (Bartl.) Spenn.
 - not accepted, family Nymphaeaceae at beginning of system
- Hydrostachyales Diels ex Reveal
 - = Cornales
- Hypericales Dumort.
 - = Malpighiales
- Hypoxidiales Takht.
 - = Asparagales
- Icacinales Tiegh. ex Reveal
 - not accepted, family under euasterids II
- Illiciales Hu ex Cronquist
 - not accepted, family at beginning of system
- Iridales Raf.
 - = Asparagales
- Ixiales Lindl.
 - = Asparagales
- Jasminales Dumort.
 - = Lamiales
- Juglandales Dumort.
 - = Fagales

CLASSIFICATION OF FLOWERING PLANTS
(cont'd.)

- Julianiales Engl.
 = Sapindales
 Juncaginales Hutch.
 = Alismatales
 Juncales Dumort.
 = Poales
 Lacistematales Baskerville
 = Malpighiales
 Lactoridales Takht. ex Reveal
 = Piperales
 Lardizabalales Loconte
 = Ranunculales
 Lecythidales Cronquist
 = Ericales
 Leitneriales Engl.
 = Sapindales
 Lentibulariales Lindl.
 = Lamiales
 Ligustrales Bartl. ex Bisch.
 = Lamiales
 Limnanthales Nakai
 = Brassicales
 Linales Baskerville
 = Malpighiales
 Loasales Bessey
 = Cornales
 Loganiales Lindl.
 = Gentianales
 Lonicerales T. Liebe
 = Dipsacales
 Loranthales Dumort.
 = Santalales
 Lythrales Caruel
 = Myrtales
 Marathrales Dumort.
 - not accepted, family
 Podostemaceae under rosids
 Mayacales Nakai
 - not accepted, family under
 commelinoids
 Medusagynales Takht.
 = Malpighiales
 Medusandrales Brenan
 - not accepted, family unplaced
 Melanthiales R. Dahlgren ex Reveal
 = Liliales
 Melastomatales Oliv.
 = Myrtales
 Meliales Lindl.
 = Sapindales
 Menispermatales Bromhead
 = Ranunculales
 Menyanthales T. Yamaz. ex Takht.
 = Asterales
 Metteniusales Takht.
 - not accepted, family unplaced
 Mitrastemonales Makino
 - not accepted, family unplaced
 Monimiales Dumort.
 = Laurales
 Moringales Nakai
 = Brassicales
 Myricales Engl.
 = Fagales
 Myristicales Thomé
 = Magnoliales
 Myrothamnales Nakai ex Reveal
 - not accepted, family under core
 eudicots
 Myrsinales Spenn.
 = Ericales
 Najadales Dumort.
 = Alismatales
 Narcissales Dumort.
 = Asparagales
 Nartheciales Reveal & Zomlefer
 - not accepted, family under
 monocots
 Nelumbonales Reveal
 = Proteales
 Nepenthales Dumort.
 = Caryophyllales
 Nolanales Lindl.
 = Solanales
 Nyctaginales Dumort.
 = Caryophyllales
 Nymphaeales Dumort.
 = not accepted, family at beginning
 of system
 Ochnales Hutch. ex Reveal
 = Malpighiales
 Oenotherales Bromhead
 = Myrtales
 Olacales Benth.
 = Santalales
 Oleales Lindl.
 = Lamiales
 Onagrales Rchb.
 = Myrtales
 Opuntiales Willk.
 = Caryophyllales
 Orchidales Raf.
 = Asparagales
 Paeoniales Heintze
 = Saxifragales
 Pandales Engl. & Gilg
 = Malpighiales
 Papaverales Dumort.
 = Ranunculales
 Paracryphiales Takht.
 - not accepted, family unplaced
 Paridales Dumort.
 = Liliales

CLASSIFICATION OF FLOWERING PLANTS
(cont'd.)

