

Research Article

A community-derived classification for extant lycophytes and ferns

The Pteridophyte Phylogeny Group

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Abstract Phylogeny has long informed pteridophyte classification. As our ability to infer evolutionary trees has improved, classifications aimed at recognizing natural groups have become increasingly predictive and stable. Here, we provide a modern, comprehensive classification for lycophytes and ferns, down to the genus level, utilizing a community-based approach. We use monophyly as the primary criterion for the recognition of taxa, but also aim to preserve existing taxa and circumscriptions that are both widely accepted and consistent with our understanding of pteridophyte phylogeny. In total, this classification treats an estimated 11 916 species in 337 genera, 51 families, 14 orders, and two classes. This classification is not intended as the final word on lycophyte and fern taxonomy, but rather a summary statement of current hypotheses, derived from the best available data and shaped by those most familiar with the plants in question. We hope that it will serve as a resource for those wanting references to the recent literature on pteridophyte phylogeny and classification, a framework for guiding future investigations, and a stimulus to further discourse.

Key words: classification, ferns, lycophytes, monophyly, phylogeny, pteridophytes.

Free-sporing vascular plants comprise two distinct evolutionary lineages—lycophytes and ferns (e.g., Kenrick & Crane, 1997; Pryer et al., 2001)—that share a unique life cycle with independent gametophyte and sporophyte phases (e.g., Haufler et al., 2016). Classifications of these plants—often referred to collectively as pteridophytes despite their phylogenetic separation—have long been grounded in evolutionary principles and have reflected perceived evolutionary trends (e.g., Copeland, 1947; Pichi Sermolli, 1973, 1977b; Kramer & Green, 1990; Smith, 1995; Smith et al., 2006b; Christenhusz & Chase, 2014). However, these classifications were often conflicting, in large part due to a paucity of information concerning pteridophyte relationships and a lack of consensus regarding patterns of morphological evolution. The increased availability of molecular data and advances in phylogenetic methods have revolutionized our understanding of lycophyte and fern relationships. Today, as a consensus emerges concerning the evolutionary history of these lineages, classifications aimed at recognizing their natural groups are becoming increasingly “predictive” (Stuessy, 2009) and, we hope, stable.

The ordinal and familial scheme by Smith et al. (2006b) was the first higher-level pteridophyte classification published in the molecular era. Although this work focused exclusively on ferns, these plants—also referred to as “monilophytes” in some publications (e.g., Pryer et al., 2004; Smith et al., 2006b; Schneider et al., 2009; here we simply use “ferns”)—account for nearly 90% of extant pteridophyte diversity. Founded on the principle of monophyly, while also recognizing the importance of maintaining well-established names and circumscriptions, the Smith et al. (2006b) classification established a new standard in fern taxonomy. Over the past decade, many important advances have been made in our understanding of relationships, some of which are reflected in subsequent higher-level schemes (e.g., Christenhusz et al., 2011; Rothfels et al., 2012b). A recent scheme by Christenhusz & Chase (2014) was also consistent with an understanding of fern phylogeny but represented a considerable departure in terms of stability and has not been widely adopted.

Here, we provide a modern, comprehensive classification for lycophytes and ferns, following the main tenets of the Smith et al. (2006b) work but utilizing a democratic community-based approach. To accomplish this goal, we have established the Pteridophyte Phylogeny Group (PPG), based loosely on the model employed for flowering plant classification (APG, 1998; APG II, 2003; APG III, 2009; APG IV, 2016). Below, we outline our general philosophy and approach, summarize our outcomes, and present a consensus classification for all pteridophytes, from the rank of class to that of genus.

Philosophy

Biological classifications are fundamentally tools for communication about biodiversity (e.g., Stuessy, 2009). The stability of names is thus of great importance, and it is critical to consider existing classifications when determining taxa worthy of recognition and the ranks at which to treat them. A focus on natural groups is similarly important, as it results in classifications that reflect evolutionary history (Schmidt-Lebuhn,

2011) and ultimately lead to greater stability. Although we acknowledge the validity of some arguments presented in favor of maintaining paraphyletic taxa (see, e.g., Hörandl & Stuessy, 2010), we ultimately reject this practice and aim to recognize only monophyletic lineages at the genus level and above. There are many reasons why monophyly might not be expected at the species level. This is especially true when polyploid speciation is rampant and, among pteridophytes, it has been estimated that nearly a third of all speciation events are correlated with an increase in ploidy (Wagner & Wagner, 1980; Wood et al., 2009). We acknowledge the difficulties inherent in translating evolutionary tree structures into hierarchical rank-based classifications. However, because such classifications have been implemented for centuries and continue to be used extensively, we do not subscribe to the alternative approach (disruptive, from the standpoint of stability) recommended in the PhyloCode (Cantino & de Queiroz, 2000). Due to the many challenges of incorporating fossil taxa, this first installment of the PPG classification focuses exclusively on extant lycophytes and ferns. Although some fossils could easily be accommodated, the phylogenetic affinities of most extinct plants are rather unclear. Many fossil taxa represent distinct evolutionary lineages and their inclusion in the PPG I classification would not only require revised circumscriptions, but almost certainly the recognition of new families, orders, and even classes.

In general, the PPG I classification seeks to preserve existing taxa and circumscriptions that are widely accepted and consistent with our understanding of lycophyte and fern phylogeny. Although monophyly is our primary criterion for the recognition of taxa (Backlund & Bremer, 1998), we adopt a conservative approach that minimizes name changes in cases where data are insufficient to circumscribe what we judge to be stable monophyletic groups; this is with the understanding that some currently accepted taxa may ultimately be revealed to be non-monophyletic. In making decisions, we secondarily weigh morphological diagnosability and homogeneity, and hierarchical equivalency in terms of both age and diversity.

This classification is not meant to be the final word on pteridophyte taxonomy, but rather a summary statement of current hypotheses, derived from the best available data and shaped by those most familiar with the plants in question. We hope that it will serve as a resource for those wanting references to recent literature on lycophyte and fern phylogeny, a framework for guiding future investigations, and a stimulus to further discourse. Although we welcome its use by systematists, other scientists, herbaria, governmental agencies, and others with a professional or non-professional interest in plants, we recognize that a single system may not serve all users and we are strongly opposed to this classification, or any other classification, being imposed on investigators, authors, editors, or reviewers. Disagreements exist even among the contributors to this PPG I classification, as noted below.

Approach

Establishment of the Pteridophyte Phylogeny Group (PPG) began through promotion of the concept at international conferences (including the 2015 *Next Generation Pteridology*

conference) and posts to society websites and e-mail lists, including those of the American Fern Society (AFS) and the International Association of Pteridologists (IAP). After a series of informal discussions among the early respondents, an electronic mailing list was established to enhance community engagement and facilitate discussion. As the project gained momentum, the community of collaborators expanded; currently, the PPG is a global community of 94 pteridologists.

The classification presented herein is community-derived, and the taxa recognized have the support of a majority (or a plurality, in select instances) of the contributors. Decisions were made using an inclusive, transparent, and straightforward approach that typically involved: (1) an initial conversation among members of a focused subcommittee consisting of experts willing to contribute to the discussion; (2) formulation of a draft proposal by the subcommittee; (3) discussion of the draft proposal among all members of the PPG community; (4) production of a revised proposal; and (5) approval of the revised proposal through a formal vote or simple acclamation.

For the highest-level taxa, a dialogue was initiated across the whole of the PPG. After discussion of the advantages and disadvantages of various options, one system (recognizing classes and subclasses) emerged as the clear preference. A vote was taken to ensure there was majority support. A similar approach was used later to reach decisions concerning the informal names to be applied to major clades.

To determine the orders, suborders, and families to be recognized, an organizing subcommittee developed the initial proposal. This was then shared electronically with all contributors, along with a survey developed to gauge acceptability and highlight areas needing further discussion. With the results of this survey in hand, discussion proceeded among all contributors. Following this dialogue, a revised poll was constructed that presented alternatives in areas of disagreement. All orders, suborders, and families recognized herein ultimately received majority support, ranging from just over 50% to unanimous approval.

After settling on a list of higher-level taxa to be recognized, members of the PPG were asked (via an online survey) whether they felt that the generic classification within particular clades was in need of attention. In cases where a unanimous consensus existed, the organizers implemented the prevailing generic classification. If a clade were identified as needing attention, a subcommittee was established, consisting of contributors with experience in the particular lineage.

Clade-focused subcommittees, under the leadership of subcommittee heads (selected by subcommittee members), discussed alternative generic classifications, reached a consensus, and presented a proposal for approval by the whole of the PPG. Any concerns were mediated via open dialogue through the PPG e-mail list.

After arriving at a system of classes, subclasses, orders, suborders, families, and genera to be recognized, subcommittee heads (with the assistance of other contributors) were then tasked with compiling the following pertinent information for each included taxon: (1) the author of the name and the protologue reference; (2) for genera, the type species and basionym, along with the lectotypification reference (where applicable); (3) a brief statement outlining the circumscription

of the taxon; (4) a brief statement concerning its monophyly; (5) a list of any included taxa (i.e., synonyms); (6) the number of species attributed to the taxon; and (7) any additional comments.

The classification presented herein reflects our current understanding of lycophyte and fern phylogeny (see references below). But, ultimately, circumscriptions adopted herein are all subject to reconsideration, given new evidence. Future research will enable greater insight into pteridophyte evolution and our classification will need to accommodate more robust hypotheses. To this end, we envision formal updates to the PPG I classification, with interim improvements tracked on a PPG website. Such adjustments (most likely a series of small incremental changes) will be carried out via the process outlined above, with initial proposals generated by smaller groups that are subsequently discussed and approved or rejected by the broader PPG.

Outcomes

We recognize two pteridophyte classes: Lycopodiopsida (lycophytes) and Polypodiopsida (ferns). These are distinct lineages within the tracheophyte tree of life, with ferns resolved as more closely related to seed plants than to lycophytes (Fig. 1; Kenrick & Crane, 1997; Pryer et al., 2001). Within Lycopodiopsida, we further recognize three orders (Lycopodiales, Isoëtiales, and Selaginellales). Order Lycopodiales includes one family and 16 genera, whereas orders Isoëtiales and Selaginellales each contain a single monogeneric family.

Within Polypodiopsida, we recognize four subclasses: Equisetidae (horsetails); Ophioglossidae; Marattiidae; and Polypodiidae (leptosporangiates). Extant Equisetidae includes a single order, a single small family, and a single genus (*Equisetum* L.). Subclass Ophioglossidae encompasses two orders, each with a single family, and a total of 12 genera. Marattiidae includes just one order, one family, and six genera.

Subclass Polypodiidae comprises the vast majority of extant fern diversity (Fig. 1). Here, we recognize seven orders (Osmundales, Hymenophyllales, Gleicheniales, Schizaeales, Salviniiales, Cyatheales, and Polypodiales), with the Polypodiales subsequently divided into six suborders (Saccolomatineae, Lindsaeineae, Pteridineae, Dennstaedtiineae, Aspleniineae, and Polypodiineae). Within Osmundales, we recognize a single small family with six genera. Order Hymenophyllales also includes just one family, but it is considerably larger and encompasses nine genera. Gleicheniales and Schizaeales each constitute three relatively small families, with ten and four total genera, respectively. The order Salviniiales comprises two families and five genera, and the order Cyatheales encompasses seven small families, with a total of ten genera, plus the larger Cyatheaceae with three genera.

Within the Polypodiales, suborder Saccolomatineae includes a single small monogeneric family (Saccolomataceae). Suborder Lindsaeineae comprises two monogeneric families plus the larger Lindsaeaceae with seven genera. We recognize a single large family within Pteridineae, which includes 52 genera. Suborder Dennstaedtiineae also includes a single family, with ten genera. The remaining two suborders,

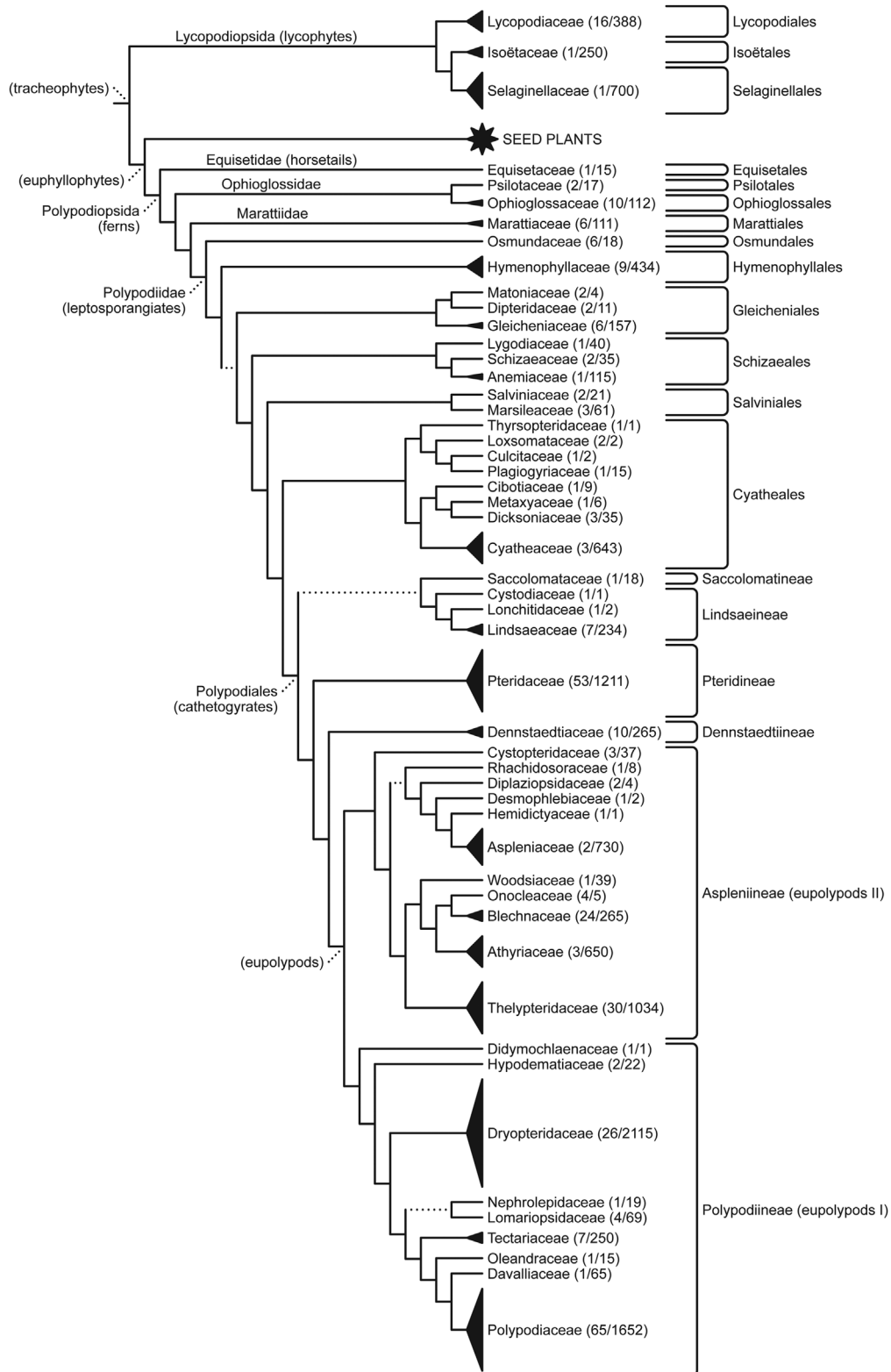


Fig. 1. Summary tracheophyte phylogeny, depicting relationships among lycophyte and fern families recognized in this PPG I classification. Composite topology is derived from the results of numerous phylogenetic studies (e.g., Pryer et al., 2001, 2004; Korall et al., 2006; Schuettpelz & Pryer, 2007; Rai & Graham, 2010; Lehtonen, 2011; Rothfels et al., 2012a, 2015; Knie et al., 2015; Zhang & Zhang, 2015). Most nodes have received consistently strong support; dotted lines indicate areas of considerable uncertainty. For each family, we note the total number of genera recognized in PPG I and the sum of species estimates for these genera (terminal clade height is roughly proportional to diversity for families with more than 100 species). Where applicable, informal clade names are provided in parentheses.

