

An update of the Angiosperm Phylogeny Group classification for the orders and families of flowering plants: APG II

THE ANGIOSPERM PHYLOGENY GROUP*

Received June 2002; accepted for publication December 2002

A revised and updated classification for the families of the flowering plants is provided. Newly adopted orders include Austrobaileyales, Canellales, Gunnerales, Crossosomatales and Celastrales. Pertinent literature published since the first APG classification is included, such that many additional families are now placed in the phylogenetic scheme. Among these are Hydnoraceae (Piperales), Nartheciaceae (Dioscoreales), Corsiaceae (Liliales), Triuridaceae (Pandanales), Hanguanaceae (Commelinales), Bromeliaceae, Mayacaceae and Rapateaceae (all Poales), Barbeuiaceae and Gisekiaceae (both Caryophyllales), Geissolomataceae, Strasburgeriaceae and Vitaceae (unplaced to order, but included in the rosids), Zygophyllaceae (unplaced to order, but included in eurosids I), Bonnetiaceae, Ctenolophonaceae, Elatinaceae, Ixonanthaceae, Lophopyxidaceae, Podostemaceae (Malpighiales), Paracryphiaceae (unplaced in euasterid II), Sladeniaceae, Pentaphragmaceae (Ericales) and Cardiopteridaceae (Aquifoliales). Several major families are recircumscribed. Salicaceae are expanded to include a large part of Flacourtiaceae, including the type genus of that family; another portion of former Flacourtiaceae is assigned to an expanded circumscription of Achariaceae. Euphorbiaceae are restricted to the uniovulate subfamilies; Phyllanthoideae are recognized as Phyllanthaceae and Oldfieldioideae as Picrodendraceae. Scrophulariaceae are recircumscribed to include Buddlejaceae and Myoporaceae and exclude several former members; these are assigned to Calceolariaceae, Orobanchaceae and Plantaginaceae. We expand the use of bracketing families that could be included optionally in broader circumscriptions with other related families; these include Agapanthaceae and Amaryllidaceae in Alliaceae *s.l.*, Agavaceae, Hyacinthaceae and Ruscaceae (among many other Asparagales) in Asparagaceae *s.l.*, Dichapetalaceae in Chrysobalanaceae, Turneraceae in Passifloraceae, Erythroxylaceae in Rhizophoraceae, and Diervillaceae, Dipsacaceae, Linnaceae, Morinaceae and Valerianaceae in Caprifoliaceae *s.l.* © 2003 The Linnean Society of London, *Botanical Journal of the Linnean Society*, 2003, 141, 399–436.

ADDITIONAL KEYWORDS: angiosperms – gene sequences – phylogenetics.

INTRODUCTION

During the 1990s, reconstruction of flowering plant phylogeny took a great step forward. Rapidly accumu-

lating DNA sequences, in particular from the plastid gene *rbcl* (e.g. Chase *et al.*, 1993), provided new and informative sets of data. Cladistic analysis of these data sets was also much improved, especially through

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Recommended citation abbreviated as 'APG II 2003.' This paper was compiled by Birgitta Bremer, Kåre Bremer, Mark W. Chase, James L. Reveal, Douglas E. Soltis, Pamela S. Soltis and Peter F. Stevens, who were equally responsible and listed here in alphabetical order only, with contributions from Arne A. Anderberg, Michael F. Fay, Peter Goldblatt, Walter S. Judd, Mari Källersjö, Jesper Kårehed, Kathleen A. Kron, Johannes Lundberg, Daniel L. Nickrent, Richard G. Olmstead, Bengt Oxelman, J. Chris Pires, James E. Rodman, Paula J. Rudall, Vincent Savolainen, Kenneth J. Sytsma, Michelle van der Bank, Kenneth Wurdack, Jenny Q.-Y. Xiang and Sue Zmarzty (in alphabetical order). Addresses: B. Bremer, The Bergius Foundation at the Royal Swedish Academy of Sciences, PO Box 50017, SE-104 05 Stockholm, Sweden; K. Bremer, Department of Systematic Botany, Evolutionary Biology Centre, Uppsala University, Norbyv. 18D, SE-752 36 Uppsala, Sweden; M. W. Chase, Jodrell Laboratory, Royal Botanic Gardens, Kew, Richmond, Surrey, TW9 3DS, UK; J. L. Reveal, University of Maryland, 18625 Spring Canyon Road, Montrose, Colorado 81401–7906, USA; D. E. Soltis, Department of Botany, University of Florida, Gainesville, Florida 32611–8526, USA; P. S. Soltis, Florida Museum of Natural History, Dickinson Hall, University of Florida, Gainesville, Florida, 32611–7800, USA; and P. F. Stevens, Department of Biology, University of Missouri–St. Louis and Missouri Botanical Garden, PO Box 299, St. Louis, Missouri 63166–0299, USA.

development of phylogenetic theory and application to analysis of large data sets (e.g. Hillis, 1996) and various methods for estimating the support for individual clades in the phylogenetic trees (Felsenstein, 1985; Farris *et al.*, 1996). The outline of a phylogenetic tree of all flowering plants became established, and several well supported major clades involving many families of flowering plants were identified. In many cases the new knowledge of phylogeny revealed relationships in conflict with the then widely used modern classifications (e.g. Cronquist, 1981; Thorne, 1992; Takhtajan, 1997), which were based on selected similarities and differences in morphology rather than cladistic analysis of larger data sets involving DNA sequences or other forms of systematic data. It became clear that none of the previous classifications accurately reflected phylogenetic relationships of flowering plants, and communication about plant evolution referring to the old classification schemes became increasingly difficult. To alleviate this problem, a group of flowering plant systematists, calling themselves the Angiosperm Phylogeny Group (APG for short), proposed a new classification for the families of flowering plants (APG, 1998).

The initial APG (1998) system comprised 462 families arranged in 40 putatively monophyletic orders and a few monophyletic higher groups. The latter were named informally as monocots, commelinoids (here changed to commelinids to prevent confusion with subfamily Commelinoideae of Commelinaceae), eudicots, core eudicots, rosids including eurosids I and II and asterids including euasterids I and II. The focus was on orders and less on families. An attempt was made to recognize orders well supported as monophyletic in large jackknife analyses of molecular data (Källersjö *et al.*, 1998). In general, the orders were fairly widely circumscribed, especially in comparison with those of Takhtajan (1997). A few monofamilial orders were recognized (Ceratophyllales, Acorales and Arecales) for cases in which these families were apparently sister groups of larger clades including several orders. Many families were not classified to order because their positions were uncertain or unknown, and these families were listed under the supraordinal groups where they were known to belong or at the end of the system in a list of families, probably eudicots, of uncertain position. APG predicted that there would be little need to change the circumscription of the orders except for inclusion of families not then assigned to order and possible transfer of occasional misplaced families. It was also realized that new orders might be established if monophyletic groups of unplaced families were identified.

The APG system also involved the recognition of strictly monophyletic groups at all levels, but it was acknowledged that there were families known to be

non-monophyletic (e.g. Euphorbiaceae and Scrophulariaceae). Reclassification of these into monophyletic units was not possible in 1998 and required further investigation. Furthermore, monophyly of many families remained to be investigated with extensive sampling and application of molecular phylogenetic techniques. Thus, it was acknowledged that some changes in family circumscription would be necessary to reflect improved understanding of phylogenetic relationships. For some families already investigated and found to be monophyletic, alternative, optional circumscriptions were indicated by listing the sister family or families in square brackets immediately after the family. For example, Nymphaeaceae could be interpreted either to exclude or include a sister family Cabombaceae.

Five years have now passed since the APG system was compiled. Recent advances in our knowledge of flowering plant phylogeny indeed have motivated several changes in family circumscription and classification, as well as the addition of a few new orders. We therefore present here an updated version of the APG system.

In general, we have adopted a conservative approach and propose here changes in the APG system only when there is substantial new evidence supporting a revised classification. Five additional orders are recognized, Austrobaileyales, Canellales, Celastrales, Crossosomatales and Gunnerales. These represent well-supported monophyletic groups of families unclassified to order in APG (1998). Circumscription of none of the APG orders has been changed except for the addition of a number of the families unclassified to order in APG (1998). When more recent analyses have demonstrated that such families of formerly uncertain position are well nested inside the APG orders or well supported as sister groups to any of the APG orders, the latter have been expanded to include these families. Thus, some APG orders have been more widely circumscribed to include their sister groups (e.g. Adoxaceae being included in Dipsacales; cf. Bremer, 2000), except in one case in which the pair of Canellaceae and Winteraceae has been established as an order Canellales rather than included in their sister group, Piperales (most researchers would consider these two groups too divergent to include in a single order). No APG orders have been merged or split, and no families have been transferred from one order to another. Only in one case has a family been removed from an APG order; Oncothecaceae have been excluded from Garryales and assigned to a position at the beginning of the euasterids I without classification to order because recent analyses have not supported any clear (i.e. bootstrap- or jackknife-supported) ordinal position for that family.

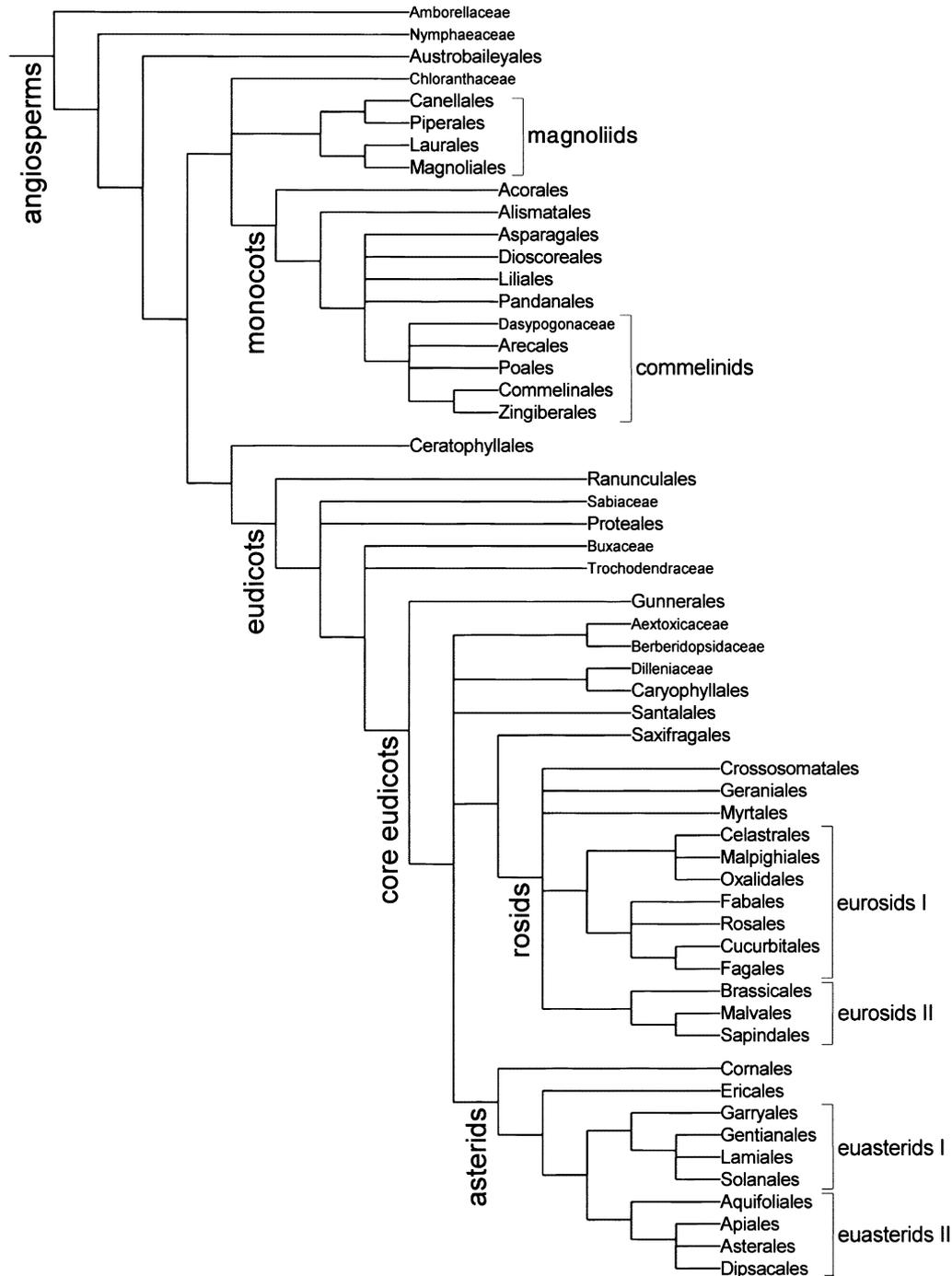


Figure 1. Interrelationships of the orders and some families supported by jackknife or bootstrap frequencies above 50% in large-scale analyses of angiosperms. All except five of the clades are supported by the Soltis *et al.* (2000) analysis of 18S rDNA, *rbcL*, and *atpB* sequences from a wide sample of angiosperms. Three clades, Caneliales+Piperales, Laurales+Magnoliales, and these four orders together, are supported by analyses of several different gene sequences of phylogenetically basal angiosperms (Qiu *et al.*, 1999; Graham & Olmstead, 2000). One clade, that of all core eudicots except Gunnerales, is supported by analysis of *rbcL* sequences from a wide sample of eudicots (Savolainen *et al.*, 2000). Another clade, that of all asterids except Cornales, is supported by a six-marker analysis of a wide sample of asterids (Bremer *et al.*, 2002). Rosid and asterid families not classified to order are not shown.

Interrelationships among the orders and some of the unclassified families are now better understood than they were when the APG system was developed. In Figure 1 we show interrelationships of the orders and some families supported by jackknife or bootstrap percentages above 50% in large-scale analyses of 18S rDNA, *rbcL*, and *atpB* sequences from a wide sample of angiosperms (Soltis *et al.*, 2000a). Similar relationships were shown based on analyses of several genes from phylogenetically basal angiosperms (Qiu *et al.*, 1999; Graham & Olmstead, 2000; Zanis *et al.*, 2002) and of *rbcL* sequences with a wide sample of eudicots (Savolainen *et al.*, 2000b; cf. also Källersjö *et al.*, 1998). However, relationships among the major orders of monocots and core eudicots, and partly among the orders of rosids and asterids, are still uncertain (Fig. 1; Chase *et al.*, 2000; Soltis *et al.*, 2000a).

At the family level several families have been synonymised or re-circumscribed, especially in Asparagales, Malpighiales and Lamiales. A few families have been re-established from synonymy to make them monophyletic in so far as it is possible given current knowledge about generic interrelationships. As a general principle, we have avoided changing circumscription of the families unless necessary to preserve monophyly. There are, however, two exceptions to this general principle of stability. First, detailed work within some taxa since APG (1998) has generated much new knowledge about interrelationships, and when specialists have proposed a new and well supported classification, it has been followed even if our previous classification did comprise monophyletic families. Second, in several cases accumulating knowledge of phylogeny has demonstrated sister-group relationships involving small monogeneric families. Such taxa represent redundancies in classification, and hence we have usually reduced monogeneric families to synonymy to reduce this redundancy. In some cases, however, we have retained the existing family classification when it was judged that a monogeneric family is so different morphologically from its sister group that merging the two would create a morphologically unrecognizable entity. We recognize that decisions using the argument 'too divergent morphologically' are likely to be highly subjective and largely intuitive, but these arguments are a long established tradition. We generally accept the opinion of specialists in such cases, but we also recognize that specialists nearly always favour splitting of groups they view as 'too heterogeneous'. In several cases, we have listed families in brackets, indicating the possibility of alternative circumscriptions as described in the introduction to the APG system above. With the changes introduced here, the number of orders has increased from 40 to 45 and the number of families decreased from 462 to 457. Of this number, 55 families are listed in brackets. We

are aware of at least one, appropriate, additional family that has yet to be formally proposed. Summarized below are the changes to APG (1998) with appropriate references supporting these alterations. Since 1998, five proposed systems for the angiosperms have been published. Two (Judd *et al.*, 1999; 2002; Stevens, 2001) more or less follow the system presented in APG (1998). One (Thorne, 2001, pers. comm.) approaches that of APG, whereas two others (Doweld, 2001; Wu *et al.*, 2002) basically follow that proposed by Takhtajan (1997).

ROOT OF THE ANGIOSPERM TREE AND MAGNOLIIDS

Relationships at the base of the angiosperms have been largely clarified with most analyses supporting *Amborella* as sister to all other extant angiosperms (Qiu *et al.*, 1999; Soltis *et al.*, 2000a). In contrast to these studies, Barkman *et al.* (2000) found strong support for Nymphaeaceae/*Amborella* as sister to all other angiosperms in an analysis from which 'noisy data' were removed. Further analyses by Zanis *et al.* (2002) rejected the Nymphaeaceae/*Amborella* rooting; nearly all tests found strong support for *Amborella* alone as sister to the rest, with Nymphaeaceae as the subsequent sister to the rest. Either one order with both families or two orders might still be possible, so we refrain from formally proposing names for these; the ordinal names Amborellales and Nymphaeales are available. Austrobaileyales are recognized by APG for the first time and comprise Austrobaileyaceae, Trimeniaceae and Schisandraceae (optionally including Illiciaceae). A clade of *Austrobaileya*, *Illicium* and *Schisandra* received 99% jackknife support in analyses of *rbcL*, *atpB* and 18S rDNA (Soltis, Soltis & Chase, 1999; Soltis *et al.*, 2000b). Material of *Trimenia* was not available for these multigene analyses; however, parsimony analyses of *rbcL* (Renner, 1999) and 26S rDNA (Soltis *et al.*, 2000b) and a maximum likelihood analysis of *rbcL*, *atpB* and 18S rDNA (Soltis *et al.*, 2000b) for fewer taxa placed *Trimenia* in this clade. Bootstrap support for this clade in 5-, 6- and 11-gene analyses was 100% (Qiu *et al.*, 1999; Zanis *et al.*, 2003).

The magnoliids, a superordinal group, comprise Laurales, Magnoliales, Piperales and a new APG order, Canellales, with two families, Canellaceae and Winteraceae. This larger magnoliid clade did not receive jackknife support greater than 50% in the three-gene analyses of Soltis *et al.* (1999) and Soltis *et al.* (2000a), but with the addition of more genes bootstrap support for this clade increased to 64% (Zanis *et al.*, 2003) and 67% (Qiu *et al.*, 1999) for five genes and 100% in a compartmentalized analysis of six genes (Zanis *et al.*, 2002) and 11 genes (Zanis *et al.*, 2003). Within the magnoliids, Laurales and Magno-

liales are sisters (71% bootstrap support, Qiu *et al.*, 1999; 100%, Zanis *et al.*, 2003), and Piperales and Canellales are sisters (83% bootstrap support, Qiu *et al.*, 1999; 100%, Zanis *et al.*, 2003). However, analysis of 104 morphological characters for 52 angiosperms (Doyle & Endress, 2000) resulted in different relationships among these clades: Magnoliales + Canellales were sister to Laurales, and Piperales were distantly related in a polytomy with the monocots, Nymphaeaceae and several clades of eudicots. None of these relationships received bootstrap support greater than 50%.

The sister-group relationship of Winteraceae and Canellaceae has received bootstrap or jackknife support of 99% or 100% in all recent multigene analyses (e.g. Soltis *et al.*, 1999; Qiu *et al.*, 1999; Soltis *et al.*, 1999; Zanis *et al.*, 2002, 2003). Doyle & Endress' (2000) morphological analysis also found this sister group (bootstrap support <50%). Their sister group, Piperales, consists of Aristolochiaceae, Lactoridaceae, Piperaceae and Saururaceae (APG, 1998), to which we now add Hydnoraceae (Nickrent *et al.*, 2001). Although the exact placement of Hydnoraceae within Piperales is uncertain, it clearly falls within this clade (Nickrent & Duff, 1996; Nickrent *et al.*, 1998, 2001). In recent analyses, *Lactoris* appears within a clade of Aristolochiaceae, as sister to *Aristolochia* + *Thottea* (Qiu *et al.*, 1999; Zanis *et al.*, 2003) or *Aristolochia* alone (Soltis *et al.*, 2000a). *Thottea* was not included in the last analysis, but support for the embedded position of *Lactoris* was weak (66% or less), even with five genes. Morphological analyses likewise recognize a clade of Piperaceae, Saururaceae, Aristolochiaceae and *Lactoris*. Given the uncertain position of *Lactoris* in both molecular and morphological trees, we recommend that Lactoridaceae be retained until more convincing evidence of placement is obtained.

The position of Chloranthaceae also requires further study. It is sister to the magnoliids + eudicots in the six-gene compartmentalized analysis (84% bootstrap support; Zanis *et al.*, 2003), but this is the only analysis that has provided support for the placement of this family. At this time, we prefer not to assign Chloranthaceae to an order until its position becomes clearer. The name Chloranthales is available should Chloranthaceae require assignment of a name at that rank.

MONOCOTS

Although the sister group of the monocots remains unclear, a great deal of progress has been made within the monocots since the last APG installment. Chase *et al.* (2000) published a review of relationships and a proposed revision of the APG system for the monocots, but nonetheless we will here provide information on changes since APG (1998). The rooting of the monocots

between Acoraceae (Acorales) and the rest continues to be supported. The Chase *et al.* (2000) and Soltis *et al.* (2000a) analyses of three genes both agreed on this placement, as did that of Fuse & Tamura (2000), which examined a relatively small number of monocots with plastid *matK* sequences. Of the five families unplaced in APG (1998), we now have clear placement of all but Petrosaviaceae (which now also includes *Japanolirion*). The name Petrosaviales is available for the family if it is assigned to its own order. Triuridaceae are placed in Pandanales, probably as sister to Pandanaceae, and Corsiaceae are included in Liliales (Neyland, 2002). Within Dioscoreales, several changes are made as a result of the extensive study of the order by Caddick *et al.* (2000, 2002a,b), which used an analysis of three genes, *rbcL*, *atpB* and 18S rDNA, and morphology to examine relationships of nearly all genera of the order. Thismiaceae are sister to Burmanniaceae, which makes it reasonable to include them together. *Trichopus* (formerly Trichopodaceae) is sister to *Avetra* (Dioscoreaceae), and this pair is sister to *Tacca* (Taccaceae). All other genera of Dioscoreaceae (*Rajania*, *Nonarapenta*, *Tamus*, etc.) are embedded in *Dioscorea*, so a simplified taxonomy of Dioscoreaceae would be to include these in *Dioscorea* and eliminate Taccaceae and Trichopodaceae (both monogeneric) by including them in an expanded Dioscoreaceae. Although bootstrap support is not exceptionally high, a position for Nartheciaceae in Dioscoreales is congruent with the non-DNA analyses of Caddick *et al.* (2000).

