1992

An Updated Phylogenetic Classification of the Flowering Plants

Robert F. Thorne
Rancho Santa Ana Botanic Garden

Follow this and additional works at: https://scholarship.claremont.edu/aliso

Part of the Botany Commons

Recommended Citation
Thorne, Robert F. (1992) "An Updated Phylogenetic Classification of the Flowering Plants," Aliso: A Journal of Systematic and Floristic Botany. Vol. 13: Iss. 2, Article 8.
Available at: https://scholarship.claremont.edu/aliso/vol13/iss2/8
AN UPDATED PHYLOGENETIC CLASSIFICATION OF THE FLOWERING PLANTS

ROBERT F. THORNE
Rancho Santa Ana Botanic Garden
Claremont, California 91711

ABSTRACT

This update of my classification of the flowering plants, or Angiospermae, is based upon about 800 pertinent books, monographs, and other botanical papers published since my last synopsis appeared in the Nordic Journal of Science in 1983. Also I have narrowed my family- and ordinal-gap concepts to bring acceptance of family and ordinal limits more in line with those of current taxonomists. This new information and the shift in my phylogenetic philosophy have caused significant changes in my interpretation of relationships and numbers and content of taxa. Also the ending "-anae" has been accepted for superorders in place in the traditional but inappropriate "-iflorae." A new phyletic "shrub" replaces earlier versions, and attempts to indicate relationships among the superorders, orders, and suborders. One table includes a statistical summary of flowering-plant taxa: ca. 235,000 species of 12,615 genera, 440 families, and 711 subfamilies and undivided families in 28 superorders, 70 orders, and 75 suborders of Angiospermae. Three other tables summarize the indigenous distribution of the families and subfamilies of Angiospermae about the world.

Key words: Angiospermae, classification, distribution, endemism, geography, hierarchy, phylogeny, synopsis, taxonomy.

INTRODUCTION

In the years since I published my "Proposed new realignments in the angiosperms" in the Nordic Journal of Botany (Thorne 1983) numerous books and scientific papers have been published on the classification, morphology, palynology, paleontology, phytochemistry, karyomorphology, cladistics, etc., of the flowering plants. These significant publications have greatly elucidated some relationships and led to a much better understanding of the phylogeny of the Angiospermae.

At the request of the editor of Botanical Review I have prepared a rather lengthy review of this significant recent literature and my interpretation of the classification and geography of the flowering plants. This has been accepted for publication in that journal; however, because of the large backlog of papers awaiting publication in the Botanical Review, my paper probably will not be published before late 1992. Therefore, I have prepared an abbreviated paper containing the revised synopsis of my classification, a redrawn chart of the Thorne phyletic shrub, and four statistical tables prepared from the new synopsis.

The review of the new literature, bibliography of nearly 800 titles, and geography of the included angiospermous taxa will be covered in the longer Botanical Review paper. Full discussion of my alignment and delineation of the angiospermous taxa must await the completion of my projected book on angiosperm phylogeny.

CLASSIFICATION OF THE ANGIOSPERMS

Since my 1983 classification, a major change in my phyletic philosophy has been my decision to narrow my family- and ordinal-gap concepts to bring my
acceptance of family and ordinal limits more in line with those of current taxonomists, especially in such difficult groups as my former broadly conceived Phytolaccaceae, Aizoaceae, Theneae, Urticaceae, Linaceae, Rhizophoraceae, Saxifragaceae, Cornaceae, Araliaceae, Solanaceae, Loganiaceae, Verbenaceae, Liliaceae, and Commelinaceae. My definition of families and other taxa still remains somewhat more conservative than that of most of my phylogenetic peers.

Another important change has been my acceptance of the ending "-anae" for superorders instead of the traditional "-iflorae." This is in line with the treatments by Takhtajan (1986, 1987) and the Dahlgrens (1989a), and is based on the criticism that logically "-iflorae" really is appropriate only for the flower-bearing Angiospermae.

Among other considerable changes in my system of classification are, in the Annonanae, deletion of Aristolochiinae but recognition of Austrobaileyinae, Sparattanthelioidae, and Ceratophyllales. In Chenopodianae, Phytolaccineae and Caryophyllineae are recognized. Significant changes in the Theanae include the transfer of Chrysobalanaceae from Rosales to Theales and of Diegodendraceae (Rhopalocarpaceae) from Theales to Malvales. Fouquieriinae have been elevated to Fouquieriales and transferred to Theanae. Celastrales are separated from Santalanae and elevated to Celastranae.

Within Malvanae Cistineae are transferred back to Violales from Malvales; suborders Sterculiinae and Malvinae and families Monotaceae and Diegodendraceae are recognized in Malvales; Gonystylaceae are recognized in and Aextoxicaceae removed from Euphorbiae (to taxa incertae sedis). In Violanae the suborder Salicinae is deleted with removal of Salicaceae to near proximity with Flacourtiaceae; Moringaceae are removed from Capparales and transferred to Sapindinae. Geraniinae are reordered with elevation of suborders Limineae, Geraniinae, and Polygalinae to ordinal rank and with addition of Rhizophorales.

In Rutanae, Juglandineae and Myricineae are removed and elevated to Juglandales near Fagales in the Rosanae. A greatly expanded and much revised Rosanae has been created by the combining of Hamamelidanae (Hamamelidiflorae) with Rosanae and the consequent inclusion of Hamamelidae, Casuarinales, Fagales, and Juglandales, along with recognition of Buxales, Pittosporales, Bruniales, Saxifragales, Podostemales, and Cunoniales as separate orders in the superorder.

Cornanae are also rather thoroughly reorganized with recognition and inclusion of Hydrangeales; removal of Rhizophoraceae and Hippuridaceae from and elevation of Gunneraceae to Gunnerinae in Cornales; restructuring of Cornaceae-Nyssaceae and Araliaceae-Apiales; recognition of Araliidaeae, Hydrocotylaceae, Morinaceae, and Triplostegiaceae in the superorder, and transfer of Calyceraeae from Dipsacales to Asterales.

Campanulanae are transferred from Solananae to Asteranae, Sphenocleaceae are recognized, and Menyanthaceae are added from Gentiananae. Brunonia is removed from Goodeniaceae and transferred as Brunoniaceae to taxa incertae sedis. In Asteraceae the tribes Barnadesieae, Tarchonanthaeae, and Coreopsideae are accepted. In Solananae, Fouquieriinae are removed as Fouquieriales to Theanae, and Hopolestigmataceae are added to the Boragineae.

Within Gentiananae the Oleales are deleted, with Salvadoraceae removed to taxa incertae sedis and Oleaceae to Bignoniales. Loganiaceae are much trimmed down with removal of Desfontainia to Hydrangeales as Desfontainiaceae and Retzia to Stilbaceae in Bignoniales adjacent to Buddlejaeae. Menyanthaceae are
current taxonomic treatments conceive families in the Convolvulaceae, Bignoniaceae, and Malvaceae. Lilianeae are transferred from Gentianales to Campanulales. In Bignoniales, Oleaceae and Stilbaceae are placed near Buddlejaceae; Globulariaceae and Selaginaceae are recognized as distinct families; and Schlegelieae (Pauownieae) are transferred from Bignonaceae to Scrophulariaceae. Lamiales are reduced in rank to Lamiineae in Bignoniales and Verbenaceae much changed with removal of several groups. Chloanthaceae, Avicenniaceae, Symphoremataceae, Nesogonaceae, and Tetraclinaceae are recognized as distinct families. Hippuridaceae are transferred from Cornaceae to Lamiineae near the equally very reduced and largely aquatic Callitrichaceae.

The subclass Monocotyledoneae has also been considerably reorganized here, especially the Lilianeae and Commelinanae. Within the superorder Liliianeae I have recognized five orders: Liliales, Burmanniales, Asparagales, Dioscoreales, and Orchidales. The Liliales are divided into the suborders Melanthiineae, Liliineae, and Iridineae, and the Asparagales into the suborders Asparagineae and Amaryllidinae. I still regard the Melanthiaceae as the most archaic and least specialized monocots, whereas I consider the Dioscoreales as relatively specialized within the Lilianeae. Obviously, my formerly very complex and polyphyletic family Lilianeae has been largely dismantled, with recognition of most of the former subfamilies as distinct families in at least two orders, much as in the treatment by Dahlgren et al. (1985).

The small Australasian family Hydatellaceae remains difficult to interpret but tentatively has been given its own order and superorder and placed between Liliianeae and Triuridanae. The superorder Typhanae has been deleted and the Typhales with single family Typhaceae, including Sparganoideae, placed tentatively in the Commelinanae between the Bromeliales and Zingiberales. My former broadly conceived order Commelinales has been redefined, with division into Bromeliales, Commelinales s.s., Cyperales, and Poales. The rather diverse order Bromeliales is divided into the suborders Bromeliineae and Pontederiineae. Similarly the Zingiberales are divided into the suborders Musineae, Strelitziineae, Lowiineae, Heliconiineae, Zingiberineae, and Marantineae; Commelinales into Xyridineae, Commelinineae, and Eriocaulineae; and Poales into Flagellarineae and Poineae. In the Flagellarineae Joinvillea and Ecdieioelea are elevated to family rank. It seems fitting that our most economically important and highly diverse, prolific, and specialized family Poaceae should sit atop the monocot “family tree.”

As usual, I have terminated the classification with a short list of Taxa Incertae Sedis to list therein those taxa whose position remains most uncertain. It is a shifting list that probably should be much longer than it is, and surely will be longer when all the anomalous genera are pruned away from the families where they are now misplaced.

EXPLANATION OF THE PHYLETIC SHRUB

The cladists notwithstanding, I do not think it possible to produce a realistic angiospermous “family tree.” Although the Angiospermae are surely monophyletic, their two subclasses must have diverged from common ancestors, possibly seed-ferns, during the apparently Early Cretaceous or possibly late Mesozoic origins of the class. Similarly, most of the superorders diverged early from their long extinct protoangiospermous ancestors. To draw one superorder or other
In the context of the above discussion, it appears that the subject of immediate concern is not the
unnamed species and not the unnamed
and unnamed hierarchies. The rank of
all present.

Analysis of the
Evolanica, 1962
above appears to
refer to micro-
mae.
major taxon from another extant major taxon would be a futile exercise and most misleading. Hence, I prefer to treat the extant Angiospermae diagrammatically as a “shrub” diverging as superorders from a hollow center representing the extinct Protoangiospermae.