Aspleniineae (eupolypods II) and Polypodiineae (eupolypods I), are exceedingly diverse, together accounting for well over half of extant pteridophyte diversity. Suborder Aspleniineae encompasses four large families, with a total of 59 genera, and seven smaller families, with 14 genera and fewer than 100 species. Finally, suborder Polypodiineae comprises three large families, with a total of 98 genera, and six small families, with ten genera.

In all, this PPG I classification treats an estimated 11 916 species in 337 genera, 51 families, 14 orders, and 2 classes. In some cases, additional divisions are made to recognize subclasses and suborders (as noted above), as well as subfamilies (see classification below). Classes, subclasses, orders, suborders, and families, are organized phylogenetically, generally with increasing species diversity (Fig. 1). Within each family, subfamilies, if recognized, are organized by increasing species diversity; genera are then organized alphabetically within each family or subfamily, as applicable.

Discussion

As noted above, the PPG I classification presented here reflects our current, collective understanding of lycophyte and fern phylogeny. It takes into consideration all studies examining the relationships of these plants published through mid-2016. The PPG I classification also aims to maintain, where possible, continuity in the naming and circumscription of families and genera as recognized by most pteridologists prior to the molecular revolution (e.g., Kramer & Green, 1990). In this respect, this study continues the approach employed in most recent classifications (e.g., Smith et al., 2006b; Christenhusz et al., 2011; Rothfels et al., 2012b) but differs from classifications that favored a reduction in the number of taxa recognized (e.g., Christenhusz & Chase, 2014).

At the highest taxonomic ranks, the PPG I classification is wholly compatible with a scheme recently proposed for all of life. Ruggiero et al. (2015) treated lycophytes and ferns as distinct subphyla (Lycopodiophytina and Polypodiophytina), each with a single class (Lycopodiopsida and Polypodiopsida). The present classification recognizes the two classes but does not make recommendations above this rank. Further, the PPG I classification agrees with Ruggiero et al. (2015) in recognizing four subclasses within ferns (Equisetidae, Ophioglossidae, Marattiidae, and Polypodiidae). This approach differs from that of Smith et al. (2006b), in which the four major lineages of ferns were recognized as classes, as well as from that of Chase & Reveal (2009), where embryophytes were treated collectively as a single class, but is consistent with the scheme used in the Tree of Life Web Project (Pryer et al., 2009). Although two of these higher-level classifications (Smith et al., 2006b; Chase & Reveal, 2009) do not provide a formal scientific name for ferns, they do both clearly unite the four fern lineages that we recognize as subclasses (Equisetidae, Ophioglossidae, Marattiidae, and Polypodiidae). We do not consider our decision to include them together in a single class to be controversial, as the corresponding clade (i.e., ferns) has been resolved consistently in analyses of molecular data (e.g., Pryer et al., 2001, 2004; Qiu et al., 2007; Schneider et al., 2009; Ruhfel et al., 2014; Wickett et al., 2014; Rothfels et al., 2015) and even

most analyses of morphological data (Kenrick & Crane, 1997; Schneider et al., 2009).

Pteridophyte classification has been exceedingly stable at the ordinal level over the past decade. Smith et al. (2006b) recognized 11 orders within ferns, one for each of four major eusporangiate lineages and seven within leptosporangiates. Christenhusz et al. (2011) and Christenhusz & Chase (2014) adopted these same 11 fern orders plus three orders for lycophytes (not treated by Smith et al., 2006b). At the ordinal level, the PPG I classification does not differ at all from the earlier classifications, but we do introduce a new informal name for one large order. Polypodiales, which accounts for more than 80% of fern diversity, has previously been referred to as “polypods” (Schneider et al., 2004b; Smith et al., 2006b). However, “polypods” has also been used to refer to the members of the family Polypodiaceae that do not belong to the distinct (and diverse) “grammitid” clade (Smith, 1995; Sundue et al., 2014). Here, we aim to avoid confusion by using a more descriptive informal name for the more inclusive clade (i.e., that equivalent to Polypodiales). We refer to this clade as “cathetogyrates” (a term first used by Bernhardt, 1806), in reference to the unique sporangium—with a vertical ring of annular cells—that characterizes this lineage. Within the Polypodiales, we recognize six suborders, providing formal names for “eupolypods I”, “eupolypods II”, and other clades. As this rank has not typically been utilized within ferns, five of these suborders are new.

Outside of the Polypodiales, the 25 families recognized in this PPG I classification are identical to those in Smith et al. (2006b, for ferns) and Christenhusz et al. (2011). Within the Polypodiales, we recognize 26 families, and there are some stark differences relative to Smith et al. (2006b) and Christenhusz et al. (2011). The Lindsaeaceae, Woodsiaceae, Dryopteridaceae, and Lomariopsidaceae sensu Smith et al. (2006b) have all been found to be paraphyletic in more recent phylogenetic analyses and are here divided into three, seven, three, and two families, respectively. The present PPG I classification additionally recognizes subfamilies within some of the larger families of lycophytes and ferns, especially those with a history of subdivision. This has the advantage of providing formal names for some clades (e.g., vittarioids and grammitids) that were long recognized as distinct families but were later subsumed into other families (within which they appear to be nested).

Unlike recent comprehensive treatments of lycophytes and ferns (e.g., Smith et al., 2006b; Christenhusz et al., 2011), the PPG I classification extends to the genus level. We formally recognize 337 pteridophyte genera, representing a 50% increase over the 223 genera included in the pre-molecular system of Kramer & Green (1990). Although this difference is dramatic, the constituent changes have, in fact, accumulated incrementally over the past quarter-century. When existing generic concepts are found to be in conflict with the results of molecular phylogenetic analyses, there are, using monophyly as a criterion, two paths to resolution: disintegration (i.e., the “splitting” of a non-monophyletic genus into multiple monophyletic genera to maintain a nested genus); or integration (i.e., the “lumping” of a nested genus with the genus it renders non-monophyletic). Both approaches have an impact on stability, as the former results in new descriptions (or reinstatements) and the latter in synonymizations.

Looking again at the marked increase in the number of pteridophyte genera, it is clear that disintegration has typically been favored and some lineages have experienced greater change than others. Instead of recognizing just four genera within the Lycopodiaceae (sensu Øllgaard, 1990), the PPG I classification takes the now-common approach of subdividing the family into 16 genera (Holub, 1964, 1975, 1983, 1985, 1991; Wagner & Beitel, 1992; Haines, 2003; Øllgaard, 2012a, 2012b, 2015; Field & Bostock, 2013; Øllgaard & Windisch, 2014; Field et al., 2016). Likewise, we mostly follow Almeida et al. (2016) in our treatment of 30 genera in Thelypteridaceae (versus five in Smith, 1990) and we also incorporate considerable subdivision recently proposed for the Hymenophyllaceae (sensu Ebihara et al., 2006), grammitids (sensu Sundue et al., 2014), and Blechnaceae (sensu Gasper et al., 2016b). In the majority of these studies, the authors were largely able to re-establish preexisting (narrower) concepts that were both introduced and discarded prior to the molecular revolution.

Of course, more inclusive generic concepts have been favored in some cases. We continue to recognize a broad *Asplenium* L. (segregating only *Hymenasplenium* Hayata, sensu Schneider et al., 2004a). And, despite recent subdivisions, the present PPG I classification ultimately recognizes an inclusive *Davallia* Sm. (sensu Tsutsumi et al., 2016) and *Woodsia* R.Br. (sensu Shao et al., 2015). Furthermore, the genus *Dryopteris* Adans. is greatly expanded here, relative to its definition at the end of the 20th century (Kramer et al., 1990), to include segregates such as *Acrophorus* C.Presl, *Dryopsis* Holttum & P.J.Edwards, *Nothoperanema* (Tagawa) Ching, and *Peranema* D.Don (Zhang & Zhang, 2012; Zhang et al., 2012). Notably, resolution via integration, and the resulting recognition of larger genera, appears to be much more common in flowering plants (Humphreys & Linder, 2009).

The PPG I classification presented below does not provide species lists; however, we do present estimates of species number for each genus. Interestingly, our genus-based totals (1338 lycophyte species and 10 578 fern species) are remarkably similar to the family-based sums provided by Christenhusz & Chase (2014; 1300 lycophytes and 10 535 ferns).

Classification

Class **Lycopodiopsida** Bartl., Ord. Nat. Pl.: 14, 19. 1830. Circumscription sensu Ruggiero et al. (2015). Monophyletic (Pryer et al., 2001; Kenrick & Crane, 1997; Rai & Graham, 2010; Wickett et al., 2014). Three orders, three families, 18 genera, and an estimated 1338 species.

A. Order **Lycopodiales** DC. ex Bercht. & J.Presl, Pfl. Rostlin: 272. 1820. Circumscription equivalent to family Lycopodiaceae in this classification. Monophyletic (Wikström & Kenrick, 1997, 2000, 2001; Ji et al., 2008; Field et al., 2016). One family, 16 genera, and an estimated 388 species.

1. Family **Lycopodiaceae** P.Beauv. in Mirb., Hist. Nat. Veg. 4: 293. 1802. Circumscription sensu Øllgaard (2015). Monophyletic (Wikström & Kenrick, 1997, 2000, 2001;

Ji et al., 2008; Field et al., 2016). Three subfamilies, 16 genera, and an estimated 388 species.

Subfamily **Lycopodielloideae** W.H.Wagner & Beitel ex B.Øllg., Nordic J. Bot. 33(2): 195. 2015. Circumscription sensu Øllgaard (2015). Monophyletic (Field et al., 2016). Included in Lycopodioideae in Field et al. (2016). Four genera and an estimated 54 species.

Lateristachys Holub, Folia Geobot. Phytotax. 18: 440. 1983. Type: *Lateristachys lateralis* (R.Br.) Holub (≡ *Lycopodium laterale* R.Br.). Circumscription sensu Holub (1983). Monophyletic (Field et al., 2016). Four species.

Lycopodiella Holub, Preslia 36: 20, 22. 1964. Type: *Lycopodiella inundata* (L.) Holub (≡ *Lycopodium inundatum* L.). Circumscription sensu Øllgaard & Windisch (2014). Monophyletic (Field et al., 2016). 15 species.

Palhinhaea Franco & Vasc., Bol. Soc. Brot., ser. 2, 41: 24. 1967. Type: *Palhinhaea cernua* (L.) Vasc. & Franco (≡ *Lycopodium cernuum* L.). Circumscription sensu Holub (1985, 1991), Øllgaard (2012b), and Øllgaard & Windisch (2014). Monophyletic (Field et al., 2016). *Palhinhaea* Franco & Vasc. is proposed to be conserved against *Lepidotis* P. Beauv. (Greuter & Troia, 2014). 25 species.

Pseudolycopodiella Holub, Folia Geobot. Phytotax. 18: 441. 1983. Type: *Pseudolycopodiella caroliniana* (L.) Holub (≡ *Lycopodium carolinianum* L.). Circumscription sensu Holub (1983). Monophyletic (Field et al., 2016). 10 species.

Subfamily **Lycopodioideae** W.H.Wagner & Beitel ex B. Øllg., Nordic J. Bot. 33(2): 195. 2015. Circumscription sensu Øllgaard (2015). Monophyletic (Field et al., 2016). Including Lycopodielloideae in Field et al. (2016). Nine genera and an estimated 58 species.

Austrolycopodium Holub, Folia Geobot. Phytotax. 26(1): 90. 1991. Type: *Austrolycopodium magellanicum* (P.Beauv.) Holub (≡ *Lepidotis magellanica* P. Beauv.). Circumscription sensu Holub (1991). Monophyletic (Field et al., 2016). Eight species.

Dendrolycopodium A.Haines, Fam. Huperziac. Lycopodiaceae. New England: 84. 2003. Type: *Dendrolycopodium obscurum* (L.) A.Haines (≡ *Lycopodium obscurum* L.). Circumscription sensu Haines (2003). Monophyletic (Field et al., 2016). Four species.

Diphasiastrum Holub, Preslia 47(2): 104. 1975. Type: *Diphasiastrum complanatum* (L.) Holub (≡ *Lycopodium complanatum* L.). Circumscription sensu Holub (1975, 1985). Monophyletic (Field et al., 2016). 20 species.

Diphasium C.Presl ex Rothm., Repert. Spec. Nov. Regni Veg. 54: 64. 1944. Type: *Diphasium jussiaei* (Desv.) Rothm. (≡ *Lycopodium jussiaei* Desv.). Circumscription sensu Holub (1985). Monophyletic (Field et al., 2016). Five species.

Lycopodiastrum Holub ex R.D.Dixit, J. Bombay Nat. Hist. Soc. 77(3): 540. 1981. Type: *Lycopodiastrum casuarinoides* (Spring) Holub ex R.D.Dixit (≡ *Lycopodium casuarinoides* Spring). Circumscription sensu Holub (1983) and Zhang & Iwatsuki (2013). Monotypic (Field et al., 2016).

Lycopodium L., Sp. Pl. 2: 1100. 1753. Lectotype (designated by W.J.Rob., Bull. Torrey Bot. Club 41: 51. 1914): *Lycopodium clavatum* L. Circumscription sensu Haines (2003). Monophyletic (Field et al., 2016). 15 species.

Pseudodiphasium Holub, Folia Geobot. Phytotax. 18: 440. 1983. Type: *Pseudodiphasium volubile* (G. Forst.) Holub (≡ *Lycopodium volubile* G.Forst.). Circumscription sensu Holub (1983). Monotypic (Field et al., 2016).