Continued work on Asparagales (Fay *et al.*, 2000b) clarified relationships within the order. In recent years, new families were published to accommodate genera that fell as sister taxa to clades composed of several families *sensu* Dahlgren, Clifford & Yeo (1985), but this process has led to both a rearrangement of family limits and an increased recognition of monogeneric and small families. Specialists in these families have hoped to take a broader view of family limits in Asparagales, which is now possible because the patterns are relatively clear (Fay *et al.*, 2000b). Because Dahlgren and co-workers believed that broadly circumscribed concepts of Liliaceae were grossly unnatural, they recognized as families only those groups in which they had some confidence of monophyly. The result of this approach was circumscription of narrowly defined families. When molecular systematists turned their attention to relationships of the lilioid monocots (Duvall *et al.*, 1993; Chase *et al.*, 1995a,b), they used this classification as the basis of their sampling. Hence they retained the circumscriptions of Dahlgren *et al.* (1985) without further consideration of whether these units should in fact be recognized as families. APG (1998) also used this system, and so Asparagales was established with 29 recognized fam-

ilies, many of them small (1–5 genera). Although this approach seemed logical at the time, it now in retrospect appears less so because it bequeathed us extremely narrowly defined family limits. Only specialists in this group understand this taxonomy, and it is so difficult to teach that many instructors use Liliaceae *s.l.* rather than the APG system. We therefore propose here to simplify the higher Asparagales by optionally reducing the number of families to two, Alliaceae and Asparagaceae. These can easily be identified by the umbellate inflorescences of Alliaceae (optionally including both Agapanthaceae and Amaryllidaceae) vs. the racemes of Asparagaceae, except for Themidaceae with umbels, but these have many subtending and internal bracts, whereas those of Alliaceae typically have just two (or if there are more they are not internal in the umbel; Pires & Sytsma, 2002). In Asparagaceae, we optionally include Agavaceae, Anemarrhenaceae (monogeneric), Anthericaceae, Aphyllanthaceae (monogeneric), Behniaceae (monogeneric), Herreriaceae (two genera), Hyacinthaceae, Laxmanniaceae, Ruscaceae and Themidaceae. In Ruscaceae, Rudall, Conran & Chase (2000a) already included Convallariaceae, Dracaenaceae (three genera), Eriospermaceae (monogeneric) and Nolinaceae (2–3 genera). We propose here to use the bracketing system to indicate that those who wish to recognize some additional monophyletic groups may continue to do so and still use the ‘APG system’. However, in that case we would recommend that Agavaceae should include Anemarrhenaceae, Anthericaceae, Behniaceae and Herreriaceae (these are listed in the family synonymy in the appendix). Along the same lines, we list Xanthorrhoeaceae *s.l.* as optionally including both Asphodelaceae and Hemerocallidaceae (which already included Phormiaceae of earlier authors). We realize that some researchers may be perturbed by this further re-organization of family lines within Asparagales, but we believe this modification provides a much-needed simplification of familial taxonomy in this order.

We were prompted to make the changes to Asparagales taxonomy by the condensation of families that has already been made in Liliales. Relative to the system of Dahlgren *et al.* (1985), APG (1998) had already reduced Calochortaceae, Petermanniaceae, Trilliaceae, Tricyrtidaceae and Uvulariaceae, and we may yet include Philesiaceae and Rhipogonaceae in Smilacaceae (following previous authors on account of their spinose pollen; Rudall *et al.*, 2000b). At this time, the only change we make is the addition of the mycoparasitic Corsiaceae on the basis of 26S rDNA data (Neyland, 2002). Pandanales have the same circumscription except for the addition of another achlorophyllous family, Triuridaceae, based on analyses of 18S rDNA sequence data (Chase *et al.*, 2000).

In the commelinids (we change the name here to avoid confusion with Commelinoideae), the relationships of many of the previously unplaced families have been resolved (as summarized in Chase *et al.*, 2000). Abolbodaceae are included in Xyridaceae, in which most recent treatments have placed them. Bromeliaceae, Mayacaceae and Rapateaceae are all included in Poales, and Hanguanaceae are moved to Commelinales. Poales are now a large order of 18 families, and some researchers have advocated splitting them into as many as three or four orders (Givnish *et al.*, 1999; Judd *et al.*, 1999; Thorne, 2001, pers. comm.), but until relationships are more clearly resolved such demolition would be premature. We also point out that Asparagales as circumscribed here is still larger and more diverse morphologically. Based on Chase *et al.* (2000), there is clear evidence that Poales are monophyletic, but some relationships within the order remain unclear. Bremer (2002) analysed family interrelationships within Poales using combined *rbcL/atpB* analyses and found strong support for cyperoid (Cyperaceae, Juncaceae and Thurniaceae) and graminoid clades (Anarthriaceae, Centrolepidaceae, Ecdeiocoleaceae, Flagellariaceae, Joinvilleaceae, Poaceae and Restionaceae). Within the latter clade, Ecdeiocoleaceae rather than Joinvilleaceae were found to be sister to Poaceae. Although the two large clades above are now clearly defined, their relationships to the other families of Poales requires further work.

We have not adopted the new monogeneric families carved out of Anarthriaceae (Briggs & Johnson, 2000) simply because they are monogeneric and clearly related to Anarthriaceae, notwithstanding the argument made by the authors that they share few morphological characters with each other and Anarthriaceae. The sole remaining unplaced commelinid family is Dasypogonaceae for which the ordinal name Dasypogonales is available should recognition become appropriate.

Monocot phylogenetics have made immense strides over the past 8 years due primarily to the foci provided by the two international monocot symposia held in 1993 and 1998 (at the Royal Botanic Gardens, Kew, Rudall *et al.*, 1995, and the Royal Botanic Gardens, Sydney, Wilson & Morrison, 2000, respectively). These meetings have focused attention both on what was known and, more importantly, on which groups needed additional attention. As a result, we now know more about monocots than any other major group of angiosperms, a situation that is a remarkable achievement given the paucity of information available in 1985 (Dahlgren *et al.*, 1985). This model should now be adopted for the other large groups of angiosperms so that attention is likewise focused on integration of research programmes and gaps in the data base. Even the relatively well-studied asterid orders have new

members that desperately need integration into the overall picture of eudicot evolution.

EUDICOTS

Relatively few changes have been made among the families/orders forming a grade at the base of the eudicots. We have placed Didymelaceae as an optional synonym of Buxaceae, and Buxales is available if Buxaceae were to be elevated to ordinal status. Sabiaceae and Trochodendraceae likewise remain unplaced to order, but if either or both of these changes becomes appropriate, Sabiales and Trochodendrales have previously been published. Proteales remain unchanged except that we have indicated that *Platanus* optionally could be included in Proteaceae, although many botanists in both Northern and Southern Hemispheres will probably object to this change for two taxa that have never before been associated. Ranunculales remain unchanged from APG (1998).

Aextoxicaceae are clearly closely related to Berberidopsidaceae (Soltis *et al.*, 2000a, among several), and these two small families (one and two genera, respectively) as yet have no clear relationship to the other eudicot orders, so we continue to leave them unplaced to order. If an ordinal name should be required (e.g. Soltis *et al.*, 2003), Berberidopsidales is available (see below). It is unclear on what morphological grounds a merger of these two families could be justified; these genera are remarkably divergent considering the similarity of their DNA sequences.

Dilleniaceae were consistently placed as sister to Caryophyllales in the three-gene analysis of Soltis *et al.* (2000a) but with jackknife support of only 60%, and on this basis we refrain from adding them to Caryophyllales. Although the name Dilleniales is available, it would be against the philosophy of APG to create a monofamilial order for them if they were found to have a clear relationship to another recognized order, in this case Caryophyllales.

Relationships in Caryophyllales continue to be in a state of flux and therefore difficult to discuss. Apart from Rhabdodendraceae, there seem to be two major lineages. The first is composed of Caryophyllales in their long-standing restricted sense plus Simmondsiaceae and Asteropeiaceae + Physenaceae as successive sister groups to the core members. The second includes Ancistrocladaceae and their mostly carnivorous relatives (Meimberg *et al.*, 2000; Cuénoud *et al.*, 2002), Tamaricaceae + Frankeniaceae and Plumbaginaceae + Polygonaceae (Källersjö *et al.*, 1998; Soltis *et al.*, 2000a; Cuénoud *et al.*, 2002). Unfortunately, the new members of the first lineage (Asteropeiaceae, Physenaceae and Simmondsiaceae) are poorly studied, and some features that make the core families appear distinctive need re-evaluating from the per-

spective of their new alignment. Within the core group, relationships remain uncertain. Appelquist & Wallace (2000) and Cuénoud *et al.* (2002) found that the distinctive Madagascan Didiereaceae are sister to *Calyptrorhiza* of Portulacaceae. However, Didiereaceae are not yet reduced to synonymy under Portulacaceae. Furthermore, Cuénoud *et al.* (2002) found that there is a well supported, but internally unresolved group, the 'succulent' clade of Manhart & Rettig (1994), that includes Basellaceae, Cactaceae, Didiereaceae, Halophytaceae and Portulacaceae. Although Portulacaceae are clearly paraphyletic as currently circumscribed, the composition and relationships of the lineages within Portulacaceae need further study before taxonomic realignment begins (hence the lack of change in the classification).

Within one of the other major clades of the core Caryophyllales, a similar problem to that of the apparently polyphyletic Portulacaceae is encountered; Phytolaccaceae are grossly polyphyletic relative to Aizoaceae, Nyctaginaceae and Sarcobataceae. We have recognized here Barbeuiaceae and Gisekiaceae; both are well supported as excluded from Phytolaccaceae and are resurrected from the list of familial synonyms in APG (1998). *Lophiocarpus* is also clearly unrelated to the Phytolacchoideae/Rivinoideae clade, but it has never been recognized as a family (the name proposed by Bortenschlager, 1973, is not validly published). *Corbichonia* (usually Molluginaceae) is sister to *Lophiocarpus*, and the pair is well removed from the rest of Molluginaceae (Cuénoud *et al.*, 2002). The third major clade of core caryophyllids is unproblematic and includes Achatocarpaceae, Amaranthaceae and Caryophyllaceae. Relationships and taxonomy of the other major clade of Caryophyllales remain as they were in APG (1998). Although additional genera and new data have been added, no new patterns for general relationships have emerged (Cuénoud *et al.*, 2002).

Relative to APG (1998), no changes to the composition in Santalales have been made (see Nickrent & Malécot, 2001, and Nickrent, 2002, for a summary of relationships). At least one of the families recognized, Olacaceae, is problematic, and ongoing studies of generic relationships should provide evidence of how to realign family limits (Nickrent, 2002). In all shortest trees produced in the combined analysis of three genes by Soltis *et al.* (2000a), Santalales were the sister group of Dilleniaceae + Caryophyllales but with less than 50% jackknife support. If they were in the future to receive strong support as sister to this clade, they would nonetheless be maintained because the APG philosophy is not to alter ordinal recognition except to add additional ones as needed for groups demonstrated to be sister to clades composed of several orders.

The composition of Saxifragales is one of the major surprises of molecular phylogenetic analyses of the angiosperms (Chase *et al.*, 1993; Morgan & Soltis, 1993; Soltis *et al.*, 1997; Soltis & Soltis, 1997; Qiu *et al.*, 1998; Hoot, Magallon-Puebla & Crane, 1999; Savolainen *et al.*, 2000a; Soltis *et al.*, 2000a). This eclectic assemblage comprises taxa placed in three subclasses in modern classifications (e.g. Cronquist, 1981; Takhtajan, 1997). Several changes are suggested here compared to APG (1998).

Phylogenetic analyses of a five-gene data set for Saxifragales (c. 9000 bp/taxon) (Fishbein, Hufford & Soltis, 2003) have identified several major, well-supported clades. There is strong support for a clade of Saxifragaceae and several woody members of the former Saxifragaceae *sensu* Engler (1930; i.e. the currently recognized families Grossulariaceae, Iteaceae and Pterostemonaceae). Within this clade, the sister-group relationship between Iteaceae and Pterostemonaceae is strongly supported. Consideration should be given to reducing Pterostemonaceae to Iteaceae by adding *Pterostemon* (two species) to that family. A second, strongly supported clade includes Crassulaceae as sister to a clade of Haloragaceae, *Tetracarpaea* (Tetracarpaeaceae), *Penthorum* (Penthoraceae), and *Aphanopetalum* (formerly of Cunoniaceae), all small genera that could be combined to form a single expanded family Haloragaceae (Fishbein *et al.*, 2003).

Although the composition of Saxifragales now appears clear, the position of the clade among the core eudicots is uncertain. The placement of the order has varied among the broad phylogenetic analyses conducted to date. Initial analyses of *rbcL* sequences (Chase *et al.*, 1993) placed the order as sister to all other rosids, whereas analyses of *atpB* sequences placed the clade as sister to a large clade containing most of the core eudicots (Savolainen *et al.*, 2000a). None of these placements received jackknife/bootstrapped support >50%. The three-gene analysis (Soltis *et al.*, 1999; Soltis *et al.*, 2000a) placed Saxifragales as sister to the rosids but with only weak jackknife support (60%). Analyses of a four-gene data set for eudicots indicated placement of Saxifragales as sister to all other core eudicots except Gunnerales (Soltis *et al.*, 2003).

ROSIDS

Our knowledge of the composition of and relationships among the rosid and eurosid I taxa has improved significantly, particularly within Malpighiales, and we provide changes to reflect these newly understood relationships. Changes to the classification elsewhere in the rosids are few. Geissolomataceae and Strasburgeriaceae, previously unplaced, and Vitaceae, previously an unplaced core eudicot, are added to the

rosids. Vitaceae may be sister to the rest of the rosids (Soltis *et al.*, 2000a), but jackknife support for this position was only moderate. Crossosomatales, newly circumscribed and recognized here, include Crossosomataceae (Sosa & Chase, 2003), Stachyuraceae and Staphyleaceae, all previously unplaced rosids (Soltis *et al.*, 1999, 2000a; Nandi, Chase & Endress, 1998; Savolainen *et al.*, 2000a). Crossosomatales share a seed character in which the cell walls of the many-layered testa are all or mostly lignified. Seed anatomy continues to be a valuable source of new systematic information that is highly congruent with phylogenetic relationships inferred from analyses of molecular data (see Doweld, 2001). Circumscription of this order is conservative; other unassigned rosid genera often recognized as families (e.g. *Geissoloma*, *Ixerba* and *Strasburgeria*) have similar testa anatomy and may be added to this order if support for this broader circumscription strengthens.

In Geraniales, there is abundant morphological and molecular evidence indicating that the small families Francoaceae, Greyiaceae and Melianthaceae are closely related (Ronse Decraene & Smets, 1999; Savolainen *et al.*, 2000b). Greyiaceae are here synonymised under Melianthaceae with Francoaceae an optional further synonym. Likewise, Hypseocharitaceae are an optional synonym of Geraniaceae, as in APG (1998).

In Myrtales, recent work (Conti, Litt & Sytsma, 1996; Conti, Baum & Sytsma, 1999) confirmed family circumscriptions. Clausen & Renner (2001) showed a well-supported sister-group relationship between Melastomataceae and Memecylaceae, clarifying the circumscriptions of both families; the two have been combined before (e.g. Cronquist, 1981), and having this option seems reasonable (they are therefore bracketed in the classification).

Zygophyllaceae and Krameriaceae are now included in eurosid I (Soltis *et al.*, 2000a; Savolainen *et al.*, 2000a); Krameriaceae (monogeneric) can be included in the already heterogeneous Zygophyllaceae (for the latter, see Sheahan & Chase, 2000), but *Krameria* shares few traits that could be considered synapomorphies with Zygophyllaceae. However, some researchers (e.g. Sheahan and Chase, pers. comm.) see little advantage in the maintenance of a monogeneric family with a clear relationship to another, regardless of how divergent the genus is from the others included. If Zygophyllaceae continue to be placed as sister to a clade composed of several orders and ordinal status is appropriate, then the name Zygophyllales is available.

Several of the previously unplaced eurosid I families are now combined with Lepidobotryaceae and Celastraceae in a newly accepted order, Celastrales (Nandi *et al.*, 1998; Savolainen *et al.*, 2000b), although the group is not easy to characterize morphologically.

Huaceae have sometimes appeared with this clade (Soltis *et al.*, 2000a), but without enough support or consistency to warrant their inclusion here. Stackhousiaceae, kept separate in APG (1998), are now synonymised with Celastraceae (Savolainen *et al.*, 2000a; Simmons *et al.*, 2001).

The circumscription of the nitrogen-fixing clade and the composition of the four orders included there, Fabales, Rosales, Cucurbitales and Fagales, remain largely unchanged (see also Savolainen, Spichiger & Manen, 1997; Jeong, Ritchie & Myrold, 1999). Relationships within Rosales, and especially within the Cannabaceae - Cecropiaceae - Celtidaceae - Moraceae - Ulmaceae-Urticaceae complex, have been problematic. Celtidaceae are paraphyletic and include Cannabaceae, and Cecropiaceae are embedded within Urticaceae (Ueda, Kosuge & Tobe, 1997; Wiegrefe, Sytsma & Guries, 1998; Sytsma *et al.*, 2002), and it is therefore appropriate to recognize altered circumscriptions of these families within the urticalean complex. Within Fagales, monogeneric Rhoipteleaceae are strongly supported as sister to Juglandaceae and so the option of combining the two is offered. However, the two differ considerably in their gynoecia and ovules.

Changes in Malpighiales mainly reflect assignment to this order of six previously unplaced families and the dismemberment of broadly circumscribed Flacourtiaceae and Euphorbiaceae. Of the families assigned to Malpighiales since APG (1998), Bonnetiaceae and Elatinaceae have a distinctive exotegmen similar to that of Clusiaceae, and Bonnetiaceae and Clusiaceae share distinctive xanthones. Xanthones are also reported from some Podostemaceae (in which Tristichaceae, previously an unplaced rosid, now are included), and both tenuinucellate ovules and exudate are known from Clusiaceae as well as at least some Podostemaceae (e.g. Contreras, Scogin & Philbrick, 1993; Jäger-Zürn, 1997). Relationships within the Clusiaceae-Bonnetiaceae-Podostemaceae clade are, however, still unclear. *Ploiarium* (Bonnetiaceae) has been included in Malvales (Savolainen *et al.*, 2000a), but this is likely to be based on misidentified material (M. W. Chase, pers. comm.). Nevertheless, Podostemaceae, for which the exact relationship with other angiosperms has long been controversial (Cusset & Cusset, 1988, and references therein), are finally close to finding a phylogenetic home. Other families assigned to Malpighiales include Ctenolophonaceae, Ixonanthaceae, Peridiscaceae and Lophopyxidaceae (Savolainen *et al.*, 2000a).

Recent work has clarified the limits of sets of genera previously assigned to Flacourtiaceae (Chase *et al.*, 2002; see also Judd, 1997; Nandi *et al.*, 1998; Savolainen *et al.*, 2000a). Salicaceae are considerably expanded to include flacourtiaceous taxa with salicoid

teeth (Nandi *et al.*, 1998), cocarcinogens and flowers in which the sepals and petals, if both are present, are equal in number. However, most of the taxa with cyclopentenoid cyanogenic glycosides and flowers in which sepals and petals are not equal in number are placed in the newly accepted Achariaceae. Sister to the rest of Salicaceae is *Casearia*, although this placement is only weakly supported in Chase *et al.* (2002; only *rbcl*) but strongly supported in a similar position with far less taxonomic sampling but more data in Soltis *et al.* (2000a; three genes). Other families newly recognized here with genera that have been in Flacourtiaceae *s.l.* include Lacistemataceae and Peridiscaceae. Somewhat unexpectedly, the poorly known Achariaceae are sister to *Kiggelaria* (Soltis *et al.*, 2000a; Chase *et al.*, 2002), and so the name of the family becomes the conserved Achariaceae (not the older but non-conserved Kiggelariaceae as in several recent papers). Other taxa with cyclopentenoid cyanogenic glycosides are Malesherbiaceae, Turneraceae and Passifloraceae. The three are closely related (Chase *et al.*, 2002). Turneraceae and Passifloraceae have foliar glands and biparental or paternal transmission of plastids (e.g. Shore, McQueen & Little, 1994) and Malesherbiaceae and Passifloraceae a corona. All three possess a hypanthium-like structure that does not bear the stamens; optional synonymization is thus appropriate.

No molecular evidence supports Euphorbiaceae *s.l.* as monophyletic, and here they are divided into three families (as in Chase *et al.*, 2002). Euphorbiaceae *s.s.* comprise the uniovulate Euphorbioideae, Crotonoideae and Acalyphoideae. Phyllanthaceae include the biovulate Phyllanthoideae, whereas Picrodendraceae include the biovulate Oldfieldioideae. The three families have similar and distinctive fruits and similarities in embryology, but other embryological details as well as features of leaf, flower, pollen and seed coat anatomy are distinct within each of the three families.

Linaceae are extended to include Hugoniaceae, and a close relationship of the two has long been suggested. Ochnaceae, Medusagynaceae and Quinaceae form a distinctive and monophyletic group (Nandi *et al.*, 1998; Savolainen *et al.*, 2000a), with leaves having the secondary and tertiary venation particularly well developed. Optional synonymization seems appropriate.

Evidence provided by Litt & Chase (1999; see also Nandi *et al.*, 1998) strongly supports monophyly of a group of four, mostly small, families: Trigoniaceae, Dichapetalaceae, Chrysobalanaceae and Euphroniaceae. Optional recognition of an expanded Chrysobalanaceae is recommended for these. All have tenuinucellate ovules, some species of each have obliquely bisymmetric flowers and all have a single

style. The sister-group relationship of Erythroxylaceae and Rhizophoraceae is confirmed by numerous features such as alkaloids and sieve tube plastid type; the rather poorly known African *Aneulophus* of Erythroxylaceae is particularly similar to some primitive Rhizophoraceae. Optional synonymization is appropriate.