The position of these superordinal stem cross-sections of the phyletic shrub (Fig. 1) indicates as closely as possible my interpretation of their interrelationships and their relative degree of specialization from their more primitive, archaic ancestors. Those farthest from the hollow center are the most specialized in their characteristics, those closest to the center the least specialized. The size of the superordinal balloons and the contained orders and suborders indicates approximately the number of species accepted for each major taxon, although the size of some of the smallest superorders has been exaggerated to make them visible. Within the superordinal balloons the orders are shown as entire ellipses, the suborders as connected branches.

This phyletic shrub replaces the one published in the *Nordic Journal of Botany* (Thorne 1983) and differs from it rather considerably due to major changes in my classification briefly mentioned above. This diagram was drawn and lettered by my associates Oscar Dorado and Dr. Scott Zona at the Rancho Santa Ana Botanic Garden. Any errors are my own and any divergences from my classification are due to the continuing evolution of the latter. Unfortunately, any such drawing will be somewhat obsolete by the time it is printed due to our rapidly expanding knowledge of the Angiospermae.

**EXPLANATION OF THE SYNOPSIS**

In the following synopsis of my classification of the flowering plants I have continued to carry the hierarchy of the class down to the subfamily level where appropriate, and even down to the tribal level in the huge family Asteraceae. Subfamilies are important for they display intrafamilial divergence as well as their immediate common ancestry with other subfamilies in the same family.

Despite my narrowed family-gap concept, I still prefer not to multiply taxa unnecessarily where common recent ancestry seems evident. Thus, I would rather not break up such well-defined, if very large, families as Papaveraceae, Fabaceae, and Apocynaceae, whose subfamilies are closely linked by their characteristics and by intermediate taxa. Other taxonomists, however, do object to my extended hierarchy, and often treat my subfamilies as distinct families. This difference in ranking of taxa is not important so long as the relationships are firmly based on all pertinent data.

Anyone interested in my philosophy of classification can find it outlined in my *Evolutionary Biology* paper (Thorne 1976) and earlier publications (Thorne 1958, 1963, 1975). It has not changed greatly over the years, though I have, as mentioned above, seen fit to narrow somewhat my ordinal- and family-gap concepts, leading to my acceptance of somewhat more narrowly defined orders and families. The

---

Fig. 1. Phylogenetic shrub of the Angiospermae, with the superorders, orders, and suborders indicated as stem cross-sections diverging from a hollow center representing the extinct Protoangiospermae.
changed total numbers of all these taxa down to the genus and species are listed in Table 1.

Space limitations prevent me from giving here my reasons for the circumscriptions and alignments accepted in this classification. Until my phylogeny book is available, one can find discussions of many of my realignments, especially those most divergent from those of my phyletic peers, in my previous phyletic publications (as Thorne 1968, 1973, 1974a, b, c, 1975, 1976, 1977, 1978, 1979, 1981, 1983, 1985, 1989a, b; Thorne et al. 1977; Thorne and Scofield 1978).

Names used for the various taxa in the synopsis are according to the International Code of Botanical Nomenclature (Greuter et al. 1988), although I have extended the principle of priority to all categories up to the class. Lindley’s Nixus Plantarum (1833) is the point of departure for ordinal names, for that botanist was the first to apply consistently the ending “-ales” to generic roots. Synonyms or additional included or excluded taxa are listed usually only where the names or treatment of taxa deviate considerably from those in A. Engler’s Syllabus der Pflanzenfamilien, ed. 12, vol. 2 (Melchior 1964). Subfamilial treatment is based largely upon those authorities that I regard as best informed and phyletically most realistic in their classification. A number of larger families still await realistic subdivision. In a few families well known to me I have devised my own tentative subfamilial classification. In the longer Botanical Review paper I have listed the many recent taxonomic treatments that I have found to be especially helpful in the preparation of this synopsis.

Because the reader deserves some indication of the degree of confidence I place in the alignment used, hierarchal level assigned, circumscription accepted, or all of these, I have used in the synopsis for each category above the subfamily a simple “A,” “B,” “C” scale to indicate degree of confidence. “A,” as used with Lactoridaceae, Chrysobalanaceae, and Ceratophyllales, represents limited confidence in the position of all three taxa and in addition the hierarchal ranking of the last taxon. Any less confidence would condemn a taxon to taxa incertae sedis. “B,” as used with Paeoniaceae, Rafflesiales, Paracyphaceae, Oncothecaceae, Asteraceae, Tetraristaceae, etc., suggests that there is some evidence that the alignment, hierarchal ranking, and circumscription are probably correct. “C,” used generally throughout the synopsis, implies considerable confidence that accumulated data have allowed a realistic placement and circumscription.

The numerals following most of the taxa listed are the number of genera and species (15/265 indicating 15 genera and 265 species) accepted for that taxon. Many were taken from Willis’s Dictionary of the Flowering Plants and Ferns, Student Ed. (Shaw 1985) or The Plant Book, A Portable Dictionary of the Higher Plants (Mabberley 1987) except where more accurate information was communicated to me by monographers or could be found in recent, reliable monographs and revisions. These are listed in the projected Botanical Review paper. Large numbers have been rounded off to the nearest five or ten to avoid spurious exactitude.

It must be emphasized that each superorder in the synopsis is merely one line of evolution within the numerous-stemmed, many-branched, complex phylegetic shrub. A phyletic tree, given our limited paleontological record, is unrealistic. A “phylogenetic” hedge, despite its double-entendre appeal, is also not realistic because I do firmly believe in the monophyletic origin of the Angiospermae and
Table 1. Statistical summary from this updated classification of the flowering plants (Class Angiospermae).

|                      | Dicotyledoneae | Monocotyledoneae | Total Angiospermae |
|----------------------|----------------|------------------|--------------------|
| Species              | 176,075        | 58,160           | 234,235            |
| Genera               | 9825           | 2796             | 12,015             |
| Subfamilies          | 306            | 88               | 394                |
| Families             | 354            | 86               | 440                |
| Subfamilies and undivided families | 566      | 145              | 711                |
| Suborders            | 56             | 20               | 76                 |
| Orders               | 50             | 19               | 69                 |
| Suborders and undivided orders | 87   | 33               | 120                |
| Superorders          | 19             | 9                | 28                 |
| Monogeneric families | 122            | 26               | 148                |
| Monogeneric subfamilies | 82        | 16               | 98                 |
| Monotypic families   | 41             | 6                | 47                 |
| Monotypic subfamilies | 29       | 4                | 33                 |
| Digeneric families   | 27             | 7                | 34                 |
| Digeneric subfamilies | 29      | 6                | 35                 |
| Ditypic families     | 31             | 2                | 33                 |
| Ditypic subfamilies  | 16             | 4                | 20                 |
| Trigeneric families  | 30             | 6                | 36                 |
| Trigeneric subfamilies | 16    | 7                | 23                 |
| Tritypic families    | 13             | 3                | 16                 |
| Tritypic subfamilies | 8              | 2                | 10                 |

of their two subclasses, as well as most of the lesser-ranked taxa. I hope most of the polyphyletic groups have been rooted out of the classification but surely some remain to be extirpated, a probable example of such being the Lamiaceae (Cantino 1990).

As each superorder, order, or suborder terminates, the classification drops back down the evolutionary ladder to the beginning of the next major line of ascent. By placement in the synopsis I have tried to indicate closeness of relationship and increasing specialization. A linear sequence cannot, of course, approximate the probable branchings nor indicate the numerous interrelationships among the superorders and lesser taxa. It is hoped that the phyletic shrub, illustrated by Figure 1, will be more helpful in these respects.

In the development of this synopsis for the longer paper a large amount of data was accumulated. To make it more readily available I have summarized that information in four tables. Table 1 presents a statistical summary of the various angiosperm taxa in the two subclasses; species, genera, subfamilies, families, suborders, orders, and superorders. The best estimate I could obtain for number of species in the flowering plants was 234,235, give or take a few thousand, with the dicots about three times more numerous than the monocots. In genera the monocots are less than one quarter of the 12,615 angiosperm genera, and in families they are about one fifth of the 440 families that I accept currently as valid. Because some of my phyletic peers (Cronquist 1981; G. Dahlgren 1989a, b; R. Dahlgren et al. 1985; Takhtajan 1987) accept many of my subfamilies as valid families, I have chosen to use subfamilies and undivided families as the most significant units. Thus, the Angiospermae consist of 711 subfamilies and undivided families.
Table 2. Putatively indigenous angiosperm families and additional subfamilies of the world.

| Region                                | Families | Monocots | Totals | Total families and additional subfamilies |
|---------------------------------------|----------|----------|--------|------------------------------------------|
| Asia (excl. Malesia)                  | 227      | 62       | 289    | 441                                      |
| South America (incl. Trinidad)        | 215      | 56       | 271    | 410                                      |
| Central America (incl. Mexico)        | 197      | 47       | 244    | 373                                      |
| Africa (S of Sahara)                  | 192      | 55       | 247    | 370                                      |
| Malesia (Malaya-Fiji)                 | 194      | 54       | 248    | 355                                      |
| Australia (incl. Tasmania)            | 162      | 60       | 222    | 332                                      |
| North America (N of Mexico)           | 167      | 43       | 210    | 310                                      |
| West Indies (incl. Bahamas)           | 159      | 37       | 196    | 287                                      |
| Madagascar and Comoros                | 154      | 41       | 195    | 286                                      |
| Pacific Basin (excl. Hawaii)          | 142      | 33       | 175    | 258                                      |
| New Caledonia and Loyalties           | 121      | 34       | 155    | 217                                      |
| Europe (incl. Med. Africa)            | 116      | 36       | 152    | 214                                      |
| Indian Ocean Islands                  | 115      | 32       | 147    | 213                                      |
| Atlantic Islands                      | 96       | 28       | 124    | 164                                      |
| New Zealand                           | 88       | 23       | 111    | 138                                      |

(ox: South America is split between the two continents, as it is a large and diverse region, and includes both South and Central America)
(or 440 families and 271 additional subfamilies, i.e., subfamilies other than the typical subfamilies).

Since I have often been accused of being overly conservative in my recognition of families, I felt it might be informative to count the oligogeneric and oligotypic families listed in the synopsis, 222 of the former and 96 of the latter. Although it may be distressing to the student of flowering plants to have to deal with 47 monospecific families and 33 monospecific subfamilies for a total of 80, one should remember that the angiosperms have been evolving on earth for at least 120 million years and have suffered very heavy extinction even before modern man became too numerous and began to eliminate most of the species-rich environments. Such extinctions have broken up the near phyletic continuum and made it possible to develop our classification, largely based upon phyletic gaps.