Pseudolycopodium Holub, Folia Geobot. Phytotax. 18: 441. 1983. Type: *Pseudolycopodium densum* (Rothm.) Holub (≡ *Lepidotis densa* Rothm.). Circumscription sensu Holub (1983). Monotypic (Field et al., 2016).

Spinulum A.Haines, Fam. Huperziac. Lycopodiac. New England: 85. 2003. Type: *Spinulum annotinum* (L.) A.Haines (≡ *Lycopodium annotinum* L.). Circumscription sensu Haines (2003). Presumably monophyletic; only one species sampled to date (Field et al., 2016). Three species.

Subfamily **Huperzioideae** W.H.Wagner & Beitel ex B. Øllg., Nordic J. Bot. 33(2): 195. 2015. Circumscription sensu Øllgaard (2015) and Field et al. (2016). Monophyletic (Field et al., 2016). Three genera and an estimated 276 species.

Huperzia Bernh., J. Bot. (Schrader) 1800(2): 126. 1801. Lectotype (designated by Rothm., Repert. Spec. Nov. Regni Veg. 54: 59. 1944): *Huperzia selago* (L.) Bernh. ex Schrank & Mart. (≡ *Lycopodium selago* L.). Circumscription sensu Wagner & Beitel (1992), Zhang & Kung (1998, 2000a), Zhang & Iwatsuki (2013), Øllgaard (2015), and Field et al. (2016). Monophyletic (Field et al., 2016). 25 species.

Phlegmariurus Holub, Preslia 36(1): 17, 21. 1964. Type: *Phlegmariurus phlegmaria* (L.) T.Sen & U.Sen (≡ *Lycopodium phlegmaria* L.). Circumscription sensu Wagner & Beitel (1992), Zhang & Kung (1999, 2000b), Øllgaard (2012a, 2012b, 2015), Field & Bostock (2013), Zhang & Iwatsuki (2013), Øllgaard & Windisch (2014), and Field et al. (2016). Monophyletic (Field et al., 2016). About 250 species.

Phylloglossum Kunze, Bot. Zeitung (Berlin) 1: 721. 1843. Type: *Phylloglossum drummondii* Kunze. Circumscription sensu Field et al. (2016). Monotypic (Field et al., 2016).

B. Order **Isoëtales** Prantl, Lehrb. Bot.: 116, 125. 1874. Circumscription equivalent to family Isoëtaceae in this classification. Monophyletic (Rydin & Wikström, 2002; Hoot et al., 2006; Larsén & Rydin, 2016). One family, one genus, and about 250 species.

2. Family **Isoëtaceae** Dumort., Anal. Fam. Pl.: 67. 1829. Circumscription sensu Jermy (1990a). Monophyletic (Rydin & Wikström, 2002; Hoot et al., 2006; Larsén & Rydin, 2016). One genus and about 250 species.

Isoëtes L., Sp. Pl. 2: 1100. 1753. Type: *Isoëtes lacustris* L. Circumscription sensu Jermy (1990a). Monophyletic (Larsén & Rydin, 2016). About 250 species.

C. Order **Selaginellales** Prantl, Lehrb. Bot.: 116, 124. 1874. Circumscription equivalent to family Selaginellaceae in this classification. Monophyletic (Korall et al., 1999; Korall & Kenrick, 2004; Zhou et al., 2015; Weststrand & Korall, 2016a). One family, one genus, and perhaps 700 species.

3. Family **Selaginellaceae** Willk., Anleit. Stud. Bot. 2: 163. 1854. Circumscription sensu Jermy (1990b). Monophyletic (Korall et al., 1999; Korall & Kenrick, 2004; Zhou et al., 2015; Weststrand & Korall, 2016a). One genus and perhaps 700 species.

Selaginella P.Beauv., Mag. Encycl. 9(5): 478. 1804. Type: *Selaginella selaginoides* (L.) P.Beauv. ex Schrank & Mart. (≡ *Lycopodium selaginoides* L.). Circumscription sensu Jermy (1990b). Monophyletic (Korall et al., 1999; Korall & Kenrick, 2004; Zhou et al., 2015; Weststrand & Korall, 2016a). Six (Zhou & Zhang, 2015) or seven (Weststrand & Korall, 2016b) subgenera can be recognized. Perhaps 700 species.

Class **Polypodiopsida** Cronquist, Takht. & W.Zimm., Taxon 15: 133. 1966. Circumscription sensu Pryer et al. (2009) and Ruggiero et al. (2015). Monophyletic (Pryer et al., 2001, 2004; Qiu et al., 2007; Schneider et al., 2009; Ruhfel et al., 2014; Wickett et al., 2014; Rothfels et al., 2015). Four subclasses, 11 orders, 48 families, 319 genera, and an estimated 10 578 species.

Subclass **Equisetidae** Warm., Osnov. Bot.: 221. 1883. Circumscription sensu Pryer et al. (2009) and Ruggiero et al. (2015). Subclass consists of one extant order, one family, one genus, and 15 species.

D. Order **Equisetales** DC. ex Bercht. & J.Presl, Pflur. Rostlin: 271. 1820. Circumscription sensu Smith et al. (2006b). Order consists of one extant family, one genus, and 15 species.

4. Family **Equisetaceae** Michx. ex DC., Essai Propr. Méd. Pl.: 49. 1804. Circumscription sensu Smith et al. (2006b). Family consists of one extant genus and 15 species.

Equisetum L., Sp. Pl. 2: 1061. 1753. Lectotype (designated by Hauke, Nova Hedwigia 30: 414. 1978): *Equisetum fluviatile* L. Circumscription sensu Hauke (1990). Monophyletic (Guillon, 2007). An isolated genus of closely related and recently diverged species (Des Marais et al., 2003). 15 species.

Subclass **Ophioglossidae** Klinge, Fl. Est.-Liv-Churland 1: 94. 1882. Circumscription sensu Ruggiero et al. (2015) and equivalent to Psilotidae in Pryer et al. (2009). Monophyletic (Pryer et al. 2001, 2004; Wickett et al., 2014; Rothfels et al., 2015). Two orders, two families, 12 genera, and an estimated 129 species.

E. Order **Psilotales** Prantl, Lehrb. Bot., ed. 5: 183. 1884. Circumscription sensu Smith et al. (2006b). Monophyletic (Pryer et al., 2004; Rothfels et al., 2015). One family, two genera, and an estimated 17 species.

5. Family **Psilotaceae** J.W.Griff. & Henfr., Microgr. Dict.: 540. 1855. Circumscription sensu Smith et al. (2006b). Monophyletic (Pryer et al., 2004). Two genera and an estimated 17 species.

Psilotum Sw., J. Bot. (Schrader) 1800(2): 8, 109. 1801. Lectotype (designated by Brongn., Dict. Class. Hist. Nat. 9: 558. 1826): *Psilotum triquetrum* Sw. Circumscription sensu Kramer (1990a). Only one species sampled to date, but assumed to be monophyletic. Two species.

Tmesipteris Bernh., J. Bot. (Schrader) 1800(2): 8, 131. 1801. Type: *Tmesipteris tannensis* (Spreng.) Bernh. (≡ *Lycopodium tannense* Spreng.). Circumscription sensu Kramer (1990a). Monophyletic (Perrie et al., 2010). About 15 species.

F. Order **Ophioglossales** Link, Hort. Berol. 2: 151.1833. Circumscription sensu Smith et al. (2006b). Monophyletic (Pryer et al., 2004; Rothfels et al., 2015). One family, ten genera, and an estimated 112 species.

6. Family **Ophioglossaceae** Martinov, Tekhno-Bot. Slovar: 438. 1820. Circumscription sensu Smith et al. (2006b). Monophyletic (Pryer et al., 2004; Rothfels et al., 2015). Four subfamilies, ten genera, and an estimated 112 species.

Subfamily **Helminthostachyoideae** C.Presl, Suppl. Tent. Pterid.: 58. 1845. Circumscription sensu Shinohara et al. (2013). Subfamily consists of a single monotypic genus.

Helminthostachys Kaulf., Enum. Filic.: 28. 1824. Type: *Helminthostachys zeylanica* (L.) Hook. (≡ *Osmunda zeylanica* L.). Circumscription sensu Wagner (1990). Includes: *Ophiala* Desv. Monotypic (Hauk et al., 2003; Shinohara et al., 2013).

Subfamily **Mankyuoideae** J.R.Grant & B.Dauphin, this classification (see below). Circumscription sensu Shinohara et al. (2013). Subfamily consists of a single monotypic genus.

Mankyua B.Y.Sun, M.H.Kim & C.H.Kim, Taxon 50 (4): 1020. 2002. Type: *Mankyua chejuensis* B.Y.Sun, M.H.Kim & C.H.Kim. Circumscription sensu Sun et al. (2009). Monotypic (Shinohara et al., 2013).

Subfamily **Ophioglossoideae** C.Presl, Suppl. Tent. Pterid.: 47. 1845. Circumscription sensu Hauk et al. (2003). Monophyletic (Hauk et al., 2003; Shinohara et al., 2013). Four genera and an estimated 47 species.

Cheiroglossa C.Presl, Suppl. Tent. Pterid.: 56. 1845. Type: *Cheiroglossa palmata* (L.) C.Presl (≡ *Ophioglossum palmatum* L.). Circumscription sensu Hauk et al. (2003). Monophyletic (Hauk et al., 2003; Shinohara et al., 2013). Two species.

Ophioderma (Blume) Endl., Gen. Pl.: 66. 1836. Type: *Ophioderma pendulum* (L.) C.Presl (≡ *Ophioglossum pendulum* L.). Circumscription sensu Hauk et al. (2003). Monophyletic (Hauk et al., 2003; Shinohara et al., 2013). Three species.

Ophioglossum L., Sp. Pl. 2: 1062. 1753. Lectotype (designated by J.Sm., Hist. Fil.: 369. 1875): *Ophioglossum vulgatum* L. Circumscription sensu Pichi Sermolli (1977b). Monophyletic (Hauk et al., 2003; Shinohara et al., 2013). 41 species.

Rhizoglossum C.Presl, Suppl. Tent. Pterid.: 47. 1845. Type: *Rhizoglossum bergianum* (Schltdl.) C.Presl (≡ *Ophioglossum bergianum* Schltdl.). Circumscription sensu Clausen (1938) and Pichi Sermolli (1977b). Monotypic.

Subfamily **Botrychioideae** C.Presl, Suppl. Tent. Pterid.: 42. 1845. Circumscription sensu Hauk et al. (2003). Monophyletic (Hauk et al., 2003; Shinohara et al., 2013). Four genera and an estimated 63 species.

Botrychium Sw., J. Bot. (Schrader) 1800(2): 110. 1801. Lectotype (designated by J.Sm., Hist. Fil.: 369. 1875): *Botrychium lunaria* (L.) Sw. (≡ *Osmunda lunaria* L.). Circumscription sensu Wagner (1990) and Dauphin et al. (2014). Monophyletic (Hauk et al., 2003). About 35 species.

Botrypus Michx., Fl. Bor.-Amer. (Michaux) 2: 274. 1803. Lectotype (designated by Pic.Serm., Webbia 26: 497. 1972): *Botrypus virginianus* (L.) Michx. (≡ *Osmunda virginiana* L.). Circumscription sensu Hauk et al. (2003). Includes: *Osmundopteris* (Milde) Small. Not monophyletic (Hauk et al., 2003; Shinohara et al., 2013). About two species.

Japanobotrychium Masam., Journ. Soc. Trop. Agric. Formosa 3: 246. 1931. Type: *Japanobotrychium arisanense* Masam. Monotypic (Shinohara et al., 2013).

Sceptridium Lyon, Bot. Gaz. 40(6): 457. 1905. Lectotype (designated by R.T.Clausen, Mem.

Torrey Bot. Club 19(2): 24. 1938): *Sceptridium obliquum* (Muhl. ex Willd.) Lyon (≡ *Botrychium obliquum* Muhl. ex Willd.). Circumscription sensu Hauk et al. (2003). Monophyletic (Hauk et al., 2003). About 25 species.

Subclass **Marattiidae** Klinge, Fl. Est.-Liv-Churland 1: 93. 1882. Circumscription sensu Christenhusz (2009) and Ruggiero et al. (2015). Monophyletic (Pryer et al., 2004). One order, one family, six genera, and an estimated 111 species.

G. Order **Marattiales** Link, Hort. Berol. 2: 148. 1833. Circumscription sensu Smith et al. (2006b). Monophyletic (Pryer et al., 2004). One family, six genera, and an estimated 111 species.

7. Family **Marattiaceae** Kaulf., Enum. Filic.: 31. 1824. Circumscription sensu Smith et al. (2006b). Monophyletic (Pryer et al., 2004). Six genera and an estimated 111 species.

Angiopteris Hoffm., Commentat. Soc. Regiae Sci. Gott. 12: 29. 1796. Type: *Angiopteris evecta* (G.Forst.) Hoffm. (≡ *Polypodium evectum* G.Forst.). Circumscription sensu Murdock (2008). Includes: *Archangiopteris* Christ & Giesenh.; *Clementea* Cav.; *Macroglossum* Copel.; *Protangiopteris* Hayata; *Protomarattia* Hayata; *Psilodochea* C.Presl. Monophyletic (Murdock, 2008). Perhaps 30 species.

Christensenia Maxon, Proc. Biol. Soc. Washington 18 (50): 239. 1905. Type: *Christensenia aesculifolia* (Blume) Maxon (≡ *Aspidium aesculifolium* Blume). Circumscription sensu Murdock (2008). Includes: *Kaulfussia* Blume.; *Macrostoma* Griff. Only one species sampled to date, but assumed to be monophyletic (Murdock, 2008). Two species.

Danaea Sm., Mem. Acad. Roy. Sci. (Turin) 5: 420, pl.9, f.11. 1793. Type: *Danaea nodosa* (L.) Sm. (≡ *Acrostichum nodosum* L.). Circumscription sensu Murdock (2008). Includes: *Heterodanaea* C.Presl. Monophyletic (Christenhusz et al., 2008; Murdock, 2008). Perhaps 50 species.

Eupodium J.Sm. in Hooker, Gen. Fil. (Hooker): t.118. 1842. Type: *Eupodium kaulfussii* (J.Sm.) J.Sm. (≡ *Marattia kaulfussii* J.Sm.). Circumscription sensu Murdock (2008). Monophyletic (Murdock, 2008). Two species.

Marattia Sw., Prodr. 8: 128. 1788. Type: *Marattia alata* Sw. Circumscription sensu Murdock (2008). Includes: *Gymnotheca* C.Presl; *Stibasia* C.Presl. Monophyletic (Murdock, 2008). Seven species.