In Oxalidales, two alterations to APG (1998) have been made. Brunelliaceae have been resurrected from synonymy because including them in Cunoniaceae was premature. *Brunellia* has been shown to be related to both Cunoniaceae and Elaeocarpaceae (Bradford & Barnes, 2001; Savolainen *et al.*, 2000b). Tremandraceae (three genera from Australia) are embedded deeply in Elaeocarpaceae, so the name is here treated as a synonym of that family.

In the eurosid II clade, several minor changes have been made relative to APG (1998). Although Brassicales have remained unchanged here, resurrection of Capparaceae and Cleomaceae may be appropriate in the future based on the results of Hall, Sytsma & Iltis (2002), who showed that Brassicaceae (*sensu* APG, 1998) comprise three strongly supported, monophyletic groups representing Brassicaceae in the narrow sense, Capparaceae subfamily Capparoideae and Capparaceae subfamily Cleomoideae. They also point out that there are some morphological features consistent with this three-family view. Emblingiaceae are placed in Brassicales based on the results of Gregory, Chandler & Bayer (2000). We list Cochlospermaceae as well as Diegodendronaceae as optional synonyms of Bixaceae. Thymelaeaceae have likewise been expanded by the inclusion of *Tepuianthus* (Wurdack & Horn 2001), the type of Tepuianthaceae, which is well supported as sister to Thymelaeaceae. Further work is needed to evaluate relationships of Dipterocarpaceae to Cistaceae and Sarcolaenaceae; Dayanandan *et al.* (1999) did not include Cistaceae and found an ambiguous relationship of Dipterocarpaceae to Sarcolaenaceae. Savolainen *et al.* (2000b) showed with *rbcL* data that *Pakaraimaea* of Dipterocarpaceae is strongly supported as sister to *Cistus* + *Helianthemum*, and in all their shortest trees, *Monotes* (Dipterocarpaceae, the type of Monotaceae) was sister to *Sarcolaena* (the type of Sarcolaenaceae), although this received bootstrap support of less than 50%. In Sapindales, Peganaceae are a possible synonym of Nitariaceae, both of which were at one time considered to be members of Zygophyllaceae (Sheahan & Chase, 1996, 2000).

ASTERIDS

The asterids are a strongly supported monophyletic group including the same 10 orders as in APG (1998). Bremer *et al.* (2002) analysed representatives of

almost all families of asterids using three genes (*rbcL*, *atpB* and *matK*) and three, non-coding, plastid regions and found Cornales to be the sister of all other asterids, followed by Ericales sister to the rest, both with high jackknife percentages. The *rbcL/atpB*/18S rDNA data (Soltis *et al.*, 2000a) indicated Cornales as sister to Ericales whereas the *ndhF* data alone (Olmstead *et al.*, 2000) or *ndhF* together with *rbcL/atpB*/18S rDNA data (Albach *et al.*, 2001b) showed Cornales as sister to the rest of the asterids, but without high support percentages. Five families of uncertain position in APG (1998) have been shown to belong to the asterids: Paracryphiaceae (of uncertain position within the euasterid II clade as discussed under Dipsacales), Pentaphragaceae and Sladeniaceae (the latter considered an optional synonym of Pentaphragaceae of Ericales, see below), Kaliphoraceae (included in Montiniaceae of Solanales; Savolainen *et al.*, 2000a), and Cardiopteridaceae (Aquifoliales; Kårehed, 2001). Furthermore, recent analyses support ordinal positions for several families that were left unclassified to order in the APG system, although listed under euasterids I or II.

Relationships within Cornales are still unclear, but the six families are all monophyletic. In many studies, *Hydrostachys* (formerly Hydrostachyaceae) has been placed within Hydrangeaceae (Soltis *et al.*, 2000a; Albach *et al.*, 2001a, b), although the exact position of the genus within Hydrangeaceae is unclear. In other studies, it has fallen outside Hydrangeaceae (Xiang *et al.*, 2002). It has been noted that for most genes *Hydrostachys* has a great number of unique substitutions, and the question of spurious attraction was addressed by Albach *et al.* (2001a). Pending further analyses, we retain Hydrostachyaceae as a separate family. *Curtisia* appears to be sister to Grubbiaceae (Soltis *et al.*, 2000a) not Cornaceae, so Curtisiaceae are here re-instated.

Ericales comprise 23 families. Relationships within Ericales have some structure, but many relationships are still unclear. One well-supported monophyletic group comprises Balsaminaceae, Marcgraviaceae and Tetrameristaceae (Soltis *et al.*, 2000a; Anderberg, Rydin & Källersjö, 2002; Bremer *et al.*, 2002; Tetrameristaceae and the monogeneric Pellicieraceae here being considered optional synonyms); it is sister to the rest of the order. Another well supported group, recently investigated in detail, is the primuloid group of families comprising the newly re-circumscribed Primulaceae, Myrsinaceae, Theophrastaceae and a new monogeneric family Maesaceae (Anderberg, Ståhl & Källersjö, 2000, Anderberg *et al.*, 2002; Källersjö, Bergqvist & Anderberg, 2000). A third group with robust support is formed by Actinidiaceae, Roridulaceae, Sarracenaceae, Clethraceae, Cyrillaceae and Ericaceae

(Anderberg *et al.*, 2002; Bremer *et al.*, 2002; classification of the last treated in Kron *et al.*, 2002). Styracaceae are sister to Diapensiaceae (94% jackknife support: Anderberg *et al.*, 2002; Bremer *et al.*, 2002), and *Halesia* is nested within Styracaceae (Soltis *et al.*, 2000a; Anderberg *et al.*, 2002; Bremer *et al.*, 2002) so Halesiaceae are here reduced to synonymy under Styracaceae. *Pentaphylax* appears as sister to *Cardiopteris* in the *rbcL* analysis of Savolainen *et al.*, 2000a, but analyses of sequences from five genes place *Pentaphylax*, *Ficalhoa* and *Sladenia* with strong support in Ericales (Anderberg *et al.*, 2002). The Savolainen *et al.* (2000a) *rbcL* sequence for *Pentaphylax* was produced from highly degraded DNA extracted from herbarium material and seems to be a contaminant or an artifact (V. Savolainen, pers. comm.). Anderberg *et al.* (2002) found that *Sladenia* and *Ficalhoa* are sister taxa (71% jackknife support), and the two together are sister to Ternstroemiaceae plus *Pentaphylax* (68% support). Ternstroemiaceae s.s. has 98% support, and *Pentaphylax* together with Ternstroemiaceae s.s. has 97% support (Anderberg *et al.*, 2002). *Sladenia* and *Ficalhoa*, with their rather small flowers in cymose inflorescences, can be combined in Sladeniaceae (although *Ficalhoa* has a straight embryo), but Anderberg *et al.* (2002) proposed including them in Ternstroemiaceae along with *Pentaphylax*, which like other taxa of that family has a curved embryo. *Lissocarpa* (the type of Lissocarpaceae) is sister to *Diospyros* (100% support), and the two are usefully combined in an expanded Ebenaceae, *Lissocarpa* differing mainly in its inferior ovary (Berry *et al.*, 2001; Anderberg *et al.*, 2002; Bremer *et al.*, 2002). Other, less well supported groups include Fouquieriaceae as sister to Polemoniaceae (72% in Anderberg *et al.*, 2002; 88% in Bremer *et al.*, 2002) and Sapotaceae as sister to Lecythidaceae s.l. (60%; Anderberg *et al.*, 2002).

All euasterids are strongly supported as monophyletic, and with the six DNA regions analysed by Bremer *et al.* (2002) euasterid I and II both received high jackknife percentages (100% and 99%, respectively, for which they also proposed the new informal names of lamiids and campanulids). In earlier analyses, both groups have low internal support. Euasterid I had low jackknife/bootstrap support, 53%/66% (Olmstead *et al.*, 2000), 56% (Soltis *et al.*, 2000a) or 40% (Albach *et al.*, 2001b), and euasterid II has 68% (Olmstead *et al.*, 2000), 88% (Soltis *et al.*, 2000a) or below 33% (Albach *et al.*, 2001b). The percentages from the latest study (Albach *et al.*, 2001b) are low and puzzling because one would not expect lower scores if data sets are combined as was done in that study.

In euasterid I, there are some changes regarding families not classified to order. Recent investigations have shown that Icacinaceae are polyphyletic (Savolainen *et al.*, 2000a; Soltis *et al.*, 2000a; Kårehed,

2001), and Doweld (2001) has recently segregated most of the genera as done here, but assigned *Emmotum* to its own order and family. Several genera in families listed in euasterid II by APG (1998) now show relationships to Cardiopteridaceae and Aquifoliales. Other genera, notably *Icacina* (Icacinaceae) belong to euasterid I and have an apparent relationship (although not well supported) to Garryales. Previously Aquifoliales included Oncothecaceae (APG, 1998), but that placement was premature as no internal support has been found for that position. Icacinaceae and Oncothecaceae are now listed under euasterid I, but without an order, as are Boraginaceae and Vahliaceae. Despite several independent analyses based on multiple genes with broad taxon sampling, there is so far no clear placement of Boraginaceae and Vahliaceae.

Garryales now consist of Eucommiaceae and Garryaceae. *Aucuba* (the type of Aucubaceae) is here included in Garryaceae. In all molecular analyses *Garrya* and *Aucuba* have been sister taxa with high support, and the molecular result is supported by many morphological (pollen and embryological) and chemical characters (Bremer *et al.*, 2001). All members of Garryales have unisexual flowers and apical placentation, which may be morphological synapomorphies for the order.

Gentianales still contain five families, but circumscription of some of these has been changed. Loganiaceae were shown earlier to be polyphyletic, and detailed studies indicate that only 13 of the genera belong to the family (Backlund, Oxelman & Bremer, 2000). Other former Loganiaceae have been reassigned to several other families. The inclusion of *Pteleocarpa*, formerly Boraginaceae s.l., in Gelsemiaceae is likely (Olmstead & Ferguson, 2001). Molecular data now provide further support for inclusion of *Dialypetalanthus* (formerly Dialypetalanthaceae) within Rubiaceae (Fay *et al.*, 2000a).

Lamiales are strongly supported as a monophyletic group of 23 families, two of which were previously (APG, 1998) not classified to order. Plocospermataceae, earlier unplaced in euasterid I, are the sister group to the rest of Lamiales (Oxelman, Backlund & Bremer, 1999; Savolainen *et al.*, 2000a; Bremer *et al.*, 2002), and Carlemanniaceae have been shown to be close to Oleaceae (Savolainen *et al.*, 2000a). Within the order, only a few interfamilial relationships received support, including a few of the basal nodes; Plocospermataceae are sister to the rest, followed by Oleaceae together with Carlemanniaceae and subsequently Tetrachondraceae as sister to the rest (Oxelman *et al.*, 1999; Savolainen *et al.*, 2000a; Olmstead *et al.*, 2000; Bremer *et al.*, 2002). In spite of analyses involving three and more genes, relationships among most families remain unclear, and more work needs to be done. In APG (1998), Martyniaceae were listed as a syn-

onym or sister taxon to Pedaliaceae, but subsequent analyses (Albach *et al.*, 2001b) have not found any support for this sister-group relationship, and *Martynia* is distant from Pedaliaceae in the trees. Bremer *et al.* (2002) found *Avicennia* to be nested in Acanthaceae, so Avicenniaceae is here included in Acanthaceae. A close relationship between Buddlejaceae and Scrophulariaceae was suggested by Dahlgren (1983) based on chemical data, but probably because of the artificial circumscription of both families involving different unrelated entities they were kept separate. In later analyses based on *ndhF* and *rbcL* data, 100% bootstrap support was found for a sister-group relationship between a restricted Buddlejaceae (*Buddleja*, *Emorya*, *Gomphostigma* and *Nicodemia*) and Scrophulariaceae *s.s.* (Oxelmann *et al.*, 1999), and the same relationship was also supported when morphological data were added (Bremer *et al.*, 2001). In Olmstead *et al.* (2001; three genes), they also presented support for a close relationship of these two families with Myoporaceae, and they included both Buddlejaceae and Myoporaceae in Scrophulariaceae, a classification followed here. The genus *Androya*, earlier placed in Loganiaceae, also belongs to the *Myoporum* clade of the extended Scrophulariaceae. Other genera of the former Buddlejaceae and/or Loganiaceae that now belong to other families of Lamiales (Oxelmann *et al.*, 1999) are *Nuxia* in Stilbaceae, *Peltanthera* and *Sanango* in Gesneriaceae, and *Polypremum* in Tetrachondraceae. A number of other genera remained unplaced to family, but *Mimulus* appears closer to *Phryma* than any genus now assigned to Scrophulariaceae (Beardsley & Olmstead, 2002), so we treat it there. Parts of the former Scrophulariaceae have also been transferred to Orobanchaceae and Plantaginaceae (Olmstead *et al.*, 2001). *Cyclocheilon* is nested in the expanded Orobanchaceae (Bremer *et al.*, 2002), so Cyclocheilaceae (= Nesogenaceae) are here reduced to synonymy under Orobanchaceae.

Solanales consist of five families, of which three are small. Of these Montiniaceae, now including *Kaliphora* (the type of Kaliphoraceae; Savolainen *et al.* 2000a), contain three small genera all characterized by having unisexual flowers. That character is unusual in euasterids, but it occurs in a few genera in different families and is also common in Garryales and Aquifoliales.

In APG (1998), euasterid II included 10 families not classified to order. Two of these, Icacinaceae and Carlemanniaceae, are now transferred to euasterid I, and Adoxaceae are now included in Dipsacales (Bremer *et al.*, 2002). Parts of Icacinaceae remain among euasterid II, and the genera involved are now included in Cardiopteridaceae and Stemonuraceae in Aquifoliales (Kårehed, 2001). There is no clear support for relationships among the families or between the unclassified

families and the orders, but there is support for Eremosynaceae and Escalloniaceae as being closely related (Hibsch-Jetter, Soltis & MacFarlane, 1997; Soltis *et al.*, 2000a; Albach *et al.*, 2001a). The genera *Desfontainia* and *Columellia* are sister groups in Columelliaceae (optionally as two families; APG, 1998). In the analysis by Savolainen *et al.* (2000a) the two genera are unrelated. The reasons for this are unclear, and the sequences of *Desfontainia* and *Columellia* from GenBank fall together in other studies (Backlund *et al.*, 2000).

Aquifoliales are strongly supported as the sister group to the rest of euasterid II (Soltis *et al.*, 2000a; Bremer *et al.*, 2002). Cardiopteridaceae have been expanded to include several former genera of Icacinaceae, e.g. *Gonocaryum*. Stemonuraceae have recently been described and comprise a strongly supported group of former genera of Icacinaceae, e.g. *Irringbaileya* (Kårehed, 2001).

Apiales have in recent investigations received strong support as monophyletic (Olmstead *et al.*, 2000; Soltis *et al.*, 2000a; Bremer *et al.*, 2002). The order now comprises eight families, with Pennantiaceae, previously in Icacinaceae, being included (Kårehed, 2001, 2003). The relationships among the small families of the order are still unclear, and there are still uncertainties about the delimitation of Apiaceae and Araliaceae (Plunkett & Lowry, 2001). Some of the families are monogeneric and could possibly be merged when well-supported sister-group relationships have been established. Newly proposed Mackinlayaceae and Myodocarpaceae include genera previously considered to be archaic members of Araliaceae (see Plunkett, 2001; Plunkett & Lowry, 2001; Kårehed, 2003).

Asterales are strongly supported as monophyletic and contain 12 families. Carpodetaceae are being merged with Rousseeaceae (Lundberg, 2001). *Cyphia*, the type of Cyphiaceae, has appeared as sister to the rest of Campanulaceae (optionally including Lobeliaceae) in several recent *rbcL* analyses (e.g. Kårehed *et al.*, 1999; Savolainen *et al.*, 2000a; Lundberg, 2001). However, it appears that the *rbcL* sequence of *Cyphia* hitherto used is a pseudo-gene (Lundberg & Bremer, 2002), and re-analysis with a new sequence places *Cyphia* as sister to other Lobeliaceae excluding Campanulaceae *s.s.* (see also Haberle, 1998). Hence, the option of recognizing Campanulaceae and Lobeliaceae as separate families is retained. Interrelationships among the families of Asterales are generally still uncertain. Since 1998, at least seven additional comprehensive studies have included a wide family sampling of the asterids (Kårehed *et al.*, 1999; Olmstead *et al.*, 2000; Soltis *et al.*, 2000a; Savolainen *et al.*, 2000a; Albach *et al.*, 2001b; Bremer *et al.*, 2002; Lundberg & Bremer, 2002). Unfortunately, interrela-

tionships among families in Asterales in these studies are somewhat different, although in most cases the differences lack jackknife/bootstrap support greater than 50%. However, Asteraceae, Calyceraceae and Goodeniaceae together with their sister group Menyanthaceae form a monophyletic group that is strongly supported (Kårehed *et al.*, 1999; Olmstead *et al.*, 2000; Soltis *et al.*, 2000a; Bremer *et al.*, 2002; Lundberg & Bremer, 2002). The relationships among the first three families are unclear. The *rbcL* and *ndhF* data (Kårehed *et al.*, 1999) and *ndhF* data (Olmstead *et al.*, 2000) support Asteraceae and Calyceraceae as sister families whereas *rbcL* together with *atpB* and 18S rDNA (Soltis *et al.*, 2000a) support Goodeniaceae and Calyceraceae as sister taxa. With morphological data, *rbcL*, *ndhF* and *atpB* sequences pooled, there is strong support for Asteraceae and Calyceraceae as sister groups (Lundberg & Bremer, 2002), a result that was also obtained by Bremer *et al.* (2002) in an analysis of six DNA regions. Another example of different phylogenetic patterns of support between *rbcL/ndhF* (Kårehed *et al.*, 1999) and *rbcL/atpB*/18S rDNA data (Soltis *et al.*, 2000a) is the well-supported relationship between Argophyllaceae and Phellinaceae in the *rbcL/ndhF* analysis. Styliaceae and Donatiaceae are close (Lundberg & Bremer, 2002); the latter is placed in optional synonymy under the former.

Dipsacales as here circumscribed are expanded to include Adoxaceae. This family was unplaced in euasterid II (APG, 1998), but recent studies show support for an expanded circumscription (Soltis *et al.*, 2000a; Albach *et al.*, 2001b; Bell *et al.*, 2001; Bremer *et al.*, 2001; 2002). In some recent systematics texts (e.g. Judd *et al.*, 1999; 2002), all other families of the order were merged into a single family, Caprifoliaceae, which we have indicated here as an option, although some specialists do not favour this broad concept. All of the families of Dipsacales originally in APG (1998) are monophyletic, none is monogeneric, and some (e.g. Dipsacaceae and Valerianaceae) are well-known entities with several hundred species. Savolainen *et al.* (2000a) included four additional families in Dipsacales, Desfontainiaceae (here included in Columelliaceae), Paracryphiaceae, Polyosmaceae and Sphenostemonaceae, but there was no bootstrap support for this expansion of Dipsacales so we retain these four families as unclassified to order. Paracryphiaceae are transferred to the euasterid II clade from the list of families of uncertain position (Bremer *et al.*, 2002). Both Paracryphiales and Desfontainiales are available should a name at an ordinal rank be required.

CONCLUSION

We emphasize that the APG classification is proposed to facilitate communication; we name organisms

because biologists require names for accurate communication. Progress since the first Angiosperm Phylogeny Group consensus classification (APG, 1998) has been considerable. Well-supported hypotheses of relationships for many of the taxa that were unplaced there have since been proposed, and these ideas allow their assignment to orders, of which five are newly recognized here. Furthermore, the basic structure of angiosperm phylogeny that was the foundation for the orders recognized in 1998 has been confirmed and strengthened. Nevertheless, our knowledge of relationships between many of the basal clades of angiosperms, among major eudicot lineages, and many orders such as Malpighiales and Lamiales remain to be resolved. It is clear where we should concentrate our efforts, as only with a much more fully resolved tree will we have a framework adequate to begin to understand the details of morphological evolution of flowering plants. Further progress in establishing the relationships of clades will depend on continued broad collaboration.

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APPENDIX

CLASSIFICATION OF FLOWERING PLANTS

The state of family name and authorships currently is in flux. The *International Code of Botanical Nomenclature* (Greuter *et al.*, 2000) provides currently for the use of pre-1789 names. However, there is a major push, which in all likelihood will be successful, to establish a formal starting date for spermatophyte (if not all vascular plants) family names as of 4 August 1789 (e.g. Jussieu’s *Genera plantarum*). As a result, this listing, in an effort to avoid the introduction of names and/or authorships that almost certainly will be incorrect after 2005, presumes 1789 as the start date for angiosperm family names. In this way, we

believe nomenclatural stability can be achieved without undue confusion in the future. Two names are retained (Potamogetonaceae and Cornaceae) in anticipation of future superconservation proposals formally establishing their continued use. Also Meerow and others likely will make a similar proposal to maintain Amaryllidaceae over Alliaceae, but Alliaceae is retained here.

*new family placement; †newly recognized order for the APG system; §new family circumscription described in the text. The list reflects a starting date for all flowering plant family names of 4 August 1789 (Jussieu, *Genera plantarum*). Full citations are available elsewhere (Reveal, 1998-onward). Families in square brackets are acceptable, monophyletic alternatives to the broader circumscription favoured here.

Amborellaceae Pichon (1948), nom. cons.
Chloranthaceae R.Br. ex. Sims (1820), nom. cons.
Nymphaeaceae Salisb. (1805), nom. cons.
[+Cabombaceae Rich. ex. A.Rich. (1822), nom. cons.]

†Austrobaileyales Takht. ex. Reveal (1992)
Austrobaileyaceae (Croizat) Croizat (1943), nom. cons.
§Schisandraceae Blume (1830), nom. cons.
[+Illiciaceae A.C.Sm. (1947), nom. cons.]
Trimeniaceae L.S.Gibbs (1917), nom. cons.

Ceratophyllales Bisch. (1839)
Ceratophyllaceae Gray (1821), nom. cons.

MAGNOLIIDS

†Canellales Cronquist (1957)
Canellaceae Mart. (1832), nom. cons.
Winteraceae R.Br. ex. Lindl. (1830), nom. cons.