Table 2 summarizes the distribution in the world’s major regions of those families and subfamilies believed to be indigenous in each. Asia, even without Malesia, is by far the richest region phyletically, partly because of its latitudinal width from the Arctic nearly to the Equator, partly because it is the crossroads between Africa, Europe, and the Americas, and partly because of its easy access to Australasia through immediately adjacent Malesia. It is also significant that the sometime insular continent of South America is second richest in families and subfamilies because of its latitudinal stretch from the Antarctic to north of the Equator, its varied topography from the equatorial rainforests along the Amazon to the snowfields of the highest Andes, and its relatively recent connection with North America through the Panamanian Isthmus and earlier contacts with that continent via Antillean island stepping-stones. Former connections with Africa before the evolution of the South Atlantic and with Australasia via Antarctica are certainly also involved in its floristic richness. The relative floristic paucity of the larger continent of Africa must be due to extinctions caused by climatic catastrophes (Raven and Axelrod 1972) as well as to the earlier tectonic losses of India, Madagascar, and Arabia.

The surprising floristic richness of Central America, here including Mexico, and Malesia must be due to their critical intercontinental positions. That of Australia and the large continental islands of Madagascar and New Caledonia must, on the other hand, be due to their present long isolation following Mesozoic separation of Australia and Madagascar from Africa and New Caledonia from Australia.
Table 3. Angiosperm families and subfamilies of limited distribution.

| Major geographic units                                      | Endemic families | Endemic subfamilies | Total families and additional subfamilies |
|-------------------------------------------------------------|------------------|---------------------|-------------------------------------------|
| 1. Africa (mainland south of Sahara)                         | 21               | 18                  | 38                                        |
| 2. South America (incl. Trinidad)                           | 18               | 16                  | 34                                        |
| 3. Asia (excl. Malesia)                                     | 16               | 10                  | 25                                        |
| 4. Australia                                                | 14               | 15                  | 29                                        |
| 5. North America (incl. Central America and West Indies)    | 10               | 7                   | 17                                        |
| 6. Madagascar (and Comoro Is.)                              | 7                | 6                   | 12                                        |
| 7. New Caledonia                                            | 5                | 0                   | 5                                         |
| 8. Malesia (to Fiji)                                       | 2                | 0                   | 2                                         |
| 9. Indian Ocean                                             | 1                | 1                   | 2                                         |
| 10. Pacific Basin                                           | -1               | 0                   | -1                                        |
| Totals                                                     | 95               | 75                  | 166                                       |

Later separation of Australia from Antarctica and South America came early in the Tertiary. The floristic poverty of oceanic islands surely is due to isolation from large continental masses, small size, relative recentness of volcanic origin, and genetic drift.

Reasonably consistent with the relative floristic richness of these regions is the relative degree of familial and subfamilial endemism recorded in Table 3. Here, however, the rather isolated continents of Africa and South America far surpass the other areas in endemism. African endemism seems even more striking if we add those taxa endemic to Madagascar and the Indian Ocean islands and four families shared only between Africa and Madagascar—a total of 56 families and additional subfamilies. Even larger figures would ensue for South America if we added those 16 essentially South American families and 20 additional subfamilies that have invaded the West Indies often north to southern Florida and Central America north to Panama, Costa Rica, or even southern Mexico. That total of 69 could be enhanced further by adding the 11 primarily South American families barely represented across the South Atlantic in Africa. One can only conclude that South America and adjacent tropical regions to the north are the richest reservoir on earth for major angiosperm taxa restricted completely or largely to one continent.

Finally, Table 4 summarizes the world distribution of angiosperm families and subfamilies. The largest number of major angiospermous taxa, 282, belongs to the subcosmopolitan, pantropical, and widespread temperate categories. Next are the narrower disjuncts between continents and/or oceanic regions, 266 taxa. Finally, those major taxa restricted to one continent number 163 taxa and combine with the above to total 711 subfamilies and undivided families.

In the synopsis of the Angiospermae within the two subclasses the hierarchy consists in descending order of superorders (-anae), orders (-ales), suborders (-ineae), families (-aceae), subfamilies (-oideae), and, in Asteraceae, tribes (-eae). An example in the Dicotyledoneae (Annonidae) is:

Superorder: Annonananae (Magnolianae)
Order: Annonales (Magnoliales)
Table 4. World distribution of angiosperm families and subfamilies.

| Subclosmopolitan | Families | Subfamilies | Subfamilies and undivided families |
|------------------|----------|-------------|-----------------------------------|
| Missing from one continent | 18 | 14 | 26 |
| Pantropical | 49 | 70 | 94 |
| Missing from one continent | 5 | 3 | 7 |
| Widespread Temperate | 9 | 8 | 12 |
| Southern Hemisphere | 12 | 4 | 17 |
| Other narrower disjuncts | 12 | 16 | 28 |
| Eurasian (incl. Malesian)-American | 36 | 36 | 66 |
| N. American (incl. C. Am. and W. Indies)-S. America | 22 | 26 | 47 |
| American-African | 15 | 15 | 30 |
| Australian-S. American | 8 | 7 | 15 |
| Africa-Madagascar-Eurasia; -Australia; -Pacific | 24 | 20 | 44 |
| Asia-Malesia; -Australia; -Pacific | 13 | 15 | 28 |
| Other disjunctions | 41 | 41 | 82 |
| Endemic to one continent | 94 | 72 | 163 |
| Totals | 440 | 392 | 711 |

Suborder: Annonineae (Magnoliineae)
Family: Magnoliaceae
Subfamily: Magnolioideae
(Tribe: Magnolieae).

This example is presented to eliminate the need to list in every case the hierarchal ranks preceding the respective taxa.

SYNOPSIS OF THE CLASS ANGIOSPERMAE (ANNONOPSIDA)

Subclass: Dicotyledoneae (Annonidae)

Annonanae (C; 466/12,380)  
Annonales (incl. Magnoliaceae) (C; 281/9510)  
Winterineae (C; 8/90)  
Winteraceae (C; 8/90)  
Illicineae (C; 3/84)  
Illiciaceae (C; 1/37)  
Schisandraceae (C; 2/47)  
Annonineae (incl. Magnoliaceae) (C; 178/3250)