Ptisana Murdock, Taxon 57(3): 744. 2008. Type: *Ptisana salicina* (Sm.) Murdock (≡ *Marattia salicina* Sm.). Circumscription sensu Murdock (2008). Monophyletic (Murdock, 2008). 20 species.

Subclass **Polyodiidae** Cronquist, Takht. & W.Zimm., Taxon 15: 133. 1966. Circumscription sensu Pryer et al. (2008) and Ruggiero et al. (2015). Monophyletic (Pryer et al., 2004; Rothfels et al., 2015). Seven orders, 44 families, 300 genera, and an estimated 10 323 species.

H. Order **Osmundales** Link, Hort. Berol.: 445. 1833. Circumscription sensu Smith et al. (2006b). Order consists of one family. One family, six genera, and an estimated 18 species.

8. Family **Osmundaceae** Martinov, Tekhno-Bot. Slovar.: 445. 1820. Circumscription sensu Smith et al. (2006b). Monophyletic (Yatabe et al., 1999; Schuettpehl & Pryer, 2007; Metzgar et al., 2008). Six genera and an estimated 18 species.

Claytosmunda (Y.Yatabe, N.Murak. & K.Iwats.) Metzgar & Rouhan, this classification (see below). Type: *Claytosmunda claytoniana* (L.) Metzgar & Rouhan (≡ *Osmunda claytoniana* L.). Circumscription equivalent to *Osmunda* subgenus *Claytosmunda* in Yatabe et al. (2005). Monotypic.

Leptopteris C.Presl, Suppl. Tent. Pterid.: 70. 1845. Lectotype (designated by C.Chr., Index Filic. lvi.1906): *Leptopteris hymenophylloides* (A.Rich.) C.Presl (≡ *Todea hymenophylloides* A.Rich.). Circumscription sensu Kramer (19900). Monophyletic (Yatabe et al., 1999; Metzgar et al., 2008; Bomfleur et al., 2015). Six species.

Osmunda L., Sp. Pl. 2: 1063. 1753. Lectotype (designated by Léman, Dict. Sci. Nat. 37: 9. 1825): *Osmunda regalis* L. Circumscription equivalent to subgenus *Osmunda* in Kramer (19900). Monophyletic (Yatabe et al., 1999; Metzgar et al., 2008; Bomfleur et al., 2015). About four species.

Osmundastrum C.Presl, Gefäßbündel Farn: 18. 1847. Type: *Osmundastrum cinnamomeum* (L.) C. Presl (≡ *Osmunda cinnamomea* L.). Circumscription sensu Yatabe et al. (2005). Monotypic (Miller, 1967; Yatabe et al., 1999; Metzgar et al., 2008).

Plenasium C.Presl, Tent. Pterid.: 109, pl.3, f.13. 1836. Lectotype (designated by C.Chr., Index Filic. lvi. 1906): *Plenasium banksiaefolium* (C.Presl) C.Presl. (≡ *Nephrodium banksiaefolium* C.Presl). Circumscription equivalent to subgenus *Plenasium* in Kramer (19900). Monophyletic (Yatabe et al., 1999; Metzgar et al., 2008; Bomfleur et al., 2015). About four species.

Todea Willd. ex Bernh., J. Bot. (Schrader) 1800(2): 126. 1801. Type: *Todea africana* Willd. ex Bernh., nom illeg. superfl. (≡ *Acrostichum barbarum* L.). Circumscription sensu Kramer (19900). Monophyletic (Metzgar et al., 2008). Two species.

I. Order **Hymenophyllales** A.B.Frank, Syn. Pflanzenk., ed. 2, 3: 1452. 1877. Circumscription sensu Smith et al. (2006b).

Order consists of one family, nine genera, and an estimated 434 species.

9. Family **Hymenophyllaceae** Mart., Consp. Regn. Veg.: 3. 1835. Circumscription sensu Smith et al. (2006b). Monophyletic (Schuettpelz & Pryer, 2007). Two subfamilies, nine genera, and an estimated 434 species.

Subfamily **Trichomanoideae** C.Presl, Hymenophyllaceae: 102. 1843. Circumscription equivalent to “trichomanoids” in Ebihara et al. (2006). Monophyletic (Pryer et al., 2001; Dubuisson et al., 2003; Ebihara et al., 2007). Relationships among the trichomanoid genera are still mostly unresolved. Eight genera and an estimated 184 species.

Abrodictyum C.Presl, Hymenophyllaceae: 20. 1843. Type: *Abrodictyum cumingii* C.Presl. Circumscription sensu Ebihara et al. (2006). Monophyletic (Ebihara et al., 2007). About 25 species.

Callistopteris Copel., Philipp. J. Sci. 67: 49. 1938. Type: *Callistopteris apiifolia* (C.Presl) Copel. (≡ *Trichomanes apiifolium* C.Presl). Circumscription sensu Ebihara et al. (2006). Monophyletic (Ebihara et al., 2007). Five species.

Cephalomanes C.Presl, Hymenophyllaceae: 17. 1843. Type: *Cephalomanes atrovirens* C.Presl. Circumscription sensu Ebihara et al. (2006). Monophyletic (Ebihara et al., 2007). Four species.

Crepidomanes C.Presl, Epimel. Bot.: 258. 1851. Type: *Crepidomanes intramarginale* (Hook. & Grev.) C.Presl (≡ *Trichomanes intramarginale* Hook. & Grev.). Circumscription sensu Ebihara et al. (2006). Includes: *Nesopteris* Copel. Monophyletic (Ebihara et al., 2007). About 30 species.

Didymoglossum Desv., Mém. Soc. Linn. Paris 6: 330. 1827. Lectotype (designated by C.Chr., Index Filic. xiv. 1906): *Didymoglossum hymenoides* (Hedw.) Copel. (≡ *Trichomanes hymenoides* Hedw.). Circumscription sensu Ebihara et al. (2006). Monophyletic (Ebihara et al., 2007). About 30 species.

Polyphlebium Copel., Philipp. J. Sci. 67: 55. 1938. Type: *Polyphlebium venosum* (R.Br.) Copel. (≡ *Trichomanes venosum* R.Br.). Circumscription sensu Ebihara et al. (2006). Monophyletic (Ebihara et al., 2007). About 15 species.

Trichomanes L., Sp. Pl. 2: 1097. 1753. Lectotype (designated by Underw., Mem. Torrey Bot. Club 6: 256, 283. 1899): *Trichomanes crispum* L. Circumscription sensu Ebihara et al. (2006). Monophyletic (Ebihara et al., 2007). About 60 species.

Vandenboschia Copel., Philipp. J. Sci. 67: 51. 1938. Type: *Vandenboschia radicans* (Sw.) Copel. (≡

Trichomanes radicans Sw.). Circumscription sensu Ebihara et al. (2006). Monophyletic (Ebihara et al., 2007). About 15 species.

Subfamily **Hymenophylloideae** Burnett, Outlines Bot.: 324. 1835. Circumscription equivalent to “hymenophylloids” in Ebihara et al. (2006). Subfamily consists of one genus and an estimated 250 species.

Hymenophyllum Sm., Mém. Acad. Roy. Sci. (Turin) 5: 418, pl.9, f.8. 1793. Lectotype (designated by C.Presl, Hymenophyllaceae: 1. 1844): *Hymenophyllum tunbrigense* (L.) Sm. (≡ *Trichomanes tunbrigense* L.). Circumscription sensu Ebihara et al. (2006). Monophyletic (Pryer et al., 2001; Hennequin et al., 2006; Ebihara et al., 2007). About 250 species.

- J. Order **Gleicheniales** Schimp., Traité Paléont. Vég. 1: 669. 1869. Circumscription sensu Smith et al. (2006b). Monophyletic (Pryer et al., 2004). Three families, ten genera, and an estimated 172 species.

10. Family **Matoniaceae** C.Presl, Gefässbündel Farrn: 32. 1847. Circumscription sensu Smith et al. (2006b). Monophyletic (Kato & Setoguchi, 1998). Two genera and an estimated four species.

Matonia R.Br. ex Wall., Pl. Asiat. Rar. 1(1): 16. 1829. Type: *Matonia pectinata* R.Br. Circumscription sensu Kramer (1990). Monophyletic (Kato & Setoguchi, 1998). Two species.

Phanerosorus Copel., Philipp. J. Sci. C 3(6): 344. 1909. Type: *Phanerosorus sarmentosus* (Baker) Copel. (≡ *Matonia sarmentosa* Baker). Circumscription sensu Kramer (1990). Monophyletic (Kato & Setoguchi, 1998). Two species.

11. Family **Dipteridaceae** Seward & E.Dale, Philos. Trans., Ser. B. 194: 487, 499, 502. 1901. Circumscription sensu Smith et al. (2006b). Monophyletic (Pryer et al., 2004). Two genera and an estimated 11 species.

Cheiropleuria C.Presl, Epimel. Bot.: 189. 1851. Lectotype (designated by J.Sm., Hist. Fil.: 139. 1875): *Cheiropleuria bicuspis* (Blume) C.Presl (≡ *Polypodium bicuspe* Blume). Circumscription sensu Kramer (1990b). Monophyletic (Kato et al., 2001). Three species.

Dipteris Reinw., Syll. Pl. Nov. 2: 3. 1825. Type: *Dipteris conjugata* Reinw. Circumscription sensu Kramer (1990f). Presumably monophyletic (sampling limited to date). About eight species.

12. Family **Gleicheniaceae** C.Presl, Reliq. Haenk. 1: 70. 1825. Circumscription sensu Smith et al. (2006b). Monophyletic (Pryer et al., 2004). Six genera and an estimated 157 species.

- Dicranopteris** Bernh., Neues J. Bot. 1(2): 38–39. 1805. Type: *Dicranopteris dichotoma* (Thunb.) Bernh. (≡ *Polypodium dichotomum* Thunb.). Circumscription sensu Kramer (1990g), but excluding *Gleichenella*. Sampling to date has been insufficient to fully assess the monophyly of the genus (Li et al., 2010). Perhaps 20 species.
- Diplopterygium** (Diels) Nakai, Bull. Natl. Sci. Mus. Tokyo 29: 47. 1950. Lectotype (designated by C. Chr., Index Filic. liv. 1906): *Diplopterygium glaucum* (Thunb. ex Houtt.) Nakai (≡ *Polypodium glaucum* Thunb. ex Houtt.). Circumscription sensu Kramer (1990g). Sampling to date has been insufficient to fully assess the monophyly of the genus (Li et al., 2010). About 25 species.
- Gleichenella** Ching, Sunyatsenia 5: 276. 1940. Type: *Gleichenella pectinata* (Willd.) Ching (≡ *Mertensia pectinata* Willd.). Circumscription sensu Mickel & Smith (2004). Monotypic.
- Gleichenia** Sm., Mém. Acad. Roy. Sci. (Turin) 5: 419, pl.9, f.10. 1793. Type: *Gleichenia polypodioides* (L.) Sm. (≡ *Onoclea polypodioides* L.). Circumscription sensu Kramer (1990g). Apparently monophyletic (Perrie et al., 2007; but see Hennequin et al., 2014), although sampling to date has been limited. About 15 species.
- Sticherus** C.Presl, Tent. Pterid.: 51. 1836. Lectotype (designated by C. Chr., Index Filic. liv. 1906): *Sticherus laevigatus* (Willd.) C.Presl (≡ *Mertensia laevigata* Willd.). Circumscription sensu Kramer (1990g). Apparently monophyletic (Perrie et al., 2007), although sampling to date has been limited. About 95 species.
- Stromatopteris** Mett., Ann. Sci. Nat. Bot., ser. 4, 15: 84. 1861. Type: *Stromatopteris moniliformis* Mett. Circumscription sensu Kramer (1990g). Monotypic.
- K. Order **Schizaeales** Schimp., Traité Paléont. Vég. 1: 674. 1869. Circumscription sensu Smith et al. (2006b). Monophyletic (Schuettpelz & Pryer, 2007). Three families, four genera, and an estimated 190 species.
13. Family **Lygodiaceae** M.Roem., Handb. Allg. Bot. 3: 520. 1840. Circumscription sensu Smith et al. (2006b). Monophyletic (Wikström et al., 2002). One genus and an estimated 40 species.
- Lygodium** Sw., J. Bot. (Schrader) 1800(2): 7, 106. 1801. Type: *Lygodium scandens* (L.) Sw. (≡ *Ophioglossum scandens* L.). Circumscription sensu Kramer (1990q). Monophyletic (Wikström et al., 2002). Perhaps 40 species.
14. Family **Schizaeaceae** Kaulf., Wesen Farrenkr.: 119. 1827. Circumscription sensu Smith et al. (2006b). Monophyletic (Wikström et al., 2002). Two genera and an estimated 35 species.
- Actinostachys** Wall., Numer. List 1. 1829. Type: *Actinostachys digitata* (L.) Wall. (≡ *Acrostichum digitatum* L.). Circumscription sensu Mickel & Smith (2004). Monophyletic (Wikström et al., 2002). About 15 species.
- Schizaea** Sm., Mém. Acad. Roy. Sci. (Turin) 5: 419, pl.9, f.9. 1793. Type: *Schizaea dichotoma* (L.) J.Sm. (≡ *Acrostichum dichotomum* L.). Circumscription sensu Mickel & Smith (2004). Monophyletic (Wikström et al., 2002). Perhaps 20 species.
15. Family **Anemiaceae** Link, Fil. Spec.: 23. 1841. Circumscription sensu Smith et al. (2006b). Monophyletic (Labiak et al., 2015a). One genus and an estimated 115 species.
- Anemia** Sw., Syn. Fil.: 6, 155. 1806. Lectotype (designated by Underw., Mem. Torrey Bot. Club 6: 267, 276. 1899): *Anemia phyllitidis* (L.) Sw. (≡ *Osmunda phyllitidis* L.). Circumscription sensu Mickel (2016). Includes: *Mohria* Sw.; *Colina* Greene. Monophyletic (Labiak et al., 2015a). About 115 species.
- L. Order **Salviniales** Link, Hort. Berol. 3: 155. 1833. Circumscription sensu Smith et al. (2006b). Monophyletic (Pryer et al., 1995; Pryer, 1999; Schuettpelz & Pryer, 2007; Rothfels et al., 2015). Two families, five genera, and an estimated 82 species.
16. Family **Salviniaceae** Martinov, Tekhno-Bot.Slovar.: 559. 1820. Circumscription sensu Smith et al. (2006b). Monophyletic (Pryer et al., 1995; Pryer, 1999; Schuettpelz & Pryer, 2007; Nagalingum et al., 2008). Two genera and an estimated 21 species.
- Azolla** Lam., Encycl. 1(1): 343. 1783. Type: *Azolla filiculoides* Lam. Circumscription sensu Schneller (1990a). Monophyletic (Metzgar et al., 2007; Reid et al., 2006; Nagalingum et al., 2008). About nine species.
- Salvinia** Ség., Pl. Veron. 3: 52. 1754. Type: *Salvinia natans* (L.) All. (≡ *Marsilea natans* L.). Circumscription sensu Schneller (1990b). Monophyletic (Nagalingum et al., 2008). About 12 species.
17. Family **Marsileaceae** Mirb., Hist. Nat. Veg. 5: 126. 1802. Circumscription sensu Smith et al. (2006b). Monophyletic (Pryer, 1999; Schuettpelz & Pryer, 2007; Nagalingum et al., 2008). Three genera and an estimated 61 species.
- Marsilea** L., Sp. Pl. 2: 1099. 1753. Lectotype (designated by Maxon, Sci. Surv. Porto Rico & Virgin Islands 6(3): 509. 1926): *Marsilea quadrifolia* L. Circumscription sensu Kramer (1990k).