Laurales Perleb (1826)
Atherospermataceae R.Br. (1814)
Calycanthaceae Lindl. (1819), nom. cons.
Gomortegaceae Reiche (1896), nom. cons.
Hernandiaceae Bercht. & J.Presl (1820), nom. cons.
Lauraceae Juss. (1789), nom. cons.
Monimiaceae Juss. (1809), nom. cons.
Siparunaceae (A.DC.) Schodde 1970

Magnoliales Bromhead (1838)
Annonaceae Juss. (1789), nom. cons.
Degeneriaceae I.W.Bailey & A.C.Sm. (1942), nom. cons.
Eupomatiaceae Endl. (1841), nom. cons.
Himantandraceae Diels (1917), nom. cons.
Magnoliaceae Juss. (1789), nom. cons.

Myristicaceae R.Br. (1810), nom. cons.

Piperales Dumort. (1829)
Aristolochiaceae Juss. (1789), nom. cons.
*Hydnoraceae C.Agardh (1821), nom. cons.
Lactoridaceae Engl. (1888), nom. cons.
Piperaceae Bercht. & J. Presl (1820), nom. cons.
Saururaceae Martynov (1820), nom. cons.

MONOCOTS

§Petrosaviaceae Hutch. (1934), nom. cons.

Acorales Reveal (1996)
Acoraceae Martynov (1820)

Alismatales Dumort. (1829)
Alismataceae Vent. (1799), nom. cons.
Aponogetonaceae J.Agardh (1858), nom. cons.
Araceae Juss. (1789), nom. cons.
Butomaceae Mirb. (1804), nom. cons.
Cymodoceaceae N.Taylor (1909), nom. cons.
Hydrocharitaceae Juss. (1789), nom. cons.
Juncaginaceae Rich. (1808), nom. cons.
Limnocharitaceae Takht. ex. Cronquist (1981)
Posidoniaceae Hutch. (1934), nom. cons.
Potamogetonaceae Rchb. (1828), nom. cons.
Ruppiceae Horan. (1834), nom. cons.
Scheuchzeriaceae F.Rudolphi (1830), nom. cons.
Tofieldiaceae Takht. (1995)
Zosteraceae Dumort. (1829), nom. cons.

Asparagales Bromhead (1838)
§Alliaceae Batsch ex. Borkh. (1797), nom. cons.
[+Agapanthaceae F.Voigt (1850)]
[+Amaryllidaceae J.St.-Hil. (1805), nom. cons.]
§Asparagaceae Juss. (1789), nom. cons.
[+Agavaceae Dumort. (1829), nom. cons.]
[+Aphyllanthaceae Burnett (1835)]
[+Hesperocallidaceae Traub (1972)]
[+Hyacinthaceae Batsch ex. Borkh. (1797)]
[+Laxmanniaceae Bubani (1901 – 02)]
[+Ruscaceae Spreng. (1826), nom. cons.]
[+Themidaceae Salisb. (1866)]
Asteliaceae Dumort. (1829)
Blandfordiaceae R.Dahlgren & Clifford (1985)
Boryaceae (Baker) M.W.Chase, Rudall & Conran (1997)
Doryanthaceae R.Dahlgren & Clifford (1985)
Hypoxidaceae R.Br. (1814), nom. cons.
Iridaceae Juss. (1789), nom. cons.
Ixioliriaceae Nakai (1943)
Lanariaceae H.Huber ex. R.Dahlgren & A.E.van Wyk (1988)
Orchidaceae Juss. (1789), nom. cons.
Tecophilaeaceae Leyb. (1862), nom. cons.

§Xanthorrhoeaceae Dumort. (1829), nom. cons.
 [+Asphodelaceae Juss. (1789)]
 [+Hemerocallidaceae R.Br. (1810)]
 Xeronemataceae M.W.Chase, Rudall & M.F.Fay
 (2001)

Dioscoreales Hook.f. (1873)

§Burmanniaceae Blume (1827), nom. cons.
 §Dioscoreaceae R.Br. (1810), nom. cons.
 *Nartheciaceae Fr. ex. Bjurzon (1846)

Liliales Perleb (1826)

Alstroemeriaceae Dumort. (1829), nom. cons.
 Campynemataceae Dumort. (1829)
 Colchicaceae DC. (1804), nom. cons.
 *Corsiaceae Becc. (1878), nom. cons.
 Liliaceae Juss. (1789), nom. cons.
 Luzuriagaceae Lotsy (1911)
 Melanthiaceae Batsch ex. Borkh. (1796), nom.
 cons.
 Philesiaceae Dumort. (1829), nom. cons.
 Rhipogonaceae Conran & Clifford (1985)
 Smilacaceae Vent. (1799), nom. cons.

Pandanales Lindl. (1833)

Cyclanthaceae Poit. ex. A.Rich. (1824), nom. cons.
 Pandanaceae R.Br. (1810), nom. cons.
 Stemonaceae Caruel (1878), nom. cons.
 *Triuridaceae Gardner (1843), nom. cons.
 Velloziaceae Hook. (1827), nom. cons.

COMMELINIDS

Dasyopogonaceae Dumort. (1829)

Arecales Bromhead (1840)

Areaceae Schultz Sch. (1832), nom. cons.

Commelinales Dumort. (1829)

Commelinaceae Mirb. (1804), nom. cons.
 Haemodoraceae R.Br. (1810), nom. cons.
 *Hanguanaceae Airy Shaw (1964)
 Philydraceae Link (1821), nom. cons.
 Pontederiaceae Kunth (1816), nom. cons.

Poales Small (1903)

Anarthriaceae D.F.Cutler & Airy Shaw (1965)
 *Bromeliaceae Juss. (1789), nom. cons.
 Centrolepidaceae Endl. (1836), nom. cons.
 Cyperaceae Juss. (1789), nom. cons.
 Ecdeiocoleaceae D.F.Cutler & Airy Shaw (1965)
 Eriocaulaceae Martynov (1820), nom. cons.
 Flagellariaceae Dumort. (1829), nom. cons.
 Hydatellaceae U.Hamann (1976)
 Joinvilleaceae Toml. & A.C.Sm. (1970)
 Juncaceae Juss. (1789), nom. cons.

*Mayacaceae Kunth (1842), nom. cons.
 Poaceae (R.Br.) Barnh. 1895, nom. cons.
 *Rapateaceae Dumort. (1829), nom. cons.
 Restionaceae R.Br. (1810), nom. cons.
 Sparganiaceae Hanin (1811), nom. cons.
 §Thurniaceae Engl. (1907), nom. cons.
 Typhaceae Juss. (1789), nom. cons.
 §Xyridaceae C.Agardh (1823), nom. cons.

Zingiberales Griseb. (1854)

Cannaceae Juss. (1789), nom. cons.
 Costaceae Nakai (1941)
 Heliconiaceae Nakai (1941)
 Lowiaceae Ridl. (1924), nom. cons.
 Marantaceae R.Br. (1814), nom. cons.
 Musaceae Juss. (1789), nom. cons.
 Strelitziaceae Hutch. (1934), nom. cons.
 Zingiberaceae Martynov (1820), nom. cons.

EUDICOTS

§Buxaceae Dumort. (1822), nom. cons.
 [+Didymelaceae Leandri (1937)]
 Sabiaceae Blume (1851), nom. cons.
 Trochodendraceae Eichler (1865), nom. cons.
 [+Tetracentraceae A.C.Sm. (1945), nom. cons.]

Proteales Dumort. (1829)

Nelumbonaceae Bercht. & J.Presl (1820), nom.
 cons.
 §Proteaceae Juss. (1789), nom. cons.
 [+Platanaceae T.Lestib. (1826), nom. cons.]

Ranunculales Dumort. (1829)

Berberidaceae Juss. (1789), nom. cons.
 Circaeasteraceae Hutch. (1926), nom. cons.
 [+Kingdoniaceae A.S.Foster ex. Airy Shaw (1964)]
 Eupteleaceae K.Wilh. (1910), nom. cons.
 Lardizabalaceae R.Br. (1821), nom. cons.
 Menispermaceae Juss. (1789), nom. cons.
 Papaveraceae Juss. (1789), nom. cons.
 [+Fumariaceae Bercht. & J.Presl (1820), nom.
 cons.]
 [+Pteridophyllaceae (Murb.) Nakai ex. Reveal &
 Hoogland (1991)]
 Ranunculaceae Juss. (1789), nom. cons.

CORE EUDICOTS

Aextoxicaceae Engl. & Gilg (1920), nom. cons.
 Berberidopsidaceae Takht. (1985)
 Dilleniaceae Salisb. (1807), nom. cons.

†Gunnerales Takht. ex. Reveal (1992)

§Gunneraceae Meisn. (1842), nom. cons.
 [+Myrothamnaceae Nied. (1891), nom. cons.]

Caryophyllales Perleb (1826)

- Achatocarpaceae Heimerl. (1934), nom. cons.
 Aizoaceae Martynov (1820), nom. cons.
 Amaranthaceae Juss. (1789), nom. cons.
 Ancistrocladaceae Planch. ex. Walp. (1851), nom. cons.
 Asteropeiaceae (Szyszyl.) Takht. ex. Reveal & Hoogland (1990)
 *Barbeuiaceae Nakai (1942)
 Basellaceae Raf. (1837), nom. cons.
 Cactaceae Juss. (1789), nom. cons.
 Caryophyllaceae Juss. (1789), nom. cons.
 Didiereaceae Radlk. (1896), nom. cons.
 Dioncophyllaceae Airy Shaw (1952), nom. cons.
 Droseraceae Salisb. (1808), nom. cons.
 Drosophyllaceae Chrtek, Slavíková & Studnicka (1989)
 Frankeniaceae Desv. (1817), nom. cons.
 *Gisekiaceae Nakai (1942)
 Halophytaceae A.Soriano (1984)
 Molluginaceae Bartl. (1825), nom. cons.
 Nepenthaceae Bercht. & J.Presl (1820), nom. cons.
 Nyctaginaceae Juss. (1789), nom. cons.
 Phytolaccaceae R.Br. (1818), nom. cons.
 Plumbaginaceae Juss. (1789), nom. cons.
 Polygonaceae Juss. (1789), nom. cons.
 Portulacaceae Juss. (1789), nom. cons.
 Rhabdodendraceae Prance (1968)
 Sarcobataceae Behnke (1997)
 Simmondsiaceae Tiegh. (1899)
 Stegnospermataceae Nakai (1942)
 Tamaricaceae Bercht. & J.Presl (1820), nom. cons.

Santalales Dumort. (1829)

- Olacaceae R.Br. (1818), nom. cons.
 Opiliaceae Valetton (1886), nom. cons.
 Loranthaceae Juss. (1808), nom. cons.
 Misodendraceae J. Agardh (1858), nom. cons.
 Santalaceae R.Br. (1810), nom. cons.

Saxifragales Dumort. (1829)

- Altingiaceae Horan. (1843), nom. cons.
 Aphanopetalaceae Doweld (2001)
 Cercidiphyllaceae Engl. (1907), nom. cons.
 Crassulaceae J.St.-Hil. (1805), nom. cons.
 Daphniphyllaceae Müll.-Arg. (1869), nom. cons.
 Grossulariaceae DC. (1805), nom. cons.
 §Haloragaceae R.Br. (1814), nom. cons.
 [+Penthoraceae Rydb. ex. Britt. (1901), nom. cons.]
 [+Tetracarpaceae Nakai (1943)]
 Hamamelidaceae R.Br. (1818), nom. cons.
 §Iteaceae J.Agardh (1858), nom. cons.
 [+Pterostemonaceae Small (1905), nom. cons.]
 Paeoniaceae Raf. (1815), nom. cons.
 Saxifragaceae Juss. (1789), nom. cons.

ROSIDS

- Aphloiaceae Takht. (1985)
 *Geissolomataceae Endl. (1841)
 Ixerbaceae Griseb. (1854)
 Picramniaceae Fernando & Quinn (1995)
 *Strasburgeriaceae Soler. (1908), nom. cons.
 *Vitaceae Juss. (1789), nom. cons.

†Crossosomatales Takht. ex. Reveal (1993)

- Crossosomataceae Engl. (1897), nom. cons.
 Stachyuraceae J.Agardh (1858), nom. cons.
 Staphyleaceae Martynov (1820), nom. cons.

Geraniales Dumort. (1829)

- Geraniaceae Juss. (1789), nom. cons.
 [+Hypseocharitaceae Wedd. (1861)]
 Ledocarpaceae Meyen (1834)
 §Melianthaceae Bercht. & J.Presl (1820), nom. cons.
 [+Francoaceae A.Juss. (1832), nom. cons.]
 Vivianiaceae Klotzsch (1836)

Myrtales Rchb. (1828)

- Alzateaceae S.A.Graham (1985)
 Combretaceae R.Br. (1810), nom. cons.
 Crypteroniaceae A.DC. (1868), nom. cons.
 Heteropyxidaceae Engl. & Gilg (1920), nom. cons.
 Lythraceae J.St.-Hil. (1805), nom. cons.
 §Melastomataceae Juss. (1789), nom. cons.
 [+Memecylaceae DC. (1827), nom. cons.]
 Myrtaceae Juss. (1789), nom. cons.
 Oliniaceae Arn. (1839), nom. cons.
 Onagraceae Juss. (1789), nom. cons.
 Penaeaceae Sweet ex. Guill. (1828), nom. cons.
 Psiloxylaceae Croizat (1960)
 Rhynchocalycaceae L.A.S.Johnson & B.G.Briggs (1985)
 Vochysiaceae A.St.-Hil. (1820), nom. cons.

EUROSIDS I

- §*Zygophyllaceae R.Br. (1814), nom. cons.
 [+Krameriaceae Dumort. (1829), nom. cons.]
 Huaceae A.Chev. (1947)

†Celastrales Baskerville (1839)

- §Celastraceae R.Br. (1814), nom. cons.
 †Lepidobotryaceae J.Léonard (1950), nom. cons.
 Parnassiaceae Martynov (1820), nom. cons.
 [+Lepuropetalaceae Nakai (1943)]

Cucurbitales Dumort. (1829)

- Anisophylleaceae Ridl. (1922)
 Begoniaceae Bercht. & J.Presl (1820), nom. cons.
 Coriariaceae DC. (1824), nom. cons.

- Corynocarpaceae Engl. (1897), nom. cons.
 Cucurbitaceae Juss. (1789), nom. cons.
 Datisceae Bercht. & J.Presl (1820), nom. cons.
 Tetramelaceae Airy Shaw (1964)
- Fabales Bromhead (1838)
 Fabaceae Lindl. (1836), nom. cons.
 Polygalaceae Hoffmanns. & Link (1809), nom. cons.
 Quillajaceae D.Don (1831)
 Surianaceae Arn. (1834), nom. cons.
- Fagales Engl. (1892)
 Betulaceae Gray (1821), nom. cons.
 Casuarinaceae R.Br. (1814), nom. cons.
 Fagaceae Dumort. (1829), nom. cons.
 §Juglandaceae DC. ex. Perleb (1818), nom. cons.
 [+Rhoipteleaceae Hand.-Mazz. (1932), nom. cons.]
 Myricaceae A.Rich. ex. Kunth (1817), nom. cons.
 Nothofagaceae Kuprian (1962)
 Ticodendraceae Gómez-Laur. & L.D.Gómez (1991)
- Malpighiales Mart. (1835)
 §Achariaceae Harms (1897), nom. cons.
 Balanopaceae Benth. & Hook.f. (1880), nom. cons.
 *Bonnetiaceae (Bartl.) L.Beauv. ex. Nakai (1948)
 Caryocaraceae Voigt (1845), nom. cons.
 §Chrysobalanaceae R.Br. (1818), nom. cons.
 [+Dichapetalaceae Baill. (1886), nom. cons.]
 [+Euphroniaceae Marc.-Berti (1989)]
 [+Trigoniaceae Endl. (1841), nom. cons.]
 §Clusiaceae Lindl. (1836), nom. cons.
 *Ctenolophonaceae (H.Winkl.) Exell & Mendonça (1951)
 *Elatinaceae Dumort. (1829), nom. cons.
 §Euphorbiaceae Juss. (1789), nom. cons.
 Goupiaceae Miers (1862)
 Humiriaceae A.Juss. (1829), nom. cons.
 §Hypericaceae Juss. (1789), nom. cons.
 Irvingiaceae (Engl.) Exell & Mendonça (1951), nom. cons.
 *Ixanthaceae Planch. ex. Miq. (1858), nom. cons.
 Lacistemataceae Mart. (1826), nom. cons.
 §Linaceae DC. ex. Perleb (1818), nom. cons.
 *Lophopyxidaceae (Engl.) H.Pfeiff. (1951)
 Malpighiaceae Juss. (1789), nom. cons.
 §Ochnaceae DC. (1811), nom. cons.
 [+Medusagynaceae Engl. & Gilg (1924), nom. cons.]
 [+Quiinaceae Choisy ex. Engl. (1888), nom. cons.]
 Pandaceae Engl. & Gilg (1912–13), nom. cons.
 §Passifloraceae Juss. ex. Roussel (1806), nom. cons.
 [+Malesherbiaceae D.Don (1827), nom. cons.]
 [+Turneraceae Kunth ex. DC. (1828), nom. cons.]
 *Peridiscaceae Kuhlm. (1950), nom. cons.
- §Phyllanthaceae Martynov (1820)
 §Picrodendraceae Small (1917), nom. cons.
 *Podostemaceae Rich. ex. C. Agardh (1822), nom. cons.
 Putranjivaceae Endl. (1841)
 §Rhizophoraceae Pers. (1807), nom. cons.
 [+Erythroxylaceae Kunth (1822), nom. cons.]
 §Salicaceae Mirb. (1815), nom. cons.
 Violaceae Batsch (1802), nom. cons.
- Oxalidales Heintze (1927)
 §Brunelliaceae Engl. (1897), nom. cons.
 Cephalotaceae Dumort. (1829), nom. cons.
 Connaraceae R.Br. (1818), nom. cons.
 Cunoniaceae R.Br. (1814), nom. cons.
 §Elaeocarpaceae Juss. ex. DC. (1816), nom. cons.
 Oxalidaceae R.Br. (1818), nom. cons.
- Rosales Perleb (1826)
 Barbeyaceae Rendle (1916), nom. cons.
 §Cannabaceae Martynov (1820), nom. cons.
 Dirachmaceae Hutch. (1959)
 Elaeagnaceae Juss. (1789), nom. cons.
 Moraceae Link (1831), nom. cons.
 Rhamnaceae Juss. (1789), nom. cons.
 Rosaceae Juss. (1789), nom. cons.
 Ulmaceae Mirb. (1815), nom. cons.
 §Urticaceae Juss. (1789), nom. cons.
- EUROSIDS II
- Tapisciaceae (Pax) Takht. (1987)
- Brassicales Bromhead (1838)
 Akaniaceae Stapf (1912), nom. cons.
 [+Bretschneideraceae Engl. & Gilg (1924), nom. cons.]
 Bataceae Perleb (1838), nom. cons.
 Brassicaceae Burnett (1835), nom. cons.
 Caricaceae Dumort. (1829), nom. cons.
 Emblingiaceae Airy Shaw (1964)
 Gyrostemonaceae Endl. (1841), nom. cons.
 Koeberliniaceae Engl. (1895), nom. cons.
 Limnanthaceae R.Br. (1833), nom. cons.
 Moringaceae Martynov (1820), nom. cons.
 Pentadiplandraceae Hutch. & Dalziel (1928)
 Resedaceae Bercht. & J.Presl (1820), nom. cons.
 Salvadoraceae Lindl. (1836), nom. cons.
 Setchellanthaceae Iltis (1999)
 Tovariaceae Pax (1891), nom. cons.
 Tropaeolaceae Bercht. & J.Presl (1820), nom. cons.
- Malvales Dumort. (1829)
 §Bixaceae Kunth (1822), nom. cons.
 [+Diegodendraceae Capuron (1964)]

[+Cochlospermaceae Planch. (1847), nom. cons.]
 Cistaceae Juss. (1789), nom. cons.
 Dipterocarpaceae Blume (1825), nom. cons.
 Malvaceae Juss. (1789), nom. cons.
 Muntingiaceae C.Bayer, M.W.Chase & M.F.Fay
 (1998)
 Neuradaceae Link (1831), nom. cons.
 Sarcolaenaceae Caruel (1881), nom. cons.
 Sphaerosepalaceae (Warb.) Tiegh. ex. Bullock
 (1959)
 §Thymelaeaceae Juss. (1789), nom. cons.

Sapindales Dumort. (1829)

Anacardiaceae R.Br. (1818), nom. cons.
 Biebersteiniaceae Endl. (1841)
 Burseraceae Kunth (1824), nom. cons.
 Kirkiaceae (Engl.) Takht. (1967)
 Meliaceae Juss. (1789), nom. cons.
 §Nitrariaceae Bercht. & J.Presl (1820), nom.
 cons.
 [+Peganaceae (Engl.) Tieghm. ex. Takht. (1987)]
 [+Tetradichidaceae (Engl.) Takht. 1986]
 Rutaceae Juss. (1789), nom. cons.
 Sapindaceae Juss. (1789), nom. cons.
 Simaroubaceae DC. (1811), nom. cons.

ASTERIDS

Cornales Dumort. (1829)

Cornaceae Dumort. (1829), nom. cons.
 [+Nyssaceae Juss. ex. Dumort. (1829), nom. cons.]
 Curtisiaceae (Engl.) Takht. (1987)
 Grubbiaceae Endl. (1839), nom. cons.
 Hydrangeaceae Dumort. (1829), nom. cons.
 Hydrostachyaceae (Tul.) Engl. (1894), nom. cons.
 Loasaceae Juss. (1804), nom. cons.

Ericales Dumort. (1829)

Actinidiaceae Gilg & Werderm. (1825), nom. cons.
 Balsaminaceae Bercht. & J.Presl (1820), nom.
 cons.
 Clethraceae Klotzsch (1851), nom. cons.
 Cyrillaceae Endl. (1841), nom. cons.
 Diapensiaceae Lindl. (1836), nom. cons.
 §Ebenaceae Gürke (1891), nom. cons.
 Ericaceae Juss. (1789), nom. cons.
 Fouquieriaceae DC. (1828), nom. cons.
 Lecythidaceae A.Rich. (1825), nom. cons.
 Maesaceae (A.DC.) Anderb., B.Stähl & Källersjö
 (2000)
 Marcgraviaceae Juss. ex. DC. (1816), nom. cons.
 § Myrsinaceae R.Br. (1810), nom. cons.
 Pentaphragmaceae Engl. (1897), nom. cons.
 [+Ternstroemiaceae Mirb. ex. DC. (1816)]
 [+Sladeniaceae Airy Shaw (1964)]
 Polemoniaceae Juss. (1789), nom. cons.