Magnoliaceae (C; 12/220)  
Magnolioideae (11/220)  
Liriodendroideae (1/2)  
Degeneriaceae (C; 1/2)  
Himantandraceae (C; 1/2)  
Eupomatiaceae (C; 1/2)  
Annonaceae (C; 132/2300)  
Aristolochiaceae (C; 8/400)  
Asaroidae (3/71)  
Aristolochioideae (5/330)
Myristicaceae (C; 17/300)  
Canellaceae (C; 6/21)  
Austrobaileyinae (C; 1/1)  
Austrobaileyaceae (C; 1/1)  
Laurinae (C; 77/2975)  
Amborellaceae (C; 1/1)  
Trimeniaceae (C; 1/5)  
Chloranthaceae (C; 4/70)  
Monimiaceae (C; 32/335)  
Hortonioideae (1/3)  
Monimioideae (3/18)  
Mollinedioideae (19/145)  
Atherospermatoideae (7/16)  
Glossocalycoideae (1/3)  
Gomortegaceae (C; 1/1)  
Calycanthaceae (C; 3/7)  
Idiospermoideae (1/1)  
Calycanthoideae (2/6)  
Lauraceae (C; 31/2490)  
Lauroideae (30/2470)  
Cassythoideae (1/20)  
Hernandiaceae (C; 4/64)  
Hernandioideae (2/42)  
Gyrocarpoideae (1/7)  
Sparattanthe1ioideae (1/15)  
Piperineae (C; 14/3110)  
Lactoridaceae (C; 1/1)  
Saururaceae (C; 5/7)  
Piperaceae (C; 8/3100)  
Piperoidae (4/2100)  
Peperomioideae (4/1000)  
Ceratophyllales (A; 1/6)  
Ceratophyllaceae (C; 1/6)  
Nelumbonales (C; 1/2)  
Nelumbonaceae (C; 1/2)  
Paeoniales (B; 2/34)  
Paeoniaceae (C; 1/33)  
Giauclidae (C; 1/1)  
Berberidales (C; 181/3490)  
Menispermaceae (C; 65/350)  
Lardizabalaceae (C; 9/38)  
Decaisneioideae (C; 1/2)  
Lardizabaloidae (incl. Sargentodoxa) (C; 8/36)  
Berberidaceae (C; 16/540)  
Nandinoideae (C; 1/1)  
Berberidoideae (3/520)  
Leonticoideae (3/8)  
Epimedioidae (9/11)  
Hydrastidaceae (C; 1/1)  
Ranunculaceae (46/1900)  
Helleboroidae (1/21)  
Isopyroideae (Thalictridoe­iae)  
Ranunculoideae (incl. King­donia)  
Circaeasteraceae (C; 1/1)  
Papaverineae (C; 42/660)  
Papaveraceae (C; 42/660)  
Platystemonoideae (3/4)  
Papaveroideae (18/185)  
Eschscholzioidae (3/12)  
Pteridophyloideoae (1/1)  
Hypecoideae (1/10)  
Fumarioideae (16/450)  
Nymphaeaceae (C; 8/70)  
Nymphaeales (C; 8/70)  
Cabombaceae (C; 2/8)  
Nymphaeaceae (C; 6/62)  
Nymphaeoideae (3/55)  
Euryaloideae (2/3)  
Barclayoideae (1/4)  
Rafflesianae (B; 10/64)  
Rafflesiales (B; 10/64)  
Hydnoraceae (C; 2/11)  
Rafflesiales (C; 8/53)  
Mitrasystemonoideae (1/2)  
Cytinoideae (2/10)  
Apodanthoideae (2/26)  
Rafflesioideae (3/15)  
Chenopodianae (Centrospermae) (C; 563/8670)  
Chenopodiales (Caryophyllales) (C; 563/8670)  
Phytolaccaceae (C; 61/500)  
Phytolaccaceae (C; 7/65)  
Phytolaccoidae (4/45)  
Gisekioideae (1/5)  
Microteoideae (2/15)  
Petiveriaceae (Rivinaceae) (C; 6/40)  
Agdestidaceae (C; 1/1)  
Barbuiaceae (C; 1/1)  
Achatocarpaeae (C; 2/10)
Stegnospermataceae (C; 1/3)
Nyctaginaceae (C; 30/290)
Portulacineae (C; 264/4070)
Aizoaceae (C; 141/2040)
Aizooidae (6/80)
Aptenioidae (Mesembryanthemoideae) (9/90)
Ruschioideae (120/1800)
Sesuvioidae (4/20)
Tetragonioideae (2150)
Molluginaceae (B; 13190)
Halophytaceae (C; 111)
Portulacaceae (C; 191575)
Hectorellaceae (C; 2/2)
Basellaceae (C; 4140)
Didiereaceae (C; 4111)
Cactaceae (C; 9311400)
Pereskioideae (2118)
Opuntioideae (4/250)
Cactoideae (871130)
Chenopodiineae (C; 16812350)
Chenopodiaceae (C; 103/1500)
Chenopodioidae (incl. Dysphania)
Salicornioideae
Salsoloideae
Amaranthaceae (C; 65/850)
Amaranthoideae
Gomphrenoideae
Caryophyllineae (C; 70/1750)
Caryophyllidaeae (incl. Geocarpom) (C; 70/1750)
Alsinoideae
Paronychioideae
Caryophylloideae
Theaceae (C; 611/13,460)
Theales (C; 272/5370)
Dilleniineae (C; 9/400)
Dilleniaceae (C; 9/400)
Dillenioidae (5/280)
Tetraceroidae (4/120)
Theinae (C; 62/1990)
Actinidiaceae (C; 3/350)
Actinidioidae (1/40)
Saurauioideae (1/300)
Clematoclethroidae (1/10)
Paracryphiaceae (B; 1/1)
Stachyuraceae (C; 1/10)
Theaceae (C; 28/500)
Ternstroemioidae (12/200)
Theoideae (16/300)
Asteroideae (B; 1/7)
Tetrameristaeae (B; 2/2)
Pelllicieraeae (C; 1/1)
Chrysobalanaceae (A; 17/495)
Symplocaceae (C; 1/500)
Caryocaraceae (C; 2/23)
Maragaviaceae (C; 5/100)
Icacinaceae (62/720)
Oncothecaceae (B; 1/2)
Aquifoliaceae (C; 1/400)
Phellinaceae (C; 1/10)
Icacinaceae (excl. Metteniusa) (B; 56/300)
Sphenostemonaceae (B; 1/7)
Cardioteridaceae (B; 1/2)
Sarracenineae (C; 3/15)
Sarracenieae (C; 3/15)
Clethrineae (B; 5/80)
Pentaphylaceae (C; 1/2)
Clethraceae (C; 1/64)
Cyrillaceae (C; 3/14)
Scytotetraizalineae (C; 55/695)
Ochnaceae (incl. Lophira) (C; 40/600)
Ochnaceae (33/525)
Sauvagesioideae (7/75)
Quinaceae (C; 4/50)
Scytotetralineae (C; 5/20)
Medusagynaceae (C; 1/1)
Strasburgeriaceae (B; 1/1)
Ancistrocladaeae (B; 1/20)
Dioncophylloideae (B; 3/3)
Nepenthinaceae (C; 1/70)
Nepenthaceae (C; 1/70)
Hypericinaceae (C; 50/1065)
Boonietaceae (C; 3/22)
Clusiaceae (incl. Hypericaceae) (C; 45/1010)
Kiemeleioideae (7/47)
Calophylloideae
Clusioideae
Moronoboiideae (6/36)
Hypericoideae (9/540)
Elatinaceae (C; 2/35)
Lecythidinae (C; 25/400)
| Order                      | Family               | Subfamily                        | Genera                                      |
|---------------------------|----------------------|----------------------------------|---------------------------------------------|
| Elychidaceae              | (C; 25/400)          |                                  |                                             |
| Planchonioidae            | (6/54)               |                                  |                                             |
| Foetidioideae             | (1/5)                |                                  |                                             |
| Lecythidoideae            | (15/325)             |                                  |                                             |
| Napoleonioideae           | (2/18)               |                                  |                                             |
| Asteranthoideae           | (1/1)                |                                  |                                             |
| Ericales                  | (C; 132/2650)        |                                  |                                             |
| Ericaceae                 | (C; 99/2650)         |                                  |                                             |
| Rhododendroideae          | (15/700)             |                                  |                                             |
| Ericoideae                | (17/865)             |                                  |                                             |
| Vaccinioideae             | (incl. Arbutueae)    | (54/660)                         |                                             |
| Pyroloideae               | (3/10)               |                                  |                                             |
| Monotropoideae            | (10/12)              |                                  |                                             |
| Epacridaceae              | (excl. Wittsteinia)  | (C; 30/400)                      |                                             |
| Empetraceae               | (C; 3/6)             |                                  |                                             |
| Fouquieriales             | (C; 1/11)            |                                  |                                             |
| Fouquieriaceae            | (C; 1/11)            |                                  |                                             |
| Ebenales                  | (C; 84/1450)         |                                  |                                             |
| Ebenineae                 | (Sapotineae)         | (C; 73/1300)                     |                                             |
| Ebenaceae                 | (C; 2/500)           |                                  |                                             |
| Lissocarpaces             | (C; 1/2)             |                                  |                                             |
| Sapotaceae                | (incl. Sarcosperma)  | (C; 70/800)                      |                                             |
| Styracaceae               | (C; 11/150)          |                                  |                                             |
| Styraceae                 | (C; 11/150)          |                                  |                                             |
| Primulales                | (C; 77/2885)         |                                  |                                             |
| Primulinae                | (C; 58/2110)         |                                  |                                             |
| Theophрастaceae           | (C; 5/110)           |                                  |                                             |
| Myrsinaceae               | (C; 33/1000)         |                                  |                                             |
| Myrsinoideae              | (incl. Aegiceras)    | (32/900)                         |                                             |
| Maesoideae                | (1/100)              |                                  |                                             |
| Primulaceae               | (incl. Coris)        | (C; 20/1000)                     |                                             |
| Plumbaginaceae            | (C; 19/775)          |                                  |                                             |
| Plumbaginaceae            | (C; 19/775)          |                                  |                                             |
| Plumbaginioideae          | (4/24)               |                                  |                                             |
| Staticioideae             | (incl. Aegialitis)   | (15/750)                         |                                             |
| Polygonales               | (B; 49/1100)         |                                  |                                             |
| Polygonaceae              | (C; 49/1100)         |                                  |                                             |
| Eriogonoideae             | (17/316)             |                                  |                                             |
| Polygonaceae              | (24/550)             |                                  |                                             |
| Coccoloboideae            | (8/230)              |                                  |                                             |
| Celastracea               | (A; 60/875)          |                                  |                                             |
| Celastrales               | (B; 60/875)          |                                  |                                             |
| Celastraceae              | (C; 55/855)          |                                  |                                             |
| Celastroideae             | (25/?)               |                                  |                                             |
| Tripteryginoideae         | (5/34)               |                                  |                                             |
| Cassinoideae              | (20/?)               |                                  |                                             |
| Hippocrateoiideae         | (4/100)              |                                  |                                             |
| Siphonodontoiideae        | (1/5)                |                                  |                                             |
| Goupiaceae                | (B; 1/3)             |                                  |                                             |