Monophyletic (Nagalingum et al., 2007, 2008; Whitten et al., 2012). About 55 species.

Pilularia L., Sp. Pl. 2: 1100. 1753. Type: *Pilularia globulifera* L. Circumscription sensu Kramer (1990k). Monophyletic (Nagalingum et al., 2008). About five species.

Regnellidium Lindm., Ark. Bot. 3(6): 2. 1904. Type: *Regnellidium diphyllum* Lindm. Circumscription sensu Kramer (1990k). Monotypic.

M. Order **Cyatheales** A.B.Frank in Leunig, Syn. Pflanzenk. (ed. 2) 3: 1452. 1877. Circumscription sensu Smith et al. (2006b). Monophyletic (Korall et al., 2006; Schuettpelz et al., 2007; Rothfels et al., 2015). Eight families, 13 genera, and an estimated 713 species.

18. Family **Thyrsopteridaceae** C.Presl, Gefässbündel Farrn: 22, 38. 1847. Circumscription sensu Smith et al. (2006b). Family consists of a single monotypic genus.

Thyrsopteris Kunze, Linnaea 9: 507. 1835. Type: *Thyrsopteris elegans* Kunze. Circumscription sensu Kramer (1990e). Includes: *Panicularia* Colla. Monotypic (Korall et al., 2006).

19. Family **Loxsomataceae** C.Presl, Gefässbündel Farrn: 31. 1847. Circumscription sensu Smith et al. (2006b). Monophyletic (Korall et al., 2006). Two monotypic genera.

Loxsoma R.Br. ex Hook. in A.Cunn., Companion Bot. Mag. 2: 366. 1837. Type: *Loxsoma cunninghamii* R.Br. ex Hook. Circumscription sensu Kramer (1990j). Includes: *Chrysodium* Fée. Monotypic.

Loxsomopsis Christ, Bull. Herb. Boissier, ser. 2, 4(5): 399. 1904. Type: *Loxsomopsis costaricensis* Christ. Circumscription sensu Lehnert et al. (2001). Monotypic.

20. Family **Culcitaceae** Pic.Serm., Webbia 24: 702. 1970. Circumscription sensu Smith et al. (2006b). Monophyletic (Korall et al., 2006). One genus and two species.

Culcita C.Presl, Tent. Pterid.: 135, t.5, f.5. 1836. Type: *Culcita macrocarpa* C.Presl. Circumscription sensu White & Turner (1988). Monophyletic (Korall et al., 2006). Two species.

21. Family **Plagiogyriaceae** Bower, Ann. Bot. (Oxford) 40: 484. 1926. Circumscription sensu Smith et al. (2006b). Family consists of a single genus and an estimated 15 species.

Plagiogyria (Kunze) Mett., Abh. Senckenberg. Naturf. Ges. 2: 1, 268. 1858. Lectotype (designated by C.Chr., Index Filic. xliii. 1906): *Plagiogyria euphlebica* (Kunze) Mett. (\equiv *Lomaria euphlebica* Kunze). Circumscription sensu Kramer (1990p).

Presumably monophyletic; seven species sampled to date (Korall et al., 2006; Ebihara, 2011). 15 species.

22. Family **Cibotiaceae** Korall, Taxon 55(3): 712. 2006. Circumscription sensu Smith et al. (2006b). Family consists of a single genus and an estimated nine species.

Cibotium Kaulf., Berlin. Jahrb. Pharm. Verbundenen Wiss. 21: 53. 1820. Type: *Cibotium chamissoi* Kaulf. Circumscription sensu Kramer (1990e). Includes: *Pinonia* Gaudich. Monophyletic (Geiger et al., 2013). Nine species.

23. Family **Metaxyaceae** Pic.Serm., Webbia 24(2): 701. 1970. Circumscription sensu Smith et al. (2006b). Family consists of a single genus and an estimated six species.

Metaxya C.Presl, Tent. Pterid.: 59. 1836. Type: *Metaxya rostrata* (Kunth) C.Presl (\equiv *Polypodium rostratum* Humb. & Bonpl. ex Willd.). Circumscription sensu Cárdenas et al. (2016). Includes: *Amphidesmium* J.Sm.; *Amphidesmium* Schott ex Kunze. Monophyletic (Cárdenas et al., 2016). Six species.

24. Family **Dicksoniaceae** M.R.Schomb., Reis. Br.-Guiana 2: 1047. 1849. Circumscription sensu Smith et al. (2006b). Monophyletic (Korall et al., 2006; Adjie & Lestari, 2014; Noben et al., pers. comm.). Three genera and an estimated 35 species.

Calochlaena (Maxon) M.D.Turner & R.A.White, Amer. Fern J. 78(3): 91. 1988. Type: *Culcita dubia* (R.Br.) Maxon (\equiv *Davallia dubia* R.Br.). Circumscription sensu White & Turner (1988). Monophyletic (Adjie & Lestari, 2014; Noben et al., pers. comm.). Five species.

Dicksonia L'Hér., Sert. Angl. 30. 1789. Lectotype (designated by J.Sm., Hist. Fil.: 254. 1875): *Dicksonia arborescens* L'Hér. Circumscription sensu Kramer (1990e). Includes: *Balantium* Kaulf. Monophyletic (Noben et al., pers. comm.). 26 species.

Lophosoria C.Presl, Gefässbündel Farrn: 36. 1847. Lectotype (designated by J.Sm., Hist. Fil.: 251. 1875): *Lophosoria pruinata* (Sw.) C.Presl (\equiv *Polypodium pruinatum* Sw.). Circumscription sensu Kramer (1990i). Includes: *Trichosorus* Liebm. Monophyletic (Noben et al., pers. comm.). About four species.

25. Family **Cyatheaceae** Kaulf., Wesen Farrenkr.: 119. 1827. Circumscription sensu Smith et al. (2006b). Monophyletic (Korall et al., 2006, 2007). Three genera and an estimated 643 species.

Alsophila R.Br., Prodr.: 158. 1810. Type: *Alsophila australis* R.Br. Circumscription sensu Conant

(1983). Includes: *Amphicosmia* Gardner; *Dichorexia* C.Presl; *Gymnosphaera* Blume; *Nephelea* R.M. Tryon; *Thysanobotrya* Alderw. Monophyletic (Korall et al., 2007). 275 species.

Cyathea Sm., Mém. Acad. Roy. Sci. (Turin) 5: 416. 1793. Lectotype (designated by J.Sm., Hist. Fil.: 244. 1875): *Cyathea arborea* (L.) Sm. (≡ *Polypodium arboreum* L.). Circumscription sensu Korall et al. (2007). Includes: *Actinophlebia* C.Presl; *Chnoophora* Kaulf.; *Cnemidaria* C.Presl; *Cnemidopteris* Reichenb.; *Cormophyllum* Newm.; *Disphenia* C. Presl; *Hemitelia* R.Br.; *Hemistegia* C.Presl; *Hymenophyllopsis* K.I.Goebel; *Microstegnus* C.Presl; *Trichopteris* C.Presl; ×*Cyathidaria* Caluff. Monophyletic (Korall et al., 2007). 265 species.

Sphaeropteris Bernh., J. Bot. (Schrader) 1800(2): 122. 1801. Type: *Sphaeropteris medullaris* (G.Forst.) Bernh. (≡ *Polypodium medullare* G.Forst.). Circumscription sensu Tryon (1970). Includes: *Eatoniopteris* Bomm.; *Fourniera* Bomm.; *Schizocaena* J.Sm. Monophyletic (Korall et al., 2007). 103 species.

- N. Order **Polypodiales** Link, Hort. Berol. 2: 5. 1833. Circumscription sensu Smith et al. (2006b). Monophyletic (Schuettpelz & Pryer, 2007). Six suborders, 26 families, 253 genera, and an estimated 8714 species.

Suborder **Saccolomatineae** Hovenkamp, this classification (see below). Circumscription equivalent to family Saccolomataceae in this classification and in Smith et al. (2006b). Additional investigation is needed to establish monophyly. One family, one genus, and an estimated 18 species.

26. Family **Saccolomataceae** Doweld, Phytologia 90(3): 417. 2008. Circumscription sensu Smith et al. (2006b). Contains a single genus, but additional investigation is needed (see below). An estimated 18 species.

Saccoloma Kaulf., Berlin. Jahrb. Pharm. Verbundenen Wiss. 21: 51. 1820. Type: *Saccoloma elegans* Kaulf. Circumscription sensu Kramer (1990d). Includes: *Orthiopteris* Copel. Additional investigation is needed (Perrie et al., 2015), as indications that the genus is not monophyletic may be based on errors in sequencing or mixed samples. 18 species.

Suborder **Lindsaeineae** Lehtonen & Tuomisto, this classification (see below). Circumscription equivalent to Lindsaeaceae in Smith et al. (2006b). Probably monophyletic, but needs to be confirmed with additional data (Lehtonen et al., 2012). Three families, nine genera, and an estimated 237 species.

27. Family **Cystodiaceae** J.R.Croft, Kew Bull. 41(4): 797. 1986. Circumscription sensu Christenhusz et al. (2011). Family consists of a single monotypic genus.

Cystodium J.Sm., Gen. Fil. (Hooker) t.96. 1841. Type: *Cystodium sorbifolium* (Sm.) J.Sm. (≡ *Dicksonia*

sorbifolia Sm.). Circumscription sensu Kramer (1990e). Monotypic.

28. Family **Lonchitidaceae** Doweld, New Syllab. Pl. Fam.: 353. 2006. Circumscription sensu Christenhusz et al. (2011). Family consists of a single genus and an estimated two species.

Lonchitis L., Sp. Pl. 2: 1078. 1753. Lectotype (designated by Brongn., Dict. Class. Hist. Nat. 9: 490. 1826): *Lonchitis hirsuta* L. Circumscription sensu Kramer (1990d). Presumably monophyletic, but only one species sampled to date. An estimated two species.

29. Family **Lindsaeaceae** C.Presl ex M.R.Schomb., Reis. Br.-Guiana 3: 883. 1849. Circumscription sensu Christenhusz et al. (2011). Monophyletic (Lehtonen et al., 2010). Seven genera and an estimated 234 species.

Lindsaea Dryand. ex Sm., Mém. Acad. Roy. Sci. (Turin) 5: 413, pl.9, f.4. 1793. Lectotype (designated by Maxon, Sci. Surv. Porto Rico & Virgin Islands 6 (3): 488. 1926): *Lindsaea guianensis* (Aubl.) Dryand. (≡ *Adiantum guianense* Aubl.). Circumscription sensu Lehtonen et al. (2010). Includes: *Guerinia* J. Sm.; *Humblotiella* Tardieu; *Lindsaenium* Fée; *Odontoloma* Maxon; *Sambirania* Tardieu; *Schizolegnia* Alston; *Schizoloma* Gaudich.; *Synaphlebium* J.Sm. Monophyletic (Lehtonen et al., 2010). About 180 species.

Nesolindsaea Lehtonen & Christenh., Bot. J. Linn. Soc. 163(3): 336–337. 2010. Type: *Nesolindsaea caudata* (Hook.) Lehtonen & Christenh. (≡ *Lindsaea caudata* Hook.). Circumscription sensu Lehtonen et al. (2010). Monophyletic (Lehtonen et al., 2010). Two species.

Odontosoria Fée, Mém. Foug., 5. Gen. Filic. 325. 1852. Type: *Odontosoria uncinella* (Kunze) Fée (≡ *Davallia uncinella* Kunze). Circumscription sensu Lehtonen et al. (2010). Includes: *Lindsayopsis* Kuhn. Monophyletic (Lehtonen et al., 2010). About 23 species.

Osmolindsaea (K.U.Kramer) Lehtonen & Christenh., Bot. J. Linn. Soc. 163(3): 335. 2010. Type: *Osmolindsaea odorata* (Roxb.) Lehtonen & Christenh. (≡ *Lindsaea odorata* Roxb.). Circumscription sensu Lehtonen et al. (2010, 2013). Monophyletic (Lehtonen et al., 2010, 2013). About seven species.

Sphenomeris Maxon, J. Wash. Acad. Sci. 3(5): 144. 1913. Type: *Sphenomeris clavata* (L.) Maxon (≡ *Adiantum clavatum* L.). Circumscription sensu Lehtonen et al. (2010). Only one species sampled to date, but assumed to be monophyletic. Three species.

Tapeinidium (C.Presl) C.Chr., Index Filic.: 631. 1906. Lectotype (designated by Copel., Ann. Cryptog. Phytopathol. 5 [Gen. Fil.]: 53. 1947): *Tapeinidium pinnatum* (Cav.) C.Chr. (≡ *Davallia pinnata* Cav.). Circumscription sensu Lehtonen et al. (2010). Includes: *Protolindsaya* Copel. Monophyletic (Lehtonen et al., 2010). 18 species.

Xyopteris K.U.Kramer, Acta Bot. Neerl. 6: 599. 1958. Type: *Xyopteris stortii* (Alderw.) K.U.Kramer (≡ *Schizoloma stortii* Alderw.). Circumscription sensu Lehtonen et al. (2010). Monotypic.

Suborder **Pteridineae** J.Prado & Schuettp., this classification (see below). Circumscription equivalent to family Pteridaceae in this classification and in Smith et al. (2006b). Monophyletic (Schuettpelz & Pryer, 2007; Rothfels et al., 2015). One family, 53 genera, and an estimated 1211 species.

30. Family **Pteridaceae** E.D.M.Kirchn., Schul-Bot.: 109. 1831. Circumscription sensu Smith et al. (2006b). Monophyletic (Schuettpelz & Pryer, 2007). Five subfamilies, 53 genera, and an estimated 1211 species.

Subfamily **Parkerioideae** Burnett, Outlines Bot.: 324. 1835, as “Parkeridae”. Circumscription equivalent to “ceratopteridoids” in Schuettpelz et al. (2007). Monophyletic (Schuettpelz et al., 2007). Two genera and an estimated nine species.