§Primulaceae Batsch ex. Borkh. (1797), nom.
 cons.
 Roridulaceae Bercht. & J.Presl (1820), nom. cons.
 Sapotaceae Juss. (1789), nom. cons.
 Sarraceniaceae Dumort. (1829), nom. cons.
 §Styracaceae DC. & Spreng. (1821), nom. cons.
 Symplocaceae Desf. (1820), nom. cons.
 §Tetrameristaceae Hutch. (1959)
 [+Pellicieraceae (Triana & Planch.) L.Beauvis. ex.
 Bullock (1959)]
 Theaceae Mirb. ex. Ker Gawl. (1816), nom. cons.
 §Theophrastaceae Link (1829), nom. cons.

EUASTERIDS I

Boraginaceae Juss. (1789), nom. cons.
 §*Icacinaceae (Benth.) Miers (1851), nom. cons.
 *Oncothecaceae Kobuski ex. Airy Shaw (1964)
 Vahliaceae Dandy (1959)

Garryales Lindl. (1846)

Eucommiaceae Engl. (1909), nom. cons.
 §Garryaceae Lindl. (1834), nom. cons.
 [+Aucubaceae J.Agardh (1858)]

Gentianales Lindl. (1833)

Apocynaceae Juss. (1789), nom. cons.
 Gelsemiaceae (G.Don) Struwe & V. Albert (1995)
 Gentianaceae Juss. (1789), nom. cons.
 Loganiaceae R.Br. (1814), nom. cons.
 Rubiaceae Juss. (1789), nom. cons.

Lamiales Bromhead (1838)

§Acanthaceae Juss. (1789), nom. cons.
 Bignoniaceae Juss. (1789), nom. cons.
 Byblidaceae (Engl. & Gilg) Domin (1922), nom.
 cons.
 Calceolariaceae (D.Don) Olmstead (2001)
 *Carlemanniaceae Airy Shaw (1964)
 Gesneriaceae Rich. & Juss. ex. DC. (1816), nom.
 cons.
 Lamiaceae Martynov (1820), nom. cons.
 Lentibulariaceae Rich. (1808), nom. cons.
 *Martyniaceae Horan. (1847), nom. cons.
 Oleaceae Hoffmanns. & Link (1809), nom. cons.
 See Orobanchaceae Vent. (1799), nom. cons.
 Paulowniaceae Nakai (1949)
 Pedaliaceae R.Br. (1810), nom. cons.
 §Phrymaceae Schauer (1847), nom. cons.
 §Plantaginaceae Juss. (1789), nom. cons.
 *Plocospermataceae Hutch. (1973)
 Schlegeliaceae (A.H.Gentry) Reveal (1996)
 §Scrophulariaceae Juss. (1789), nom. cons.
 Stilbaceae Kunth (1831), nom. cons.
 Tetrachondraceae Wettst. (1924)
 Verbenaceae J.St.-Hil. (1805), nom. cons.

Solanales Dumort. (1829)

- Convolvulaceae Juss. (1789), nom. cons.
 Hydroleaceae Bercht. & J. Presl (1820)
 §Montiniaceae Nakai (1943), nom. cons.
 Solanaceae Juss. (1789), nom. cons.
 Sphenocleaceae (Lindl.) Baskerville (1839), nom. cons.

EUASTERIDS II

- Bruniaceae Bercht. & J. Presl (1820), nom. cons.
 Columelliaceae D. Don (1828), nom. cons.
 [+Desfontainiaceae Endl. (1841), nom. cons.]
 Eremosynaceae Dandy (1959)
 Escalloniaceae R. Br. ex. Dumort. (1829), nom. cons.
 Paracryphiaceae Airy Shaw (1964)
 Polyosmaceae Blume (1851)
 Sphenostemonaceae P. Royen & Airy Shaw (1972)
 Tribelaceae Airy Shaw (1964)

Apiales Nakai (1930)

- Apiaceae Lindl. (1836), nom. cons.
 Araliaceae Juss. (1789), nom. cons.
 Aralidiaceae Philipson & B. C. Stone (1980)
 Griselinaceae J. R. Forst. & G. Forst. ex. A. Cunn. (1839)
 Mackinlayaceae Doweld (2001)
 Melanophyllaceae Takht. ex. Airy Shaw (1972)
 Myodocarpaceae Doweld (2001)
 Pennantiaceae J. Agardh (1858)
 Pittosporaceae R. Br. (1814), nom. cons.
 Torricelliaceae Hu (1934)

Aquifoliales Senft (1856)

- Aquifoliaceae DC. ex. A. Rich. (1828), nom. cons.
 *§Cardiopteridaceae Blume (1847), nom. cons.
 Helwingiaceae Decne. (1836)
 Phyllonomaceae Small (1905)
 §Stemonuraceae (M. Roem.) Kårehed (2001)

Asterales Lindl. (1833)

- Alseuosmiaceae Airy Shaw (1964)
 Argophyllaceae (Engl.) Takht. 1987
 Asteraceae Martynov (1820), nom. cons.
 Calyceraceae R. Br. ex. Rich. (1820), nom. cons.
 §Campanulaceae Juss. (1789), nom. cons.
 [+Lobeliaceae Juss. ex. Bonpl. (1813), nom. cons.]
 Goodeniaceae R. Br. (1810), nom. cons.
 Menyanthaceae Bercht. & J. Presl (1820), nom. cons.
 Pentaphragmataceae J. Agardh (1858), nom. cons.
 Phellinaceae (Loes.) Takht. 1967
 §Rousseaceae DC. (1839)
 Stylidiaceae R. Br. (1810), nom. cons.
 [+Donatiaceae B. Chandler (1911), nom. cons.]

Dipsacales Dumort. (1829)

- *Adoxaceae E. Mey. (1839), nom. cons.
 §Caprifoliaceae Juss. (1789), nom. cons.
 [+Diervillaceae (Raf.) Pyck 1998]
 [+Dipsacaceae Juss. (1789), nom. cons.]
 [+Linnaeaceae (Raf.) Backlund 1998]
 [+Morinaceae Raf. (1820)]
 [+Valerianaceae Batsch (1802), nom. cons.]

TAXA OF UNCERTAIN POSITION

If an unplaced genus is the type of a family name, that name is given for information purposes.

Aneulophus Benth.

Apodanthaceae van Tieghem ex. Takhtajan in Takhtajan (1997) [three genera]

Bdallophyton Eichl.

Balanophoraceae Rich. (1822), nom. cons.

Centroplacus Pierre

Cynomorium L. [Cynomoriaceae Lindl. (1833), nom. cons.]

Cytinus L. [Cytinaceae A. Rich. (1824)]

Dipentodon Dunn [Dipentodontaceae Merr. (1941), nom. cons.]

Gumillea Ruiz & Pav.

Hoplostigma Pierre [Hoplostigmataceae Engl. & Gilg (1924), nom. cons.]

Leptaulus Benth.

Medusandra Brenan [Medusandraceae Brenan (1952), nom. cons.]

Metteniusa H. Karst. [Metteniusaceae H. Karst. ex. Schnizl. (1860–1870)]

Mitrastema Makino [Mitrastemonaceae Makino (1911), nom. cons.]

Pottingeria Prain [Pottingeriaceae (Engl.) Takht. 1987]

Rafflesiaceae Dumort. (1829), nom. cons. [three genera included]

Soyauxia Oliv.

Trichostephanus Gilg

ORDINAL NAMES AND SYNONYMS

Accepted ordinal names are in bold face; those based on a family not yet placed in an order are in italics. Year of publication is indicated.

Acanthales Lindl. (1833) = Lamiales

Acerales Lindl. (1833) = Sapindales

Acorales Reveal (1996)

Actinidiales Takht. ex. Reveal (1993) = Ericales

Adoxales Nakai (1949) = Dipsacales

Aesculales Bromhead (1838) = Sapindales

Agavales Hutch. (1934) = Asparagales

Akaniales Doweld (2001) = Brassicales

Alismatales Dumort. (1829)

Alliales Traub (1972) = Asparagales

- Alseuosmiales Doweld (2001) = Asterales
 Alstroemeriales Hutch. (1934) = Liliales
 Altingiales Doweld (1998) = Saxifragales
 Amaranthales Dumort. (1829) = Caryophyllales
 Amaryllidales Bromhead (1840) = Asparagales
Amborellales Melikyan, A.V. Bobrov & Zaytzeva
 (1999) – family unplaced
 Ambrosiales Dumort. (1829) = Asterales
 Ammiales Small (1903) = Apiales
 Amomales Lindl. (1835) = Zingiberales
 Ancistrocladales Takht. ex. Reveal (1992) =
 Caryophyllales
 Anisophylleales (Benth. & Hook.f.) Takht. ex.
 Reveal & Doweld (1999)
 Annonales Lindl. (1833) = Magnoliales
 Anthobolales Dumort. (1829) = Santalales
Apiales Nakai (1930)
 Apocynales Bromhead (1838) = Gentianales
 Aponogetonales Hutch. (1934) = Alismatales
Aquifoliales Senft (1856)
 Arales Dumort. (1829) = Alismatales
 Araliales Reveal (1996) = Apiales
 Aralidiales Takht. ex. Reveal (1992) = Apiales
Arecales Bromhead (1840)
 Aristolochiales Dumort. (1829) = Piperales
 Asarales Horan (1847) = Piperales
 Asclepiadales Dumort. (1829) = Gentianales
Asparagales Bromhead (1838)
 Asphodelales Doweld (2001) = Asparagales
 Asteliales Dumort. (1829) = Asparagales
Asterales Lindl. (1833)
 Atriplicales Horan (1847) = Caryophyllales
 Aucubales Takht. (1997) = Garryales
Austrobaileyales Takht. ex. Reveal (1992)
 Avenales Bromhead (1838) = Poales
 Balanitales C.Y.Wu (2002) – family unplaced in
 eurosids I = *Zygophyllales*
 Balanopales Engl. (1897) = Malpighiales
Balanophorales Dumort. (1829) – family unplaced
 at end of system
 Balsaminales Lindl. (1833) = Ericales
 Barbeyales Takht. & Reveal (1993) = Rosales
 Barclayales Doweld (2001) = *Nymphaeales*, family
 unplaced at beginning of system
 Batales Engl. (1907) = Brassicales
 Begoniales Dumort. (1829) = Cucurbitales
 Berberidales Dumort. (1829) = Ranunculales
Berberidopsidales Doweld (2001) – family
 unplaced in core eudicots
 Betulales Bromhead (1838) = Fagales
 Biebersteiniales Takht. (1997) = Sapindales
 Bignoniales Lindl. (1833) = Lamiales
 Bixales Lindl. (1833) = Malvales
Boraginales Dumort. (1829) – family unplaced
 under euasterid I
Brassicales Bromhead (1838)
 Brexiales Lindl. (1833) = Celastrales
 Bromeliales Dumort. (1829) = Poales
Bruniales Dumort. (1829) – family unplaced
 under euasterid II
 Brunoniales Lindl. (1833) = Asterales
 Burmanniales Heinze (1927) = Dioscoreales
 Burserales Baskerville (1839) = Sapindales
 Butomales Hutch. (1934) = Alismatales
Buxales Takht. ex. Reveal (1996) – family
 unplaced under eudicots
 Byblidales Nakai ex. Reveal (1993) = Lamiales
 Cactales Dumort. (1829) = Caryophyllales
 Callitrichales Dumort. (1829) = Lamiales
 Calycanthales Mart. (1835) = Laurales
 Calycerales Takht. ex. Reveal (1996) = Asterales
 Campanulales Rchb. (1828) = Asterales
 Campynematales Doweld (2001) = Liliales
Canellales Cronquist (1957)
 Cannales Dumort. (1829) = Zingiberales
 Capparales Hutch. (1924) = Brassicales
 Caprifoliales Lindl. (1833) = Dipsacales
 Cardiopteridales Takht. (1997) = Aquifoliales
 Carduales Small (1903) = Asterales
 Caricales L.D. Benson (1957) = Brassicales
 Carlemanniales Doweld (2001) = Lamiales
Caryophyllales Perleb (1826)
 Cassiales Horan. (1847) = Fabales
 Casuarinales Lindl. (1833) = Fagales
Celastrales Baskerville (1839)
 Centrolepidales R. Dahlgren ex. Takht. (1997) =
 Poales
 Cephalotales Nakai (1943) = Oxalidales
Ceratophyllales Bisch. (1839)
 Cercidiphyllales Hu ex. Reveal (1993) =
 Saxifragales
 Chenopodiales Dumort. (1829) = Caryophyllales
 Chironiales Griseb. (1854) = Gentianales
Chloranthales A.C.Sm. ex. J.-F. Leroy (1983) –
 family unplaced at beginning of system
 Chrysobalanales (DC.) Takht. ex. Reveal & Dow-
 eld (1999) = Malpighiales
 Cinchonales Lindl. (1835) = Gentianales
 Circaeasterales Takht. (1997) = Ranunculales
 Cistales Rchb. (1828) = Malvales
 Citrales Dumort. (1829) = Sapindales
 Cocosales Nakai (1930) = Arecales
 Colchicales Dumort. (1829) = Liliales
Columelliales Doweld (2001) – family unplaced in
 euasterids II
 Combretales Baskerville (1839) = Myrtales
Commelinales Dumort. (1829)
 Connarales Takht. ex. Reveal (1996) = Oxalidales
 Convolvulales Dumort. (1829) = Solanales
 Coriariales Lindl. (1833) = Cucurbitales
Cornales Dumort. (1829)
 Corylales Dumort. (1829) = Fagales

- Corynocarpales Takht. (1997) = Cucurbitales
 Crassulales Lindl. (1833) = Saxifragales
Crossosomatales Takht. ex. Reveal (1993)
Cucurbitales Dumort. (1829)
 Cunoniales Hutch. (1924) = Oxalidales
 Cyclanthales J.H.Schaffn. (1911) = Pandanales
 Cymodoceales Nakai (1943) = Alismatales
 Cynarales Raf. (1837) = Asterales
Cynomoriales Burnett (1835) – type genus unplaced at end of system
 Cyperales Wettst. (1911) = Poales
 Cyrillales Doweld (2001) = Ericales
Cytinales Dumort. (1829) – type genus unplaced at end of system
 Daphnales Lindl. (1833) = Malvales
 Daphniphyllales Pulle ex. Cronquist (1981) = Saxifragales
Dasyogonales Doweld (2001) – family unplaced under commelinids
 Datiscales Dumort. (1829) = Cucurbitales
 Degeneriales C.Y.Wu (2002) = Magnoliales
Desfontainiales Takht. (1997) – family unplaced under euasterids II
 Diapensiales Engl. & Gilg (1924) = Ericales
 Didymelales Takht. (1967) – see *Buxales*
Dilleniales Hutch. (1924) – family unplaced under core eudicots
 Dioncophyllales Takht. ex. Reveal (1993) = Caryophyllales
Dioscoreales Hook.f. (1873)
 Diospyrales Prantl (1874) = Ericales
Dipentodontales C.Y.Wu (2002) – type genus unplaced at end of system
Dipsacales Dumort. (1829)
 Droserales Griseb. (1854) = Caryophyllales
 Ebenales Engl. (1892) = Ericales
 Echiales Lindl. (1838) – see *Boraginales*
 Elaeagnales Bromhead (1838) = Rosales
 Elaeocarpaceales Takht. (1997) = Oxalidales
 Elatinales Nakai (1949) = Malpighiales
 Elodeales Nakai (1950) = Alismatales
 Emmotales Doweld (2001) = *Icacinales*, unplaced family under euasterids I
 Empetrales Raf. (1838) = Ericales
Ericales Dumort. (1829)
 Eriocaulales Nakai (1930) = Poales
 Erythralales Tiegh. (1899) = Santalales
Escalloniales Doweld (2001) – family unplaced in euasterids II
 Eucommiales Nemejc ex. Cronquist (1981) = Garryales
 Euphorbiales Lindl. (1833) = Malpighiales
 Eupomatiales Takht. ex. Reveal (1992) = Magnoliales
 Eupteleales Hu ex. Reveal (1993) = Ranunculales
 Euryalales H.L.Li (1955) – see *Nymphaeales*
 Fabales Bromhead (1838)
Fagales Engl. (1892)
 Ficales Dumort. (1829) = Rosales
 Flacourtiiales Heinze (1927) = Malpighiales
 Flagellariales (Meisn.) Takht. ex. Reveal & Doweld (1999) = Poales
 Fouquieriales Takht. ex. Reveal (1992) = Ericales
 Francoales Takht. (1997) = Geraniales
 Frangulales Wirtg. (1860) = Rosales
 Galiales Bromhead (1838) = Gentianales
Garryales Lindl. (1846)
Geissolomatales Takht. ex. Reveal (1992) – family unplaced under core eudicots
Gentianales Lindl. (1833)
Geraniales Dumort. (1829)
 Gesneriales Dumort. (1829) = Lamiales
 Glaucidiales Takht. ex. Reveal (1992) = Ranunculales
 Globulariales Dumort. (1829) = Lamiales
 Goodeniales Lindl. (1833) = Asterales
 Greyiales Takht. (1997) = Geraniales
 Griseliniales (J.R.Forst. & G.Forst. ex. A.Cunn.) Takht. ex. Reveal & Doweld (1999) = Apiales
 Grossulariales Lindl. (1833) = Saxifragales
 Grubbiales Doweld (2001) = Cornales
Gunnerales Takht. ex. Reveal (1992)
 Gyrocarpaceales Dumort. (1829) = Laurales
 Gyrostemonales Takht. (1997) = Brassicales
 Haemodorales Hutch. (1934) = Commelinales
 Haloragales Bromhead (1838) = Saxifragales
 Hamamelidales Griseb. (1854) = Saxifragales
 Hanguanales R.Dahlgren ex. Reveal (1992) = Commelinales
 Heisteriales Tiegh. (1899) = Santalales
 Helleborales Nakai (1949) = Ranunculales
 Helwingiales Takht. (1997) = Aquifoliales
 Himantandrales Doweld & Shevryyova (1998) = Magnoliales
 Hippuridales Thomé (1874) = Lamiales
 Homaliales Bromhead (1838) = Malpighiales
 Hortensiales Griseb. (1854) = Cornales
 Huales Doweld (2001) = Malpighiales
 Huerteales Doweld (2001) – see Tapisciaceae, an unplaced family in rosids
 Hydatellales (U.Hamann) Cronquist ex. Reveal & Doweld (1999) = Poales
 Hydnoales Takht. ex. Reveal (1992) = Piperales
 Hydrangeales Nakai (1943) = Cornales
 Hydrastidales Takht. (1997) = Ranunculales
 Hydrocharitales Dumort. (1829) = Alismatales
 Hydropeltidales Spenn. (1834) – see Nymphaeaceae
 Hydrostachyales Diels ex. Reveal (1993) = Cornales
 Hypericales Dumort. (1829) = Malpighiales

- Hypoxidales Takht. ex. Reveal & Doweld (1999) = Asparagales
Icacinales Tiegh. (1899) – family unplaced under euasterids I
 Illiciales Hu ex. Cronquist (1981) = Austrobaileyales
 Iridales Raf. (1815) = Asparagales
 Irvingiales Doweld (2001) = Malpighiales
 Iteales Doweld (2001) = Saxifragales
Ixerbales Doweld (2001) – family unplaced in rosids
 Ixiales Lindl. (1835) = Asparagales
 Jasminales Dumort. (1829) = Lamiales
 Juglandales Dumort. (1829) = Fagales
 Julianiales Engl. (1907) = Sapindales
 Juncaginales Hutch. (1934) = Alismatales
 Juncales Dumort. (1829) = Poales
 Lacistematales Baskerville (1839) = Malpighiales
 Lactoridales Takht. ex. Reveal (1993) = Piperales
Lamiales Bromhead (1838)
 Lardizabalales Loconte (1995) = Ranunculales
Laurales Perleb (1826)
 Lecythidales Cronquist (1957) = Ericales
 Ledocarpales Doweld (2001) = Geraniales
 Leitneriales Engl. (1897) = Sapindales
 Lentibulariales Lindl. (1833) = Lamiales
 Ligustrales Bartl. ex. Bisch. (1839) = Lamiales
Liliales Perleb (1826)
 Limnanthales Nakai (1930) = Brassicales
 Linales Baskerville (1839) = Malpighiales
 Loasales Bessey (1907) = Cornales
 Lobeliales Drude (1888) = Asterales
 Loganiales Lindl. (1833) = Gentianales
 Lonicerales T.Liebe (1866) = Dipsacales
 Loranthales Dumort. (1829) = Santalales
 Lowiales Takht. ex. Reveal & Doweld (1999) = Zingiberales
 Lythrales Caruel (1881) = Myrtales
Magnoliales Bromhead (1838)
Malpighiales Mart. (1835)
Malvales Dumort. (1829)
 Marathrales Dumort. (1829) = Malpighiales
 Marcgraviales Doweld (2001) = Ericales
 Mayacales Nakai (1943) = Poales
 Medusagynales Takht. ex. Reveal & Doweld (1999) = Malpighiales
Medusandrales Brenan (1952) – type genus unplaced at end of system
 Melanthiales R.Dahlgren ex. Reveal (1992) = Liliales
 Melastomatales Oliv. (1895) = Myrtales
 Meliales Lindl. (1833) = Sapindales
 Melianthales Doweld = Geraniales
Meliosmales C.Y.Wu (2002) – see *Sabiales*
 Menispermatales Bromhead (1838) = Ranunculales
 Menyanthales T.Yamaz. ex. Takht. (1997) = Asterales
Metteniusales Takht. (1997) – type genus unplaced at end of system
 Miyoshiales Nakai (1941) – see *Petrosaviales*, family unplaced under monocots
 Monimiales Dumort. (1829) = Laurales
 Moringales Nakai (1943) = Brassicales
 Musales Reveal (1997) = Zingiberales
 Myricales Engl. (1897) = Fagales
 Myristicales Thomé (1877) = Magnoliales
 Myrothamnales Nakai ex. Reveal (1993) = Gunnerales
 Myrsinales Spenn. (1835) = Ericales
Myrtales Rchb. (1828)
 Najadales Dumort. (1829) = Alismatales
 Nandinales Doweld (2001) = Ranunculales
 Narcissales Dumort. (1829) = Asparagales
 Nartheciales Reveal & Zomlefer (1998) = Dioscoreales
 Nelumbonales Willk. & Lange (1861) = Proteales
 Nepenthales Dumort. (1829) = Caryophyllales
 Neuradales Doweld (2001) = Malvales
 Nitrariales Doweld (2001) = Sapindales
 Nolanales Lindl. (1835) = Solanales
 Nothofagales Doweld (2001) = Fagales
 Nyctaginales Dumort. (1829) = Caryophyllales
Nymphaeales Dumort. (1829) = family unplaced at beginning of system
 Ochnales Hutch. ex. Reveal (1992) = Malpighiales
 Oenotherales Bromhead (1838) = Myrtales
 Olacales Benth. & Hook.f. (1862) = Santalales
 Oleales Lindl. (1833) = Lamiales
 Onagrales Rchb. (1828) = Myrtales
Oncothecales Doweld (2001) – family unplaced under euasterids I
 Opuntiales Endl. ex. Willk. (1854) = Caryophyllales
 Orchidales Raf. (1815) = Asparagales
Oxalidales Heintze (1927)
 Paeoniales Heinze (1927) = Saxifragales
 Pandales Engl. & Gilg (1912–13) = Malpighiales
Pandanales Lindl. (1833)
 Papaverales Dumort. (1829) = Ranunculales
Paracryphiales Takht. ex. Reveal (1992) – family unplaced under euasterid II
 Paridales Dumort. (1829) = Liliales
 Parnassiales Nakai (1943) = Celastrales
 Passiflorales Dumort. (1829) = Malpighiales
 Penaeales Lindl. (1833) = Myrtales
 Pennantiales Doweld (2001) = Apiales
 Pentaphragmatales Doweld (2001) = Asterales
 Petiveriales Lindl. (1833) = Caryophyllales
Petrosaviales Takht. (1997) – family unplaced under monocots
 Phellinales Doweld (2001) = Asterales

