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## Synopsis of a Putatively Phylogenetic Classification of the Flowering Plants

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## SYNOPSIS OF A PUTATIVELY PHYLOGENETIC CLASSIFICATION OF THE FLOWERING PLANTS

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### INTRODUCTION

The classification of the class Angiospermae presented here is the culmination of more than 15 years effort to express as accurately as present knowledge permits the phylogenetic relationships among the higher taxa of flowering plants. In the course of 30 years of floristic and other phytogeographic studies, considerable botanical collecting and observation on all the continents, and visits to many of the world's major botanical gardens, I have had the good fortune to collect or observe in living condition representatives of all but 44 of the 312 families accepted here. I have studied preserved or dried herbarium materials of representatives of the 44 missed families, mostly monogeneric taxa of Africa and South America. In more than 10 years of library research I have gleaned from numerous publications data relevant to a better understanding of the relationships, origins, and classification of the angiosperms. Particularly helpful have been reports of original research on vegetative anatomy, floral morphology, palynology, embryology, phytochemistry, cytology, phytogeography, and paleobotany. Many of these publications are too recent to have been available to the earlier phylogenists.

Feeling strongly that new systems of classification should be published only with accompanying thorough documentation and explanation, I have resisted until now the many requests to publish my system. I am completing a book in which the system will be discussed at considerable length and will be thoroughly documented with the listing of extensive bibliography, keyed by author's name and date of publication cited after each involved order and family. However, it will probably be a year or two before the book is in print, and the pressure of requests for the system from authors of floras, teachers of plant taxonomy, students of various botanical disciplines, and members of the Editorial Committee of the *Flora North America Project* makes immediate publication of even this naked synopsis seem desirable.

Although this system of classification has not had wide exposure in the taxonomic community, it and earlier versions of it have been studied by a good many taxonomy students at the Universities of Iowa, Hawaii, and California at Riverside, the Claremont Graduate School, and perhaps other institutions. I have sent it to or discussed it at length with many botanical colleagues in this country

and abroad. An earlier version was used experimentally in my annotated check list of the vascular plants of Johnson County, Iowa (1955), though I now much prefer an alphabetical arrangement, at least within classes or subclasses, for florulas. At the Tenth International Botanical Congress at Edinburgh (1964) I presented my realignment of the "ranalian" families in the Annonales, Berberidales, Nymphaeales, and Hamamelidales. More recently (1966) I used my classification in the rather esoteric journal *Bio-Philately* to list the families and subfamilies of flowering plants represented on postage stamps of the world. At that time, incidentally, there were 225 families and subfamilies (or composite tribes) of 144 different angiosperm families so represented. I have also published (1958, 1963), with some discussion and examples, the guiding principles that I have followed in developing this classification.

#### ACKNOWLEDGMENTS

In the construction of this classification I am indebted deeply to all the phylogenists and numerous other botanists who have published before me on the various taxa of Angiospermae. I am particularly indebted to such morphologists as Carl Wilson, A. J. Eames, C. R. Metcalfe, and my esteemed Claremont colleague Sherwin Carlquist for their invaluable suggestions and their encouragement of my phylogenetic efforts. I am also most grateful to the United States Educational Foundation and the National Science Foundation for making possible extensive field research in Australasia and Malesia and study of critical groups and literature at the Royal Botanic Gardens, Kew, and the British Museum (Natural History), London, through their generous awards in 1959 and 1960 of Fulbright Research Scholarships to the University of Queensland, a Senior Postdoctoral Fellowship, and N. S. F. Grant No. 6484. Without these two years of botanical travel and study I would not feel competent to present this system of classification.

#### EXPLANATION OF THE SYNOPSIS

I have carried the synopsis down to the subfamily category, and in the Asteraceae down to the tribe since in that huge family it is quite possible that the tribes will ultimately be treated as subfamilies. In this age of taxonomic inflation, my treatment of orders, families, and perhaps other taxa will probably seem rather inclusive and conservative. I think, however, that phylogeny is better served and teaching of taxonomy made easier by avoiding unnecessary fragmentation. I have tried to be as consistent as possible throughout the system in the size of the discontinuities that I accept to separate related groupings of each major category. This has led to the demotion of some familiar families, such as the Amaryllidaceae, Apiaceae, Asclepiadaceae, etc. No new family names have needed proposal here. The names chosen for the various taxa are according to the *International Code of Botanical Nomenclature* (1966), although I have extended the principle of priority up to the class. My point of departure for ordinal names is Lindley's *Nixus Plantarum* (1833). I have avoided use of synonyms except where the names or my circumscriptions of families or subfamilies deviate considerably from those in A. Engler's *Syllabus der Pflanzenfamilien*, Ed. 12, Vol. 2, edited by Melchior (1964).