| Lophopyxidaceae           | (B; 1/2)             |                                  |                                             |
| Stackhousiaceae           | (B; 3/16)            |                                  |                                             |
| Macgregorioidae           | (1/1)                |                                  |                                             |
| Stackhousioideae          | (2/15)               |                                  |                                             |
| Malvaneae                 | (C; 769/14,610)      |                                  |                                             |
| Malvales                  | (C; 246/3300)        |                                  |                                             |
| Sterculineae              | (C; 151/2120)        |                                  |                                             |
| Sterculiaceae             | (C; 60/700)          |                                  |                                             |
| Sterculioideae            | (12/?)               |                                  |                                             |
| Byttnerioidae             | (48/?)               |                                  |                                             |
| Huaceae                   | (C; 2/3)             |                                  |                                             |
| Elaeocarpaceae            | (excl. Muntingia)    | (A; 9/350)                       |                                             |
| Plagiopteraceae           | (A; 1/1)             |                                  |                                             |
| Tiliaceae                 | (C; 49/450)          |                                  |                                             |
| Brownlowioideae           | (12/56)              |                                  |                                             |
| Tetralicoideae            | (1/3)                |                                  |                                             |
| Tilioideae                | (35/390)             |                                  |                                             |
| Neotessmannioideae        | (1/1)                |                                  |                                             |
| Monotaceae                | (C; 3/21)            |                                  |                                             |
| Pakaramaeoideae           | (1/1)                |                                  |                                             |
| Monotoideae               | (2/20)               |                                  |                                             |
| Dipterocarpaceae          | (C; 16/550)          |                                  |                                             |
| Sarcolaenaceae            | (C; 8/28)            |                                  |                                             |
| Diegodendraceae           | (Rhopalocarpaeceae)   | (B; 3/15)                        |                                             |
| Rhopalocarpoidae          | (C; 2/14)            |                                  |                                             |
| Diegodendroideae          | (1/1)                |                                  |                                             |
| Malvaceae                 | (C; 95/1180)         |                                  |                                             |
| Bombacaceae               | (C; 20/180)          |                                  |                                             |
| Malvaceae                 | (C; 75/1000)         |                                  |                                             |
| Urticales (excl. Barbeya) | (C; 116/2680)        |                                  |                                             |
| Urticales                 | (C; 15/200)          |                                  |                                             |
| Celtidoideae              |                       |                                  |                                             |
| Ulmoideae                 |                       |                                  |                                             |
| Moraceae                  | (C; 53/1400)         |                                  |                                             |
| Cecropiaceae              | (C; 6/275)           |                                  |                                             |
| Urticales                 | (C; 39/800)          |                                  |                                             |
| Cannabaceae               | (C; 3/3)             |                                  |                                             |
| Rhamnales                 | (C; 48/900)          |                                  |                                             |
Rhamnaceae (C; 45/850)
Elaeagnaceae (C; 3/50)
Euphorbiales (C; 359/7730)
Euphorbiaceae (C; 304/7030)
Phylanthoideae
Oldfieldioideae (incl. *Picrodendron*)
Acalyphoideae
Crotonoideae
Euphorbioidae
Pandioideae (C; 4/28)
Simmondsiaceae (C; 1/1)
Dichapetalaceae (B; 4/200)
Gonystylaceae (C; 3/23)
Thymelaeaceae (C; 47/475)
Aquilarioideae (5/40)
Gilgiodaphnoideae (1/1)
Thymelaeoideae (41/435)
Violanee (C; 716/9550)
Violales (C; 288/5350)
Cistineae (C; 11/225)
Bixaceae (1/4)
Coelospermaceae (C; 2/20)
Cistaceae (C; 8/200)
Violineae (incl. Caricinaceae, Sali- cales) (C; 144/3185)
Violaceae (C; 22/900)
Violoidae (21/895)
Leonioideae (1/6)
Flacourtiaeae (C; 79/880)
Lacistemataceae (C; 2/27)
Salicaceae (C; 3/530)
Dipentodontaceae (C; 1/1)
Perdiscaceae (B; 2/2)
Scrophulomaceae (C; 1/1)
Passifloraceae (incl. Abatieae, Paropsieae) (C; 18/630)
Turneraceae (C; 8/120)
Malesherbiaceae (C; 1/35)
Achariaceae (C; 3/3)
Caricaceae (C; 4/55)
Tamaricinaceae (C; 7/190)
Tamaricaceae (C; 5/100)
Frankeniaceae (C; 2/90)
Begoniineae (C; 126/1750) (incl. Cucurbitineae)
Cucurbitaceae (18/80)
Zanioioideae (118/825)
Cucurbitoideae (100/745)
Begoniaceae (C; 5/920)
Datiscaeae (incl. Tetrameleae) (C; 3/4)
Capparales (C; 428/4200)
Resedaceae (C; 6/70)
Capparaceae (C; 45/850)
Tovarioidae (C; 1/2)
Pentadiplandroideae (B; 1/2)
Koeberlinioideae (C; 1/1)
Capparoidae (incl. *Dipterygium, Oceanopapaver*) (C; 30/640)
Cleomoidae (incl. *Buhsia, Podandrogyn* (C; 13/285)
Brassicaceae (excl. *Dipterygium*) (C; 376/3200)
Sanalanae (B; 163/2040)
Santalales (C; 143/1995)
Olacaceae (C; 25/250)
Olocoideae (23/240)
Ocknemoidae (1/6)
Erythropaloeidosae (1/2)
Opiliaceae (C; 10/30)
Medusandraceae (C; 1/2)
Santalaceae (incl. *Okoubaka*) (C; 30/400)
Misodendraceae (C; 1/11)
Loranthaceae (C; 65/850)
Eremolepidaceae (C; 3/12)
Viscaceae (C; 8/440)
Balanophorales (B; 19/45)
Balanophoraceae (C; 18/43)
Mystropetaloidaeae (1/1)
Dactylanthoidae (2/2)
Sarcophytoidae (2/3)
Helosoidae (6/12)
Lophophytoidae (4/8)
Balanophoroideae (3/17)
Cynomoriaceae (B; 1/1-2)
Geranianae (B; 189/5565)
Linales (C; 56/865)
Humiriaceae (C; 8/50)
Ctenolophonaceae (C; 1/3)
Hugoniaceae (C; 6/55)
Ixonomatraceae (B; 4/33)
Linaceae (C; 6/210)
Erythroxylaceae (C; 2/250)
Zygophyllaceae (C; 28/255)
Peganioideae (1/6)
Morkillioideae (Chitonioideae) (3/4)
Tetradiscioidae (1/1)
Tribulioideae (4/60)
Neoluederitzioideae (2/2)
Zygophyloideae (15/175)
Augeoideae (1/1)
Nitrarioideae (1/8)
Balaniaceae (B; 1/9)
Rhizophorales (B; 12/84)
Rhizophoraceae (C; 12/84)
Geraniaceae (B; 29/2370)
Oxalidaceae (incl. Averrhoaceae, Lepidobotrys) (C; 7/890)
Geraniaceae (B; 13/775)
Geranioideae (5/750)
Biebersteinioideae (1/5)
Dirachmoideae (1/1)
Vivianoideae (4/6)
Ledocarpoideae (2/11)
Balsaminaceae (C; 5/600)
Tropaeolaceae (C; 2/92)
Limnanthaceae (C; 1/11)
Malpighiales (C; 92/2245)
Malpighiaceae (C; 66/1200)
Byroninoideae
Gaudichaudioidae
Malpighioideae
Trigonioideae (C; 3/26)
Vochysiaceae (C; 7/200)
Polygalaceae (incl. Diclidanthera, Xanthophyllum) (C; 15/800)
Kramerioideae (B; 1/20)
Rutaceae (C; 1135/24,300)
Rutaceae (C; 154/925)
Rutaleae (C; 1135/24,300)
Rutaceae (C; 326/3545)
Rutaceae (C; 154/925)
Rutoideae (incl. Toddaliaioideae) (117/?)
Citroideae (=Aurantioidae) (30/?)
Flindersioideae (2/17)
Spathelioideae (4/23)
Dictyloomatoideae (1/2)
Rhabdodendraceae (B; 1/4)
Cneoraceae (C; 1/3)
Simaroubaceae (C; 27/192)
Simarouboidae (incl. Harisonia) (20/116)
Kirkioideae (1/8)
Irvingioideae (incl. Allanto-spernum) (4/23)
Picramnioideae (1/40)
Alvaradoideae (1/5)
Ptaeroxylaceae (C; 2/5)
Meliaceae (C; 52/1310)
Meliodae (incl. Nymania) (37/1260)
Quivisianthioideae (1/1)
Capuronioideae (1/1)
Swietenioideae (13/47)
Burseraceae (C; 17/500)
Anacardiaceae (incl. Blepharocarya, Dobinea, Julianiaceae) (C; 70/600)
Leitnerioideae (B; 1/1)
Tepuianthioideae (A; 1/5)
Coriariineae (C; 1/5)
Coriariaceae (C; 1/5)
Sapindinae (C; 161/2425)
Sapindaceae (incl. Filicium) (C; 143/2000)
Dodonioideae (29/120)
Stylobasioideae (1/2)
Emblingioideae (1/1)
Sapindoideae (112/1880)
Gyrostemonaceae (C; 5/17)
Bataceae (B; 1/2)
Sabioideae (C; 3/160)
Meliomioideae (2/105)
Sabioideae (B; 1/55)
Melianthioideae (C; 2/15)
Akanioideae (C; 1/1)
Aceraceae (C; 2/200)
Hippocastanaceae (C; 2/15)
Bretschneideraceae (C; 1/2)
Moringaceae (B; 1/14)
Fabioideae (C; 647/18,325)
Surianaceae (A; 1/1)
Connaraceae (C; 16/325)
Connaroideae (15/322)
Jollydoroideae (1/3)
Fabaceae (C; 630/18,000)
Caesalpinioideae (150/2700)
Mimosoideae (40/2500)
Swartzioideae (11/185)
Faboideae (429/12,615)
Proteaceae (C; 75/1050)
Proteaethraceae (C; 75/1050)
Prosoecmoidae (7/743)
Proteoideae (26/7)
Sphalmoideae (1/1)
Carnarvonioideae (1/2)
Grevilleioideae (40/7)
Rosaceae (B; 396/6830)
Hamamelidales (C; 34/105)
Trochodendridae (C; 5/7)
Trochodendraceae (C; 2/2)
Trochodendroideae (C; 1/1)
Tetracentroideae (C; 1/1)
Eupteleaceae (C; 1/2)
Cercidiphyllaceae (C; 1/2)
Eucommiaceae (C; 1/1)
Hamamelidinae (C; 31/130)
Platanaceae (C; 1/9)
Hamamelidaceae (C; 30/120)
Hamamelidoideae (22/100)
Rhodoleioideae (1/1)
Exbucklandioideae (incl. Disanthus) (4/5)
Altingioideae (=Liquidambaroideae) (3/12)
Casuarinaceae (C; 4/70)
Casuarinaceae (C; 4/70)
Buxales (C; 8/120)
Buxineae (B; 6/105)
Buxaceae (excl. Simmondsia) (C; 5/103)
Buxoideae (4/100)
Styloceratoideae (1/3)
Didymelaceae (B; 1/2)
Daphniphyllineae (C; 2/17)
Daphniphyllaceae (C; 1/9)
Balanopaceae (C; 1/8)
Pittosporales (C; 14/195)
Pittosporaceae (C; 10/150)
Byblidaceae (C; 1/2)
Tremandraceae (C; 3/43)
Bruniaceae (C; 17/115)
Roridulaceae (C; 1/2)
Bruniaceae (C; 12/75)
Geissolomataceae (C; 1/1)
Grubbiaceae (C; 1/3)
Myrothamnaceae (C; 1/2)
Hydrostachyaceae (C; 1/30)
Juglandales (A; 13/100)
Juglandineae (C; 9/60)
Rhoipteleaceae (C; 1/1)
Juglandaceae (C; 8/59)
Myricineae (C; 3/40)
Myricaceae (incl. Canacomyrica) (C; 3/40)
Fagales (C; 17/890)
Ticodendraceae (C; 1/1)
Betulaceae (C; 6/157)
Coryloideae (4/62)
Betuloideae (2/95)
Nothofagaceae (C; 1/35)
Fagaceae (C; 9/700-800)
Castaneoideae (4/300)
Fagoideae (5/400-500)
Rosales (C; 110/2050)
Rosaceae (C; 100/2000)
Spiraeoideae (incl. Lyonothamnus)
Quillajeoideae (2/8)
Rosoideae
Maloidae (incl. Lindleya, Vauquelinia)
Prunoideae (incl. Exochorda)
Neuradaceae (B; 3/10)
Crossosomataceae (incl. Apache, Glossopetalon) (C; 3/7)
Anisophylleaceae (A; 4/34)
Saxifragales (C; 95/2575)
Tetracarpaeaceae (B; 1/1)
Crassulaceae (C; 35/1500)
Sedoideae (incl. Sempervivae, Echeverieae)
Cotyledonoideae (incl. Kalanchoeeae)
Crassulaceae
Cephalotaceae (C; 1/1)
Penthoraceae (C; 1/2)
Saxifragaceae (C; 30/550)
Astilboideae (3/40)
