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

THE ANGIOSPERM PHYLOGENY GROUP*

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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), Bromeliacae, 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, Pentaphylacaceae (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, Linnaeaceae, Morinaceae and Valerianaceae in Caprifoliaceae *s.l.* © 2003 The Linnean Society of London, *Botanical Journal of the Linnean Society*, 2003, **141**, 399–436.

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## INTRODUCTION

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

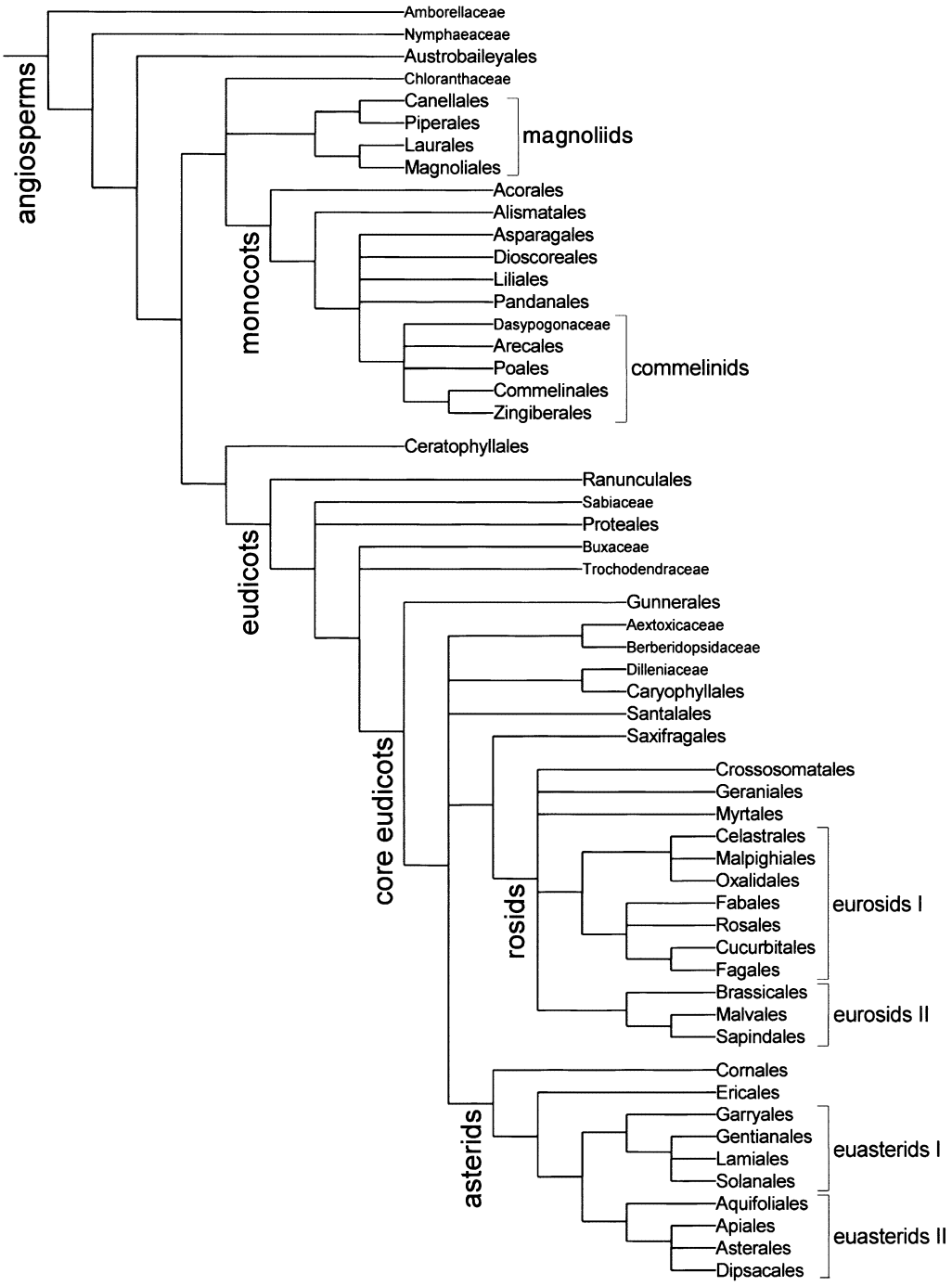


**Figure 1.** Interrelationships of the orders and some families supported by jackknife or bootstrap frequencies above 50% in large-scale analyses of angiosperms. All except five of the clades are supported by the Soltis *et al.* (2000) analysis of 18S rDNA, *rbcL*, and *atpB* sequences from a wide sample of angiosperms. Three clades, Canellales+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 classifed 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 *Trimeni*a 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, Anthericaeae, 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, Joinvilleacae, Poaceae and Restionaceae). Within the latter clade, Ecdeiocoleaceae rather than Joinvilleacae 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 Plumbaginacae + 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 perspective of their new alignment. Within the core group, relationships remain uncertain. Appelquist & Wallace (2000) and Cuénoud *et al*. (2002) found that the distinctive Madagascaran Didiereaceae are sister to *Calyptrotheca* 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 Basellacaeae, 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 Phytolaccoideae/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/bootstrap 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. Clausing & 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 Quiinaceae 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 Nitrariaceae, 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 amost 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), Pentaphylacaceae and Sladeniaceae (the latter considered an optional synonym of Pentaphylacaceae 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 sup-ported 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, Sarraceniaceae, 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.* (Oxelman *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 (Oxelman *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. *Irvingbaileya* (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 Rousseaceae (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. Stylidiaceae 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.