## SYNOPSIS OF A CLASSIFICATION OF THE CLASS ANGIOSPERMAE

*Subclass: DICOTYLEDONEAE*

- Superorder: Annoniflorae  
 Order: Annonales  
 Suborder: Winterineae  
 Family: Winteraceae  
 Suborder: Illicineae  
 Family: Illiciaceae  
 Family: Schisandraceae  
 Suborder: Magnoliineae  
 Family: Magnoliaceae  
 Subfamily: Magnolioideae  
 Subfamily: Liriodendroideae  
 Family: Degeneriaceae  
 Family: Eupomatiaceae  
 Family: Himantandraceae  
 Suborder: Annonineae  
 Family: Annonaceae  
 Subfamily: Annonoideae  
 Subfamily: Monodoroideae  
 Family: Myristicaceae  
 Family: Canellaceae  
 Suborder: Aristolochineae  
 Family: Aristolochiaceae  
 Suborder: Laurineae  
 Family: Austrobaileyaceae  
 Family: Chloranthaceae  
 Family: Amborellaceae  
 Family: Trimeniaceae  
 Family: Monimiaceae  
 Subfamily: Hortonioideae  
 Subfamily: Atherospermatoideae  
 Subfamily: Monimioideae  
 Subfamily: Siparunoideae  
 Family: Calycanthaceae  
 Family: Lactoridaceae  
 Family: Gomortegaceae  
 Family: Lauraceae  
 Subfamily: Lauroideae  
 Subfamily: Cassythoideae  
 Family: Hernandiaceae  
 Family: Gyrocarpaceae  
 Suborder: Piperineae  
 Family: Piperaceae  
 Family: Saururaceae  
 Order: Berberidales  
 Suborder: Berberidineae  
 Family: Lardizabalaceae  
 Family: Sargentodoxaceae  
 Family: Menispermaceae  
 Family: Ranunculaceae  
 Subfamily: Hydrastoideae  
 Subfamily: Helleboroideae  
 Subfamily: Ranunculoideae  
 Subfamily: Kingdonioideae  
 Family: Berberidaceae  
 Subfamily: Berberidoideae  
 Subfamily: Nandinoideae  
 Subfamily: Epimedioideae  
 Subfamily: Podophylloideae  
 Suborder: Papaverineae  
 Family: Papaveraceae  
 Subfamily: Platystemonoideae  
 Subfamily: Chelidonioideae  
 Subfamily: Eschscholzioideae  
 Subfamily: Papaveroideae  
 Subfamily: Pteridophylloideae  
 Subfamily: Hypocidoideae  
 Subfamily: Fumarioideae  
 Superorder: Nymphaeiflorae  
 Order: Nymphaeales  
 Family: Nymphaeaceae  
 Subfamily: Nymphaeoidae  
 Subfamily: Nelumboideae  
 Subfamily: Cabomboideae  
 Family: Ceratophyllaceae  
 Superorder: Sarraceniiflorae  
 Order: Sarraceniales  
 Family: Sarraceniaceae  
 Superorder: Theiflorae  
 Order: Theales  
 Suborder: Dilleniineae  
 Family: Dilleniaceae  
 Subfamily: Tetraceroidae  
 Subfamily: Dillenioideae  
 Family: Paeoniaceae  
 Suborder: Theineae  
 Family: Actinidiaceae  
 Subfamily: Actinidoideae  
 Subfamily: Saurauioideae  
 Subfamily: Clematoclethroideae  
 Family: Stachyuraceae  
 Family: Theaceae  
 Subfamily: Theoideae  
 Subfamily: Ternstroemioidae  
 Subfamily: Bonnetioideae  
 Subfamily: Asteropeioideae  
 Subfamily: Tetrameristoideae  
 Subfamily: Pellicerioideae  
 Family: Aquifoliaceae  
 Family: Marcgraviaceae  
 Family: Caryocaraceae  
 Suborder: Clethrineae  
 Family: Clethraceae  
 Family: Cyrillaceae  
 Family: Pentaphylacaceae  
 Suborder: Scytopetalineae  
 Family: Ochnaceae