Acrostichum L., Sp. Pl. 2: 1067. 1753. Lectotype (designated by J.Sm., Hist. Fil.: 146. 1875): *Acrostichum aureum* L. Circumscription sensu Tryon et al. (1990). Monophyletic (Schuettpelz et al., 2007). Three species.

Ceratopteris Brongn., Bull. Sci. Soc. Philom. Paris 1821: 186. 1822. Lectotype (designated by Brongn., Dict. Class. Hist. Nat. 3: 350. 1823): *Ceratopteris thalictroides* (L.) Brongn. (≡ *Acrostichum thalictroides* L.). Circumscription sensu Tryon et al. (1990). Monophyletic (Schuettpelz et al., 2007). Perhaps six species.

Subfamily **Cryptogrammoideae** S.Lindsay, Edinburgh. J. Bot. 66(2): 358. 2009. Circumscription equivalent to “cryptogramroids” in Schuettpelz et al. (2007). Monophyletic (Schuettpelz et al., 2007; Metzgar et al., 2013). Three genera and an estimated 31 species.

Coniogramme Fée, Mém. Foug., 5. Gen. Filic.: 167. 1852. Type: *Coniogramme javanica* (Blume) Fée (≡ *Gymnogramme javanica* Blume). Circumscription sensu Tryon et al. (1990). Monophyletic (Metzgar et al., 2013). At least 20 species.

Cryptogramma R.Br., Narr. Journey Polar Sea: 767. 1823. Type: *Cryptogramma acrostichoides* R.Br. Circumscription sensu Metzgar et al. (2013) and

Jessen et al. (2012). Monophyletic (Metzgar et al., 2013). About 10 species.

Llavea Lag., Gen. Sp. Pl.: 33. 1816. Type: *Llavea cordifolia* Lag. Circumscription sensu Tryon et al. (1990). Monotypic.

Subfamily **Pteridoideae** Link, Fil. Spec.: 48. 1841. Circumscription sensu Zhang et al. (2015). Monophyletic (Schuettpelz et al., 2007; Zhang et al., 2015). 13 genera and an estimated 400 species.

Actiniopteris Link, Fil. Spec.: 79. 1841. Lectotype (designated by Pic.Serm., Webbia 17: 6–7. 1962): *Actiniopteris radiata* (Sw.) Link (≡ *Asplenium radiatum* Sw.). Circumscription sensu Tryon et al. (1990). Monophyletic (Schneider et al., 2013). Six species.

Anogramma Link, Fil. Spec.: 137. 1841. Lectotype (designated by C.Chr., Index Filic. xxxvii. 1906): *Anogramma leptophylla* (L.) Link (≡ *Polypodium leptophyllum* L.). Circumscription sensu Nakazato & Gastony (2003). Polyphyletic (Schneider et al., 2013; Hennequin et al., 2014). About five species.

Austrogramme E.Fourn., Ann. Sci. Nat. Bot., ser. 5, 18: 278. 1873. Lectotype (designated by C.Chr., Index Filic. xxxvii. 1906): *Austrogramme marginata* (Mett.) E.Fourn. (≡ *Gymnogramme marginata* Mett.). Circumscription sensu Tryon et al. (1990). Monophyletic (Cochran et al., 2014), but relatively few species sampled. Six species.

Cerosora Domin, Acta Bot. Bohem. 8: 3. 1929. Type: *Cerosora chrysosora* (Baker) Domin (≡ *Gymnogramme chrysosora* Baker). Circumscription sensu Schneider et al. (2013). Monophyletic (Schneider et al., 2013). Four species.

Cosentinia Tod., Giorn. Sci. Nat. Econ. Palermo 1: 219. 1866. Type: *Cosentinia vellea* (Aiton) Tod. (≡ *Acrostichum velleum* Aiton). Circumscription sensu Tryon et al. (1990). Monotypic.

Jamesonia Hook. & Grev., Pl. Voy. Russes Monde 2: t.178. 1830. Type: *Jamesonia pulchra* Hook. & Grev. Circumscription sensu Pabón-Mora & González (2015). Includes: *Eriosorus* Fée; *Nephtopteris* Lellinger. Monophyletic (Pabón-Mora & González, 2015). About 50 species.

Onychium Kaulf., Berlin. Jahrb. Pharm. Verbundenen Wiss. 21: 45. 1820. Type: *Onychium capense* Kaulf. Circumscription sensu Tryon et al. (1990). Monophyletic (Schuettpelz et al., 2007). Perhaps 10 species.

Pityrogramma Link, Handbuch 3: 19–20. 1833. Type: *Pityrogramma chrysophylla* (Sw.) Link (≡ *Acrostichum chrysophyllum* Sw.). Circumscription

sensu Tryon et al. (1990). Includes: *Trismeria* Fée. Presumably monophyletic, but sampling incomplete (Schneider et al., 2013; Zhang et al., 2015). About 20 species.

Pteris L., Sp. Pl. 2: 1073. 1753. Lectotype (designated by J.Sm., Hist. Fil.: 295. 1875): *Pteris longifolia* L. Circumscription sensu Zhang et al. (2015). Includes: *Afropteris* Alston; *Neopteris* Prantl ex Diels; *Ochropteris* J.Sm.; *Neurocallis* Fée; *Platyzoma* R.Br. Monophyletic (Chao et al., 2014; Zhang et al., 2015). Perhaps 250 species.

Pterozonium Fée, Mém. Soc. Hist. Nat. Strasbourg 4(1): 202. 1850. Type: *Pterozonium reniforme* (Mart.) Fée (≡ *Gymnogramma reniformis* Mart.). Circumscription sensu Tryon et al. (1990). Monophyletic (Cochran et al., 2014), but relatively few species sampled. 14 species.

Syngamma J.Sm., London J. Bot. 4: 168–169. 1845. Lectotype (designated by J.Sm., Hist. Fil.: 152. 1875): *Syngamma alismifolia* (C.Presl) J.Sm. (≡ *Diplazium alismifolium* C.Presl). Circumscription sensu Tryon et al. (1990). Only one species sampled to date, but assumed to be monophyletic. About 15 species.

Taenitis Willd. ex Schkuhr, Kl. Linn. Pfl.-Syst. 1: 20. 1804. Type: *Taenitis pteroides* Willd. ex Schkuhr. Circumscription sensu Tryon et al. (1990). Monophyletic (Cochran et al., 2014), but sampling insufficient. About 15 species.

Tryonia Schuettp., J.Prado & A.T.Cochran, PhytoKeys 35: 35–37. 2014. Type: *Tryonia myriophylla* (Sw.) Schuettp., J.Prado & A.T.Cochran (≡ *Gymnogramma myriophylla* Sw.). Circumscription sensu Cochran et al. (2014). Monophyletic (Cochran et al., 2014). Four species.

Subfamily **Vittarioideae** Link, Fil. Spec.: 116. 1841. Circumscription equivalent to “adiantoids” in Schuettpelz et al. (2007). Monophyletic (Prado et al., 2007; Schuettpelz et al., 2007; Rothfels & Schuettpelz, 2014). 12 genera and an estimated 345 species.

Adiantum L., Sp. Pl. 2: 1094. 1753. Lectotype (designated by J.Sm., Hist. Fil.: 274. 1875): *Adiantum capillus-veneris* L. Circumscription sensu Tryon et al. (1990). Monophyletic (Rothfels & Schuettpelz, 2014; Pryer et al., 2016). About 225 species.

Ananthacorus Underw. & Maxon, Contr. U.S. Natl. Herb. 10: 487. 1908. Type: *Ananthacorus angustifolius* (Sw.) Underw. & Maxon (≡ *Pteris angustifolia* Sw.). Circumscription sensu Schuettpelz et al. (2016). Monotypic (Schuettpelz et al., 2016).

Antrophyopsis (Benedict) Schuettp., Taxon 65(4): 717. 2016. Type: *Antrophyopsis boryana* (Willd.)

Schuettp. (≡ *Hemionitis boryana* Willd.). Circumscription sensu Schuettpelz et al. (2016). Monophyletic (Schuettpelz et al., 2016). Three species.

Antrophyum Kaulf., Enum. Filic.: 197, 282. 1824. Lectotype (designated by J.Sm., Hist. Fil.: 154. 1875): *Antrophyum plantagineum* (Cav.) Kaulf. (≡ *Hemionitis plantaginea* Cav.). Circumscription sensu Schuettpelz et al. (2016). Monophyletic (Schuettpelz et al., 2016). Perhaps 40 species.

Haplopteris C.Presl, Tent. Pterid.: 141. 1836. Type: *Haplopteris scolopendrina* (Bory) C.Presl (≡ *Pteris scolopendrina* Bory). Circumscription sensu Schuettpelz et al. (2016). Includes: *Pleurofossa* Nakai ex H.Ito; *Monogramma* Comm. ex Schkuhr (proposal to conserve *Haplopteris* against *Monogramma* pending; Chen et al., 2016). Monophyletic (Schuettpelz et al., 2016). Perhaps 40 species.

Hecistopteris J.Sm., London J. Bot. 1: 193. 1842. Type: *Hecistopteris pumila* (Spreng.) J.Sm. (≡ *Gymnogramma pumila* Spreng.). Circumscription sensu Schuettpelz et al. (2016). Presumably monophyletic, but only one species sampled to date (Schuettpelz et al., 2016). Three species.

Polytaenium Desv., Mém. Soc. Linn. Paris 6: 174, 218. 1827. Type: *Polytaenium lanceolatum* (Sw.) Desv. (≡ *Vittaria lanceolata* Sw.). Circumscription sensu Schuettpelz et al. (2016). Includes: *Anetium* Splitg. Monophyletic (Schuettpelz et al., 2016). About 10 species.

Radiovittaria (Benedict) E.H.Crane, Syst. Bot. 22: 514–515. 1997 (1998). Type: *Radiovittaria remota* (Fée) E.H.Crane (≡ *Vittaria remota* Fée). Circumscription sensu Schuettpelz et al. (2016). Monophyletic (Schuettpelz et al., 2016). About 10 species.

Rheopteris Alston, Nova Guinea, n.s. 7: 2. 1956. Type: *Rheopteris cheesmaniae* Alston. Circumscription sensu Schuettpelz et al. (2016). Monotypic.

Scoliosorus T.Moore, Index Fil. xxix. 1857. Type: *Scoliosorus ensiformis* (Hook.) T.Moore (≡ *Antrophyum ensiforme* Hook.). Circumscription sensu Schuettpelz et al. (2016). Monotypic (Schuettpelz et al., 2016).

Vaginularia Fée, Mém. Foug., 3. Hist. Vittar.: 30–31. 1852. Type: *Vaginularia trichoides* Fée. Circumscription sensu Schuettpelz et al. (2016). Includes: *Diclidopteris* Brack. Monophyletic (Schuettpelz et al., 2016). Four species.

Vittaria Sm., Mém. Acad. Roy. Sci. (Turin) 5: 413, t.9, f.5. 1793. Type: *Vittaria lineata* (L.) Sm. (≡ *Pteris lineata* L.). Circumscription sensu Schuettpelz et al.

(2016). Monophyletic (Schuettpelz et al., 2016). Seven species.

Subfamily **Cheilanthoideae** Horvat, Acta Bot. Inst. Bot. Univ. Zagreb. 2: 114. 1927, as “Cheilanthinae”. Circumscription equivalent to “cheilanthoids” in Schuettpelz et al. (2007). Monophyletic (Rothfels & Schuettpelz, 2014). 23 genera and an estimated 426 species.

Adiantopsis Fée, Mém. Foug., 5. Gen. Filic.: 145. 1852. Lectotype (designated by C.Chr., Index Filic. xli. 1906): *Adiantopsis radiata* (L.) Fée (≡ *Adiantum radiatum* L.). Circumscription sensu Link-Pérez et al. (2011) with additions by Link-Pérez & Hickey (2011) and Schuettpelz et al. (2014). Monophyletic (Link-Pérez et al., 2011; Schuettpelz et al., 2014). About 35 species.

Aleuritopteris Fée, Mém. Foug., 5. Gen. Filic.: 153–154. 1852. Lectotype (designated by C.Chr., Index Filic. xlii. 1906): *Aleuritopteris farinosa* (Forssk.) Fée (≡ *Pteris farinosa* Forssk.). Circumscription sensu Zhang et al. (2013a). Includes: *Leptolepidium* K.H. Shing & S.K.Wu; *Sinopteris* C.Chr. & Ching. Not monophyletic as circumscribed (see Eiserhardt et al., 2011). About 40 species.

Allosorus Bernh., Neues J. Bot. 1(2): 36. 1805. Lectotype (designated by Pic.Serm., Webbia 9: 394. 1953): *Allosorus pusillus* (Willd. ex Bernh.) Bernh. (≡ *Adiantum pusillum* Willd. ex Bernh.). Circumscription sensu Christenhusz (2012). Includes: *Oeosporangium* De Visiani. Questionably monophyletic as circumscribed. Eight species.

Argyrochosma (J.Sm.) Windham, Amer. Fern J. 77 (2): 38. 1987. Lectotype (designated by C.Chr., Index Filic. xl. 1906): *Argyrochosma nivea* (Poir.) Windham (≡ *Pteris nivea* Poir.). Circumscription sensu Windham (1987) with additions by Wang et al. (2015). Monophyletic (Sigel et al., 2011). About 20 species.

Aspidotis (Nutt. ex Hook.) Copel., Ann. Cryptog. Phytopathol. 5 [Gen. Fil.]: 68. 1947. Type: *Aspidotis californica* (Hook.) Nutt. ex Copel. (≡ *Hypolepis californica* Hook.). Circumscription sensu Li et al. (2012b). Monophyletic (Li et al., 2012b). Four species.

Astrolepis D.M.Benham & Windham, Amer. Fern J. 82(2): 55. 1992. Type: *Astrolepis sinuata* (Lag. ex Sw.) D.M.Benham & Windham (≡ *Acrostichum sinuatum* Lag. ex Sw.). Circumscription sensu Benham & Windham (1992) with additions by Beck et al. (2010). Monophyletic (Beck et al., 2010). Eight species.

Bommeria E.Fourn., Dict. Bot. 1: 448. 1876 (1877). Lectotype (designated by Maxon, Contr. U.S. Natl.

Herb. 13: 160. 1913): *Bommeria ehrenbergiana* (Klotzsch) Underw. (≡ *Gymnogramma ehrenbergiana* Klotzsch). Circumscription sensu Ranker & Haufler (1990). Monophyletic based on limited sampling (two species in Eiserhardt et al., 2011). Five species.

Calciphlopteris Yesilyurt & H.Schneid., Phytotaxa 7: 52. 2010. Type: *Calciphlopteris ludens* (Wall. ex Hook.) Yesilyurt & H.Schneid. (≡ *Pteris ludens* Wall. ex Hook.). Circumscription sensu Yesilyurt & Schneider (2010). Presumably monophyletic based on morphological similarity (only one species sampled; Schuettpelz et al., 2007; Eiserhardt et al., 2011; Rothfels & Schuettpelz, 2014). Four species.