## REFERENCES

**Albach DC, Soltis DE, Chase MW, Soltis PS. 2001a.** Phylogenetic placement of the enigmatic angiosperm *Hydrostachys*. *Taxon* **50:** 781–805.

**Albach DC, Soltis PS, Soltis DE, Olmstead RG. 2001b.** Phylogenetic analysis of the Asteridae based on sequences of four genes. *Annals of the Missouri Botanical Garden* **88:** 163–212.

**Anderberg AA, Rydin C, Källersjö M. 2002.** Phylogenetic relationships in the order Ericales *s. l.* analyses of molecular data from five genes from the plastid and mitochondrial genomes. *American Journal of Botany* **89:** 677–687.

**Anderberg AA, Ståhl B, Källersjö M. 2000.** Maesaceae, a new primuloid family in the order Ericales *s.l. Taxon* **49:** 183–197.

**APG. 1998.** An ordinal classification for the families of flowering plants. *Annals of the Missouri Botanical Garden* **85:** 531–553.

**Appelquist WL, Wallace RS. 2000.** Phylogeny of the Madagascan endemic family Didieraceae. *Plant Systematics and Evolution* **221:** 157–166.

**Backlund M, Oxelman B, Bremer B. 2000.** Phylogenetic relationships within the Gentianales based on *ndhF* and *rbcL* sequences, with particular reference to the Loganiaceae. *American Journal of Botany* **87:** 1029–1043.

**Barkman TJ, Chenery G, McNeal JR, Lyons-Weiler J, dePamphilis CW. 2000.** Independent and combined analyses of sequences from all three genomic compartments converge on the root of flowering plant phylogeny. *Proceedings of the National Academy of Sciences, USA* **97:** 13166–13171.

**Beardsley PM, Olmstead RG. 2002.** Redefining Phrymacae: the placement of *Mimulus*, tribe Mimuleae, and *Phzrma*. *American Journal of Botany* **89:** 1093–1102.

**Bell CD, Edwards EJ, Kim S-T, Donoghue MJ. 2001.** Dipsacales phylogeny based on chloroplast DNA sequences. *Harvard Papers in Botany* **6:** 481–489.

**Berry PE, Savolainen V, Sytsma KJ, Hall JC, Chase MW. 2001.** *Lissocarpa* is sister to *Diospyros* (Ebenaceae). *Kew Bulletin* **56:** 725–729.

**Bortenschlager S. 1973.** Morphologie pollinique des Phytolaccaceae. *Pollen et Spores* **15:** 227–253.

**Bradford JC, Barnes RW. 2001.** Phylogenetics and classification of Cunoniaceae (Oxalidales) using chloroplast DNA sequences and morphology. *Systematic Botany* **26:** 354–385.

**Bremer K. 2000.** Phylogenetic nomenclature and the new ordinal system of the angiosperms. In: Nordenstam B, El-Ghazaly G, Kassas M, Laurent TC, eds. *Plant systematics for the 21st century*. London: Portland Press, 125–133.

**Bremer K. 2002.** Gondwanan evolution of the grass alliance of families (Poales). *Evolution* **56:** 1374–1387.

**Bremer K, Backlund A, Sennblad B, Swenson U, Andreasen K, Hjertson M, Lundberg J, Backlund M, Bremer B. 2001.** A phylogenetic analysis of 100+ genera and 50+ families of euasterids based on morphological and molecular data with notes on possible higher level morphological synapomorphies. *Plant Systematics and Evolution* **229:** 137–169.

**Bremer B, Bremer K, Heidari N, Erixon P, Anderberg AA, Olmstead RG, Källersjö M, Barkhordarian E. 2002.** Phylogenetics of asterids based on three coding and three non-coding chloroplast DNA markers and the utility of non-coding DNA at higher taxonomic levels. *Molecular Phylogenetics and Evolution* **24:** 274–301.

**Briggs BG, Johnson LAS. 2000.** Hopkinsiaceae and Lyginiaceae, two new families of Poales in western Australia, with revisions of *Hopkinsia* and *Lyginia*. *Telopea* **8:** 477–502.

**Caddick LR, Rudall PJ, Wilkin P, Chase MW. 2000.** Yams and their allies: systematics of Dioscoreales. In: Wilson KL, Morrison DA, eds. *Systematics and evolution of monocots. Proceedings of the 2nd International Monocot Symposium*. Melbourne: CSIRO, 475–487.