- Parnassiales Nakai
- not accepted, family under
 eurosids I
Passiflorales Dumort.
 = Malpighiales
Penaeales Lindl.
 = Myrtales
Petiveriales Lindl.
 = Caryophyllales
Petrosaviales Takht.
- not accepted, family under
 monocots
Phylodrales Dumort.
 = Commelinales
Physenales Takht.
 = Caryophyllales
Pinguiculales Dumort.
 = Lamiales
Pittosporales Lindl.
 = Apiales
Plantaginales Lindl.
 = Lamiales
Platanales J. H. Schaffn.
 = Proteales
Plumbaginales Lindl.
 = Caryophyllales
Podophyllales Dumort.
 = Ranunculales
Podostemales Lindl.
 = not accepted, family under rosids
Polemoniales Bromhead
 = Ericales
Polygalales Dumort.
 = Fabales
Polygonales Dumort.
 = Caryophyllales
Pontederiales Hook. f.
 = Commelinales
Portulacales Dumort.
 = Caryophyllales
Posidoniales Nakai
 = Alismatales
Potamogetonales Dumort.
 = Alismatales
Primulales Dumort.
 = Ericales
Quercuales Burnett
 = Fagales
Rafflesiales Oliv.
- not accepted, family at beginning
 of system
Resedales Dumort.
 = Brassicales
Restionales J. H. Schaffn.
 = Poales
Rhamnales Dumort.
 = Rosales
Rhinanthales Dumort.
 = Lamiales
Rhizophorales Tiegh. ex Reveal
 = Malpighiales
Rhodorales Horan.
 = Ericales
Rhoipteleales Novák ex Reveal
 = Fagales
Roridulales Nakai
 = Ericales
Rubiales Dumort.
 = Gentianales
Ruppiales Nakai
 = Alismatales
Rutales Perleb
 = Sapindales
Sabiales Takht.
 = not accepted, family under
 eudicots
Salicales Lindl.
 = Malpighiales
Salvadorales R. Dahlgren ex Reveal
 = Brassicales
Samolales Dumort.
 = Ericales
Samydales Dumort.
 = Malpighiales
Sanguisorbales Dumort.
 = Rosales
Sapotales Hook. f.
 = Ericales
Sarraceniales Bromhead
 = Ericales
Scheuchzeriales B. Boivin
 = Alismatales
Scleranthales Dumort.
 = Caryophyllales
Scrophulariales Lindl.
 = Lamiales
Scyphostegiales Croizat
 = Malpighiales
Sedales Rchb.
 = Saxifragales
Silenales Lindl.
 = Caryophyllales
Simmondsiales Reveal
 = Caryophyllales
Smilacales Lindl.
 = Liliales
Stellariales Dumort.
 = Caryophyllales
Stylidiales Takht. ex Reveal
 = Asterales
Styracales Bisch.
 = Ericales
Taccales Dumort.
 = Dioscoreales

CLASSIFICATION OF FLOWERING PLANTS

(cont'd.)

Tamales Dumort.
 = Dioscoreales
 Tamaricales Hutch.
 = Caryophyllales
 Tecophilaeales Traub ex Reveal
 = Asparagales
 Theales Lindl.
 = Ericales
 Theligonales Nakai
 = Gentianales
 Thymelaeales Willk.
 = Malvales
 Tiliales Caruel
 = Malvales
 Tofieldiales Reveal & Zomlefer
 = Alismatales
 Torricelliales Takht. ex Reveal
 = Apiales
 Tovariales Nakai
 = Brassicales
 Trilliales Takht.
 = Liliales
 Triuridales Hook. f.
 - not accepted, family under monocots
 Trochodendrales Takht. ex Cronquist
 - not accepted, family under
 eudicots
 Tropaeolales Takht. ex Reveal
 = Brassicales
 Turnerales Dumort.
 = Malpighiales
 Typhales Dumort.
 = Poales
 Ulmales Lindl.
 = Rosales
 Urticales Dumort.
 = Rosales
 Vacciniales Dumort.
 = Ericales
 Vallisneriales Nakai
 = Alismatales
 Velloziales R. Dahlgren ex Reveal
 = Pandanales
 Veratrales Dumort.
 = Liliales
 Verbenales Horan.
 = Lamiales
 Viburnales Dumort.
 - not accepted, family under
 euasterids II
 Vinciales Horan.
 = Gentianales
 Violaes Perleb
 = Malpighiales
 Vitales Reveal
 - not accepted, family under core
 eudicots