- Suborder: Scytopetalineae (cont.)
  - Family: Quinaceae
  - Family: Scytopetalaceae
  - Family: Sarcolaenaceae
  - Family: Strasburgeriaceae
  - Family: Dipterocarpaceae
    - Subfamily: Dipterocarpoideae
    - Subfamily: Monotoideae
  - Family: Dioncophyllaceae
- Suborder: Hypericineae
  - Family: Clusiaceae
    - Subfamily: Kielmeyeroideae
    - Subfamily: Calophylloideae
    - Subfamily: Clusioideae
    - Subfamily: Moronoboideae
    - Subfamily: Lorostemonoideae
    - Subfamily: Hypericoideae
  - Family: Elatinaceae
- Suborder: Lecythidineae
  - Family: Lecythidaceae
    - Subfamily: Planchonioideae
    - Subfamily: Lecythidoideae
    - Subfamily: Napoleonoideae
- Order: Nepenthales
  - Family: Nepenthaceae
- Order: Ericales
  - Suborder: Ericineae
    - Family: Ericaceae
      - Subfamily: Rhododendroideae
      - Subfamily: Vaccinioideae
      - Subfamily: Arbutoideae
      - Subfamily: Ericoideae
      - Subfamily: Pyroloideae
      - Subfamily: Monotropoideae
    - Family: Epacridaceae
  - Suborder: Empetrineae
    - Family: Empetraceae
- Order: Ebenales
  - Suborder: Sapotineae
    - Family: Ebenaceae
    - Family: Sapotaceae
      - Subfamily: Sideroxyloideae
      - Subfamily: Omphalocarpoideae
      - Subfamily: Sapotoideae
        - (Achradoideae)
        - Subfamily: Madhucoideae
        - Subfamily: Sarcospermatoideae
  - Suborder: Styracineae
    - Family: Symplocaceae
    - Family: Lissocarpaceae
    - Family: Styracaceae
- Order: Primulales
  - Family: Myrsinaceae
    - Subfamily: Myrsinoideae
    - Subfamily: Maesoideae
    - Subfamily: Aegiceratoideae
  - Family: Theophrastaceae
  - Family: Primulaceae
- Order: Plumbaginales
  - Family: Plumbaginaceae
    - Subfamily: Plumbaginoideae
    - Subfamily: Staticoideae
- Superorder: Rafflesiiflorae
  - Order: Rafflesiales
    - Family: Rafflesiaceae
      - Subfamily: Cytinoideae
      - Subfamily: Apodanthoideae
      - Subfamily: Rafflesioideae
      - Subfamily: Mitrastemonoideae
    - Family: Hydnoraceae
- Superorder: Cistiflorae
  - Order: Cistales
    - Suborder: Cistaceae
      - Family: Flacourtiaceae
      - Family: Dipentodontaceae
      - Family: Peridicaceae
      - Family: Scyphostegiaceae
      - Family: Violaceae
        - Subfamily: Violeoidae
        - Subfamily: Leonioideae
      - Family: Bixaceae
        - Subfamily: Bixioideae
        - Subfamily: Cochlospermoideae
    - Suborder: Caricineae
      - Family: Turneraceae
      - Family: Malesherbiaceae
      - Family: Passifloraceae
      - Family: Achariaceae
      - Family: Caricaceae
    - Suborder: Cucurbitineae
      - Family: Cucurbitaceae
        - Subfamily: Cucurbitoidaeae
        - Subfamily: Zanonioideae
    - Suborder: Begoniineae
      - Family: Begoniaceae
      - Family: Datisceaeae
    - Suborder: Loasineae
      - Family: Loasaceae
        - Subfamily: Mentzelioideae
        - Subfamily: Loasoideae
        - Subfamily: Gronovioideae
- Order: Salicales
  - Family: Salicaceae
- Order: Tamaricales
  - Family: Tamaricaceae
  - Family: Frankeniaceae
- Order: Capparidales
  - Family: Capparidaceae (incl. *Oceanopapaver*, *Tovaria*)
    - Subfamily: Capparidoideae
    - Subfamily: Cleomoideae
      - Family: Moringaceae
      - Family: Resedaceae
      - Family: Brassicaceae
- Superorder: Malviiflorae
  - Order: Malvales
    - Family: Sterculiaceae
    - Family: Sphaerosepalaceae
    - Family: Elaeocarpaceae

## Order: Malvales (cont.)

- Family: Tiliaceae
  - Subfamily: Brownlowioideae
  - Subfamily: Tetralicoideae
  - Subfamily: Tilioideae
  - Subfamily: Neotessmannioideae
- Family: Bombacaceae
- Family: Malvaceae

## Order: Urticales

- Family: Ulmaceae
  - Subfamily: Ulmoideae
  - Subfamily: Celtidoideae
- Family: Moraceae
  - Subfamily: Moroiideae
  - Subfamily: Cannabinoideae
- Family: Urticaceae
  - Subfamily: Conocephaloideae
  - Subfamily: Urticoideae