**Caddick LR, Rudall PJ, Wilkin P, Hedderson TAJ, Chase MW. 2002a.** Phylogenetics of Dioscoreales based on combined analyses of morphological and molecular data. *Botanical Journal of the Linnean Society* **138:** 123–144.

**Caddick LR, Wilkin P, Rudall PJ, Hedderson TAJ, Chase MW. 2002b.** Yams reclassified: a recircumscription of Dioscoreaceae and Dioscoreales. *Taxon* **51:** 103–114.

**Chase MW, Duvall MR, Hills HG, Conran JG, Cox AV, Eguiarte LE, Hartwell J, Fay MF, Caddick LR, Cameron KM, Hoot S. 1995a.** Molecular systematics of Lilianae. In: Rudall PJ, Cribb PJ, Cutler DF, Humphries CJ, eds. *Monocotyledons: Systematics and Evolution*. Kew: Royal Botanic Gardens. 109–137.

**Chase MW, Soltis DE, Olmstead RG, Morgan D, Les DH, Mishler BD, Duvall MR, Price RA, Hills HG, Qiu YL, Kron KA, Rettig JH, Conti E, Palmer JD, Manhart JR, Sytsma KJ, Michael HJ, Kress WJ, Karol KA, Clark WD, Hedrén M, Gaut BS, Jansen RK, Kim KJ, Wimpee CF, Smith JF, Furnier GR, Strauss SH, Xiang QY, Plunkett GM, Soltis PS, Swensen SM, Williams SE, Gadek PA, Quinn CJ, Eguiarte LE, Golenberg E, Learn GH, Graham SW Jr, Barrett SCH, Dayanandan S, Albert VA. 1993.** Phylogenetics of seed plants: an analysis of nucleotide sequences from the plastid gene *rbcL*. *Annals of the Missouri Botanical Garden* **80:** 528–580.

**Chase MW, Soltis DE, Soltis PS, Rudall PJ, Fay MF, Hahn WJ, Sullivan S, Joseph J, Molvray M, Kores PJ, Givnish TJ, Sytsma KJ, Pires JC. 2000.** Higher-level systematics of the monocotyledons: An assessment of current knowledge and a new classification. In: Wilson KL, Morrison DA, eds. *Systematics and evolution of monocots. Proceedings of the 2nd International Monocot Symposium*. Melbourne: CSIRO, 3–16.

**Chase MW, Stevenson WDW, Wilkin P, Rudall PJ. 1995b.** Monocot systematics: a combined analysis. In: Rudall PJ, Cribb PJ, Cutler DF, Humphries CJ, eds. *Monocotyledons: Systematics and evolution*. Kew: Royal Botanic Gardens. 685–730.

**Chase MW, Zmartzty S, Lledó MD, Wurdack KJ, Swensen SM, Fay MF. 2002.** When in doubt, put it in Flacourtiaceae: a molecular phylogenetic analysis based on plastid *rbcL* DNA sequences. *Kew Bulletin* **57:** 141–181.

**Clausing G, Renner SS. 2001.** Molecular phylogenetics of Melastomataceae and Memecylaceae: implications for character evolution. *American Journal of Botany* **88:** 486–498.

**Conti E, Baum D, Sytsma K. 1999.** Phylogeny of Crypteroniaceae and related families: implications for morphology and biogeography. In: *XVI International Botanical Congress, abstracts*. St. Louis: Missouri Botanical Garden, 250.

**Conti E, Litt A, Sytsma KJ. 1996.** Circumscription of Myrtales and their relationships to other rosids: evidence from *rbcL* sequence data. *American Journal of Botany* **83:** 221–233.

**Contreras VR, Scogin R, Philbrick CT. 1993.** A phytochemical study of selected Podostemaceae: systematic implications. *Aliso* **13:** 513–520.

**Cronquist A. 1981.** *An integrated system of classification of flowering plants*. New York: Columbia University Press.

**Cuénoud P, Savolainen V, Powell M, Grayer RJ, Chase MW. 2002.** Molecular phylogenetics of the Caryophyllales based on combined analyses of 18S rDNA and *rbcL*, *atpB* and *matK* sequences. *American Journal of Botany* **89:** 132–144.

**Cusset C, Cusset G. 1988.** Étude sur les Podostemales. 9. Delimitation taxinomiques dans les Tristichaceae. *Bulletin du Muséum d'Histoire Naturelle, Séries* **4** (10)**:** 149–175.

**Dahlgren R. 1983.** General aspects of angiosperm evolution and macrosystematics. *Nordic Journal of Botany* **3:** 119–149.

**Dahlgren RMT, Clifford HT, Yeo PF. 1985.** *The families of the monocotyledons: structure, evolution, and taxonomy*. Berlin: Spinger-Verlag.

**Dayanandan S, Ashton PS, Williams SM, Primack RB. 1999.** Phylogeny of the tropical tree family Dipterocarpaceae based on nucleotide sequences of the chloroplast *rbcL* gene. *American Journal of Botany* **86:** 1182–1190.