Saxifragoideae (27/510)
| Family                              | Subdivision  | Rank   | Nodes  |
|-------------------------------------|--------------|--------|--------|
| Francoaceae                         | C; 2/2       |        |        |
| Alseuosmiaceae (incl. Wittsteinia s.l.) | C; 3/12      |        |        |
| Grossulariaceae                     | C; 1/150     |        |        |
| Vahliaeae                           | C; 1/5       |        |        |
| Eremosynaceae                       | C; 1/1       |        |        |
| Lepuropetalaceae                    | C; 1/1       |        |        |
| Parnassiaceae                       | B; 1/50      |        |        |
| Stylidiaceae                        | B; 6/172     |        |        |
| Donatioideae                        | C; 1/2       |        |        |
| Stylidioidae                        | C; 5/170     |        |        |
| Droseraceae                         | C; 4/110     |        |        |
| Greyiaeae                           | C; 1/3       |        |        |
| Diapensiaceae (excl. Diplarche)     | B; 6/20      |        |        |
| Podostemales                        | B; 50/140    |        |        |
| Podostemaceae                       | C; 50/140    |        |        |
| Tristichoideae                      | 5/10         |        |        |
| Podostemoideae                      | 45/130       |        |        |
| Cunoniales                          | C; 33/470    |        |        |
| Cunoniaceae                         | C; 27/410    |        |        |
| Cunonioideae                        | 24/350       |        |        |
| Baueroideae                         | 1/3          |        |        |
| Eucryphioidae                       | 1/6          |        |        |
| Brunellioidae                       | 1/52         |        |        |
| Davidsoniaceae                      | C; 1/1       |        |        |
| Staphyleaceae                       | C; 5/60      |        |        |
| Staphyleoidae                       | 3/55         |        |        |
| Tapisioideae                        | 2/5          |        |        |
| Cornanae (B; 578/7120)              |              |        |        |
| Hydrangeales                        | B; 42/485    |        |        |
| Hydrangeaceae                       | C; 17/250    |        |        |
| Philadelphioideae                   | C; 7/135     |        |        |
| Kirengeshimoideae                   | C; 1/1       |        |        |
| Hydrangeoidae                       | C; 9/114     |        |        |
| Escalloniaceae                      | C; 15/200    |        |        |
| Escallonioideae (incl. Corokia)     | C; 10/165    |        |        |
| Iteoideae                           | 2/22         |        |        |
| Tribeloideae                        | 1/1          |        |        |
| Phyllonimoideae                     | 1/8          |        |        |
| Pterostemoideae                     | 1/2          |        |        |
| Griseliniaceae                      | B; 1/6       |        |        |
| Montiniaceae (incl. Kaliphora, Melanophylla) | C; 4/13      |        |        |
| Braxiaceae                          | B; 3/11      |        |        |
| Columelliaceae                      | C; 1/4       |        |        |
| Desfontainiaceae                    | B; 1/1       |        |        |
| Cornales (B; 34/985)                |              |        |        |
| Vitineae (B; 13/735)                |              |        |        |
| Vitaceae (C; 13/735)                |              |        |        |
| Vitoideae (12/700)                  |              |        |        |
| Leeoideae                           | 1/34         |        |        |
| Gunnerineae (B; 1/35)               |              |        |        |
| Gunneraceae                         | C; 1/35      |        |        |
| Haloragaceae                        | C; 9/100     |        |        |
| Haloragineae                        | C; 9/100     |        |        |
| Cornineae                           | C; 11/115    |        |        |
| Cornaceae                           | C; 6/78      |        |        |
| Davidioideae                        | 1/1          |        |        |
| Nyssioideae                         | 2/6          |        |        |
| Mastixioideae                       | 2/25         |        |        |
| Cornoideae                          | 1/46         |        |        |
| Curtisiaceae                        | C; 1/1       |        |        |
| Alangiaceae                         | C; 1/19      |        |        |
| Garryaceae                          | C; 1/12      |        |        |
| Aucubaceae                          | C; 1/3       |        |        |
| Araliaceae                          | C; 1/1       |        |        |
| Araliaceae (C; 462/4260)            |              |        |        |
| Helwingiaceae                       | C; 1/5       |        |        |
| Torricelliaceae                     | C; 1/3       |        |        |
| Araliaceae (C; 50/1150)             |              |        |        |
| Hydrocotylaceae                     | C; 45/300    |        |        |
| Apiaceae (C; 365/2800)              |              |        |        |
| Saniculoideae                       |              |        |        |
| Apioideae                           |              |        |        |
| Dipsaceae (C; 40/1390)              |              |        |        |
| Caprifoliaceae                      | C; 12/450    |        |        |
| Adoxaceae (C; 5/243)                |              |        |        |
| Adoxoideae (incl. Sambucus)         | C; 4/43      |        |        |
| Viburnoideae                        | 1/200        |        |        |
| Valerianaceae                       | C; 13/400    |        |        |
| Triplostegiaceae                    | C; 1/2       |        |        |
| Dipsaceae                           | C; 8/280     |        |        |
| Morinaceae                          | C; 1/17      |        |        |
| Asteranae (incl. Campanulanae)      | B; 1251/21,500|        |        |
| Asterales (C; 1164/19,125)          |              |        |        |
| Calyceraceae                        | C; 4/40      |        |        |
| Asteraceae (C; 1160/19,085)         |              |        |        |
| Lactucoideae (Chloridoideae)        | 340/6370     |        |        |
| Barnadesieae                        | 9/95         |        |        |
| Mutisieae (81/800)                  |              |        |        |
| Tarchonantheae (2/27)               |              |        |        |
| Family                        | Species | Page |
|-------------------------------|---------|------|
| Cardueae (incl. Carlineae,    |         | 13/180 |
| Echinopsiдаe, Ere-           |         |      |
| methanмeae, Gundе-           |         |      |
| lieae) (80/2610)             |         |      |
| Vernonieae (incl. Stokesia,   |         | 70/1500 |
| Trichospira) (70/1500)       |         |      |
| Liabeae (15/160)             |         |      |
| Lactuceae (Cichorieae) (70/1000) |       |      |
| Arctoteae (excl. Ursinia) (13/180) |       |      |
| Asteroideae (820/12,715)     |         |      |
| Astereae (135/2500)          |         |      |
| Anthemideae (incl. Ursinia,   |         | 107/1650 |
| Cotula) (107/1650)           |         |      |
| Inuleae (incl. Gnaphalieae) (185/2050) |   |      |
| Senecioneae (incl. Blen-     |         | 100/2000 |
| nosperma) (100/2000)         |         |      |
| Calenduleae (7/110)          |         |      |
| Eupatoriаe (60/2000)         |         |      |
| Heliantheae (incl. Arnica,   |         | 177/1630 |
| Bahiinеae, Gaillardinеae, He-|         |      |
| leniеae, Medicеae) (177/1630)|       |      |
| Coreopsisеae (32/535)        |         |      |
| Tagetiаe (17/240)            |         |      |
| Campanulalеs (C; 87/2370)    |         |      |
| Menyanthaceе (C; 5/40)       |         |      |
| Pentaphragmatеae (C; 1/30)   |         |      |
| Sphenоcleаеae (C; 1/2)       |         |      |
| Campanulалеs (C; 65/2000)    |         |      |
| Campanuloidеae (34/820)      |         |      |
| Cyphiоiоdae (1/50)           |         |      |
| Lobeliоideae (incl. Cyphо- |         | 30/11300 |
| carpus) (30/11300)           |         |      |
| Goodeniасеae (excl. Brunоni-|         | 15/3000 |
| a) (C; 15/300)               |         |      |
| Goodenioideae (12/210)       |         |      |
| Dampierioideae (3/88)        |         |      |
| Solananeаe (C; 295/7730)     |         |      |
| Solanales (C; 295/7730)      |         |      |
| Solaninеае (C; 142/4755)     |         |      |
| Solananeае (C; 76/2900)      |         |      |
| Solanoideае (55/2400)       |         |      |
| Cestroiоdеae (20/485)        |         |      |
| Scleroiphylаcidеae (1/12)    |         |      |
| Duckeоdendrеae (B; 1/1)     |         |      |
| Goerzeасеae (B; 4/5)         |         |      |
| Nolanасеae (C; 1/18)        |         |      |
| Convolvulaceе (C; 59/1830)   |         |      |
| Humbertiоideae (1/1)         |         |      |
| Dichondriоideae (2/9)        |         |      |
| Convolvulоideae (55/1650)    |         |      |
| Cuscutoideae (1/170)         |         |      |
| Boragineае (C; 137/2655)     |         |      |
| Hydrophyllaceе (C; 18/250)   |         |      |
| Boragineае (C; 116/2400)    |         |      |
| Ehrettiоideae (11/145)       |         |      |
| Cordiоideae (4/255)          |         |      |
| Heliotropоideae (incl. Ixo- |         | 6/430 |
| rhea, Nogaliа) (6/430)       |         |      |
| Boragineае (95/1570)        |         |      |
| Wellstediоideae (1/2)        |         |      |
| Hoplestigmatеae (B; 1/2)    |         |      |
| Lennoасеae (C; 2/4)         |         |      |
| Polemoninеае (C; 16/320)    |         |      |
| Polemoniасеae (incl. Cobеа-|         | 16/320 |
| a) (C; 16/320)               |         |      |
| Loasaеae (A; 13/280)        |         |      |
| Loasales (C; 13/280)        |         |      |
| Loаsасеae (C; 13/280)       |         |      |
| Mentzelioideae (2/71)        |         |      |
| Loasoidеae (7/200)          |         |      |
| Gronoviоideae (4/8)         |         |      |
| Myrtaеae (C; 463/8120)      |         |      |
| Myrtalеs (C; 463/8120)      |         |      |
| Lythrинеae (B; 301/4465)    |         |      |
| Lythraceе (C; 25/460)       |         |      |
| Lythroidеae (22/450)        |         |      |
| Dубangoiоdеae (1/3)         |         |      |
| Sonneratiоideae (1/4)       |         |      |
| Punicоideae (1/2)           |         |      |
| Alzатеae (C; 1/2)           |         |      |
| Rhynchochalycanеae (C; 1/1) |         |      |
| Penеаеae (C; 5/25)          |         |      |
| Oliniаеae (C; 1/10)         |         |      |
| Trараеae (B; 1/1-3)         |         |      |
| Cryptерonoiaеae (C; 3/10)   |         |      |
| Melastomatеae (C; 244/3360) |         |      |
| Melastomatоideae (237/2950) |         |      |
| Memcеyloideae (incl. Ast-   |         | 7/410 |
| rоnia) (7/410)              |         |      |
| Combretеae (C; 20/600)      |         |      |
| Strephonematoideae (1/6)    |         |      |
| Combretоideae (19/595)      |         |      |
| Onагrineае (C; 18/650)     |         |      |
Onagraceae (C; 18/650)
Myrtineae (C; 144/3000)
Myrtaeae (C; 144/3000)
Heteropyxidoideae (incl. Psi­loxylon) (2/2)
Myrtoideae (incl. Lepto­spemoideae) (142/3000)