- Phylidrales Dumort. (1829) = Commelinales
 Phyllanthales Doweld (2001) = Malpighiales
 Physenales Takht. (1977) = Caryophyllales
 Phytolaccales Doweld (2001) = Caryophyllales
Picramniales Doweld (2001) – family unplaced under rosids
 Pinguiculales Dumort. (1829) = Lamiales
Piperales Dumort. (1829)
 Pittosporales Lindl. (1833) = Apiales
 Plantaginales Lindl. (1833) = Lamiales
 Platanales J.H.Schaffn. (1911) = Proteales
 Plumbaginales Lindl. (1833) = Caryophyllales
Poales Small (1903)
 Podophyllales Dumort. (1829) = Ranunculales
 Podostemales Lindl. (1833) = Malpighiales
 Polemoniales Bromhead (1838) = Ericales
 Polygalales Dumort. (1829) = Fabales
 Polygonales Dumort. (1829) = Caryophyllales
 Pontederiales Hook.f. (1873) = Commelinales
 Portulacales Dumort. (1829) = Caryophyllales
 Posidoniales Nakai (1943) = Alismatales
 Potamogetonales Dumort. (1829) = Alismatales
 Primulales Dumort. (1829) = Ericales
Proteales Dumort. (1829)
 Quercuales Burnett (1835) = Fagales
 Quillajales Doweld (2001) = Fabales
Quintiniales Doweld (2001) = *Sphenostemonales*, unplaced under euasterids II
Rafflesiales Oliv. (1895) – unplaced family type at end of system
Ranunculales Dumort. (1829)
 Rapateales (Meisn.) Colella ex. Reveal & Doweld = Poales
 Resedales Dumort. (1829) = Brassicales
 Restionales Hook.f. (1873) = Poales
 Rhabdodendrales Doweld (2001) = Caryophyllales
 Rhamnales Dumort. (1829) = Rosales
 Rhinanthales Dumort. (1829) = Lamiales
 Rhizophorales (Pers.) Reveal & Doweld (1999) = Malpighiales
 Rhodorales Horan. (1847) = Ericales
 Rhoipteleales Novák ex. Reveal (1992) = Fagales
 Roridulales Nakai (1943) = Ericales
Rosales Perleb (1826)
 Rouseales Doweld (2001) = Asterales
 Rubiales Dumort. (1829) = Gentianales
 Ruppiales Nakai (1950) = Alismatales
 Rutales Perleb (1826) = Sapindales
Sabiales Takht. (1987) = family unplaced under eudicots
 Salicales Lindl. (1833) = Malpighiales
 Salvadorales R.Dahlgren ex. Reveal (1993) = Brassicales
 Samolales Dumort. (1829) = Ericales
 Samydales Dumort. (1829) = Malpighiales
 Sanguisorbales Dumort. (1829) = Rosales
Santalales Dumort. (1829)
Sapindales Dumort. (1829)
 Sapotales Hook.f. (1868) = Ericales
 Sarraceniales Bromhead (1838) = Ericales
Saxifragales Dumort. (1829)
 Scheuchzeriales B.Boivin (1956) = Alismatales
 Scleranthales Dumort. (1829) = Caryophyllales
 Scrophulariales Lindl. (1833) = Lamiales
 Scyphostegiales Croizat (1994) = Malpighiales
 Sedales Rchb. (1828) = Saxifragales
 Silenales Lindl. (1833) = Caryophyllales
 Simmondsiales Reveal (1992) = Caryophyllales
 Smilacales Lindl. (1833) = Liliales
Solanales Dumort. (1829)
 Sphenocleales Doweld (2001) = Solanales
Sphenostemonales Doweld (2001) – family unplaced under euasterids II
 Stellariales Dumort. (1829) = Caryophyllales
 Stemonales Takht. ex. Doweld (2001) = Pandanales
 Stilbales Doweld (2001) = Lamiales
 Styliiales Takht. ex. Reveal (1992) = Asterales
 Styracales Bisch. (1839) = Ericales
 Surianales Doweld (2001) = Fabales
 Taccuales Dumort. (1829) = Dioscoreales
 Tamales Dumort. (1829) = Dioscoreales
 Tamaricales Hutch. (1924) = Caryophyllales
 Tecophilaeales Traub ex. Reveal (1993) = Asparagales
 Ternstroemiales Doweld (2001) = Ericales
 Theales Lindl. (1833) = Ericales
 Theligonales Nakai (1942) = Gentianales
 Thymelaeales Willk. (1854) = Malvales
 Tiliales Caruel (1881) = Malvales
 Tofieldiales Reveal & Zomlefer (1998) = Alismatales
 Torricelliales Takht. ex. Reveal & Doweld (1999) = Apiales
 Tovariales Nakai (1943) = Brassicales
Tribelales Doweld (2001) – family unplaced in euasterids II
 Trilliales Takht. (1997) = Liliales
 Trimeniales Doweld (2001) = Austrobaileales
 Triuridales Hook.f. (1873) = Pandanales
Trochodendrales Takht. ex. Cronquist (1981) – unplaced family under eudicots
 Tropaeolales Takht. ex. Reveal (1992) = Brassicales
 Turnerales Dumort. (1829) = Malpighiales
 Typhales Dumort. (1829) = Poales
 Ulmales Lindl. (1833) = Rosales
 Urticales Dumort. (1829) = Rosales
 Vacciniales Dumort. (1829) = Ericales
Vahliales Doweld (2001) – family unplaced in euasterids I
 Vallisneriales Nakai (1949) = Alismatales

Velloziales R.Dahlgren ex. Reveal (1992) = Pandanales
 Veratrales Dumort. (1829) = Liliales
 Verbenales Horan. (1847) = Lamiales
 Viburnales Dumort. (1829) = Dipsacales
 Vinciales Horan. (1847) = Gentianales
 Violales Perleb (1826) = Malpighiales
 Viscales Tiegh. (1899) = Santalales
Vitales Reveal (1996) – family unplaced under core eudicots
 Vochysiales Dumort. (1829) = Myrtales
 Winterales (Meisn.) A.C. Sm. ex. Reveal (1993) = Canellales
 Xanthorrhoeales Takht. ex. Reveal & Doweld (1999) = Asparagales
 Ximinales Tiegh. (1899) = Santalales
 Xyridales Lindl. (1846) = Poales
Zingiberales Griseb. (1854)
 Zosteriales Nakai (1943) = Alismatales
Zygophyllales Chalk (1990) – family unplaced under eurosid I

SELECTED FAMILIAL SYNONYMS

The following names are primarily those in current use or listed here so as to define more clearly the recognized families. Accepted family names are in bold face. Families included as belonging to type genera of an uncertain position are in italics.

Abolbodaceae Nakai (1943) = Xyridaceae
 Abrophyllaceae Nakai (1943) = Rousseeaceae
Acanthaceae Juss. (1789), nom. cons.
 Acanthochlamydeaceae P.C.Kao (1989) = Velloziaceae
 Aceraceae Juss. (1789), nom. cons. = Sapindaceae
Achariaceae Harms (1897), nom. cons.
Achatocarpaceae Heimerl (1934), nom. cons.
 Achradaceae Vest (1818) = Sapotaceae
Acoraceae Martynov (1820)
Actinidiaceae Gilg & Werderm. (1825), nom. cons.
Adoxaceae E.Mey. (1839), nom. cons.
 Aegialitidaceae Lincz. (1968) = Plumbaginaceae
 Aegicerataceae Blume (1833) = Myrsinaceae
Aextoxicaceae Engl. & Gilg (1920), nom. cons.
Agapanthaceae F.Voigt (1850), optional synonym of Alliaceae
Agavaceae Dumort. (1829), nom. cons., optional synonym of Asparagaceae
 Agdestidaceae Nakai (1942) = Phytolaccaceae
Aizoaceae Martynov (1820), nom. cons.
Akaniaceae Stapf (1912), nom. cons.
 Alangiaceae DC. (1827), nom. cons. = Cornaceae
 Aldrovandaceae Nakai (1949) = Droseraceae
Alismataceae Vent. (1799), nom. cons.

Alliaceae Batsch ex. Borkh. (1797), nom. cons.
 Aloaceae Batsch (1802) = Asphodelaceae, optional synonym of Xanthorrhoeaceae
Alseuosmiaceae Airy Shaw (1964)
 Alsinaceae Bartl. (1825), nom. cons. = Caryophyllaceae
Alstroemeriaceae Dumort. (1829), nom. cons.
Altingiaceae Horan. (1843), nom. cons.
Alzateaceae S.A.Graham (1985)
Amaranthaceae Juss. (1789), nom. cons.
Amaryllidaceae J.St.-Hil. (1805), nom. cons., optional synonym of Alliaceae
Amborellaceae Pichon (1948), nom. cons.
 Ambrosiaceae Martynov (1820), nom. cons. = Asteraceae
 Amygdalaceae Marquis (1820), nom. cons. = Rosaceae
 Amyridaceae Kunth (1824) = Rutaceae
Anacardiaceae R.Br. (1818), nom. cons.
Anarthriaceae D.F.Cutler & Airy Shaw (1965)
Ancistrocladaceae Planch. ex. Walp. (1851), nom. cons.
 Androstachyaceae Airy Shaw (1964) = Picrodendraceae
 Anemarrhenaceae Conran, M.W.Chase & Rudall (1997) = Agavaceae, optional synonym of Asparagaceae
Anisophylleaceae Ridl. (1922)
Annonaceae Juss. (1789), nom. cons.
 Anomochloaceae Nakai (1943) = Poaceae
 Anopteraceae Doweld (2001) = Escalloniaceae
 Anthericaceae J.Agardh (1858) = Agavaceae, optional synonym of Asparagaceae
 Antirrhinaceae Pers. (1807) = Plantaginaceae
 Antoniaceae Hutch. (1959) = Loganiaceae
Aphanopetalaceae Doweld (2001)
Aphloiaceae Takht. (1985)
Aphyllanthaceae Burnett (1835), optional synonym of Asparagaceae
Apiaceae Lindl. (1836), nom. cons.
Apocynaceae Juss. (1789), nom. cons.
 Apodanthaceae (R.Br.) Tiegh. ex. Takht. (1987) = Rafflesiaceae
Aponogetonaceae J.Agardh (1858), nom. cons.
 Apostasiaceae Lindl. (1833), nom. cons. = Orchidaceae
 Aptandraceae Miers (1853) = Olacaceae
Aquifoliaceae DC. ex. A.Rich. (1828), nom. cons.
 Aquilariaceae R.Br. ex. DC. (1825) = Thymelaeaceae
Araceae Juss. (1789), nom. cons.
 Aragoaceae D.Don (1835) = Plantaginaceae
Araliaceae Juss. (1789), nom. cons.
Aralidiaceae Philipson & B.C.Stone (1980)
Arecaceae Schultz-Sch. (1832), nom. cons.
Argophyllaceae (Engl.) Takht. 1987

- Aristolochiaceae Dumort. (1829) = Elaeocarpaceae
Aristolochiaceae Juss. (1789), nom. cons.
 Asclepiadaceae Borkh. (1797), nom. cons. =
 Apocynaceae
Asparagaceae Juss. (1789), nom. cons.
Asphodelaceae Juss. (1789), optional synonym
 of Xanthorrhoeaceae
 Aspidistraceae Endl. (1841) = Ruscaceae, optional
 synonym of Asparagaceae
Asteliaceae Dumort. (1829)
Asteraceae Martynov (1820), nom. cons.
 Asteranthaceae R.Knuth (1939), nom. cons. =
 Lecythidaceae
Asteropeiaceae (Szyszyl.) Takht. ex. Reveal &
 Hoogland (1990)
Atherospermataceae R.Br. (1814)
Aucubaceae J.Agardh (1858), optional synonym
 of Garryaceae
Austrobaileyaceae (Croizat) Croizat 1943, nom.
 cons.
 Avertrhoaceae Hutch. (1959) = Oxalidaceae
 Avetraceae Takht. (1997) = Dioscoreaceae
 Avicenniaceae Endl. (1841) = Acanthaceae
 Balanitaceae Endl. (1841), nom. cons. =
 Zygophyllaceae
 Balanitaceae Endl. (1841) = Zygophyllaceae
Balanopaceae Benth. & Hook.f. (1880), nom.
 cons.
Balanophoraceae Rich. (1822), nom. cons.,
 unplaced
Balsaminaceae Bercht. & J.Presl (1820), nom.
 cons.
 Bambusaceae Burnett (1835) = Poaceae
Barbeuiaceae Nakai (1942)
Barbeyaceae Rendle (1916), nom. cons.
 Barclayaceae H.L.Li (1955) = Nymphaeaceae
 Barringtoniaceae F.Rudolphi (1830), nom. cons. =
 Lecythidaceae
Basellaceae Raf. (1837), nom. cons.
Bataceae Perleb (1838), nom. cons.
 Baueraceae Lindl. (1830) = Cunoniaceae
 Baxteriaceae Takht. (1996) = Dasypogonaceae
Begoniaceae Bercht. & J.Presl (1820), nom.
 cons.
 Behniaceae Conran, M.W.Chase & Rudall (1997)
 = Agavaceae, optional synonym of Asparagaceae
 Bembiciaceae R.C.Keating & Takht. (1996) =
 Salicaceae
Berberidaceae Juss. (1789), nom. cons.
Berberidopsidaceae Takht. (1985)
 Berryaceae Doweld (2001) = Malvaceae
 Bersamaceae Doweld = Melianthaceae
 Berzeliaceae Nakai (1943) = Bruniaceae
Betulaceae Gray (1821), nom. cons.
Biebersteiniaceae Endl. (1841)
Bignoniaceae Juss. (1789), nom. cons.
 Bischofiaceae Airy Shaw (1964) = Phyllanthaceae
Bixaceae Kunth (1822), nom. cons.
Blandfordiaceae R.Dahlgren & Clifford
 (1985)
 Blepharocaryaceae Airy Shaw (1964) =
 Anacardiaceae
 Boerlagellaceae H.J.Lam (1925) = Sapotaceae
 Bombacaceae Kunth (1822), nom. cons. = Mal-
 vaceae
Bonnetiaceae (Bartl.) L.Beauv. ex. Nakai (1948)
 Boopidaceae Cass. (1816) = Calyceraceae
Boraginaceae Juss. (1789), nom. cons.
Boryaceae (Baker) M.W.Chase, Rudall & Conran
 (1997)
Brassicaceae Burnett (1835), nom. cons.
Bretschneideraceae Engl. & Gilg (1924), nom.
 cons., optional synonym of Akaniaceae
 Brexiaceae Loudon (1830) = Celastraceae
Bromeliaceae Juss. (1789), nom. cons.
Brunelliaceae Engl. (1897), nom. cons.
Bruniaceae Bercht. & J.Presl (1820), nom. cons.
 Brunoniaceae Dumort. (1829), nom. cons. =
 Goodeniaceae
 Buddlejaceae K.Wilh. (1910), nom. cons. =
 Scrophulariaceae
 Burchardiaceae Takht. (1996) = Colchicaceae
Burmanniaceae Blume (1827), nom. cons.
Burseraceae Kunth (1824), nom. cons.
Butomaceae Mirb. (1804), nom. cons.
Buxaceae Dumort. (1822), nom. cons.
Byblidaceae (Engl. & Gilg) Domin 1922, nom.
 cons.
 Byttneriaceae R.Br. (1814), nom. cons. =
 Malvaceae
Cabombaceae Rich. ex. A.Rich. (1822), nom.
 cons., optional synonym of Nymphaeaceae
Cactaceae Juss. (1789), nom. cons.
 Caesalpiniaceae R.Br. (1814), nom. cons. =
 Fabaceae
Calceolariaceae (D.Don) Olmstead (2001)
 Calectasiaceae Endl. (1838) = Dasypogonaceae
 Calligonaceae Chalk (1985) = Polygonaceae
 Callitrichaceae Bercht. & J.Presl (1820), nom.
 cons. = Plantaginaceae
 Calochortaceae Dumort. (1829) = Liliaceae
Calycanthaceae Lindl. (1819), nom. cons.
Calyceraceae R.Br. ex. Rich. (1820), nom.
 cons.
Campanulaceae Juss. (1789), nom. cons.
Campynemataceae Dumort. (1829)
 Canacomyracaceae Baum.-Bod. ex. Doweld (2001)
 = Myricaceae
Canellaceae Mart. (1832), nom. cons.
Cannabaceae Martynov (1820), nom. cons.
Cannaceae Juss. (1789), nom. cons.
 Canotiaceae Airy Shaw (1964) = Celastraceae

- Capparaceae Juss. (1789), nom. cons. =
Brassicaceae
- Caprifoliaceae** Juss. (1789), nom. cons.
- Cardiopteridaceae** Blume (1847), nom. cons.
- Caricaceae** Dumort. (1829), nom. cons.
- Carlemanniaceae** Airy Shaw (1964)
- Carpinaceae Vest (1818) = Betulaceae
- Carpodetaceae Fenzl (1841) = Rousseeaceae
- Caryocaryaceae Pichon (1946) = Commelinaceae
- Caryocaraceae** Voigt (1845), nom. cons.
- Caryophyllaceae** Juss. (1789), nom. cons.
- Cassythaceae Bartl. ex. Lindl. (1833), nom. cons. =
Lauraceae
- Casuarinaceae** R.Br. (1814), nom. cons.
- Cecropiaceae C.C.Berg (1978) = Urticaceae
- Celastraceae** R.Br. (1814), nom. cons.
- Celtidaceae Link (1831), nom. cons. = Cannabaceae
- Centrolepidaceae** Endl. (1836), nom. cons.
- Cephalotaceae** Dumort. (1829), nom. cons.
- Ceratophyllaceae** Gray (1821), nom. cons.
- Cercidiphyllaceae** Engl. (1907), nom. cons.
- Chenopodiaceae Vent. (1799), nom. cons. =
Amaranthaceae
- Chionographidaceae Takht. (1966) =
Melanthiaceae
- Chloanthaceae Hutch. (1959) = Lamiaceae
- Chloranthaceae** R.Br. ex. Sims (1820), nom. cons.
- Chrysobalanaceae** R.Br. (1818), nom. cons.
- Cichoriaceae Juss. (1789), nom. cons. = Asteraceae
- Circaeasteraceae** Hutch. (1926), nom. cons.
- Cistaceae** Juss. (1789), nom. cons.
- Cleomaceae Horan. (1834) = Brassicaceae
- Clethraceae** Klotzsch (1851), nom. cons.
- Clusiaceae** Lindl. (1836), nom. cons.
- Cneoraceae Vest (1818), nom. cons. = Rutaceae
- Cobaeaceae D.Don (1824) = Polemoniaceae
- Cochlospermaceae** Planch. (1847), nom. cons.,
optional synonym of Bixaceae
- Colchicaceae** DC. (1804), nom. cons.
- Columelliaceae** D.Don (1828), nom. cons.
- Combretaceae** R.Br. (1810), nom. cons.
- Commelinaceae** Mirb. (1804), nom. cons.
- Compositae Giseke (1792), nom. alt. et cons. =
Asteraceae
- Connaraceae** R.Br. (1818), nom. cons.
- Conostylidaceae (Benth.) Takht. (1987) =
Haemodoraceae
- Convallariaceae Horan. (1834) = Ruscaceae,
optional synonym of Asparagaceae
- Convolvulaceae** Juss. (1789), nom. cons.
- Cordiaceae R.Br. ex. Dumort. (1829), nom. cons. =
Boraginaceae
- Coriariaceae** DC. (1824), nom. cons.
- Coridaceae J.Agardh (1858) = Myrsinaceae
- Cornaceae** Dumort. (1829), nom. cons.
- Corokiaceae Kapil ex. Takht. (1997) =
Argophyllaceae
- Corsiaceae** Becc. (1878), nom. cons.
- Corylaceae Mirb. (1815), nom. cons. = Betulaceae
- Corynocarpaceae** Engl. (1897), nom. cons.
- Costaceae** Nakai (1941)
- Crassulaceae** J.St.-Hil. (1805), nom. cons.
- Croomiaceae Nakai (193) = Stemonaceae
- Crossosomataceae** Engl. (1897), nom. cons.
- Cruciferae Juss. (1789), nom. alt. et cons. =
Brassicaceae
- Crypteroniaceae** A.DC. (1868), nom. cons.
- Ctenophonaceae** (H.Winkl.) Exell &
Mendonça (1951)
- Cucurbitaceae** Juss. (1789), nom. cons.
- Cunoniaceae** R.Br. (1814), nom. cons.
- Curtisiaceae** (Engl.) Takht. (1987)
- Cuscutaceae Bercht. & J.Presl (1820), nom. cons.
= Convolvulaceae
- Cyananthaceae J.Agardh (1858) =
Campanulaceae
- Cyanastraceae Engl. (1900), nom. cons. =
Tecophilaeaceae
- Cyclanthaceae** Poit. ex. A.Rich. (1824), nom. cons.
- Cyclocheilaceae Marais (1981) = Orobanchaceae
- Cymodoceaceae** N.Taylor (1909), nom. cons.
- Cynomoriaceae* Lindl. (1833), nom. cons.,
unplaced
- Cyperaceae** Juss. (1789), nom. cons.
- Cyphiaceae A.DC. (1839) = Lobeliaceae, optional
synonym of Campanulaceae
- Cyphocarpaceae (Miers) Reveal & Hoogl. (1996) =
Lobeliaceae, optional synonym of Campanulaceae
- Cypripediaceae Lindl. (1833) = Orchidaceae
- Cyrillaceae** Endl. (1841), nom. cons.
- Cytinaceae* A.Rich. (1824), unplaced
- Dactylanthaceae (Engl.) Takht. (1987) =
Balanophoraceae
- Daphniphyllaceae** Müll.-Arg. (1869), nom. cons.
- Dasyogonaceae** Dumort. (1829)
- Datisaceae** Bercht. & J.Presl (1820), nom. cons.
- Davidiaceae H.L.Li (1955) = Cornaceae
- Davidsoniaceae Bange (1952) = Cunoniaceae
- Decaisneaceae (Takht. ex. H. N. Qin) Loconte
(1995) = Lardizabalaceae
- Degeneriaceae** I.W.Bailey & A.C.Sm. (1942),
nom. cons.
- Desfontainiaceae** Endl. (1841), nom. cons.,
optional synonym of Columelliaceae
- Dialypetalanthaceae Rizzini & Occhioni (1948),
nom. cons. = Rubiaceae
- Dianellaceae Salisb. (1866) = Hemerocallidaceae,
optional synonym of Xanthorrhoeaceae