**Doweld AB. 2001.** *Tentamen Systematis Plantarum Vascularium (Tracheophytorum).* Moscow: GEOS.

**Doyle JA, Endress PK. 2000.** Morphological phylogenetic analysis of basal angiosperms: comparison and combination

with molecular data. *International Journal of Plant Sciences* **161** (6 Suppl.): S121–S153.

**Duvall MR, Clegg MT, Chase MW, Clark WD, Kress WJ, Hills HG, Eguiarte LE, Smith JF, Gaut BS, Zimmer EA, Learn GH. 1993.** Phylogenetic hypotheses for the monocotyledons constructed from *rbcL* sequences. *Annals of the Missouri Botanical Garden* **80:** 607–619.

**Engler A. 1930.** Saxifragaceae. In: Engler A, Prantl K, eds. *Die natürlichen Pflanzenfamilien 18a*. Leipzig: W. Engelman, 74–226.

**Farris JS, Albert VA, Källersjö M, Lipscomb D, Kluge AG. 1996.** Parsimony jackknifing outperforms neighbor-joining. *Cladistics* **12:** 99–124.

**Fay MF, Bremer B, Prance GT, van der Bank M, Bridson D, Chase MW. 2000a.** Plastid *rbcL* sequence data show *Dialypetalanthus* to be a member of Rubiaceae. *Kew Bulletin* **55:** 853–864.

**Fay MF, Rudall PJ, Sullivan S, Stobart KL, de Bruijn AY, Reeves G, Qamaruz-Zaman F, Hong W-P, Joseph J, Hahn WJ, Conran JG, Chase MW. 2000b.** Phylogenetic studies of Asparagales based on four plastic DNA loci. In: Wilson KL, Morrison DA, eds. *Systematics and evolution of monocots. Proceedings of the 2nd International Monocot Symposium*. Melbourne: CSIRO, 360–371.

**Felsenstein J. 1985.** Confidence limits on phylogenies: an approach using the bootstrap. *Evolution* **39:** 783–791.

**Fishbein M, Hufford L, Soltis DE. 2003.** Phylogeny of Saxifragales: patterns of floral evolution and taxonomic revision. *Systematic Botany* in press.

**Fuse S, Tamura MN. 2000.** A phylogenetic analysis of the plastid *matK* gene with emphasis on Melanthiaceae *sensu lato*. *Plant Biology* **2:** 415–427.

**Givnish TJ, Evans TM, Pires JC, Sytsma KJ. 1999.** Polyphyly and convergent morphological evolution in Commelinales and Commelinidae: evidence from *rbcL* sequence data. *Molecular Phylogenetics and Evolution* **12:** 360–385.

**Graham SW, Olmstead RG. 2000.** Evolutionary significance of an unusual chloroplast DNA inversion found in two basal angiosperm lineages. *Current Genetics* **37:** 183–188.

**Gregory T, Chandler GT, Bayer RJ. 2000.** Phylogenetic placement of the enigmatic Western Australian genus *Emblingia* based on *rbcL* sequences. *Plant Species Biology* **15:** 67–72.

**Greuter W, McNeill J, Barrie FR, Burdet HM, Demoulin V, Filgueiras TS, Nicolson DH, Silva PC, Skog JE, Trehane P, Turland NJ, Hawksworth DL. 2000.** International code of botanical nomenclature (Saint Louis Code) adopted by the Sixteenth International Botanical Congress, St. Louis, Missouri, July – August 1999. *Regnum Vegetabile* **138:** 1–474.

**Haberle RC. 1998.** Phylogenetic systematics of *Pseudonemacladus* and the North American cyphioids (Campanulaceae *sensu lato*). MSc Thesis, Northern Arizona University.

**Hall JC, Sytsma KJ, Iltis HH. 2002.** Phylogeny of Capparaceae and Brassicaceae based on chloroplast sequence data. *American Journal of Botany* **89:** 1826–1842.

**Hibsch-Jetter C, Soltis DE, MacFarlane TD. 1997.** Phylogenetic analysis of *Eremosyne pectinata* (Saxifragaceae *s.l.*) based on *rbcL* sequence data. *Plant Systematics and Evolution* **204:** 225–232.

**Hillis DM. 1996.** Inferring complex phylogenies. *Nature* **383:** 130.

**Hoot SB, Magallon-Puebla S, Crane PR. 1999.** Phylogeny of basal eudicots based on three molecular data sets: *atpB*, *rbcL* and 18S nuclear ribosomal DNA sequences. *Annals of the Missouri Botanical Garden* **86:** 119–131.

**Jäger-Zürn I. 1997.** Embryological and floral studies in *Weddellina squamulosa* Tul. (Podostemaceae, Tristichoideae). *Aquatic Botany* **57:** 151–182.

**Jeong SC, Ritchie NJ, Myrold DD. 1999.** Molecular phylogenies of plants and *Frankia* support multiple origins of actinorhizal symbioses. *Molecular Phylogenetics and Evolution* **13:** 493–503.