Cheilanthes Sw., Syn. Fil. 5, 126. 1806. Lectotype (designated by Maxon, Sci. Surv. Porto Rico & Virgin Islands 6(3): 428. 1926): *Cheilanthes micropteris* Sw. Circumscription sensu Zhang & Yatskievych (2013) but excluding *Allosorus* and *Mildella*. Includes: *Cheilosoria* Trevis.; *Negripteris* Pic.Serm.; *Neurosoria* Mett. ex Kuhn. Not monophyletic as circumscribed (Eiserhardt et al., 2011). About 100 species.

Cheiloplecton Fée, Mém. Foug., 7. Ic. Esp. Nouv.: 33, 135, t.20. 1857. Type: *Cheiloplecton rigidum* (Sw.) Fée (≡ *Pteris rigida* Sw.). Circumscription sensu Mickel & Smith (2004). Monotypic (Rothfels et al., 2008; Johnson et al., 2012).

Doryopteris J.Sm. emend. J.C.Yesilyurt, J. Bot. (Hooker) 3: 404. 1841. Lectotype (designated by C.V.Morton, Amer. Fern J. 34: 26. 1944): *Doryopteris palmata* (Willd.) J.Sm. (≡ *Pteris palmata* Willd.). Circumscription sensu Yesilyurt et al. (2015). Includes: *Bakeriopteris* C.Chr.; *Cassebeera* Kaulf.; *Heteropteris* Fée; *Tryonella* Pic.Serm. Monophyletic (Yesilyurt et al., 2015). 21 species.

Gaga Pryer, F.W.Li & Windham, Syst. Bot. 37(4): 855. 2012. Type: *Gaga marginata* (Kunth) F.W.Li & Windham (≡ *Cheilanthes marginata* Kunth). Circumscription sensu Li et al. (2012b). Monophyletic (Li et al., 2012b). 19 species.

Hemionitis L., Sp. Pl. 2: 1077 1753. Lectotype (designated by Kaulf., Enum. Filic.: 68, 198. 1824): *Hemionitis palmata* L. Circumscription sensu Tryon et al. (1990). Includes: *Gymnopteris* Bernh.; *Gymnogramma* Desv.; *Neurogramma* Link. Monophyletic (four species sampled in Eiserhardt et al., 2011). Five species.

Lytoneuron (Klotzsch) Yesilyurt, Phytotaxa 221(2): 116. 2015. Type: *Lytoneuron lomariaceum* (Klotzsch) Yesilyurt (≡ *Doryopteris lomariacea* Klotzsch). Circumscription sensu Yesilyurt et al. (2015). Monophyletic (Yesilyurt et al., 2015). 12 species.

Mildella Trevis., *Reich. Ist. Lombardo Sci., Rendiconti* 9: 810. 1877. Type: *Mildella intramarginalis* (Kaulf. ex Link) Trevis. (\equiv *Pteris intramarginalis* Kaulf. ex Link). Circumscription sensu Hall & Lellinger (1967). Not monophyletic as circumscribed; New World species (including type) and Old World species belong to different clades. Seven species.

Myriopteris Fée emend. Grusz & Windham, *Mém. Foug.*, 5. Gen. Filic.: 148. 1852. Lectotype (designated by Copel., *Ann. Cryptog. Phytopathol.* 5 [Gen. Fil.]: 65. 1947): *Myriopteris marsupianthes* Fée. Circumscription sensu Grusz & Windham (2013). Includes: *Pomatophytum* M.E.Jones. Monophyletic (Grusz et al., 2014). About 45 species.

Notholaena R.Br., *Prodr.*: 145. 1810. Lectotype (designated by J.Sm., *Hist. Fil.*: 278. 1875): *Notholaena trichomanoides* (L.) Desv. (\equiv *Pteris trichomanoides* L.). Circumscription sensu Rothfels et al. (2008) with additions by Yatskievych & Arbelaez (2008). Includes: *Chrysochosma* (J.Sm.) Kümmerle. See Yatskievych & Smith (2003) for details regarding arguments over the typification of *Notholaena*. Not monophyletic as circumscribed (Rothfels et al., 2008; Johnson et al., 2012). About 30 species.

Ormopteris J.Sm. ex J.Sm., *Hist. Fil.*: 281. 1875. Type: *Ormopteris gleichenioides* (Gardner) J.Sm. (\equiv *Cassebeera gleichenioides* Gardner). Circumscription sensu Yesilyurt et al. (2015). Monophyletic (Yesilyurt et al., 2015). Six species.

Paragymnopteris K.H.Shing, *Indian Fern J.* 10: 227. 1993. Type: *Paragymnopteris marantae* (L.) K.H. Shing (\equiv *Acrostichum marantae* L.). Circumscription sensu Zhang & Ranker (2013b). Not monophyletic as circumscribed. Five species.

Parahemionitis Panigrahi, *Amer. Fern J.* 83(3): 90, f.1. 1993. Type: *Parahemionitis arifolia* (Burm.f.) Panigrahi (\equiv *Asplenium arifolium* Burm.f.). Circumscription sensu Zhang & Ranker (2013a). Monotypic.

Pellaea Link, *Fil. Spec.*: 59. 1841. Lectotype (designated by C.Chr., *Index Filic.* xxxix. 1906): *Pellaea atropurpurea* (L.) Link (\equiv *Pteris atropurpurea* L.). Circumscription sensu Tryon et al. (1990) but excluding *Ormopteris*. Includes: *Choristosoria* Mett. ex Kuhn; *Paraceterach* Copel.; *Pellaeopsis* J. Sm.; *Platyloma* J.Sm.; *Pteridella* Kuhn. Not monophyletic as circumscribed (Yesilyurt et al., 2015). About 40 species.

Pentagramma Yatsk., Windham & E.Wollenw., *Amer. Fern J.* 80(1): 13. 1990. Type: *Pentagramma triangularis* (Kaulf.) Yatsk., Windham & E. Wollenw. (\equiv *Gymnogramma triangularis* Kaulf.).

Circumscription sensu Schuettpelz et al. (2015). Monophyletic (Schuettpelz et al., 2007). Six species.

Trachypteris André ex Christ, *Neue Denkschr. Allg. Schweiz. Ges. Gesamten Naturwiss.* 36: 150. 1899. Type: *Trachypteris aureonitens* (Hook.) André ex Christ (\equiv *Acrostichum aureonitens* Hook.). Circumscription sensu Ramos-Giacosa et al. (2011). Includes: *Saffordia* Maxon. Monophyly not assessed (only one species sampled; Eiserhardt et al., 2011). Four species.

Suborder **Dennstaedtiineae** Schwartsb. & Hovenkamp, this classification (see below). Circumscription equivalent to family Dennstaedtiaceae in this classification and in Smith et al. (2006b). Monophyletic (Schuettpelz & Pryer, 2007). An estimated 265 species.

31. Family **Dennstaedtiaceae** Lotsy, *Vort. Bot. Stammesgesch.* 2: 655. 1909. Circumscription sensu Smith et al. (2006b). Includes: Hypolepidaceae Pic.Serm.; Monachosoraceae Ching; Pteridiaceae Ching. Monophyletic (Schuettpelz & Pryer, 2007). Ten genera and an estimated 265 species.

Blotiella R.M.Tryon, *Contr. Gray Herb.* 191: 96. 1962. Type: *Blotiella glabra* (Bory) R.M.Tryon (\equiv *Lonchitis glabra* Bory). Circumscription sensu Tryon (1962) and Kramer (1990d). Monophyletic (Perrie et al., 2015), although only two species were sampled. Perhaps 20 species.

Dennstaedtia Bernh., *J. Bot. (Schrader)* 1800(2): 124. 1801. Type: *Dennstaedtia flaccida* (G.Forst.) Bernh. (\equiv *Trichomanes flaccidum* G.Forst.). Circumscription sensu Kramer (1990d). Includes: *Adectum* Link; *Coptodipteris* Nakai & Momose; *Costarcia* Christ; *Emodiopteris* Ching & S.K.Wu; *Fuziifilix* Kanai & Momose; *Paradennstaedtia* Tagawa; *Patania* C. Presl; *Sitobolium* Desv. Not monophyletic as circumscribed; needs further sampling to include several competing type species (Perrie et al., 2015). About 70 species.

Histiopteris (J.Agardh) J.Sm., *Hist. Fil.*: 294: 1875. Type: *Histiopteris vespertilionis* (Labill.) J.Sm. (\equiv *Pteris vespertilionis* Labill.). Circumscription sensu Kramer (1990d). Includes: *Lepidocaulon* Copel. Monophyletic (Perrie et al., 2015), although only two species were sampled. About seven species.

Hypolepis Bernh., *Neues J. Bot.* 1(2): 34. 1805. Type: *Hypolepis tenuifolia* (G.Forst.) Bernh. ex C.Presl (\equiv *Lonchitis tenuifolia* G.Forst.). Circumscription sensu Kramer (1990d) and Schwartsburd & Prado (2015, 2016). Mostly monophyletic (Wolf, 1995; Perrie et al., 2015), but a few species may need to be transferred to a different genus (Brownsey, 1983). Perhaps 80 species.

Leptolepia Mett. ex Prantl, *Arbeiten Königl. Bot. Gart. Breslau* 1: 23. 1892. Lectotype (designated by C.Chr., *Index Filic.* xxviii. 1906): *Leptolepia novae-zelandiae* (Colenso) Mett. ex Diels (\equiv *Davallia novae-zelandiae* Colenso). Circumscription sensu Kramer (1990d). Monotypic.

Microlepia C.Presl, *Tent. Pterid.*: 124, pl. 4, f. 21–23. 1836. Lectotype (designated by J.Sm., *Hist. Fil.*: 260. 1875): *Microlepia polypodioides* (Sw.) C.Presl (\equiv *Dicksonia polypodioides* Sw.). Circumscription sensu Kramer (1990d). Includes: *Scypholepia* J.Sm. Monophyletic; sister to the old world clade of *Dennstaedtia* (Perrie et al., 2015). About 60 species.

Monachosorum Kunze, *Bot. Zeitung* (Berlin) 6: 119. 1848. Type: *Monachosorum davallioides* Kunze. Circumscription sensu Kramer (1990m). Includes: *Ptilopteris* Hance; *Monachosorella* Hayata. Monophyletic (Perrie et al., 2015; Ebihara et al., 2016). About six species.

Oenotrichia Copel., *Univ. Calif. Publ. Bot.* 16: 82. 1929. Type: *Oenotrichia maxima* (E.Fourn.) Copel. (\equiv *Leucostegia maxima* E.Fourn.). Circumscription sensu Kramer (1990d). Monophyletic (Perrie et al., 2015). About two species.

Paesia A.St.-Hil., *Voy. Distr. Diam.* 1: 381. 1833. Type: *Paesia viscosa* A.St.-Hil. Circumscription sensu Kramer (1990d). Monophyletic (Perrie et al., 2015), although only two species were sampled. About 15 species.

Pteridium Gled. ex Scop., *Fl. Carniol.*: 169. 1760. Type: *Pteridium aquilinum* (L.) Kuhn (\equiv *Pteris aquilina* L.). Circumscription sensu Kramer (1990d), Der et al. (2009), and Thomson (2012). Includes: *Cincinalis* Gled.; *Eupteris* Newman; *Ornithopteris* (J. Agardh) J.Sm.; *Filix-foemina* Farwell. Monophyletic (Der et al., 2009; Zhou et al., 2014; Wolf et al., 2015). Species number uncertain; about 20 morphotypes have been recognized, but molecular evidence points to substantially fewer species. Four species.

Suborder **Aspleniineae** H.Schneid. & C.J.Rothf., this classification (see below). Circumscription equivalent to “eupolypods II” in Smith et al. (2006b). Monophyletic (Schuettpelz & Pryer, 2007; Rothfels et al., 2012a). 11 families, 72 genera, and an estimated 2775 species.

32. Family **Cystopteridaceae** Shmakov, *Turczaninowia* 4: 60. 2001. Circumscription sensu Rothfels et al. (2012b). Monophyletic (Rothfels et al., 2012a, 2013; Wei & Zhang, 2014). Three genera and an estimated 37 species.

Acystopteris Nakai, *Bot. Mag. (Tokyo)* 47: 180. 1933. Type: *Acystopteris japonica* (Luerss.) Nakai (\equiv *Cystopteris japonica* Luerss.). Circumscription

sensu Rothfels et al. (2012b). Monophyletic (Rothfels et al., 2012a, 2013). At least three species.

Cystopteris Bernh., *Neues J. Bot.* 1(2): 26. 1805. Lectotype (designated by J.Sm., *Hist. Fil.*: 236. 1875): *Cystopteris fragilis* (L.) Bernh. (\equiv *Polypodium fragile* L.). Circumscription sensu Rothfels et al. (2013) and Wei & Zhang (2014). Includes: *Cystoathyrium* Ching; *Rhizomatopteris* A.P.Khokhr. Monophyletic (Rothfels et al., 2012a, 2013; Wei & Zhang, 2014). At least 26 species.

Gymnocarpium Newman, *Phytologist* 4: 371. 1851. Lectotype (designated by Ching, *Contr. Biol. Lab. Sci. Soc. China, Bot. Ser.* 9: 38. 1933): *Gymnocarpium dryopteris* (L.) Newman (\equiv *Polypodium dryopteris* L.). Circumscription sensu Sarvela (1978) and Rothfels et al. (2013). Includes: *Currantia* Copel. Monophyletic (Rothfels et al., 2012a, 2013). At least eight species.

33. Family **Rhachidosoraceae** X.C.Zhang, *Phytotaxa* 19: 16. 2011. Circumscription sensu Christenhusz et al. (2011) and Rothfels et al. (2012b). Family consists of a single genus and an estimated eight species.

Rhachidosorus Ching, *Acta Phytotax. Sin.* 9(1): 73. 1964. Type: *Rhachidosorus mesosorus* (Makino) Ching (\equiv *Asplenium mesosorum* Makino). Circumscription sensu Lindsay et al. (2012). Likely monophyletic (Li et al., 2011; Rothfels et al., 2012a). Eight species.

34. Family **Diplaziopsidaceae** X.C.Zhang & Christenhusz, *Phytotaxa* 19: 15. 2011. Circumscription sensu Rothfels et al. (2012b). Likely monophyletic (Kuo et al., 2011; Rothfels et al., 2012a). Two genera and an estimated four species.

Diplaziopsis C.Chr., *Index Filic.* 227. 1905. Type: *Diplaziopsis brunoniana* (Wall.) W.M.Chu (\equiv *Allantodia brunoniana* Wall.). Circumscription sensu He & Kato (2013). Likely monophyletic (Li et al., 2011; Wei et al., 2010; Rothfels et al., 2012a). Three species.