## Order: Rhamnales

- Family: Rhamnaceae
- Family: Elaeagnaceae

## Order: Euphorbiales

- Family: Euphorbiaceae
  - (incl. *Picrodendron*)
  - Subfamily: Phyllanthoideae
  - Subfamily: Oldfieldioideae
  - Subfamily: Euphorbioideae
- Family: Pandaceae
- Family: Aextoxicaceae
- Family: Didymelaceae
- Family: Dichapetalaceae
- Family: Thymelaeaceae
  - Subfamily: Gonystyloideae
  - Subfamily: Aquillarioideae
  - Subfamily: Gilgiodaphnoideae
  - Subfamily: Thymelaeoideae
- Family: Buxaceae

## Order: Solanales

- Suborder: Solanineae
  - Family: Solanaceae
    - Subfamily: Nolanoideae
    - Subfamily: Solanoideae
    - Subfamily: Duckeodendroideae
- Family: Convolvulaceae
  - Subfamily: Humbertoideae
  - Subfamily: Dichondroideae
  - Subfamily: Convolvuloideae
  - Subfamily: Cuscutioideae

## Suborder: Polemoniineae

- Family: Polemoniaceae

## Suborder: Fouquieriineae

- Family: Fouquieriaceae

## Order: Campanulales

- Family: Pentaphragmataceae
- Family: Campanulaceae
  - Subfamily: Campanuloideae
  - Subfamily: Cyphioideae
  - Subfamily: Lobelioideae
  - Subfamily: Sphenocloideae
- Family: Goodeniaceae
  - Subfamily: Goodenioideae

## Subfamily: Leschenaultioideae

- Subfamily: Dampieroideae
- Subfamily: Brunonioideae

## Superorder: Santaliflorae

## Order: Santalales

- Suborder: Celastrineae
  - Family: Celastraceae
    - Subfamily: Celastroideae
    - Subfamily: Tripterygioidae
    - Subfamily: Cassinoideae
    - Subfamily: Hippocrateoideae
    - Subfamily: Goupioideae
    - Subfamily: Siphonodonoideae
- Family: Stackhousiaceae
  - Subfamily: Macgregorioideae
  - Subfamily: Stackhousioideae

## Suborder: Icacinineae

- Family: Icacinaceae
- Family: Cardiopteridaceae
- Family: Medusandraceae

## Suborder: Santalineae

- Family: Olacaceae
  - Subfamily: Schoepfioideae
  - Subfamily: Olacoideae
- Family: Opiliaceae
- Family: Santalaceae
- Family: Misodendraceae
- Family: Loranthaceae
- Family: Viscaceae
- Family: Balanophoraceae
  - Subfamily: Mystropetaloidae
  - Subfamily: Dactylanthoideae
  - Subfamily: Sarcophytoideae
  - Subfamily: Helosidoideae
  - Subfamily: Lophophytoideae
  - Subfamily: Balanophoroideae

## Suborder: Cynomoriineae

- Family: Cynomoriaceae

## Order: Oleales

- Family: Salvadoraceae
- Family: Oleaceae
  - Subfamily: Jasminoideae
  - Subfamily: Oleoideae

## Superorder: Geraniiflorae

## Order: Geraniales

- Suborder: Lineae
  - Family: Linaceae
    - Subfamily: Humirioideae
    - Subfamily: Linoideae
    - Subfamily: Ctenolophonoideae
    - Subfamily: Ixonanthoideae
- Family: Ancistrocladaceae
- Family: Erythroxylaceae
- Family: Zygophyllaceae
  - Subfamily: Peganoideae
  - Subfamily: Chitonioideae
  - Subfamily: Tetradiclidoideae
  - Subfamily: Augeoideae
  - Subfamily: Zygoophylloideae