**Judd WS. 1997.** The Flacourtiaceae in the southeastern United States. *Harvard Papers in Botany* **1:** 65–79.

**Judd WS, Campbell CS, Kellogg EA, Stevens PF. 1999.** *Plant systematics – a phylogenetic approach*. Sunderland, Massachusetts: Sinauer.

**Judd WS, Campbell CS, Kellogg EA, Stevens PF, Donoghue MJ. 2002.** *Plant systematics – a phylogenetic approach*, 2nd edn. Sunderland, Massachusetts: Sinauer.

**Källersjö M, Bergqvist G, Anderberg A. 2000.** Generic realignment in primuloid families of the Ericales *s. l.* a phylogenetic analysis based on DNA sequences from three chloroplast genes and morphology. *American Journal of Botany* **87:** 1325–1341.

**Källersjö M, Farris JS, Chase MW, Bremer B, Fay MF, Humphries CJ, Petersen G, Seberg O, Bremer K. 1998.** Simultaneous parsimony jacknife analysis of 2538 *rbcL* DNA sequences reveals support for major clades of green plants, land plants, seed plants and flowering plants. *Plant Systematics and Evolution* **213:** 259–287.

**Kårehed J. 2001.** Multiple origin of the tropical forest tree family Icacinaceae. *American Journal of Botany* **88:** 2259–2274.

**Kårehed J. 2003.** The family Pennantiaceae and its relationships to Apiales. *Botanical Journal of the Linnean Society* **141:** 1–24.

**Kårehed J, Lundberg J, Bremer B, Bremer K. 1999.** Evolution of the Australasian families Alseuosmiaceae, Argophyllaceae, and Phellinaceae. *Systematic Botany* **24:** 660–682.

**Kron KA, Judd WS, Stevens PF, Crayn DM, Anderberg AA, Gadek PA, Quinn CJ, Luteyn JL. 2002.** Phylogenetic classification of Ericaceae: molecular and morphological evidence. *Botanical Review* **68:** 335–423.

**Litt A, Chase MW. 1999.** The systematic position of *Euphronia*, with comments on the position of *Balanops*: an analysis based on *rbcL* sequence data. *Systematic Botany* **23:** 401–409.

**Lundberg J. 2001.** The asteralean affinity of the Mauritian *Roussea* (Rousseaceae). *Botanical Journal of the Linnean Society* **136:** 267–276.

**Lundberg J, Bremer K. 2002.** A phylogenetic study of the order Asterales using one large morphological and three molecular data sets. *International Journal of Plant Sciences*, in press.

**Manhart JR, Rettig JH. 1994.** Gene sequence data. In: Behnke, H-D, Mabry, TJ, eds. *Caryophyllales: evolution and systematics*. Berlin: Springer Verlag, 235–246.

**Meimberg H, Dittrich P, Bringmann G, Schlauer J, Heubl G. 2000.** Molecular phylogeny of Caryophyllidae *s.l.* based on *matK* sequences with special emphasis on carnivorous taxa. *Plant Biology* **2:** 218–228.

**Morgan DR, Soltis DE. 1993.** Phylogenetic relationships among members of the Saxifragaceae *sensu lato* based on *rbcL* sequence data. *Annals of the Missouri Botanical Garden* **80:** 631–660.

**Nandi O, Chase MW, Endress PK. 1998.** A combined cladistic analysis of angiosperms using *rbcL* and non-molecular data sets. *Annals of the Missouri Botanical Garden* **85:** 137–212.

**Neyland R. 2002.** A phylogeny inferred from large subunit (26S) ribosomal DNA sequences suggests that Burmanniales is polyphyletic. *Australian Plant Research* **15:** 19–28.

**Nickrent DL. 2002.** Orígenes filogenéticos de las plantas parásitas. In: López-Sáez JA, Catalán P, Sáez L, eds. *Plantas parásitas de la Península Ibérica e Islas Baleares*. Madrid, Spain: Mundi-Prensa Libros, 29–56.

**Nickrent DL, Blarer A, Qiu Y-L, Soltis DE, Zanis M. 2001.** Paleoherb status of Hydnoraceae supported by multigene analyses. In: *Botany 2001: plants and people*, Abstracts. Columbus, Ohio: Botanical Society of America, 130–131.

**Nickrent DL, Duff RJ. 1996.** Molecular studies of parasitic plants using ribosomal RNA. In: Moreno MT, Cubero JI, Berner D, Joel D, Musselman LJ, Parker C, eds. *Advances in parasitic plant research*. Cordoba, Spain: Junta de Andalucia, Direccion General de Investigacion Agraria, 28–52.

**Nickrent DL, Duff RJ, Colwell AE, Wolfe AD, Young ND, Steiner KE, dePamphilis CW. 1998.** Molecular phylogenetic and evolutionary studies of parasitic plants. In: Soltis DE, Soltis PS, Doyle JJ, eds. *Molecular systematics of plants II*. Boston: Kluwer, 211–241.

**Nickrent DL, Malécot V. 2001.** A molecular phylogeny of Santalales. In: Fer A, Thalouarn P, Joel DM, Musselman LJ, Parker C, Verkleij JAC, eds. *Proceedings of the 7th International Parasitic Weed Symposium.* Nantes, France: Faculté Des Sciences, Université de Nantes, 69–74.