Vochysiales Dumort.
 = Myrtales
 Winterales A. C. Sm. ex Reveal
 - not accepted, family at beginning
 of system
 Xyridales Lindl.
 = Poales
 Zosterales Nakai
 = Alismatales
 Zygomphyllales Takht.
 - not accepted, family under rosids

SELECTED FAMILIAL SYNONYMS

Abrophyllaceae
 = Carpodetaceae
 Acanthochlamydeaceae
 = Velloziaceae
 Aceraceae
 = Sapindaceae
 Achradaceae
 = Sapotaceae
 Aegicerataceae
 = Myrsinaceae
 Agdestidaceae
 = Phytolaccaceae
 Aitoniaceae
 = Meliaceae
 Alangiaceae
 = Cornaceae
 Aloaceae
 = Asphodelaceae
 Alsinaceae
 = Caryophyllaceae
 Ambrosiaceae
 = Asteraceae
 Amygdalaceae
 = Rosaceae
 Androstachyaceae
 = Euphorbiaceae
 Antoniaceae
 = Loganiaceae
 Apodanthaceae
 = Rafflesiaceae
 Apostasiaceae
 = Orchidaceae
 Aptandraceae
 = Olacaceae
 Aristoteliaceae
 = Elaeocarpaceae
 Asclepiadaceae
 = Apocynaceae
 Asteranthaceae
 = Lecythidaceae
 Avertrhoaceae
 = Oxalidaceae
 Avetraceae
 = Dioscoreaceae

CLASSIFICATION OF FLOWERING PLANTS
(cont'd.)

- Balanitaceae
 - = Zygophyllaceae
- Barbeuiaceae
 - = Phytolaccaceae
- Barclayaceae
 - = Nymphaeaceae
- Barringtoniaceae
 - = Lecythidaceae
- Baueraceae
 - = Cunoniaceae
- Baxteriaceae
 - = Dasypogonaceae
- Bembiciaceae
 - = Flacourtiaceae
- Berzeliaceae
 - = Bruniaceae
- Bischofiaceae
 - = Euphorbiaceae
- Blepharocaryaceae
 - = Anacardiaceae
- Boerlagellaceae
 - = Sapotaceae
- Bombacaceae
 - = Malvaceae
- Boopidaceae
 - = Calyceraceae
- Bretschneideraceae
 - = Akaniaceae
- Brexiaceae
 - = Celastraceae
- Brunelliaceae
 - = Cunoniaceae
- Brunoniaceae
 - = Goodeniaceae
- Bumeliaceae
 - = Sapotaceae
- Burchardiaceae
 - = Colchicaceae
- Byttneriaceae
 - = Malvaceae
- Cabombaceae
 - = Nymphaeaceae
- Caesalpiniaceae
 - = Fabaceae
- Calectasiaceae
 - = Dasypogonaceae
- Callitrichaceae
 - = Plantaginaceae
- Calochortaceae
 - = Liliaceae
- Camelliaceae
 - = Theaceae
- Canotiaceae
 - = Celastraceae
- Cansjeraceae
 - = Opiliaceae
- Capparaceae
 - = Brassicaceae
- Carduaceae
 - = Asteraceae
- Cassythaceae
 - = Lauraceae
- Chailletiaceae
 - = Dichapetalaceae
- Chenopodiaceae
 - = Amaranthaceae
- Chionographidaceae
 - = Melanthiaceae
- Chloanthaceae
 - = Lamiaceae
- Cichoriaceae
 - = Asteraceae
- Cleomaceae
 - = Brassicaceae
- Cneoraceae
 - = Rutaceae
- Cobaeaceae
 - = Polemoniaceae
- Compositae
 - = Asteraceae
- Conostylidaceae
 - = Haemodoraceae
- Cordiaceae
 - = Boraginaceae
- Coridaceae
 - = Primulaceae
- Corokiaceae
 - = Argophyllaceae
- Corylaceae
 - = Betulaceae
- Croomiaceae
 - = Stemonaceae
- Cruciferae
 - = Brassicaceae
- Curtisiaceae
 - = Cornaceae
- Cuscutaceae
 - = Convolvulaceae
- Cyananthaceae
 - = Campanulaceae
- Cyanastraceae
 - = Tecophilaeaceae
- Cynocrambaceae nom. illeg.
 - = Rubiaceae
- Cyphiaceae
 - = Campanulaceae
- Cyphocarpaceae
 - = Campanulaceae
- Cypripediaceae
 - = Orchidaceae
- Dactylanthaceae
 - = Balanophoraceae

CLASSIFICATION OF FLOWERING PLANTS
(cont'd.)