Family: Zygophyllaceae (cont.)  
   Subfamily: Nitrarioideae  
 Suborder: Geraniineae  
   Family: Oxalidaceae  
   Family: Geraniaceae  
   Family: Balsaminaceae  
   Family: Tropaeolaceae  
 Suborder: Limnanthineae  
   Family: Limnanthaceae  
 Suborder: Polygalineae  
   Family: Malpighiaceae  
     Subfamily: Hiraeeoideae  
     Subfamily: Malpighioideae  
   Family: Polygalaceae  
   Family: Krameriaceae  
   Family: Trigoniaceae  
   Family: Vochysiaceae  
 Superorder: Rutiflorae  
 Order: Rutales  
   Suborder: Rutineae  
     Family: Rutaceae  
       Subfamily: Rutoideae  
       Subfamily: Dictyolomatoideae  
       Subfamily: Flindersioideae  
       Subfamily: Spathelioideae  
       Subfamily: Toddaloideae  
       Subfamily: Aurantioideae  
       Subfamily: Rhabdodendroideae  
     Family: Simaroubaceae  
       Subfamily: Simarouboideae  
       Subfamily: Kirkioidae  
       Subfamily: Irvingioideae  
       Subfamily: Balanitoideae  
       Subfamily: Picramnioideae  
       Subfamily: Alvaradoideae  
     Family: Surianaceae  
     Family: Cneoraceae  
     Family: Meliaceae  
       Subfamily: Cedreloideae  
       Subfamily: Swietenioideae  
       Subfamily: Melioideae  
     Family: Burseraceae  
     Family: Anacardiaceae  
       (incl. Julianaceae)  
   Suborder: Sapindineae  
     Family: Sapindaceae  
       Subfamily: Dodonaeoideae  
       Subfamily: Sapindoideae  
     Family: Sabiaceae  
     Family: Melianthaceae  
     Family: Akaniaceae  
     Family: Aceraceae  
     Family: Hippocastanaceae  
     Family: Bretschneideraceae  
   Suborder: Juglandineae  
     Family: Rhoipteleaceae  
     Family: Juglandaceae  
       Subfamily: Pterocaryoideae  
       Subfamily: Juglandoideae  
 Order: Myricales

Family: Myricaceae  
 Order: Leitneriales  
   Family: Leitneriaceae  
 Superorder: Chenopodiiflorae  
 Order: Chenopodiales  
   Suborder: Chenopodiineae  
     Family: Phytolaccaceae  
       Subfamily: Phytolaccoideae  
       Subfamily: Stegnospermatoideae  
       Subfamily: Microtoideae  
       Subfamily: Achatocarpoideae  
   Family: Gyrostemonaceae  
   Family: Nyctaginaceae  
   Family: Aizoaceae  
     Subfamily: Molluginoideae  
     Subfamily: Aizooideae  
     Subfamily: Tetragonioideae  
   Family: Cactaceae  
     Subfamily: Pereskioideae  
     Subfamily: Opuntioideae  
     Subfamily: Cactoideae  
   Family: Didiereaceae  
   Family: Portulacaceae  
     Subfamily: Portulacoidae  
     Subfamily: Montioideae  
   Family: Basellaceae  
   Family: Chenopodiaceae  
     (incl. *Dysphania*)  
   Family: Halophytaceae  
   Family: Amaranthaceae  
     Subfamily: Amaranthoideae  
     Subfamily: Gomphrenoideae  
   Suborder: Caryophyllineae  
     Family: Caryophyllaceae  
       Subfamily: Paronychioideae  
       Subfamily: Alsinoideae  
       Subfamily: Caryophylloideae  
   Family: Polygonaceae  
     Subfamily: Eriogonoideae  
     Subfamily: Polygonoideae  
     Subfamily: Coccoleboideae  
 Order: Batidales  
   Family: Batidaceae  
 Superorder: Hamamelidiflorae  
 Order: Hamamelidales  
   Suborder: Trochodendrineae  
     Family: Trochodendraceae  
     Family: Tetracentraceae  
     Family: Eupteleaceae  
     Family: Cercidiphylloaceae  
   Suborder: Eucommineae  
     Family: Eucommiaceae  
   Suborder: Hamamelidineae  
     Family: Hamamelidaceae  
       Subfamily: Disanthoideae  
       Subfamily: Hamamelidoideae  
       Subfamily: Rhodoleioideae  
       Subfamily: Symingtonioideae  
       Subfamily: Liquidambaroideae  
   Family: Platanaceae