**Olmstead RG, DePamphilis CW, Wolfe AD, Young ND, Elisons WJ, Reeves PA. 2001.** Disintegration of the Scrophulariaceae. *American Journal of Botany* **88:** 348–361.

**Olmstead RG, Ferguson D. 2001.** A molecular phylogeny of the Boraginaceae-Hydrophyllaceae. In: *Botany 2001: plants and people*, Abstracts. Columbus, Ohio: Botanical Society of America, 131.

**Olmstead RG, Kim K-J, Jansen RK, Wagstaff SJ. 2000.** The phylogeny of the Asteridae *sensu lato* based on chloroplast *ndhF* gene sequences. *Molecular Phylogenetics and Evolution* **16:** 96–112.

**Oxelman B, Backlund M, Bremer B. 1999.** Relationships of Buddlejaceae *s.l.* investigated using parsimony jackknife and branch support analysis of chloroplast *ndhF* and *rbcL* sequence data. *Systematic Botany* **24:** 164–182.

**Pires JC, Sytsma KJ. 2002.** A phylogenetic evaluation of a biosystematic framework: *Brodiaea* and related petaloid monocots (Themidaceae). *American Journal of Botany* **89:** 1342–1359.

**Plunkett GM. 2001.** Relationship of the order Apiales to subclass Asteridae: a re-evaluation of morphological characters based on insights from molecular data. *Edinburgh Journal of Botany* **8:** 183–200.

**Plunkett GM, Lowry PP. 2001.** Relationships among 'ancient araliads' and their significance for the systematics of Apiales. *Molecular Phylogenetics and Evolution* **19:** 259–276.

**Qiu Y-L, Chase MW, Hoot SB, Conti E, Crane PR, Sytsma KJ, Parks CR. 1998.** Phylogenetics of Hamamelidae and their allies: parsimony analyses of nucleotide sequences of the plastid gene *rbcL*. *International Journal of Plant Sciences* **159:** 891–905.

**Qiu Y-L, Lee J, Bernasconi-Quadroni F, Soltis DE, Soltis PS, Zanis M, Zimmer EA, Chen Z, Savolainen V, Chase MW. 1999.** The earliest angiosperms: evidence from mitochondrial, plastid and nuclear genomes. *Nature* **402:** 404–407.

**Renner SS. 1999.** Circumscription and phylogeny of the Laurales: evidence from molecular and morphological data. *American Journal of Botany* **86:** 1301–1315.

**Reveal JL. 1998–onward.** *Indices nominum supragenericorum plantarum vascularium.* Alphabetical listing by genera of validly published suprageneric names. http://www.inform.umd.edu/PBIO/fam/inspvindex.html.

**Ronse Decraene LP, Smets EF. 1999.** Similarities in floral ontogeny and anatomy between the genera *Francoa* (Francoaceae) and *Greyia* (Greyiaceae). *International Journal of Plant Sciences* **160:** 377–393.

**Rudall PJ, Conran JG, Chase MW. 2000a.** Systematics of Ruscaceae/Convallariaceae: a combined morphological and molecular investigation. *Botanical Journal of the Linnean Society* **134:** 73–92.

**Rudall PJ, Cribb PJ, Cutler DF, Humphries CJ. 1995.** *Monocotyledons: systematics and evolution*. Kew: Royal Botanic Gardens.

**Rudall PJ, Furness CA, Fay MF, Chase MW. 2000b.** Consider the lilies – systematics of Liliales. In: Wilson KL, Morrison DA, eds. *Systematics and evolution of monocots. Proceedings of the 2nd International Monocot Symposium*. Melbourne: CSIRO, 347–359.

**Savolainen V, Chase MW, Hoot SB, Morton CM, Soltis DE, Bayer C, Fay MF, de Bruijn AY, Sullivan S, Qiu Y-L. 2000a.** Phylogenetics of flowering plants based on combined analysis of plastid *atpB* and *rbcL* gene sequences. *Systematic Biology* **49:** 306–362.

**Savolainen V, Fay MF, Albach DC, Backlund A, van der Bank M, Cameron KM, Johnson SA, Lledó MD, Pintaud J-C, Powell M, Sheahan MC, Soltis DE, Soltis PS, Weston P, Whitten WM, Wurdack KJ, Chase MW. 2000b.** Phylogeny of the eudicots: a nearly complete familial

analysis based on *rbcL* gene sequences. *Kew Bulletin* **55:** 257–309.

**Savolainen V, Spichiger R, Manen JF. 1997.** Polyphyletism of Celastrales deduced from a chloroplast non-coding DNA region. *Molecular Phylogenetics and Evolution* **7:** 145–157.

**Sheahan MC, Chase MW. 1996.** A phylogenetic analysis of Zygophyllaceae R. Br. based on morphological, anatomical and *rbcL* sequence data. *Botanical Journal of the Linnean Society* **122:** 279–300.