- Davidiaceae
 = Cornaceae
 Davidsoniaceae
 = Cunoniaceae
 Decaisneaceae
 = Lardizabalaceae
 Desfontainiaceae
 = Columelliaceae
 Dialypetalanthaceae
 = Rubiaceae
 Dianellaceae
 = Hemerocallidaceae
 Dichondraceae
 = Convolvulaceae
 Diclidantheraceae
 = Polygalaceae
 Diegodendraceae
 = Bixaceae
 Dionaeaceae
 = Droseraceae
 Dracaenaceae
 = Convallariaceae
 Duabangaceae
 = Lythraceae
 Duceodendraceae
 = Solanaceae
 Dulongiaceae nom. illeg.
 = Phyllonomaceae
 Dysphaniaceae
 = Amaranthaceae
 Ehretiaceae
 = Boraginaceae
 Ellisiophyllaceae
 = Scrophulariaceae
 Empetraceae
 = Ericaceae
 Epacridaceae
 = Ericaceae
 Eremolepidaceae
 = Santalaceae
 Eriospemaceae
 = Convallariaceae
 Erycibaceae
 = Convolvulaceae
 Erythropalaceae
 = Olacaceae
 Eucryphiaceae
 = Cunoniaceae
 Euryalaceae
 = Nymphaeaceae
 Exocarpaceae
 = Santalaceae
 Flindersiaceae
 = Rutaceae
 Foetidiaceae
 = Lecythidaceae
 Frangulaceae
 = Rhamnaceae
 Fumariaceae
 = Papaveraceae
 Funkiaceae
 = Agavaceae
 Galacaceae
 = Diapensiaceae
 Geitonoplesiaceae
 = Hemerocallidaceae
 Geniostomaceae
 = Loganiaceae
 Geosiridaceae
 = Iridaceae
 Gisekiaceae
 = Phytolaccaceae
 Glaucidiaceae
 = Ranunculaceae
 Globulariaceae
 = Plantaginaceae
 Goetzeaceae
 = Solanaceae
 Gonystylaceae
 = Thymelaeaceae
 Gouaniaceae
 = Rhamnaceae
 Gramineae
 = Poaceae
 Gronoviaceae
 = Loasaceae
 Gustaviaceae
 = Lecythidaceae
 Guttiferae
 = Clusiaceae
 Gyrocarpaceae
 = Hernandiaceae
 Halophilaceae
 = Hydrocharitaceae
 Halophytaceae
 = Amaranthaceae
 Hectorellaceae
 = Portulacaceae
 Heliotropiaceae
 = Boraginaceae
 Heloniadaceae
 = Melanthiaceae
 Helosidaceae
 = Balanophoraceae
 Henriqueziaceae
 = Rubiaceae
 Hippocastanaceae
 = Sapindaceae
 Hippocrateaceae
 = Celastraceae
 Hippuridaceae
 = Plantaginaceae

CLASSIFICATION OF FLOWERING PLANTS
(cont'd.)