- Diapensiaceae** Lindl. (1836), nom. cons.
Dichapetalaceae Baill. (1886), nom. cons., optional synonym of Chrysobalanaceae
 Dichondraceae Dumort. (1829) = Convolvulaceae
 Diclidantheraceae J. Agardh (1858), nom. cons. = Polygalaceae
Didiereaceae Radlk. (1896), nom. cons.
Didymelaceae Leandri (1937), optional synonym of Buxaceae
Diegodendraceae Capuron (1964), optional synonym of Bixaceae
Diervillaceae (Raf.) Pyck (1998), optional synonym of Caprifoliaceae
Dilleniaceae Salisb. (1807), nom. cons.
 Dionaeaceae Raf. (1837) = Droseraceae
Dioncophyllaceae Airy Shaw (1952), nom. cons.
Dioscoreaceae R.Br. (1810), nom. cons.
Dipentodontaceae Merr. (1941), nom. cons., unplaced
Dipsacaceae Juss. (1789), nom. cons., optional synonym of Caprifoliaceae
Dipterocarpaceae Blume (1825), nom. cons.
Dirachmaceae Hutch. (1959)
Donatiaceae B.Chandler (1911), nom. cons., optional synonym of Stylidiaceae
Doryanthaceae R.Dahlgren & Clifford (1985)
 Dracaenaceae Salisb. (1866) = Ruscaceae, optional synonym of Asparagaceae
Droseraceae Salisb. (1808), nom. cons.
Drosophyllaceae Chrték, Slavíková & Studnicka (1989)
 Duabangaceae Takht. (1986) = Lythraceae
 Duckeodendraceae Kuhl. (1950) = Solanaceae
 Dysphaniaceae (Pax) Pax (1927), nom. cons. = Amaranthaceae
Ebenaceae Gürke (1891), nom. cons.
Ecdiocolaceae D.F.Cutler & Airy Shaw (1965)
 Ehretiaceae Mart. (1827), nom. cons. = Boraginaceae
Elaeagnaceae Juss. (1789), nom. cons.
Elaeocarpaceae Juss. ex. DC. (1816), nom. cons.
Elatinaceae Dumort. (1829), nom. cons.
 Ellisiohyllaceae Honda (1930) = Plantaginaceae
Emblingiaceae Airy Shaw (1964)
 Emottaceae Tiegh. (1899) = Icacinaceae
 Empetraceae Bercht. & J.Presl (1820), nom. cons. = Ericaceae
 Engelhardtaceae Reveal & Doweld (1999) = Juglandaceae
 Epacridaceae R.Br. (1810), nom. cons. = Ericaceae
 Epimediaceae Menge (1839) = Berberidaceae
 Eremolepidaceae Tiegh. ex. Nakai (1952) = Santalaceae
Eremosynaceae Dandy (1959)
Ericaceae Juss. (1789), nom. cons.
Eriocaulaceae Martynov (1820), nom. cons.
 Eriospermaceae Endl. (1841) = Ruscaceae, optional synonym of Asparagaceae
 Erycibaceae Endl. ex. Meisn. (1840) = Convolvulaceae
 Erythralaceae Pilg. & K.Krause (1914), nom. cons. = Olacaceae
Erythroxyloaceae Kunth (1822), nom. cons.
Escalloniaceae R.Br. ex. Dumort. (1829), nom. cons.
 Eschscholziaceae Ser. (1847) = Papaveraceae
Eucommiaceae Engl. (1909), nom. cons.
 Eucryphiaceae Endl. (1841), nom. cons. = Cunoniaceae
Euphorbiaceae Juss. (1789), nom. cons.
Euphroniaceae Marc.-Berti (1989), optional synonym of Chrysobalanaceae
Eupomatiaceae Endl. (1841), nom. cons.
Eupteleaceae K.Wilh. (1910), nom. cons.
 Euryalaceae J.Agardh (1858) = Nymphaeaceae
 Eustrephaceae Chupov (1994) = Laxmanniaceae, optional synonym of Asparagaceae
 Exbucklandiaceae Reveal & Doweld (1999) = Hamamelidaceae
 Exocarpaceae J.Agardh (1858) = Santalaceae
Fabaceae Lindl. (1836), nom. cons.
Fagaceae Dumort. (1829), nom. cons.
 Flacourtiaceae Rich. (1815-1816), nom. cons. = Salicaceae
Flagellariaceae Dumort. (1829), nom. cons.
 Flindersiaceae C.T.White ex. Airy Shaw (1964) = Rutaceae
 Foetidiaceae Airy Shaw (1964) = Lecythidaceae
Fouquieriaceae DC. (1828), nom. cons.
Francoaceae A.Juss. (1832), nom. cons., optional synonym of Melianthaceae
 Frangulaceae DC. (1805) = Rhamnaceae
Frankeniaceae Desv. (1817), nom. cons.
Fumariaceae Bercht. & J.Presl (1820), nom. cons., optional synonym of Papaveraceae
Garryaceae Lindl. (1834), nom. cons.
Geissolomataceae Endl. (1841)
 Geitonoplesiaceae R.Dahlgren ex. Conran (1994) = Hemerocallidaceae, optional synonym of Xanthorrhoeaceae
Gelsemiaceae (G.Don) Struwe & V.A.Albert (1995)
 Geniostomaceae Struwe & V.A.Albert (1995) = Loganiaceae
Gentianaceae Juss. (1789), nom. cons.
 Geosiridaceae Jonker (1939), nom. cons. = Iridaceae
Geraniaceae Juss. (1789), nom. cons.
Gesneriaceae Rich. & Juss. ex. DC. (1816), nom. cons.
Gisekiaceae Nakai (1942)
 Glaucidiaceae Tamura (1972) = Ranunculaceae

- Globulariaceae DC. (1805), nom. cons. = Plantaginaceae
- Goetzeaceae Miers ex. Airy Shaw (1964) = Solanaceae
- Gomortegaceae** Reiche (1896), nom. cons.
- Gonystylaceae Tiegh. (1896), nom. cons. = Thymelaeaceae
- Goodeniaceae** R.Br. (1810), nom. cons.
- Goupiaceae** Miers (1862)
- Gramineae Juss. (1789), nom. alt. et cons. = Poaceae
- Greyiaceae Hutch. (1926), nom. cons. = Melianthaceae
- Griselinaceae** J.R.Forst. & G.Forst. ex. A.Cunn. (1839)
- Gronoviaceae Endl. (1841) = Loasaceae
- Grossulariaceae** DC. (1805), nom. cons.
- Grubbiaceae** Endl. (1839), nom. cons.
- Gunneraceae** Meisn. (1842), nom. cons.
- Gustaviaceae Burnett (1835) = Lecythidaceae
- Guttiferae Juss. (1789), nom. alt. et cons. = Clusiaceae
- Gyrocarpaceae Dumort. (1829) = Hernandiaceae
- Gyrostemonaceae** Endl. (1841), nom. cons.
- Hachetteaceae Doweld (2001) = Balanophoraceae
- Haemodoraceae** R.Br. (1810), nom. cons.
- Halesiaceae D.Don (1828) = Styracaceae
- Halophilaceae J.Agardh (1858) = Hydrocharitaceae
- Halophytaceae** A.Soriano (1984)
- Haloragaceae** R.Br. (1814), nom. cons.
- Hamamelidaceae** R.Br. (1818), nom. cons.
- Hanguanaceae** Airy Shaw (1964)
- Hectorellaceae Philipson & Skipw. (1961) = Portulacaceae
- Heliamporaceae Chrtek, Slavíková & Studnicka (1992) = Sarraceniaceae
- Heliconiaceae** Nakai (1941)
- Heliotropiaceae Schrad. (1819), nom. cons. = Boraginaceae
- Helleboraceae Vest (1818) = Ranunculaceae
- Heloniadaceae J.Agardh (1858) = Melanthiaceae
- Helosaceae (Schott & Endl.) Bromhead (1840) = Balanophoraceae
- Helwingiaceae** Decne. (1836)
- Hemerocallidaceae** R.Br. (1810), optional synonym of Xanthorrhoeaceae
- Hemimeridaceae Doweld (2001) = Plantaginaceae
- Henriqueziaceae Bremek. (1957) = Rubiaceae
- Hernandiaceae** Bercht. & J.Presl (1820), nom. cons.
- Herreriaceae Endl. (1841) = Agavaceae, optional synonym of Asparagaceae
- Hesperocallidaceae** Traub (1972), optional synonym of Asparagaceae
- Heteropyxidaceae** Engl. & Gilg (1920), nom. cons.
- Himantandraceae** Diels (1917), nom. cons.
- Hippocastanaceae A.Rich. (1823), nom. cons. = Sapindaceae
- Hippocrateaceae Juss. (1811), nom. cons. = Celastraceae
- Hippuridaceae Vest (1818), nom. cons. = Plantaginaceae
- Hopkinsiaceae B.G.Briggs & L.A.S.Johnson (2000) = Anarthriaceae
- Hoplostigmataceae* Gilg (1924), nom. cons., unplaced
- Hortoniaceae (J.R.Perkins & Gilg) A.C.Sm. (1971) = Monimiaceae
- Hostaceae B.Mathew (1988) = Agavaceae, optional synonym of Asparagaceae
- Huaceae** A.Chev. (1947)
- Huerteaceae Doweld (2001) = Tapisciaceae
- Hugoniaceae Arn. (1834) = Linaceae
- Humbertiaceae Pichon (1947), nom. cons. = Convolvulaceae
- Humiriaceae** A.Juss. (1829), nom. cons.
- Hyacinthaceae** Batsch ex. Borkh. (1797), optional synonym of Asparagaceae
- Hydatellaceae** U.Hamann (1976)
- Hydnoraceae** C.Agardh (1821), nom. cons.
- Hydrangeaceae** Dumort. (1829), nom. cons.
- Hydrastidaceae Martynov (1820) = Ranunculaceae
- Hydrocharitaceae** Juss. (1789), nom. cons.
- Hydrocotylaceae (Link) N.Hyl. (1945), nom. cons. = Araliaceae
- Hydroleaceae** Bercht. & J.Presl (1820)
- Hydropeltidaceae (DC.) Dumort. (1822) = Nymphaeaceae
- Hydrophyllaceae R.Br. (1817), nom. cons. = Boraginaceae
- Hydrostachyaceae** (Tul.) Engl. (1894), nom. cons.
- Hymenocardiaceae Airy Shaw (1964) = Phyllanthaceae
- Hypecoaceae Willk. & Lange (1880) = Papaveraceae
- Hypericaceae** Juss. (1789), nom. cons.
- Hypoxidaceae** R.Br. (1814), nom. cons.
- Hypseocharitaceae** Wedd. (1861), optional synonym of Geraniaceae
- Ilacinaceae** (Benth.) Miers (1851), nom. cons.
- Idiospermaceae S.T.Blake (1972) = Calycanthaceae
- Illecebraceae R.Br. (1810), nom. cons. = Caryophyllaceae
- Illiciaceae** A.C.Sm. (1947), nom. cons., optional synonym of Schisandraceae
- Iridaceae** Juss. (1789), nom. cons.

- Irvingiaceae** (Engl.) Exell & Mendonça (1951), nom. cons.
 Isophysidaceae (Hutch.) F.A.Barkley (1948) = Iridaceae
Iteaceae J.Agardh (1858), nom. cons.
Ixerbaceae Griseb. (1854)
Ixioliriaceae Nakai (1943)
Ixonanthaceae Planch. ex. Miq. (1858), nom. cons.
 Japonoliriaceae Takht. (1996) = Petrosaviaceae
 Johnsoniaceae Lotsy (1911) = Hemerocallidaceae, optional synonym of Xanthorrhoeaceae
Joinvilleaceae Toml. & A.C.Sm. (1970)
Juglandaceae DC. ex. Perleb (1818), nom. cons.
 Julianiaceae Hemsl. (1906), nom. cons. = Anacardiaceae
Juncaceae Juss. (1789), nom. cons.
Juncaginaceae Rich. (1808), nom. cons.
 Justiciaceae Raf. (1838) = Acanthaceae
 Kaliphoraceae Takht. (1996) = Montiniaceae
 Kiggelariaceae Link (1831) = Achariaceae
Kingdoniaceae A.S.Foster ex. Airy Shaw (1964), optional synonym of Circaeasteraceae
 Kirengeshomaceae Nakai (1943) = Hydrangeaceae
Kirkiaceae (Engl.) Takht. (1967)
Koerberliniaceae Engl. (1895), nom. cons.
Krameriaceae Dumort. (1829), nom. cons., optional synonym of Zygophyllaceae
 Labiatae Juss. (1789), nom. alt. et cons. = Lamiaceae
 Lacandoniaceae E.Martínes & Ramos (1989) = Triuridaceae
Lacistemataceae Mart. (1826), nom. cons.
Lactoridaceae Engl. (1888), nom. cons.
Lamiaceae Martynov (1820), nom. cons.
Lanariaceae H.Huber ex. R.Dahlgren & A.E.vanWyk (1988)
 Langsdorffiaceae Tiegh. ex. Pilger (1914) = Balanophoraceae
Lardizabalaceae R.Br. (1821), nom. cons.
Lauraceae Juss. (1789), nom. cons.
Laxmanniaceae Bubani (1901-1902), optional synonym of Asparagaceae
Lecythidaceae A.Rich. (1825), nom. cons.
Ledocarpaceae Meyen (1834)
 Leeaceae Dumort. (1829), nom. cons. = Vitaceae
 Leguminosae Juss. (1789), nom. alt. et cons. = Fabaceae
 Leitneriaceae Benth. & Hook.f. (1880), nom. cons. = Simaroubaceae
 Lemnaceae Martynov (1820), nom. cons. = Araceae
 Lennoaceae Solms (1870), nom. cons. = Boraginaceae
Lentibulariaceae Rich. (1808), nom. cons.
 Leoniaceae A.DC. (1844) = Violaceae
 Leonticaceae Bercht. & J. Presl (1820) = Berberidaceae
Lepidobotryaceae J.Léonard (1950), nom. cons.
Lepuropetalaceae Nakai (1943), optional synonym of Parnassiaceae
 Lilaeeaceae Dumort. (1829), nom. cons. = Juncaginaceae
Liliaceae Juss. (1789), nom. cons.
Limnanthaceae R.Br. (1833), nom. cons.
Limnocharitaceae Takht. ex. Cronquist (1981)
 Limoniaceae Ser. (1851), nom. cons. = Plumbaginaceae
Linaceae DC. ex. Perleb (1818), nom. cons.
 Lindenbergiaceae Doweld (2001) = Orobanchaceae
Linnaeaceae (Raf.) Backlund (1998), optional synonym of Caprifoliaceae
 Liriodendraceae F.A.Barkley (1975) = Magnoliaceae
 Lissocarpaceae Gilg (1924), nom. cons. = Ebenaceae
Loasaceae Juss. (1804), nom. cons.
Lobeliaceae Juss. (1813), nom. cons., optional synonym of Campanulaceae
Loganiaceae R.Br. (1814), nom. cons.
 Lomandraceae Lotsy (1911) = Laxmanniaceae, optional synonym of Asparagaceae
 Lophiolaceae Nakai (1943) = Nartheciaceae
 Lophiraceae Loud. (1830) = Ochnaceae
 Lophophytaceae (Schott & Endl.) Bromhead (1840) = Balanophoraceae
Lophopyxidaceae (Engl.) H.Pfeiff. (1951)
Loranthaceae Juss. (1808), nom. cons.
Lowiaceae Ridl. (1924), nom. cons.
 Luxemburgiaceae Soler. (1908) = Ochnaceae
Luzuriagaceae Lotsy (1911)
 Lyginiaceae B.G.Briggs & L.A.S.Johnson (2000) = Anarthriaceae
Lythraceae J.St.-Hil. (1805), nom. cons.
Mackinlayaceae Doweld (2001)
Maesaceae (A.DC.) Anderb., B.Ståhl & Källersjö (2000)
Magnoliaceae Juss. (1789), nom. cons.
 Malaceae Small (1903), nom. cons. = Rosaceae
Malesherbiaceae D.Don (1827), nom. cons., optional synonym of Passifloraceae
Malpighiaceae Juss. (1789), nom. cons.
Malvaceae Juss. (1789), nom. cons.
Marantaceae R.Br. (1814), nom. cons.
Marcgraviaceae Juss. ex. DC. (1816), nom. cons.
Martyniaceae Horan. (1847), nom. cons.
 Mastixiaceae Calest. (1905) = Cornaceae
 Maundiaceae Nakai (1943) = Juncaginaceae
Mayacaceae Kunth (1842), nom. cons.
 Medeolaceae (S.Watson) Takht. (1987) = Liliaceae

- Medusagynaceae** Engl. & Gilg (1924), nom. cons., optional synonym of Ochnaceae
Medusandraceae Brenan (1952), nom. cons., unplaced
- Melanophyllaceae** Takht. ex. Airy Shaw (1972)
- Melanthiaceae** Batsch ex. Borkh. (1796), nom. cons.
- Melastomataceae** Juss. (1789), nom. cons.
- Meliaceae** Juss. (1789), nom. cons.
- Melianthaceae** Bercht. & J.Presl (1820), nom. cons.
- Meliosmaceae Endl. (1841) = Sabiaceae
- Memecylaceae** DC. (1827), nom. cons., optional synonym of Melastomataceae
- Mendonciaceae Bremek. (1954) = Acanthaceae
- Menispermaceae** Juss. (1789), nom. cons.
- Menyanthaceae** Bercht. & J.Presl (1820), nom. cons.
- Mesembryanthemaceae Fenzl (1836), nom. cons. = Aizoaceae
- Metteniusaceae* H.Karst. ex. Schnizl. (1860-1870), unplaced
- Meyeniaceae Sreem. (1977) = Acanthaceae
- Milulaceae Traub (1972) = Alliaceae
- Mimosaceae R.Br. (1814), nom. cons. = Fabaceae
- Misodendraceae** J.Agardh (1858), nom. cons.
- Mitrastemonaceae* Makino (1911), nom. cons., unplaced
- Molluginaceae** Bartl. (1825), nom. cons.
- Monimiaceae** Juss. (1809), nom. cons.
- Monotaceae Kosterm. (1989) = Dipterocarpaceae
- Monotropaceae Nutt. (1818), nom. cons. = Ericaceae
- Montiniaceae** Nakai (1943), nom. cons.
- Moraceae** Link (1831), nom. cons.
- Morinaceae** Raf. (1820), optional synonym of Caprifoliaceae
- Moringaceae** Martynov (1820), nom. cons.
- Mouririaceae Gardner (1840) = Memecylaceae, optional synonym of Melastomataceae
- Moutabeaceae Endl. (1841) = Polygalaceae
- Muntingiaceae** C.Bayer, M.W.Chase & M.F.Fay (1998)
- Musaceae** Juss. (1789), nom. cons.
- Myodocarpaceae** Doweld (2001)
- Myoporaceae R.Br. (1810), nom. cons. = Scrophulariaceae
- Myricaceae** A.Rich. ex. Kunth (1817), nom. cons.
- Myriophyllaceae Schultz Sch. (1832) = Haloragaceae
- Myristicaceae** R.Br. (1810), nom. cons.
- Myrothamnaceae** Nied. (1891), nom. cons., optional synonym of Gunneraceae
- Myrsinaceae** R.Br. (1810), nom. cons.
- Myrtaceae** Juss. (1789), nom. cons.
- Mystropetalaceae Hook.f. (1853) = Balanophoraceae
- Najadaceae Juss. (1789), nom. cons. = Hydrocharitaceae
- Nandinaceae Horan. (1834) = Berberidaceae
- Napoleonaceae A.Rich. (1827) = Lecythidaceae
- Nartheciaceae** Fr. ex. Bjurzon (1846)
- Naucleaceae Wernh. (1911) = Rubiaceae
- Nectaropetalaceae (H.Winkl.) Exell & Mendonça (1951) = Erythroxyloaceae
- Nelsoniaceae Sreem. (1977) = Acanthaceae
- Nelumbonaceae** Bercht. & J.Presl (1820), nom. cons.
- Nemacladaceae Nutt. (1842) = Lobeliaceae, optional synonym of Campanulaceae
- Nepenthaceae** Bercht. & J.Presl (1820), nom. cons.
- Nesogenaceae Marais (1981) = Orobanchaceae
- Neuradaceae** Link (1831), nom. cons.
- Neuwiediaceae (Burns-Bal. & V.A.Funk) R.Dahlgren ex. Reveal & Hoogland (1991) = Orchidaceae
- Nitrariaceae** Bercht. & J.Presl (1820), nom. cons.
- Nolanaceae Dumort. (1829), nom. cons. = Solanaceae
- Nolinaceae Nakai (1943) = Ruscaceae, optional synonym of Asparagaceae
- Nothofagaceae** Kuprian (1962)
- Nupharaceae A.Kern. (1891) = Nymphaeaceae
- Nyctaginaceae** Juss. (1789), nom. cons.
- Nyctanthaceae J.Agardh (1858) = Oleaceae
- Nymphaeaceae** Salisb. (1805), nom. cons.
- Nypaceae Brongn. ex. Le Maout & Decne. (1868) = Areaceae
- Nyssaceae** Juss. ex. Dumort. (1829), nom. cons., optional synonym of Cornaceae
- Ochnaceae** DC. (1811), nom. cons.
- Octoknemaceae Soler. (1908), nom. cons. = Olacaceae
- Oftiaceae Takht. & Reveal (1993) = Scrophulariaceae
- Olacaceae** R.Br. (1818), nom. cons.
- Oleaceae** Hoffmanns. & Link (1809), nom. cons.
- Oliniaceae** Arn. (1839), nom. cons.
- Onagraceae** Juss. (1789), nom. cons.
- Oncothecaceae** Kobuski ex. Airy Shaw (1964)
- Ophiopogonaceae Endl. (1841) = Ruscaceae, optional synonym of Asparagaceae
- Opiliaceae** Valetton (1886), nom. cons.
- Orchidaceae** Juss. (1789), nom. cons.
- Orobanchaceae** Vent. (1799), nom. cons.
- Orontiaceae Bartl. (1830) = Araceae
- Oxalidaceae** R.Br. (1818), nom. cons.