**Sheahan MC, Chase MW. 2000.** Phylogenetic relationships within Zygophyllaceae based on DNA sequences of three plastid regions, with special emphasis on Zygophylloideae. *Systematic Botany* **25:** 371–384.

**Shore JS, McQueen KL, Little SL. 1994.** Inheritance of plastid DNA in the *Turnera ulmifolia* complex. *American Journal of Botany* **81:** 1636–1639.

**Simmons MP, Clevinger CC, Savolainen V, Archer RH, Mathews S, Doyle JJ. 2001.** Phylogeny of the Celastraceae inferred from phytochrome B gene sequence and morphology. *American Journal of Botany* **88:** 313–325.

**Soltis DE, Senters AE, Kim S, Thompson JD, Soltis PS, Zanis MJ, de Craene LS, Endress PK, Farris JS, 2003.** Gunnerales are sister to other core eudicots and exhibit floral features of early-diverging eudicots. *American Journal of Botany* **90:** 461–470.

**Soltis PS, Soltis DE, Chase MW. 1999.** Angiosperm phylogeny inferred from multiple genes as a tool for comparative biology. *Nature* **402:** 402–404.

**Soltis DE, Soltis PS, Chase MW, Mort ME, Albach DC, Zanis M, Savolainen V, Hahn WH, Hoot SB, Fay MF, Axtell M, Swensen SM, Prince LM, Kress WJ, Nixon KC, Farris JA. 2000a.** Angiosperm phylogeny inferred from 18S rDNA, *rbcL*, and *atpB* sequences. *Botanical Journal of the Linnean Society* **133:** 381–461.

**Soltis DE, Soltis PS, Nickrent DL, Johnson LA, Hahn WJ, Hoot SB, Sweere JA, Kuzoff RK, Kron KA, Chase MW, Swensen SM, Zimmer EA, Chaw SM, Gillespie LJ, Kress WJ, Sytsma KJ. 1997.** Angiosperm phylogeny inferred from 18S ribosomal DNA sequences. *Annals of the Missouri Botanical Garden* **84:** 1–49.

**Soltis PS, Soltis DE, Zanis MJ, Kim S. 2000b.** Basal lineages of angiosperms: Relationships and implications for floral evolution. *International Journal of Plant Sciences* **161** (6, Suppl.): S97–S107.

**Soltis, DE, Soltis, PS. 1997.** Phylogenetic relationships in Saxifragaceae *sensu lato*: a comparison of topologies based on 18S rDNA and *rbcL* sequences. *American Journal of Botany* **84:** 504–522.

**Sosa V, Chase MW. 2003** Phylogenetics of Crossosomataceae based on *rbcL* DNA sequence data. *Systematic Botany* **27**, in press.

**Stevens, PF. 2001**. Angiosperm phylogeny website. http://www.mobot.org./MOBOT/research/APweb/.

**Sytsma KJ, Morawetz J, Pires JC, Nepokroeff M, Conti E, Zjhra M, Hall JC, Chase MW. 2002.** Urticalean rosids: circumscription, rosid ancestry, and phylogenetics based on *rbcL*, *trnLF*, and *ndhF* sequences. *American Journal of Botany* **89:** 1531–1546.

**Takhtajan AL. 1997.** *Diversity and classification of flowering plants*. New York: Columbia University Press.

**Thorne RF. 1992.** Classification and geography of the flowering plants. *Botanical Review* **58:** 225–348.

**Thorne RF. 2001.** The classification and geography of flowering plants: dicotyledons of the class Angiospermae (subclasses Magnoliidae, Ranunculidae, Caryophyllidae, Dilleniidae, Rosidae, Asteridae, and Lamiidae). *Botanical Review* **66:** 441–647.

**Ueda K, Kosuge H, Tobe H. 1997.** A molecular phylogeny of Celtidaceae and Ulmaceae (Urticales) based on *rbcL* nucleotide sequences. *Journal of Plant Research* **110:** 171–178.

**Wiegrefe SJ, Sytsma KJ, Guries RP. 1998.** The Ulmaceae, one family or two? Evidence from chloroplast DNA restriction site mapping. *Plant Systematics and Evolution* **210:** 249–270.

**Wilson KL, Morrison DA. 2000.** Systematics and evolution of monocots. *Proceedings of the 2nd International Monocot Symposium.* Melbourne: CSIRO.

**Wu C-Y, Tang Y-C, Chen Z-D, Li D-Z. 2002.** Synopsis of a new 'polyphyletic-polychronic-polytopic' system of the angiosperms. *Acata Phytotaxonoica Sinica* **40:** 289–322.

**Wurdack KJ, Horn JW. 2001.** A reevaluation of the affinities of the Tepuianthaceae: molecular and morphological evidence for placement in the Malvales. In: *Botany 2001: plants and people*, Abstracts. Columbus, Ohio: Botanical Society of America, 151.