- Hortoniaceae
 - = Monimiaceae
 - Hostaceae
 - = Agavaceae
 - Humbertiaceae
 - = Convolvulaceae
 - Hydrastidaceae
 - = Ranunculaceae
 - Hydrocotylaceae
 - = Araliaceae
 - Hydropeltidaceae
 - = Nymphaeaceae
 - Hydrophyllaceae
 - = Boraginaceae
 - Hymenocardiaceae
 - = Euphorbiaceae
 - Hypecoaceae
 - = Papaveraceae
 - Hypericaceae
 - = Clusiaceae
 - Hypseocharitaceae
 - = Geraniaceae
 - Idiospermaceae
 - = Calycanthaceae
 - Illecebraceae
 - = Caryophyllaceae
 - Jasionaceae
 - = Campanulaceae
 - Jasminiaceae
 - = Oleaceae
 - Johnsoniaceae
 - = Hemerocallidaceae
 - Julianiaceae
 - = Anacardiaceae
 - Kiggelariaceae
 - = Flacourtiaceae
 - Kingdoniaceae
 - = Circaeasteraceae
 - Kirengeshomaceae
 - = Hydrangeaceae
 - Labiatae
 - = Lamiaceae
 - Langsdorffiaceae
 - = Balanophoraceae
 - Leeaceae
 - = Vitaceae
 - Leguminosae
 - = Fabaceae
 - Leitneriaceae
 - = Simaroubaceae
 - Lemnaceae
 - = Araceae
 - Lennoaceae
 - = Boraginaceae
 - Leoniaceae
 - = Violaceae
 - Lepuropetalaceae
 - = Parnassiaceae
 - Lilaeaceae
 - = Juncaginaceae
 - Limoniaceae
 - = Plumbaginaceae
 - Liriodendraceae
 - = Magnoliaceae
 - Lobeliaceae
 - = Campanulaceae
 - Lomandraceae
 - = Laxmanniaceae
 - Lophiraceae
 - = Ochnaceae
 - Lophophytaceae
 - = Balanophoraceae
 - Luxemburgiaceae
 - = Ochnaceae
 - Malaceae
 - = Rosaceae
 - Martyniaceae
 - = Pedaliaceae
 - Mastixiaceae
 - = Cornaceae
 - Medeolaceae
 - = Liliaceae
 - Meliosmaceae
 - = Sabiaceae
 - Mendonciaceae
 - = Acanthaceae
 - Mesembryanthemaceae
 - = Aizoaceae
 - Mimosaceae
 - = Fabaceae
 - Monotaceae
 - = Dipterocarpaceae
 - Monotropaceae
 - = Ericaceae
 - Mouririaceae
 - = Memecylaceae
 - Moutabeaceae
 - = Polygalaceae
 - Myriophyllaceae
 - = Haloragaceae
 - Mystropetalaceae
 - = Balanophoraceae
 - Najadaceae
 - = Hydrocharitaceae
 - Nandinaceae
 - = Berberidaceae
 - Napoleonaceae
 - = Lecythidaceae
 - Naucleaceae
 - = Rubiaceae
 - Nectaropetalaceae
 - = Erythroxylaceae
-

CLASSIFICATION OF FLOWERING PLANTS
(cont'd.)

- Nelsoniaceae
 = Acanthaceae
 Nemacladaceae
 = Campanulaceae
 Nesogenaceae
 = Cyclocheilaceae
 Nolanaceae
 = Solanaceae
 Nolinaceae
 = Convallariaceae
 Nupharaceae
 = Nymphaeaceae
 Nyctanthaceae
 = Oleaceae
 Nyssaceae
 = Cornaceae
 Octoknemaceae
 = Olacaceae
 Oftiaceae
 = Scrophulariaceae
 Ophiopogonaceae
 = Convallariaceae
 Osyridaceae
 = Santalaceae
 Pachysandraceae
 = Buxaceae
 Palmae
 = Arecaceae
 Papilionaceae
 = Fabaceae
 Peganaceae
 = Nitrariaceae
 Pentastemonaceae
 = Stemonaceae
 Peperomiaceae
 = Piperaceae
 Periplocaceae
 = Apocynaceae
 Peripterygiaceae
 = Cardiopteridaceae
 Petermanniaceae
 = Colchicaceae
 Petiveriaceae
 = Phytolaccaceae
 Philadelphaceae
 = Hydrangeaceae
 Phormiaceae
 = Hemerocallidaceae
 Phyllicaceae
 = Rhamnaceae
 Picrodendraceae
 = Euphorbiaceae
 Pinguiculaceae
 = Lentibulariaceae
 Pistaciaceae
 = Anacardiaceae
 Pistiaceae
 = Araceae
 Platystemonaceae
 = Papaveraceae
 Plumeriaceae
 = Apocynaceae
 Podoaceae
 = Anacardiaceae
 Podophyllaceae
 = Berberidaceae
 Polygonanthaceae
 = Anisophylleaceae
 Potaliaceae
 = Gentianaceae
 Ptaeroxylaceae
 = Rutaceae
 Pteridophyllaceae
 = Papaveraceae
 Punicaceae
 = Lythraceae
 Pyrolaceae
 = Ericaceae
 Ranzaniaceae
 = Berberidaceae
 Reaumuriaceae
 = Tamaricaceae
 Retziaceae
 = Stilbaceae
 Rhinanthaceae
 = Orobanchaceae
 Rhodoleiaceae
 = Hamamelidaceae
 Rhopalocarpaceae
 = Sphaerosepalaceae
 Rhynchothecaceae
 = Ledocarpaceae
 Roxburghiaceae
 = Stemonaceae
 Ruscaceae
 = Convallariaceae
 Saccifoliaceae
 = Gentianaceae
 Salaciaceae
 = Celastraceae
 Salicorniaceae
 = Amaranthaceae
 Salpiglossidaceae
 = Solanaceae
 Sambucaceae
 = Adoxaceae
 Samolaceae
 = Primulaceae
 Saniculaceae
 = Apiaceae
 Sarcophytaceae
 = Balanophoraceae