Gentiananae (C; 2039/31,825)
Gentianales (C; 958/14,145)
Loganiaceae (B; 22/545)
Loganieae (18/480)
Potilioideae (3/65)
Plocospermaoideae (1/1)

Rubiaceae (C; 500–600/9000)
Cinchoonoeae (incl. Hillia)
Antirrheoeae (=Guettard­oaideae)
Ixoroideae
Rubioideae (incl. Theligo­eeae, Henriquesiae)

Apocynaceae (incl. Asclepiad­acea) (C; 355/3700)
Plumerioideae (incl. Cerber­oeae) (101/?)
Apocynoideae (87/?)
Periplocoideae (C; 45/200)
Secamonoideae
Asclepiadoideae
Gentianaceae (C; 80/900)
Saccifo1iaceae (B; 1/1)

Bignonieae (C; 1083/17,680)
Bignonieae (C; 786/10,820)
Oleaceae (C; 29/600)
Jasminoideae (incl. Nyc­tanthes)
Oleoidae (incl. Hesper­ea)

Buddlejaceae (C; 10/150)
Stilbaceae (C; 6/13)
Retzioidae (1/1)
Stilboideae (5/12)
Bignoniaceae (excl. Schlegel­ieae=Paulownieae) (C; 113/800)

Pedaliaceae (incl. Trapella) (C; 12/70)
Martyniaceae (C; 2/12)
Myoporaceae (C; 3/135)
Scrophulariaceae (incl. Schle­gelieae, Leucophy1ae, Of­tia) (C; 212/2700)
Scrophularioideae
Rhinanthioideae
Orobanchoideae (13/150)

Selaginaceae (C; 8/300)
Globulariaceae (C; 2/30)
Plantaginaceae (C; 3/220)
Lentibulariaceae (C; 4/170)
Acanthaceae (C; 256/2770)
Nelsonioideae (5/15)
Thunbergioideae (4/205)
Mendoncioideae (2/60)
Acanthioideae

Rubioideae

Gesneriaceae (C; 126/2850)
Gesnerioideae (54/1280)
Coronantherioideae (9/20)

Cyrta­ndroideae (63/1550)

Lamiineae (C; 297/6860)
Verbenaceae (C; 99/3150)
Viticoideae
Verbenoideae
Caryopteridoideae (6/40)
Phrymatoideae (1/1)
Symphoremataceae (B; 3/34)
Chloanthaceae (excl. Spar­tothammella) (C; 9/105)

Nesogenaceae (B; 2/11)
Avicenniaceae (C; 1/15)
Lamiaceae (C; 180/3500)


Ocimoideae

Lamioidae
Tetrachondraceae (C; 1/2)
Calitrichaceae (C; 1/40–60)

Hippuridaceae (B; 1/3)
Subclass: Monocotyledoneae (Liliidae)

Liliaceae (B; 22/485)
  Tricyrtidoideae (incl. Uvulariae) (8/40)
  Lilioidae (incl. Calochortus, Gageae, Medeoleae, Tulipeae) (14/445)
Trilliaceae (C; 2/50)
Iridinae (C; 78/1655)
  Iridinae (C; 78/1655)
  Isophysioidae (1/1)
  Niwenioideae (incl. Geosiris) (6/85)
  Irioidae (incl. Sisyrichieae, Tigridae, Marcoeae) (43/700)
  Ixioideae (28/870)
Burmanniales (C; 17/145)
  Burmanniaceae (C; 15/135)
  Burmannioidae (9/100)
  Thismioidae (6/35)
  Corsiaceae (C; 2/9)
Asparagales (B; 252/5290)
  Asparagineae (B; 120/2570)
  Asparagaceae (B; 26/440)
  Convallarioideae (incl. Aspidistreae, Ophiopogonae, Polygonatae) (19/110)

Asparagoideae (1/312)
Ruscoideae (3/8)
Herreroideae (3/9)
Asphodelaceae (incl. Aloeae) (B; 15/800)
Aphyllanthaceae (incl. Anthéricae: Caesiae, Hodgsonioideae, Johnsonioeae, Leucocrinum, Simethiéeae, Thysanoteae) (34/620)
Phormiaceae (B; 8/35)
Phormioideae (incl. Dianellae) (B; 7/32)
Doryanthoideae (1/3)
Tecophilaeaceae (incl. Walleriéeae) (B; 5/20)
Lanariaceae (C; 1/1)
Hemerocalliaceae (C; 1/16)
Dracaenaceae (B; 9/230)
Dracaenoidae (incl. Sansevieriéeae) (2/130)
Nolinoideae (3/50)
Astelioideae (4/50)
Hanguanaceae (B; 1/1 or 2)
Agavaceae (incl. only Agaveae, Yuccae) (C; 8/300)
Yuccoideae (2/42)
Agavoideae (6/260)
Hostaceae (C; 1/10)
Blandfordiaceae (B; 1/4)
Dasypogonaceae (B; 9/72)
Dasypogonoideae (1/3)
Calectasiae (1/2)
Lomandroideae (incl. Lomandreae, Xeroteae) (5/65)
Kingioideae (2/2)
Xanthorrhoeaceae (C; 1/28)
Amaryllidinae (B; 133/2720)
Ixiolirionaceae (C; 1/4)
Hyacinthaceae (= Scilloideae) (incl. Bowieae, Chloragaloideae, Hyacintheae, Massonieae, Scilleae) (C; 40/900)
| Family                      | Subclass | Class     | Order     | Number of Species |
|-----------------------------|----------|-----------|-----------|-------------------|
| Alliaceae                   | C        | C         | 30/720    |                   |
| Agapanthoideae              |          |           |           |                   |
| Allioideae (incl. Brodiaeae, Milleae) | 19/665  |           |           |                   |
| Gilliesioideae              | C        |           | 9/25      |                   |
| Amaryllidaceae (C; 50/860)  |          |           |           |                   |
| Hypoxidaceae (B; 10/150)    |          |           |           |                   |
| Cyanastraceae (C; 1/6)      |          |           |           |                   |
| Eriospermaeae (C; 1/80)     |          |           |           |                   |
| Dioscoreales (B; 16/1050)   |          |           |           |                   |
| Rhipogonaceae (C; 1/70)     |          |           |           |                   |
| Smilacaceae (C; 3/310)      |          |           |           |                   |
| Petermanniaceae (C; 1/1)    |          |           |           |                   |
| Dioscoreaceae (C; 5/625)    |          |           |           |                   |
| Stenomeridoideae (2/6)      |          |           |           |                   |
| Dioscoreoideae (3/620)      |          |           |           |                   |
| Trichopodaceae (C; 1/1)     |          |           |           |                   |
| Stemonaceae (C; 4/32)       |          |           |           |                   |
| Taccaceae (C; 1/10)         |          |           |           |                   |
| Orchidales (C; 736/20,120)  |          |           |           |                   |
| Orchidaceae (C; 736/20,120) |          |           |           |                   |
| Apostasiioideae (2/18)      |          |           |           |                   |
| Cypripedioidae (4/100–150)  |          |           |           |                   |
| Orchidoidae (incl. Neottioideae) |         |           |           |                   |
| Epidendroidae (incl. Van- doideae) |         |           |           |                   |
| Hydatellanae (A; 2/8)       |          |           |           |                   |
| Hydatellales (C; 2/8)       |          |           |           |                   |
| Hydatellaceae (C; 2/8)      |          |           |           |                   |
| Triuridanae (B; 8/80)       |          |           |           |                   |
| Triuridales (C; 8/80)       |          |           |           |                   |
| Triuridaceae (incl. Lacandonia, Peltophyllum) (8/80) | | | | |
| Alismatananae (C; 57/440)   |          |           |           |                   |
| Alismatales (C; 33/180)     |          |           |           |                   |
| Butomaceae (C; 1/1)         |          |           |           |                   |
| Alismataceae (C; 16/100)    |          |           |           |                   |
| Limnocharitoideae (3/11)    |          |           |           |                   |
| Alismatoideae (13/90)       |          |           |           |                   |
| Hydrocharitaceae (C; 16/80) |          |           |           |                   |
| Hydrocharitoideae (incl. Enhalus) (4/11) | | | | |
| Vallisnerioideae (10/64)    |          |           |           |                   |
| Thalassioidae (1/2)         |          |           |           |                   |
| Halophiloideae (1/4)        |          |           |           |                   |
| Zosterales (C; 23/209)      |          |           |           |                   |
| Aponogetonineae (C; 1/47)   |          |           |           |                   |
| Aponogetonaceae (C; 1/47)   |          |           |           |                   |
| Potamogetonineae (C; 19/162)|          |           |           |                   |
| Scheuchzeriaceae (C; 1/1)   |          |           |           |                   |
| Juncaginaceae (C; 5/17)     |          |           |           |                   |
| Juncaginoideae (C; 4/16)    |          |           |           |                   |
| Lilaeeoideae (C; 1/1)       |          |           |           |                   |
| Potamogetonaceae (C; 3/95)  |          |           |           |                   |
| Potamogetonoidae (2/90)     |          |           |           |                   |
| Ruppioidae (1/3–7)          |          |           |           |                   |
| Posidoniaceae (C; 1/3)      |          |           |           |                   |
| Cymodoceaceae (C; 5/16)     |          |           |           |                   |
| Zannichelliaceae (C; 4/12)  |          |           |           |                   |
| Zosteraeae (C; 3/18)        |          |           |           |                   |
| Najadaceae (C; 1/50)        |          |           |           |                   |
| Najadaeae (C; 1/50)         |          |           |           |                   |
| Aranae (C; 105/2500)        |          |           |           |                   |
| Arales (C; 105/2500)        |          |           |           |                   |
| Acoraceae (A; 1/3)          |          |           |           |                   |
| Araceae (C; 104/2500)       |          |           |           |                   |
| Pothoideae (incl. Monster- oideae) (19/1000) | | | | |
| Calloideae (incl. Philoden- droideae) (40/800) | | | | |
| Colocasioideae (15/205)     |          |           |           |                   |
| Lasioideae (incl. Symlocar- peae, Orontieae) (12/80) | | | | |
| Aroideae (incl. Pistia) (18/415) | | | | |
| Lemnaceae (C; 4/28)         |          |           |           |                   |
| Lemnoideae (2/14)           |          |           |           |                   |
| Wolffioideae (2/14)         |          |           |           |                   |
| Cyclanthanae (B; 11/240)    |          |           |           |                   |
| Cyclanthales (C; 11/240)    |          |           |           |                   |
| Cyclanthaceae (C; 11/240)   |          |           |           |                   |
| Carludovicoidae (10/240)    |          |           |           |                   |
| Cyclanthoideae (1/1)        |          |           |           |                   |
| Pandananae (B; 3/700)       |          |           |           |                   |
| Pandanales (C; 3/700)       |          |           |           |                   |
| Pandanaceae (C; 3/700)      |          |           |           |                   |
| Pandanoideae (2/600)        |          |           |           |                   |
| Freycinetioideae (1/100)    |          |           |           |                   |
| Arecales (C; 200/2780)      |          |           |           |                   |
| Arecales (C; 200/2780)      |          |           |           |                   |
| Arecales (C; 200/2780)      |          |           |           |                   |
| Ceroxyloideae (11/180)      |          |           |           |                   |
Arecoideae (incl. Caryotoidae, Cocosioideae) (124/1525)
Phytelephantoideae (3/15)
Commelinanae (C; 1229/22,120)
Bromeliales (C; 79/1905)
Bromeliinae (C; 56/1790)
Bromeliaceae (C; 51/1520)
Bromelioideae (30/425)
Pitcairnioideae (incl. Navia) (13/420)
Tillandsioideae (8/675)
Velloziaceae (C; 51250)
Vellozioideae (2/125)
Barbacenioideae (6/125)
Philydraceae (C; 3/6)
Pontederiaceae (C; 23/115)
Pontederiaceae (C; 5/30)
Typhales (C; 2/30)
Typhaceae (C; 2/30)
Sparganioideae (1/14)
Typhoideae (1/15)
Zingiberales (C; 92/1975)
Musineae (C; 2/42)
Musaceae (C; 2/42)
Strelitziinae (C; 3/7)
Strelitziaceae (C; 3/7)
Lowiinae (C; 1/6)
Lowiaceae (C; 1/6)
Heliconiinae (C; 1/250)
Heliconiaceae (C; 1/250)
Zingiberinae (C; 54/1150)
Zingiberaceae (C; 50/1000)
Costaceae (C; 4/150)
Marantinae (C; 31/520)
Cannaceae (C; 1/20)
Marantaceae (C; 30/500)
Commelinales (C; 74/2140)
Xyridineae (C; 20/350)
Rapateaceae (C; 16/80)
Saxofridericioidae (8/40)
Rapateoideae (8/40)
Xyridaceae (C; 4/270)
Xyridoideae (2/250)
Alobboidioideae (2/20)
Commelinineae (C; 41/615)
Commelinaceae (C; 40/605)
Caronematoideae (C; 2/7)
Commelinioideae (C; 38/600)
Mayacaceae (C; 1/10)
Eriocaulineae (C; 13/1175)
Eriocaulaceae (C; 13/1175)
Eriocauloideae (2/410)
Syngonanthoideae (2/200)
Paeplanthoideae (5/565)
Cyperales (C; 155/5620)
Thurniaceae (C; 1/3)
Juncaceae (C; 8/300)
Cyperaceae (C; 146/5315)
Mapanioidae (14/200)
Cyperoideae (57/2750)
Sclerioideae (70/365)
Caricoideae (15/2000)
Poaales (C; 800/10,450)
Flagellariineae (C; 49/450)
Flagellariaceae (excl. Hanguana) (C; 1/4)
Joinvilleaceae (C; 1/2)
Rustinaceae (C; 41/105)
Restionoideae (40/400)
Anarthrioidae (1/7)
Edecoiaceae (C; 2/2)
Centrolepidaeae (C; 4/30-35)
Poinaeae (C; 750/10,000)
Poaceae (C; 750/10,000)
Bambusoidae (incl. Anomochloaeae, Arundinarieae, Ehrhartaeae, Olyreae, Pariaeae, Streptochaetaeae) (94/?)
Oryzoideae (incl. Oryzeae, Zizanieae) (8/?)
Arundinoideae (incl. Aristidiaeae, Arundineae, Centosteeae, Micrarraeae, Stipeaeae, Thysanolaeneae) (65/?)
Poiideae (incl. Agrostioideae, Avenaeae, Bromeaeae, Lygeaeae, Nardeaeae, Triitiiaeae) (161/?)
Chloridoideae (incl. Eragostioideae, Muhlenbergiaeae, Neyraudiaeae, Pappophorineae, Triraphis) (122/?)
Panicoideae (incl. Andropogoneae, Eriachne) (237/?)