**Xiang Q-Y, Moody M, Soltis DE, Fan CZ, Soltis PS. 2002.** Relationships within Cornales and circumscription of Cornaceae – *matK* and *rbcL* sequence data and effects of outgroups and long branches. *Molecular Phylogenetics and Evolution* **24:** 35–47.

**Zanis MJ, Soltis DE, Soltis PS, Qiu Y-L, Mathews S, Donoghue MJ. 2002.** The root of the angiosperms revisited. *Proceedings of the National Academy of Sciences (USA)* **99:** 6848–6853.

**Zanis MJ, Soltis DE, Soltis PS, Qiu Y-L, Zimmer EA. 2003.** Phylogenetic analyses and perianth evolution in basal angiosperms. *Annals of the Missouri Botanical Garden* in press.

## 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.
Ruppiaceae 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

Dasypogonaceae Dumort. (1829)

Arecales Bromhead (1840)
Arecaceae 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.
Physenaceae Takht. (1985)
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 Valeton (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.]
[+Tetracarpaeaceae 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.
Datiscaceae 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.
*Ixonanthaceae 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)]
[+Tetradiclidaceae (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.Ståhl & Källersjö (2000)
Marcgraviaceae Juss. ex. DC. (1816), nom. cons.
§ Myrsinaceae R.Br. (1810), nom. cons.
Pentaphylacaceae 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)
Griseliniaceae 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.
*Hoplestigma* Pierre [Hoplestigmataceae 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 & Doweld (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
*Dasypogonales* 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
Elaeocarpales 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
Erythropalales 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
Flacourtiales 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)
Gyrocarpales 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 & Shevyryova (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
Hydnorales 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*
Menispermales 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

Philydrales 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)
Quercales 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)
Rousseales 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
Stylidiales Takht. ex. Reveal (1992) = Asterales
Styracales Bisch. (1839) = Ericales
Surianales Doweld (2001) = Fabales
Taccales 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) = Austrobaileyales
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
Vincales 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
Ximeniales Tiegh. (1899) = Santalales
Xyridales Lindl. (1846) = Poales
**Zingiberales** Griseb. (1854)
Zosterales 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) = Rousseaceae
**Acanthaceae** Juss. (1789), nom. cons.
Acanthochlamydaceae 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
Aegiceratacеae 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

Aristoteliaceae 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.
Averrhoaceae 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. = Malvaceae
**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)
Canacomyricaceae 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) = Rousseaceae
Cartonemataceae 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) = Urticacaeae
**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.
**Ctenolophonaceae** (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.
**Dasypogonaceae** Dumort. (1829)
**Datiscaceae** 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 Columelliacae
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** Chrtek, Slavíková & Studnicka (1989)
Duabangaceae Takht. (1986) = Lythraceae
Duckeodendraceae Kuhlm. (1950) = Solanaceae
Dysphaniaceae (Pax) Pax (1927), nom. cons. = Amaranthaceae
**Ebenaceae** Gürke (1891), nom. cons.
**Ecdeiocoleaceae** 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.
Ellisiophyllaceae Honda (1930) = Plantaginaceae
**Emblingiaceae** Airy Shaw (1964)
Emottaceae Tiegh. (1899) = Icacinaceae
Empetraceae Bercht. & J.Presl (1820), nom. cons. = Ericaceae
Engelhardtiaceae 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
Erythropalaceae Pilg. & K.Krause (1914), nom. cons. = Olacaceae
**Erythroxylaceae** 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
**Griseliniaceae** 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
Heliamphoraceae 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
*Hoplestigmataceae* 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
**Icacinaceae** (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)
**Koeberliniaceae** 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
Lilaeaceae 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) = Erythroxylaceae
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) = Arecaceae
**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** Valeton (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
**Paeoniaceae** Raf. (1815), nom. cons.
Paivaeusaceae 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
**Penaeaceae** 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** Kuhlm. (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) = Hemerocallidaceae, optional synonym of Xanthorrhoeaceae
**Phrymaceae** Schauer (1847), nom. cons.
**Phyllanthaceae** Martynov (1820)
**Phyllonomaceae** Small (1905)
**Physenaceae** 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) = Escalloniaceae
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 Erythroxylaceae
Rhodoleiaceae Nakai (1943) = Hamamelidaceae
**Rhoipteleaceae** Hand.-Mazz. (1932), nom. cons., optional synonym of Juglandaceae
Rhopalocarpaceae Hemsl. ex. Takht. (1987) = Sphaerosepalaceae
**Rhynchocalycaceae** 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
**Sauruaceae** 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
Scytopetalaceae 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 Pentaphylacaceae
**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
Styloceratacеae (Pax) Takht. ex. Reveal & Hoogland (1990) = Buxaceae
**Styracaceae** DC. & Spreng. (1821), nom. cons.
**Surianaceae** Arn. (1834), nom. cons.
Symphorematacеae (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 & Steyerm. (1981) = Thymelaeaceae
**Ternstroemiaceae** Mirb. ex. DC. (1816), optional synonym of Pentaphylacaceae
**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
Thalictraceae 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)
**Torricelliaceae** 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) = Dipsaceaceae, 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.
Viticaceae 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.