CLASSIFICATION OF FLOWERING PLANTS
(cont'd.)

- Sarcospermataceae
 - = Sapotaceae
 - Sargentodoxaceae
 - = Lardizabalaceae
 - Saurauiaceae
 - = Actinidiaceae
 - Sauvagesiaceae
 - = Ochnaceae
 - Scaevolaceae
 - = Goodeniaceae
 - Scepaceae
 - = Euphorbiaceae
 - Schoepfiaceae
 - = Olacaceae
 - Sclerophylacaceae
 - = Solanaceae
 - Scoliopaceae
 - = Liliaceae
 - Scybaliaceae
 - = Balanophoraceae
 - Scytopetalaceae
 - = Lecythidaceae
 - Selaginaceae
 - = Scrophulariaceae
 - Sesamaceae
 - = Pedaliaceae
 - Sesuviaceae
 - = Aizoaceae
 - Simethidaceae
 - = Hemerocallidaceae
 - Siphonodontaceae
 - = Celastraceae
 - Sonneratiaceae
 - = Lythraceae
 - Spigeliaceae
 - = Loganiaceae
 - Stenomeridaceae
 - = Dioscoreaceae
 - Sterculiaceae
 - = Malvaceae
 - Stilaginaceae
 - = Euphorbiaceae
 - Strychnaceae
 - = Loganiaceae
 - Stylobasiaceae
 - = Surianaceae
 - Stylocerataceae
 - = Buxaceae
 - Symphoremataceae
 - = Lamiaceae
 - Syringaceae
 - = Oleaceae
 - Tetracentraceae
 - = Trochodendraceae
 - Tetradiclidaceae
 - = Peganaceae
 - Tetragoniaceae
 - = Aizoaceae
 - Tetrastylidiaceae
 - = Olacaceae
 - Thalassiaceae
 - = Hydrocharitaceae
 - Theligonaceae
 - = Rubiaceae
 - Thunbergiaceae
 - = Acanthaceae
 - Tiliaceae
 - = Malvaceae
 - Trapaceae
 - = Lythraceae
 - Trapellaceae
 - = Pedaliaceae
 - Tribulaceae
 - = Zygophyllaceae
 - Tricyrtidaceae
 - = Liliaceae
 - Trilliaceae
 - = Melanthiaceae
 - Triplostegiaceae
 - = Valerianaceae
 - Uapacaceae
 - = Euphorbiaceae
 - Ullucaceae
 - = Basellaceae
 - Umbelliferae
 - = Apiaceae
 - Utriculariaceae
 - = Lentibulariaceae
 - Uvulariaceae
 - = Colchicaceae
 - Vacciniaceae
 - = Ericaceae
 - Viburnaceae
 - = Adoxaceae
 - Viscaceae
 - = Santalaceae
 - Vitaceae
 - = Lamiaceae
 - Walleriaceae
 - = Tecophilaeaceae
 - Wellstediaceae
 - = Boraginaceae
 - Xanthophyllaceae
 - = Polygalaceae
 - Xerophyllaceae
 - = Melanthiaceae
 - Zannichelliaceae
 - = Potamogetonaceae
-