## Superorder: Hamamelidiflorae (cont.)

- Order: Casuarinales
  - Family: Casuarinaceae
- Order: Fagales
  - Family: Fagaceae
  - Subfamily: Fagoideae
  - Subfamily: Castaneoideae
  - Family: Betulaceae
- Order: Balanopales
  - Family: Balanopaceae
- Superorder: Rosiflorae
  - Order: Rosales
    - Suborder: Rosineae
      - Family: Rosaceae
        - Subfamily: Spiraeoideae
        - Subfamily: Rosoideae
        - Subfamily: Maloideae
        - Subfamily: Neuroideae
        - Subfamily: Prunoideae
        - Subfamily: Chrysobalanoideae
      - Family: Crossosomataceae
      - Family: Connaraceae
        - Subfamily: Jollydoroideae
        - Subfamily: Connarioideae
      - Family: Fabaceae
        - Subfamily: Mimosoideae
        - Subfamily: Caesalpinoideae
        - Subfamily: Faboideae
    - Suborder: Saxifragineae
      - Family: Crassulaceae
        - Subfamily: Sedoideae
        - Subfamily: Sempervivoideae
        - Subfamily: Echeverioideae
        - Subfamily: Cotyledonoideae
        - Subfamily: Kalanchoideae
        - Subfamily: Crassuloideae
      - Family: Cephalotaceae
    - Family: Saxifragaceae
      - Subfamily: Penthoroideae
      - Subfamily: Saxifragoideae
      - Subfamily: Ribesioideae
      - Subfamily: Vahlioideae
      - Subfamily: Francooideae
      - Subfamily: Eremosynoideae
      - Subfamily: Lepuropetaloidae
      - Subfamily: Parnasioideae
      - Subfamily: Pterostemonoideae
      - Subfamily: Hydrangeoideae
      - Subfamily: Tetracarpaeoideae
      - Subfamily: Iteoideae
      - Subfamily: Brexioideae
      - Subfamily: Escallonioidae
      - Subfamily: Columelloideae
      - Subfamily: Montinioideae
      - Subfamily: Phyllonomoideae
  - Family: Styliaceae
    - Subfamily: Donatioideae
    - Subfamily: Styliidoideae
  - Family: Droseraceae
  - Family: Greyiaceae

- Family: Podostemaceae
  - Subfamily: Tristichioideae
  - Subfamily: Podostemoideae
- Family: Diapensiaceae
- Suborder: Cunoniineae
  - Family: Cunoniaceae (incl. *Bauera*)
  - Family: Brunelliaceae
  - Family: Davidsoniaceae
  - Family: Eucryphiaceae
  - Family: Medusagynaceae
  - Family: Staphyleaceae
    - Subfamily: Staphyleoideae
    - Subfamily: Tapiscioideae
  - Family: Corynocarpaceae
- Suborder: Coriariineae
  - Family: Coriariaceae
- Order: Pittosporales
  - Suborder: Daphniphyllineae
    - Family: Daphniphyllaceae
  - Suborder: Pittosporineae
    - Family: Pittosporaceae
    - Family: Byblidaceae
    - Family: Tremandraceae
  - Suborder: Brunineae
    - Family: Roridulaceae
    - Family: Bruniaceae
    - Family: Geissolomataceae
    - Family: Grobbiaceae
    - Family: Myrothamnaceae
    - Family: Hydrostachyaceae
- Superorder: Proteiflorae
  - Order: Proteales
    - Family: Proteaceae
      - Subfamily: Proteoideae
      - Subfamily: Grevilleoideae
- Superorder: Myrtiflorae
  - Order: Myrtales
    - Family: Lythraceae
      - (incl. Sonneratiaceae)
    - Family: Punicaceae
    - Family: Crypteroniaceae
    - Family: Trapaceae
    - Family: Combretaceae
    - Family: Oliaceae
    - Family: Penaeaceae
    - Family: Myrtaceae
      - Subfamily: Leptospermoideae
      - Subfamily: Myrtoideae
    - Family: Melastomataceae
      - Subfamily: Melastomatoideae
      - Subfamily: Astronioideae
      - Subfamily: Memecyloideae
    - Family: Onagraceae
- Superorder: Gentianiflorae
  - Order: Gentianales
    - Family: Loganiaceae
      - Subfamily: Loganioideae
      - Subfamily: Desfontainioideae
      - Subfamily: Buddlejoideae
    - Family: Rubiaceae