- Oxystylidaceae Hutch. (1969) = Brassicaceae
 Pachysandraceae J.Agardh (1858) = Buxaceae
Paeaniaceae Raf. (1815), nom. cons.
 Paivausaceae A. Meeuse (1990) =
 Picrodendraceae
 Palmae Juss. (1789), nom. alt. et cons. = Arecaceae
Pandaceae Engl. & Gilg (1912-1913), nom. cons.
Pandanaceae R.Br. (1810), nom. cons.
 Pangiaceae Endl. (1841) = Achariaceae
Papaveraceae Juss. (1789), nom. cons.
 Papilionaceae Giseke (1792), nom. alt. et cons. =
 Fabaceae
Paracryphiaceae Airy Shaw (1964)
Parnassiaceae Martynov (1820), nom. cons.
 Paronychiaceae Juss. (1815) = Caryophyllaceae
 Paropsiaceae Dumort. (1829) = Passifloraceae
Passifloraceae Juss. ex. Roussel (1806), nom.
 cons.
Paulowniaceae Nakai (1949)
Pedaliaceae R.Br. (1810), nom. cons.
Peganaceae (Engl.) Tieghm. ex. Takht. (1987),
 optional synonym of Nitrariaceae
Pellicieraceae (Triana & Planch.) L.Beauvis. ex.
 Bullock (1959), optional synonym of
 Tetrameristaceae
Penaecaceae Sweet ex. Guill. (1828), nom. cons.
Pennantiaceae J.Agardh (1858)
Pentadiplandraceae Hutch. & Dalziel (1928)
Pentaphragmataceae J.Agardh (1858), nom.
 cons.
Pentaphylacaceae Engl. (1897), nom. cons.
 Pentastemonaceae Duyfjes (1992) = Stemonaceae
Penthoraceae Rydb. ex. Britt. (1901), nom.
 cons., optional synonym of Haloragaceae
 Peperomiaceae A.C.Sm. (1981) = Piperaceae
 Peraceae Klotzsch = Euphorbiaceae
Peridiscaceae Kuhl. (1950), nom. cons.
 Periplocaceae (Kostel.) Schltr. (1905), nom. cons. =
 Apocynaceae
 Peripterygiaceae G. King (1895) =
 Cardiopteridaceae
 Petermanniaceae Hutch. (1934), nom. cons. =
 Colchicaceae
 Petiveriaceae C.Agardh (1824) = Phytolaccaceae
Petrosaviaceae Hutch. (1934), nom. cons.
Phellinaceae (Loes.) Takht. (1967)
 Philadelphaceae Martynov (1820) =
 Hydrangeaceae
Philesiaceae Dumort. (1829), nom. cons.
Philydraceae Link (1821), nom. cons.
 Phormiaceae J.Agardh (1858) = Hemerocalli-
 daceae, optional synonym of Xanthorrhoeaceae
Phrymaceae Schauer (1847), nom. cons.
Phyllanthaceae Martynov (1820)
Phyllonomaceae Small (1905)
Phytenaceae Takht. (1985)
Phytolaccaceae R.Br. (1818), nom. cons.
Picramniaceae Fernando & Quinn (1995)
Picrodendraceae Small (1917), nom. cons.
Piperaceae Bercht. & J. Presl (1820), nom. cons.
 Pistiaceae Rich. ex. C.Agardh (1822) = Araceae
Pittosporaceae R.Br. (1814), nom. cons.
 Plagiopteraceae Airy Shaw (1964) = Celastraceae
Plantaginaceae Juss. (1789), nom. cons.
Platanaceae T.Lestib. (1826), nom. cons.,
 optional synonym of Proteaceae
 Platycaryaceae Nakai ex. Doweld (2001) =
 Juglandaceae
 Platyspermataceae Doweld (2001) = Escalloni-
 aceae
 Platystemonaceae (Spach) Lilja (1870) =
 Papaveraceae
Plocospermataceae Hutch. (1973)
Plumbaginaceae Juss. (1789), nom. cons.
 Plumeriaceae Horan. (1834) = Apocynaceae
Poaceae (R.Br.) Barnh. (1895), nom. cons.
 Podoaceae Baill. ex. Franch. (1889) =
 Anacardiaceae
 Podophyllaceae DC. (1817), nom. cons. =
 Berberidaceae
Podostemaceae Kunth (1816), nom. cons.
Polemoniaceae Juss. (1789), nom. cons.
 Poliothyrsidaceae (G.S.Fan) Doweld (2001) =
 Salicaceae
 Polpodaceae Nakai (1942) = Molluginaceae
Polygalaceae Hoffmanns. & Link (1809), nom.
 cons.
Polygonaceae Juss. (1789), nom. cons.
 Polygonanthaceae Croizat (1943) =
 Anisophylleaceae
Polyosmaceae Blume (1851)
Pontederiaceae Kunth (1816), nom. cons.
 Porantheraceae (Pax) Hurus. (1954) =
 Phyllanthaceae
Portulacaceae Juss. (1789), nom. cons.
 Portulacariaceae (Fenzl) Doweld (2001) =
 Portulacaceae
Posidoniaceae Hutch. (1934), nom. cons.
 Potaliaceae Mart. (1827) = Gentianaceae
Potamogetonaceae Rchb. (1828), nom. cons.
Pottingeriaceae (Engl.) Takht. (1987), unplaced
Primulaceae Batsch ex. Borkh. (1797), nom. cons.
 Prioniaceae S.L.Munro & H.P.Linder (1998) =
 Thurniaceae
 Prionotaceae Hutch. (1969) = Ericaceae
Proteaceae Juss. (1789), nom. cons.
 Pseudanthaceae Endl. (1839) = Picrodendraceae
Psiloxylaceae Croizat (1960)
 Ptaeroxylaceae J.-F.Leroy (1960) = Rutaceae
Pteridophyllaceae (Murb.) Nakai ex. Reveal &
 Hoogland (1991), optional synonym of
 Papaveraceae

- Pterostemonaceae** Small (1905), nom. cons., optional synonym of *Iteaceae*
- Punicaceae** Horan. (1834), nom. cons. = *Lythraceae*
- Putranjivaceae** Endl. (1841)
- Pyrolaceae** Lindl. (1829), nom. cons. = *Ericaceae*
- Quiinaceae** Choisy ex. Engl. (1888), nom. cons., optional synonym of *Ochnaceae*
- Quillajaceae** D.Don (1831)
- Quintiniaceae** Doweld (2001) = *Sphenostemonaceae*
- Rafflesiaceae** Dumort. (1829), nom. cons., unplaced
- Ranunculaceae** Juss. (1789), nom. cons.
- Ranzaniaceae** (Kumaz. & Terab.) Takht. (1994) = *Berberidaceae*
- Rapateaceae** Dumort. (1829), nom. cons.
- Reaumuriaceae** Ehrenb. ex. Lindl. (1830) = *Tamaricaceae*
- Resedaceae** Bercht. & J.Presl (1820), nom. cons.
- Restionaceae** R.Br. (1810), nom. cons.
- Retziaceae** Bartl. (1830) = *Stilbaceae*
- Rhabdodendraceae** Prance (1968)
- Rhamnaceae** Juss. (1789), nom. cons.
- Rhinanthaceae** Vent. (1799) = *Orobanchaceae*
- Rhipogonaceae** Conran & Clifford (1985)
- Rhizophoraceae** Pers. (1807), nom. cons., optional synonym of *Erythroxyloideae*
- Rhodoleiaceae** Nakai (1943) = *Hamamelidaceae*
- Rhoipteleaceae** Hand.-Mazz. (1932), nom. cons., optional synonym of *Juglandaceae*
- Rhopalocarpaceae** Hemsl. ex. Takht. (1987) = *Sphaerosepalaceae*
- Rhynchoalycaceae** L.A.S.Johnson & B.G.Briggs (1985)
- Rhynchothecaceae** Endl. (1841) = *Ledocarpaceae*
- Roridulaceae** Bercht. & J.Presl (1820), nom. cons.
- Rosaceae** Juss. (1789), nom. cons.
- Rousseaceae** DC. (1839)
- Roxburghiaceae** Wall. (1832) = *Stemonaceae*
- Rubiaceae** Juss. (1789), nom. cons.
- Ruppiaceae** Horan. (1834), nom. cons.
- Ruscaceae** Spreng. (1826), nom. cons., optional synonym of *Asparagaceae*
- Rutaceae** Juss. (1789), nom. cons.
- Sabiaceae** Blume (1851), nom. cons.
- Saccifoliaceae** Maguire & Pires (1978) = *Gentianaceae*
- Salazariaceae** F.A.Barkley (1975) = *Lamiaceae*
- Salicaceae** Mirb. (1815), nom. cons.
- Salicorniaceae** Martynov (1820) = *Amaranthaceae*
- Salpiglossidaceae** Hutch. (1969) = *Solanaceae*
- Salsolaceae** Menge (1839) = *Amaranthaceae*
- Salvadoraceae** Lindl. (1836), nom. cons.
- Sambucaceae** Batsch ex. Borkh. (1797) = *Adoxaceae*
- Samolaceae** Raf. (1820) = *Theophrastaceae*
- Samydaceae** Vent. (1799) = *Salicaceae*
- Saniculaceae** (Burnett) A.Löve & D.Löve (1974) = *Apiaceae*
- Sansevieriaceae** Nakai (1936) = *Ruscaceae*, optional synonym of *Asparagaceae*
- Santalaceae** R.Br. (1810), nom. cons.
- Sapindaceae** Juss. (1789), nom. cons.
- Sapotaceae** Juss. (1789), nom. cons.
- Sarcobataceae** Behnke (1997)
- Sarcolaenaceae** Caruel (1881), nom. cons.
- Sarcophytaceae** A.Kern. (1891) = *Balanophoraceae*
- Sarcospermataceae** H.J.Lam (1925), nom. cons. = *Sapotaceae*
- Sargentodoxaceae** Stapf ex. Hutch. (1926), nom. cons. = *Lardizabalaceae*
- Sarraceniaceae** Dumort. (1829), nom. cons.
- Saurauiaceae** Griseb. (1854), nom. cons. = *Actinidiaceae*
- Saururaceae** Martynov (1820), nom. cons.
- Sauvagesiaceae** Dumort. (1829) = *Ochnaceae*
- Saxifragaceae** Juss. (1789), nom. cons.
- Scaevolaceae** Lindl. (1830) = *Goodeniaceae*
- Scepaceae** Lindl. (1836) = *Phyllanthaceae*
- Scheuchzeriaceae** F.Rudolphi (1830), nom. cons.
- Schisandraceae** Blume (1830), nom. cons.
- Schlegeliaceae** (A.H.Gentry) Reveal (1996)
- Sclerophylacaceae** Miers (1848) = *Solanaceae*
- Scoliopaceae** Takht. (1996) = *Liliaceae*
- Scrophulariaceae** Juss. (1789), nom. cons.
- Scybaliaceae** A.Kern. (1891) = *Balanophoraceae*
- Scyphostegiaceae** Hutch. (1926), nom. cons. = *Salicaceae*
- Scyttopetalaceae** Engl. (1897), nom. cons. = *Lecythidaceae*
- Selaginaceae** Choisy (1823), nom. cons. = *Scrophulariaceae*
- Sesamaceae** R.Br. ex. Bercht. & J.Presl (1820) = *Pedaliaceae*
- Sesuviaceae** Horan. (1834) = *Aizoaceae*
- Setchellanthaceae** Iltis (1999)
- Simaroubaceae** DC. (1811), nom. cons.
- Simmondsiaceae** Tiegh. (1899)
- Sinofranchetiaceae** Doweld (2001) = *Lardizabalaceae*
- Siparunaceae** (A.DC.) Schodde (1970)
- Siphonodontaceae** (Croizat) Gagnep. & Tardieu ex. Tardieu (1951), nom. cons. = *Celastraceae*
- Sladeniaceae** Airy Shaw (1964), optional synonym of *Pentaphragmaceae*
- Smilacaceae** Vent. (1799), nom. cons.
- Solanaceae** Juss. (1789), nom. cons.
- Sonneratiaceae** Engl. (1897), nom. cons. = *Lythraceae*

- Sparganiaceae** Hanin (1811), nom. cons.
 Spergulaceae Bartl. (1825) = Caryophyllaceae
Sphaerosepalaceae (Warb.) Tiegh. ex. Bullock (1959)
Sphenocleaceae (Lindl.) Baskerville (1839), nom. cons.
Sphenostemonaceae P.Royen & Airy Shaw (1972)
 Spigeliaceae Mart. (1827) = Loganiaceae
 Spiraeaceae Bertuch (1801) = Rosaceae
Stachyuraceae J.Agardh (1858), nom. cons.
 Stackhousiaceae R.Br. (1814), nom. cons. = Celastraceae
Staphyleaceae Martynov (1820), nom. cons.
 Staticaceae Cassel (1817) = Plumbaginaceae
Stegnospermataceae Nakai (1942)
Stemonaceae Caruel (1878), nom. cons.
Stemonuraceae (M.Roem.) Kårehed (2001)
 Stenomeridaceae J.Agardh (1858) = Dioscoreaceae
 Sterculiaceae Vent. ex. Salisb. (1807), nom. cons. = Malvaceae
 Stilaginaceae C.Agardh (1824) = Euphorbiaceae
Stilbaceae Kunth (1831), nom. cons.
Strasburgeriaceae Soler. (1908), nom. cons.
Strelitziaceae Hutch. (1934), nom. cons.
 Streptochaetaceae Nakai (1943) = Poaceae
 Strychnaceae DC. ex. Perleb (1818) = Loganiaceae
Stylidiaceae R.Br. (1810), nom. cons.
 Stylobasiaceae J.Agardh (1858) = Surianaceae
 Stylocerataceae (Pax) Takht. ex. Reveal & Hoogland (1990) = Buxaceae
Styracaceae DC. & Spreng. (1821), nom. cons.
Surianaceae Arn. (1834), nom. cons.
 Symphoremataceae (Meisn.) Mold. ex. Reveal & Hoogland (1991) = Lamiaceae
Symplocaceae Desf. (1820), nom. cons.
 Taccaceae Bercht. & J.Presl (1820), nom. cons. = Dioscoreaceae
 Takhtajaniaceae (J.-F.Leroy) J.-F.Leroy (1980) = Winteraceae
 Talinaceae (Fenzl) Doweld (2001) = Portulacaceae
Tamaricaceae Bercht. & J.Presl (1820), nom. cons.
Tapisciaceae (Pax) Takht. (1987)
Tecophilaeaceae Leyb. (1862), nom. cons.
 Tepuianthaceae Maguire & Steyer. (1981) = Thymelaeaceae
Ternstroemiaceae Mirb. ex. DC. (1816), optional synonym of Pentaphragmaceae
Tetracarpaeaceae Nakai (1943), optional synonym of Haloragaceae
Tetracentraceae A.C.Sm. (1945), nom. cons., optional synonym of Trochodendraceae
Tetrachondraceae Wettst. (1924)
Tetradiclidaceae (Engl.) Takht. (1986), an optional synonym of Nitrariaceae
 Tetragoniaceae Link (1831), nom. cons. = Aizoaceae
Tetramelaceae Airy Shaw (1964)
Tetrameristaceae Hutch. (1959)
 Tetrastylidiaceae Tiegh. (1899) = Olacaceae
 Thalassiaceae Nakai (1943) = Hydrocharitaceae
 Thalictiaceae Raf. (1815) = Ranunculaceae
Theaceae Mirb. ex. Ker Gawl. (1816), nom. cons.
 Theligonaceae Dumort. (1829), nom. cons. = Rubiaceae
Themidaceae Salisb. (1866), optional synonym of Asparagaceae
Theophrastaceae Link (1829), nom. cons.
 Thismiaceae J.Agardh (1858), nom. cons. = Burmanniaceae
 Thomandersiaceae Sreem. (1977) = Acanthaceae
 Thunbergiaceae (Dumort.) Lilja (1870) = Acanthaceae
Thurniaceae Engl. (1907), nom. cons.
Thymelaeaceae Juss. (1789), nom. cons.
Ticodendraceae Gómez-Laur. & L.D.Gómez (1991)
 Tiliaceae Juss. (1789), nom. cons. = Malvaceae
Tofieldiaceae Takht. (1995)
Toricelliaceae Hu (1934)
Tovariaceae Pax (1891), nom. cons.
 Trapaceae Dumort. (1829), nom. cons. = Lythraceae
 Trapellaceae Honda & Sakis. (1930) = Pedaliaceae
 Tremandraceae R.Br. ex. DC. (1824), nom. cons. = Elaeocarpaceae
 Trewiaceae Lindl. (1836) = Euphorbiaceae
Tribelaceae Airy Shaw (1964)
 Tribulaceae Trautv. (1853) = Zygophyllaceae
 Trichopodaceae Hutch. (1934), nom. cons. = Dioscoreaceae
 Tricyrtidaceae Takht. (1997), nom. cons. = Liliaceae
Trigoniaceae Endl. (1841), nom. cons., optional synonym of Chrysobalanaceae
 Trilliaceae Chevall. (1827), nom. cons. = Melanthiaceae
Trimeniaceae L.S.Gibbs (1917), nom. cons.
 Triplostegiaceae A.E. Bobrov ex. Airy Shaw (1964) = Dipsacaceae, optional synonym of Caprifoliaceae
 Tristichaceae Willis (1915) = Podostemaceae
Triuridaceae Gardner (1843), nom. cons.
Trochodendraceae Eichler (1865), nom. cons.
Tropaeolaceae Bercht. & J.Presl (1820), nom. cons.
 Tulbaghiaceae Salisb. (1866) = Alliaceae
Turneraceae Kunth ex. DC. (1828), nom. cons., optional synonym of Passifloraceae

- Typhaceae** Juss. (1789), nom. cons.
Uapacaceae Airy Shaw (1964) = Phyllanthaceae
Ulmaceae Mirb. (1815), nom. cons.
Umbelliferae Juss. (1789), nom. alt. et cons. =
Apiaceae
Urticaceae Juss. (1789), nom. cons.
Uvulariaceae A.Gray ex. Kunth (1843), nom. cons.
= Colchicaceae
Vacciniaceae DC. ex. Perleb (1818), nom. cons. =
Ericaceae
Vahliaceae Dandy (1959)
Valerianaceae Batsch (1802), nom. cons.,
optional synonym of Caprifoliaceae
Vallisneriaceae Link (1829) = Hydrocharitaceae
Velloziaceae Hook. (1827), nom. cons.
Verbascaceae Raf. (1821) = Scrophulariaceae
Verbenaceae J.St.-Hil. (1805), nom. cons.
Veronicaceae Cassel (1817) = Plantaginaceae
Viburnaceae Raf. (1820) = Adoxaceae
Violaceae Batsch (1802), nom. cons.
Viscaceae Batsch (1802) = Santalaceae
Vitaceae Juss. (1789), nom. cons.
Vitaceae Juss. (1789) = Lamiaceae
Vivianiaceae Klotzsch (1836)
Vochysiaceae A.St.-Hil. (1820), nom. cons.
Walleriaceae (R.Dahlgren) Takht. (1995), nom.
cons. = Tecophilaeaceae
Wellstediaceae (Pilg.) Novák (1943) =
Boraginaceae
Winteraceae R.Br. ex. Lindl. (1830), nom.
cons.
Xanthophyllaceae (Baill.) Gagnep. ex. Reveal &
Hoogland (1990) = Polygalaceae
Xanthorrhoeaceae Dumort. (1829), nom.
cons.
Xeronemataceae M.W.Chase, Rudall & M.F.Fay
(2001)
Xerophyllaceae Takht. (1996) = Melanthiaceae
Xyridaceae C.Agardh (1823), nom. cons.
Zannichelliaceae Chevall. (1827), nom. cons. =
Potamogetonaceae
Zingiberaceae Martynov (1820), nom. cons.
Zosteraceae Dumort. (1829), nom. cons.
Zygophyllaceae R.Br. (1814), nom. cons.