TAXA INCERTAE SEDIS

Aextoxicon Ruiz & Pav., Aextoxicaceae (1)—removed from Euphorbiales.
Barbeya Schweinf., Barbeyaceae (1)—removed from Urticales.
Brunonia Sm. ex R. Br., Brunoniaceae (1)—removed from Goodeniaceae.
Carpodetus J. R. & G. Forst., Carpodetaceae (10)—removed from Escalloniaceae.
Corynocarpus Forster & Forster, Corynocarpaceae (5)—removed from Cunoniales.

Haptanthus Goldberg & Nelson—relationships still unknown.
Heteranthia Nesse et Mart. (1)—probably in or near Solanaceae.
Metteniusa Karst, Metteniusiaceae (6)—removed from Alangiaceae or Icacinaceae, possibly related to latter.
Physena Nor. ex Thou., Physenaceae (2)—removed from Capparaceae or Passifloraceae.
Pteleocarpa Oliv. (1)—removed from Ehretioidae of Boraginaceae.
Salvadoraceae (3/12)—removed from Celastrales or Oleales.
Setchellanthus T. S. Brandegee (1)—removed from Capparaceae.
Trichostephanus Gilg (1)—removed from Flacourtiaceae.

ACKNOWLEDGMENTS

I am most grateful to all those botanists who have so generously supplied separates, books, specimens, and other information useful in compiling this synopsis. I am especially indebted to my fellow phylogenists, Arthur Cronquist, Armen Takhtajan, and Rolf and Gertrud Dahlgren for fruitful discussions, generous sharing of references and literature, and not least for their friendship and encouragement. I am also indebted to the various curators who have allowed me the use of their herbaria or who have sent me specimens on loan or on exchange for study.

LITERATURE CITED

Cantino, P. D. 1990. Evidence for a polyphyletic origin of the Labiatae. Suppl. Amer. J. Bot. 77(6): 110. (Abstr.)
Cronquist, A. 1981. An integrated system of classification of flowering plants. Columbia Univ. Press, New York. 1262 p.
Dahlgren, G. 1989a. The last Dahlgrenogram: system of classification of the dicotyledons, pp. 249–260. In K. Tan, R. R. Mill, and T. S. Elias [eds.], Plant taxonomy, phytogeography and related subjects. Edinburgh Univ. Press, Edinburgh.
———. 1989b. An updated angiosperm classification. J. Linn. Soc., Bot. 100:197–203.
Dahlgren, R. T., H. T. Clifford, and P. F. Yeo. 1985. The families of the Monocotyledons: structure, evolution, and taxonomy. Springer-Verlag, New York. 520 p.
Greuter, W., and other members of Editorial Committee [eds.]. 1988. International code of botanical nomenclature. Adopted by the Fourteenth International Botanical Congress, Berlin, July–August 1987. Reg. Veg. 118:1–328.
Lindley, J. 1833. Nixus Plantarum. London. x + 44 p.
Mabberley, D. J. 1987. The plant book. A portable dictionary of the higher plants. Cambridge Univ. Press, New York. xii + 706 p.
Melchior, H. [ed.] 1964. A. Engler’s Syllabus der Pflanzenfamilien, II. Angiospermen. 12th ed. Gebr. Borntraeger, Berlin. 666 p.
Raven, P. H., and D. I. Axelrod. 1972. Angiosperm biogeography and past continental movements. Ann. Missouri Bot. Gard. 61:539–673.

Shaw, H. K. Airy. 1985. A dictionary of the flowering plants and ferns by the late J. C. Willis. 8th (Student) Ed. Cambridge University Press, Cambridge. 1245 & ivi p.

Takhtajan, A. L. 1986. Floristic regions of the world. Univ. Calif. Press, Berkeley. 522 p.

Thorne, R. F. 1958. Some guiding principles of angiosperm phylogeny. Brittonia 10:72–77.

Thorne, R. F. 1963. Some problems and guiding principles of angiosperm phylogeny. Amer. Naturalist 97:287–305.

1968. Synopsis of a putatively phylogenetic classification of the flowering plants. Aliso 6(4): 57–66.

1973. Inclusion of the Apiaceae (Umbelliferae) in the Araliaceae. Notes Roy. Bot. Gard. Edinburgh 32:161–165.

1973 [publ. 1974a]. The “Amentiferae” or Hamamelidae as an artificial group: a summary statement. Brittonia 25:395–405.

1974b. Sapindales. Encycl. Brit. Ed. 15, 16:239–244.

1974c. A phylogenetic classification of the Annoniflorae. Aliso 8:147–209.

1975. Angiosperm phylogeny and geography. Ann. Missouri Bot. Gard. 62:362–367.

1976. A phylogenetic classification of the Angiospermae. Evol. Biol. 9:35–106.

1977. Some realignments in the Angiospermae. P. Syst. Evol. Suppl. 1:299–319.

1978. Winteraceae, p. 28. In V. H. Heywood, D. M. Moore, I. B. K. Richardson, and W. T. Stearn [eds.], Flowering plants of the world. Mayflower Books, New York.

1979. Parasites and phytophages—pragmatic chemists?, pp. 200–209. In I. Hedberg [ed.], Parasites as plant taxonomists. Proceedings of Symposium Held in Uppsala Aug. 25–27, 1978, in Commemoration of C. Linnaeus, C. P. Thunberg, E. Fries. Sym. Bot. Upsal. 22 (4).

1981. Phytochemistry and angiosperm phylogeny: a summary statement, pp. 233–295. In D. A. Young and D. S. Seigler (eds.), Phytochemistry and angiosperm phylogeny. Praeger Sci., New York.

1983. Proposed new realignments in the angiosperms. Nord. J. Bot. 3:85–117.

1985. Phylogenetic relationships of the monotypic family Simmondsiaceae. Jojoba Happenings 13(2):8.

1989a. Phylogeny and phytogeography. Rhodora 91:10–24.

1989b. ‘Hamamelididae’: a commentary, pp. 9–16, Vol. 1. In P. R. Crane and S. Blackmore [eds.], Evolution, systematics, and fossil history of the Hamamelidae. Systematics Assoc., Clarendon Press, Oxford.

1977. Glossopetalon A. Gray, a third genus in the Crossosomataceae (Rosineae, Rosales). Bot. Soc. Amer. Misc. Ser., Publ. 154:70. (Abstr.)

1978. Forseselisia Greene (Glossopetalon A. Gray), a third genus in the Crossosomataceae, Rosineae, Rosales. Aliso 9:171–178.