- Family: Rubiaceae (cont.)
  - Subfamily: Cinchonoideae
  - Subfamily: Guettardoideae
  - Subfamily: Ixoroideae
  - Subfamily: Rubioideae
  - Subfamily: Henriquezioideae
- Family: Apocynaceae
  - Subfamily: Plumerioideae
  - Subfamily: Cerberioideae
  - Subfamily: Apocynoideae
  - Subfamily: Periplocoideae
  - Subfamily: Secamonoideae
  - Subfamily: Asclepiadoideae
- Family: Gentianaceae
- Family: Menyanthaceae
- Order: Bignoniales
  - Family: Bignoniaceae
  - Family: Pedaliaceae
  - Family: Martyniaceae
  - Family: Myoporaceae
  - Family: Scrophulariaceae
    - (incl. Globulariaceae)
  - Family: Plantaginaceae
  - Family: Orobanchaceae
  - Family: Lentibulariaceae
  - Family: Acanthaceae
    - Subfamily: Nelsonioideae
    - Subfamily: Thunbergioideae
    - Subfamily: Mendoncioideae
    - Subfamily: Acanthoideae
  - Family: Gesneriaceae
    - Subfamily: Cyrtandroideae
    - Subfamily: Gesnerioideae
- Superorder: Corniflorae
  - Order: Cornales
    - Suborder: Rhizophorineae
      - Family: Rhizophoraceae
    - Suborder: Vitineae
      - Family: Vitaceae
        - Subfamily: Vitoideae
        - Subfamily: Leeoideae
    - Suborder: Cornineae
      - Family: Nyssaceae
        - Subfamily: Davidioideae
        - Subfamily: Nyssoidae
    - Family: Cornaceae
      - Subfamily: Mastixioideae
      - Subfamily: Curtisioideae
      - Subfamily: Helwingioideae
      - Subfamily: Torricelloideae
      - Subfamily: Cornoideae
    - Family: Alangiaceae
    - Family: Garryaceae
    - Suborder: Haloragidineae
      - Family: Haloragidaceae
        - Subfamily: Haloragidoideae
        - Subfamily: Gunneroideae
    - Family: Hippuridaceae
  - Suborder: Araliineae
    - Family: Araliaceae
      - Subfamily: Aralioideae
      - Subfamily: Hydrocotyloideae
      - Subfamily: Saniculoideae
      - Subfamily: Apioideae
- Order: Dipsacales
  - Family: Caprifoliaceae
  - Family: Adoxaceae
  - Family: Valerianaceae
  - Family: Dipsacaceae
  - Family: Calyceraceae
- Superorder: Lamiiflorae
  - Order: Lamiales
    - Suborder: Boraginineae
      - Family: Hydrophyllaceae
      - Family: Boraginaceae
        - Subfamily: Cordioideae
        - Subfamily: Ehretioideae
        - Subfamily: Heliotropoideae
        - Subfamily: Boraginoideae
        - Subfamily: Wellstedioideae
    - Family: Lennoaceae
    - Family: Hoplestigmataceae
    - Suborder: Lamiineae
      - Family: Verbenaceae
        - Subfamily: Viticoideae
        - Subfamily: Chloanthoideae
        - Subfamily: Verbenoideae
        - Subfamily: Phrymangoideae
        - Subfamily: Nyctanthoideae
        - Subfamily: Caryopteridoideae
        - Subfamily: Stilboideae
        - Subfamily: Symphorematoideae
        - Subfamily: Avicennioideae
  - Family: Callitricheae
  - Family: Lamiaceae
    - Subfamily: Prostantheroideae
    - Subfamily: Ajugoideae
    - Subfamily: Prasioideae
    - Subfamily: Ocimoideae
    - Subfamily: Catopheroideae
    - Subfamily: Lavanduloideae
    - Subfamily: Scutellarioideae
    - Subfamily: Lamioidae
      - (Stachyoideae)
      - Subfamily: Tetrachondroideae
- Superorder: Asteriflorae
  - Order: Asterales
    - Family: Asteraceae
      - Tribe: Mutisieae
      - Tribe: Vernonioeae
      - Tribe: Eupatorioeae
      - Tribe: Cardueae
      - Tribe: Arctoteae
      - Tribe: Cichorieae
      - Tribe: Inuleae
      - Tribe: Heliantheae
        - (incl. Helenieae)
      - Tribe: Astereae
      - Tribe: Anthemideae
      - Tribe: Senecioneae
      - Tribe: Calenduleae

## Subclass: MONOCOTYLEDONEAE

## Superorder: Alismiflorae

## Order: Alismales

Family: Butomaceae

Family: Alismaceae

Subfamily: Limnocharitoideae

Subfamily: Alismoideae

Family: Hydrocharitaceae

Subfamily: Hydrocharitoideae

Subfamily: Vallisnerioideae

Subfamily: Thalassioideae

Subfamily: Halophiloideae

## Order: Zosterales

Suborder: Aponogetonineae

Family: Aponogetonaceae

Suborder: Potamogetonineae

Family: Scheuchzeriaceae

Subfamily: Scheuchzerioideae

Subfamily: Juncaginoideae

Family: Potamogetonaceae

Family: Posidoniaceae

Family: Zannichelliaceae

Suborder: Zosterineae

Family: Zosteraceae

## Order: Najadales

Family: Najadaceae

## Superorder: Triuridiflorae

## Order: Triuridales

Family: Triuridaceae

## Superorder: Liliiflorae

## Order: Liliales

Suborder: Liliineae

Family: Liliaceae

Subfamily: Melanthioideae

Subfamily: Herrerioideae

Subfamily: Asphodeloideae

Subfamily: Dracaenoideae

Subfamily: Xanthorrhoeoideae

Subfamily: Wurmbaeoideae

Subfamily: Lilioideae

Subfamily: Scilloideae

Subfamily: Allioideae

Subfamily: Alstroemerioideae

Subfamily: Ixiolirioideae

Subfamily: Amaryllidoideae

Subfamily: Agavoideae

Subfamily: Hypoxidoideae

Subfamily: Haemodoroideae

Subfamily: Cyanastroideae

Subfamily: Asparagoideae

Subfamily: Ophiopogonoideae

Subfamily: Aletroideae

Subfamily: Luzuriagoideae

Subfamily: Smilacoideae

Family: Roxburghiaceae

Family: Dioscoreaceae

Family: Taccaceae

Family: Velloziaceae

## Suborder: Iridineae

Family: Iridaceae (incl. *Geostiris*)

Family: Burmanniaceae

Subfamily: Burmannioideae

Subfamily: Corsioideae

## Suborder: Orchidineae

Family: Orchidaceae

Subfamily: Apostasioideae

Subfamily: Cypripedioideae

Subfamily: Neottioideae

Subfamily: Orchidoideae

Subfamily: Epidendroideae

## Superorder: Ariflorae

## Order: Arales

Suborder: Arineae

Family: Araceae

Subfamily: Acoroideae

Subfamily: Pothoideae

Subfamily: Monsteroideae

Subfamily: Calloideae

Subfamily: Lasioideae

Subfamily: Philodendroideae

Subfamily: Colocasioideae

Subfamily: Aroideae

Subfamily: Pistioideae

Family: Lemnaceae

Subfamily: Lemnoideae

Subfamily: Wolffioideae

## Suborder: Typhineae

Family: Sparganiaceae

Family: Typhaceae

## Order: Arecales

Family: Arecaceae

Subfamily: Coryphoideae

Subfamily: Phoenicoideae

Subfamily: Borassoideae

Subfamily: Caryotoideae

Subfamily: Lepidocaryoideae

Subfamily: Cocosioideae

Subfamily: Arecoideae

Subfamily: Phytelephantoideae

Subfamily: Nypoideae

## Order: Cyclanthales

Family: Cyclanthaceae

Subfamily: Carludovicoideae

Subfamily: Cyclanthoideae

## Order: Pandanales

Family: Pandanaceae

## Superorder: Commeliniflorae

## Order: Commelinales

Suborder: Bromelilineae

Family: Bromeliaceae

Subfamily: Pitcairnioideae

Subfamily: Tillandsioideae

Subfamily: Bromelioideae

Family: Rapateaceae

Subfamily: Saxofridericioideae

Family: Rapateaceae (cont.)  
 Subfamily: Rapateoideae  
 Family: Xyridaceae  
 Suborder: Pontederiineae  
 Family: Pontederiaceae  
 Family: Philydraceae  
 Suborder: Juncineae  
 Family: Juncaceae (incl. *Thurnia*)  
 Family: Cyperaceae  
 Subfamily: Cyperoideae  
 Subfamily: Caricoideae  
 Suborder: Commelinineae  
 Family: Commelinaceae  
 Family: Mayacaceae  
 Suborder: Eriocaulineae  
 Family: Eriocaulaceae  
 Subfamily: Eriocauloideae  
 Subfamily: Paepalanthoideae  
 Suborder: Flagellariineae  
 Family: Flagellariaceae  
 Family: Restionaceae  
 Family: Centrolepidaceae

Suborder: Poineae  
 Family: Poaceae  
 Subfamily: Streptochaetoideae  
 Subfamily: Bambusoideae  
 Subfamily: Parioideae  
 Subfamily: Oryzoideae  
 Subfamily: Micraioideae  
 Subfamily: Pooideae  
 Subfamily: Centothecoideae  
 Subfamily: Eragrostoideae  
 Subfamily: Panicoideae  
 Order: Zingiberales  
 Family: Musaceae  
 Subfamily: Strelitzioideae  
 Subfamily: Musoideae  
 Subfamily: Heliconioideae  
 Family: Lowiaceae  
 Family: Zingiberaceae  
 Subfamily: Zingiberoideae  
 Subfamily: Costoideae  
 Family: Cannaceae  
 Family: Marantaceae

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