Homalosorus Small ex Pic.Serm., *Webbia* 31(1): 246. 1977. Type: *Homalosorus pyncarpos* (Spreng.) Pic.Serm. (\equiv *Asplenium pyncarpos* Spreng.). Circumscription sensu Pichi Sermolli (1977a). Monotypic.

35. Family **Desmophlebiaceae** Mynssen, A.Vasco, Sylvestre, R.C.Moran & Rouhan, *Taxon* 65(1): 19. 2016. Circumscription sensu Mynssen et al. (2016). Family consists of a single genus and two species.

Desmophlebium Mynssen, A.Vasco, Sylvestre, R.C.Moran & Rouhan, *Taxon* 65(1): 27, f.5. 2016. Type: *Desmophlebium lechleri* (Mett.) Mynssen, A.Vasco, Sylvestre, R.C.Moran & Rouhan (\equiv *Asplenium*

- lechleri* Mett.). Circumscription sensu Mynssen et al. (2016). Only one species included in a phylogenetic analysis, but assumed to be monophyletic based on morphological evidence (Mynssen et al., 2016). Two species.
36. Family **Hemidictyaceae** Christenh. & H.Schneid., *Phytotaxa* 28: 51. 2011. Circumscription sensu Rothfels et al. (2012b) and Christenhusz & Schneider (2011). Family consists of a single monotypic genus.
- Hemidictyum** C.Presl, *Tent. Pterid.*: 110, t.3, f.24–26. 1836. Lectotype (designated by J.Sm., *Hist. Fil.*: 335. 1875): *Hemidictyum marginatum* (L.) C.Presl (≡ *Asplenium marginatum* L.). Circumscription sensu Kramer et al. (1990). Monotypic.
37. Family **Aspleniaceae** Newman, *Hist. Brit. Ferns*: 6. 1840. Circumscription sensu Smith et al. (2006b) and Rothfels et al. (2012b). Monophyletic (Schneider et al., 2004a; Schneider et al., 2005). Two genera and an estimated 730 species.
- Asplenium** L., *Sp. Pl.* 2: 1078. 1753. Lectotype (designated by J.Sm., *Hist. Fil.*: 316. 1875): *Asplenium marinum* L. Circumscription sensu Schneider et al. (2004a). Includes: *Antigramma* C.Presl; *Campptosorus* Link; *Ceterach* Willd.; *Ceterachopsis* (J.Sm.) Ching; *Diellia* Brack.; *Diplora* Baker; *Holodictyum* Maxon; *Loxoscapha* T.Moore; *Phyllitis* Hill; *Pleurosorus* Fée; *Schaffneria* Fée ex T.Moore; *Scolopendrium* Adans.; *Sinephropteris* Mickel. Monophyletic (Schneider et al., 2004a). At least 700 species.
- Hymenasplenium** Hayata, *Bot. Mag. (Tokyo)* 41 (492): 712. 1927. Type: *Hymenasplenium unilaterale* (Lam.) Hayata (≡ *Asplenium unilaterale* Lam.). Circumscription sensu Schneider et al. (2004a). Monophyletic (Schneider et al., 2004a). At least 30 species.
38. Family **Woodsiaceae** Herter, *Revista Sudamer. Bot.* 9: 14. 1949. Circumscription sensu Christenhusz et al. (2011) and Rothfels et al. (2012b). Family consists of a single genus and an estimated 39 species.
- Woodsia** R.Br., *Prodr.*: 158, Obs. 4. 1810. Lectotype (designated by J.Sm., *Hist. Fil.*: 237. 1875): *Woodsia ilvensis* (L.) R.Br. (≡ *Acrostichum ilvense* L.). Circumscription sensu Shao et al. (2015). Includes: *Eriosoriopsis* (Kitag.) Ching & S.H.Wu; *Cheilanthes* Hieron.; *Hymenocystis* C.A.Mey; *Physematium* Kaulf.; *Protowoodsia* Ching; *Woodsiopsis* Shmakov. Monophyletic (Rothfels et al., 2012a; Shao et al., 2015; Shmakov, 2015). 39 species.
39. Family **Onocleaceae** Pic.Serm., *Webbia* 24: 708. 1970. Circumscription sensu Smith et al. (2006b). Monophyletic (Gastony & Ungerer, 1997; Rothfels et al., 2012a). Four genera and an estimated five species.
- Matteuccia** Tod., *Giorn. Sci. Nat. Econ. Palermo* 1 (3–4): 235. 1866. Type: *Matteuccia struthiopteris* (L.) Tod. (≡ *Osmunda struthiopteris* L.). Circumscription sensu Gastony & Ungerer (1997) and Rothfels et al. (2012b). Monotypic, although American and European populations could be treated as distinct species (Koenemann et al., 2011).
- Onoclea** L., *Sp. Pl.* 2: 1062. 1753. Type: *Onoclea sensibilis* L. Circumscription sensu Gastony & Ungerer (1997) and Rothfels et al. (2012b). Includes: *Pterinodes* Siegesb. ex Kuntze; *Calypterium* Bernh.; *Ragiopteris* C.Presl; *Riedlea* Mirb. Monotypic (Gastony & Ungerer, 1997).
- Onocleopsis** F.Ballard, *Amer. Fern J.* 35: 1. 1945. Type: *Onocleopsis hintonii* F.Ballard. Circumscription sensu Gastony & Ungerer (1997) and Rothfels et al. (2012b). Monotypic.
- Pentarhizidium** Hayata, *Bot. Mag. (Tokyo)* 42: 345. 1928. Type: *Pentarhizidium japonicum* Hayata. Circumscription sensu Gastony & Ungerer (1997) and Rothfels et al. (2012b). Monophyletic (Gastony & Ungerer, 1997; Rothfels et al., 2012a). The name *Pentarhizidium* was first used in 1927, in the context of describing the morphological distinctiveness of the *P. orientale* stele (Hayata, 1927). However, the paper lacked a description of the genus itself and we consider *Pentarhizidium* and *P. orientale* as nomina nuda until the genus was formally described and a type (*P. japonicum*) was designated (Hayata, 1928). Two species.
40. Family **Blechnaceae** Newman, *Hist. Brit. Ferns* (ed. 2): 8. 1844. Circumscription sensu Smith et al. (2006b). Monophyletic (Schuettpelz & Pryer 2007; Rothfels et al., 2012a; Gasper et al., 2016a). Three subfamilies, 24 genera, and an estimated 265 species.
- Subfamily **Stenochlaenoideae** (Ching) J.P.Roux, *Concept. South. Afr. Pteridophyta*: 156. 2001. Circumscription sensu Roux (2001) emend. Gasper et al. (2016b). Monophyletic (Gasper et al., 2016a). Three genera and an estimated 12 species.
- Salpichlaena** J.Sm., *Gen. Fil. pl.* 93. 1842. Type: *Salpichlaena volubilis* (Kaulf.) J.Sm. (≡ *Blechnum volubile* Kaulf.). Circumscription sensu Perrie et al. (2014) and Gasper et al. (2016b). Monophyletic (Gasper et al., 2016a). Three species.
- Stenochlaena** J.Sm., *J. Bot. (Hooker)* 3: 401. 1841. Lectotype (designated by Pfeiffer, *Nom.* 2: 1274. 1874): *Stenochlaena palustris* (Burm.f.) Bedd. (≡ *Polypodium palustre* Burm.f.). Circumscription sensu Perrie et al. (2014) and Gasper et al. (2016b). Monophyletic (Gasper et al., 2016a). We follow Copeland (1947) in identifying the name *Acrostichum scandens* L. (referred to in both the

description of the genus and its lectotypification) with *Stenochlaena palustris* (Burm.f.) Bedd. Seven species.

Telmatoblechnum Perrie, D.J.Ohlsen & Brownsey, *Taxon* 63(4): 755. 2014. Type: *Telmatoblechnum serrulatum* (Rich.) Perrie, D.J.Ohlsen & Brownsey (≡ *Blechnum serrulatum* Rich.). Circumscription sensu Perrie et al. (2014) and Gasper et al. (2016b). Monophyletic (Perrie et al., 2014; Gasper et al., 2016a). Two species.

Subfamily **Woodwardioideae** Gasper, V.A.O.Dittrich & Salino, *Phytotaxa* 275(3): 197. 2016. Circumscription sensu Gasper et al. (2016b). Monophyletic (Cranfill & Kato, 2003; Perrie et al., 2014; Gasper et al., 2016a). Three genera and an estimated 15 species.

Anchistea C.Presl, *Epimel. Bot.*: 71. 1851. Type: *Anchistea virginica* (L.) C.Presl (≡ *Blechnum virginicum* L.). Circumscription sensu Gasper et al. (2016b). Monotypic (Gasper et al., 2016a).

Lorinseria C.Presl, *Epimel. Bot.*: 72. 1851. Lectotype (designated by J.Sm., *Hist. Fil.*: 310. 1875): *Lorinseria areolata* (L.) C.Presl (≡ *Acrostichum areolatum* L.). Circumscription sensu Gasper et al. (2016b). *Lorinseria* C.Presl appears to be a later homonym of *Lorinseria* Opiz, and will therefore most likely require a new name (or conservation). Monotypic (Gasper et al., 2016a).

Woodwardia Sm., *Mém. Acad. Roy. Sci. Turin* 5: 411. 1793. Lectotype (designated by J.Sm., *Hist. Fil.*: 310. 1875): *Woodwardia radicans* (L.) Sm. (≡ *Blechnum radicans* L.). Circumscription sensu Gasper et al. (2016b). Includes: *Chieniopteris* Ching. Monophyletic (Gasper et al., 2016a). 13 species.

Subfamily **Blechnoideae** Gasper, V.A.O.Dittrich & Salino, *Phytotaxa* 275(3): 201. 2016. Circumscription sensu Gasper et al. (2016b). Monophyletic (Gasper et al., 2016a). 18 genera and an estimated 238 species.

Austroblechnum Gasper & V.A.O.Dittrich, *Phytotaxa* 275(3): 202. 2016. Type: *Austroblechnum penna-marina* (Poir.) Gasper & V.A.O.Dittrich (≡ *Polypodium penna-marina* Poir.). Circumscription sensu Gasper et al. (2016b). Monophyletic (Gasper et al., 2016a). 40 species.

Blechnidium T.Moore, *Index Fil. clv.* 1860; *Brit. Ferns*: 210. 1860. Type: *Blechnidium melanopus* (Hook.) T.Moore (≡ *Blechnum melanopus* Hook.). Circumscription sensu Gasper et al. (2016b). Monotypic (Gasper et al., 2016a).

Blechnopsis C.Presl, *Epimel. Bot.*: 115. 1851. Lectotype (designated by Pic.Serm., *Webbia* 28: 456. 1973): *Blechnopsis orientalis* (L.) C.Presl (≡

Blechnum orientale L.). Circumscription sensu Gasper et al. (2016b). Monophyletic (Gasper et al., 2016a). Two species.

Blechnum L., *Sp. Pl.* 2: 1077. 1753. Lectotype (designated by J.Sm., *Hist. Fil.*: 300. 1875): *Blechnum occidentale* L. Circumscription sensu Gasper et al. (2016b). Monophyletic (Gasper et al., 2016a). 30 species.

Brainea J.Sm., *Cat. Kew Ferns*: 5. 1856. Type: *Brainea insignis* (Hook.) J.Sm. (≡ *Bowringia insignis* Hook.). Circumscription sensu Gasper et al. (2016b). Monotypic (Gasper et al., 2016a).

Cleistoblechnum Gasper & Salino, *Phytotaxa* 275(3): 207. 2016. Type: *Cleistoblechnum eburneum* (Christ) Gasper & Salino (≡ *Blechnum eburneum* Christ). Circumscription sensu Gasper et al. (2016b). Monotypic (Gasper et al., 2016a).

Cranfillia Gasper & V.A.O.Dittrich, *Phytotaxa* 275(3): 207. 2016. Type: *Cranfillia fluviatilis* (R.Br.) Gasper & V.A.O.Dittrich (≡ *Stegania fluviatilis* R.Br.). Circumscription sensu Gasper et al. (2016b). Monophyletic (Gasper et al., 2016a). 11 species.

Diploblechnum Hayata, *Bot. Mag. (Tokyo)* 41: 702. 1927. Type: *Diploblechnum integripinnulum* Hayata. Circumscription sensu Gasper et al. (2016b). Includes: *Pteridoblechnum* Hennipman and *Steenioblechnum* Hennipman. Monophyletic (Gasper et al., 2016a). Six species.

Doodia R.Br., *Prodr. Fl. Nov. Holl.*: 151. 1810. Lectotype (designated by J.Sm., *Hist. Fil.*: 309. 1875): *Doodia aspera* R.Br. Circumscription sensu Gasper et al. (2016b). Monophyletic (Gasper et al., 2016a). 19 species.

Icarus Gasper & Salino, *Phytotaxa* 275(3): 209. 2016. Type: *Icarus filiformis* (A.Cunn.) Gasper & Salino (≡ *Lomaria filiformis* A.Cunn.). Circumscription sensu Gasper et al. (2016b). Monotypic (Gasper et al., 2016a).

Lomaria Willd., *Mag. Neuesten Entdeck. Gesammten Naturk. Ges. Naturf. Freunde Berlin* 3: 160. 1809. Lectotype (designated by J.Sm., *Hist. Fil.*: 303. 1875): *Lomaria nuda* (Labill.) Willd. (≡ *Onoclea nuda* Labill.). Circumscription sensu Gasper et al. (2016b). Includes: *Stegania* R.Br. Monophyletic (Gasper et al., 2016a). Six species.

Lomaridium C.Presl, *Epimel. Bot.*: 154. 1851. Lectotype (designated by C.Chr., *Index Filic.* xxxv. 1906): *Lomaridium plumieri* (Desv.) C.Presl (≡ *Lomaria plumieri* Desv.). Circumscription sensu Gasper et al. (2016b). Monophyletic (Gasper et al., 2016a). 16 species.

Lomariocycas (J.Sm.) Gasper & A.R.Sm., *Phytotaxa* 275(3): 212. 2016. Type: *Lomaria boryana* (Sw.) Willd. (\equiv *Onoclea boryana* Sw.). Circumscription sensu Gasper et al. (2016b). Monophyletic (Gasper et al., 2016a). 19 species.

Neoblechnum Gasper & V.A.O.Dittrich, *Phytotaxa* 275(3): 214. 2016. Type: *Neoblechnum brasiliense* (Desv.) Gasper & V.A.O.Dittrich (\equiv *Blechnum brasiliense* Desv.). Circumscription sensu Gasper et al. (2016b). Monotypic (Gasper et al., 2016a).

Oceaniopteris Gasper & Salino, *Phytotaxa* 275(3): 214. 2016. Type: *Oceaniopteris gibba* (Labill.) Gasper & Salino (\equiv *Lomaria gibba* Labill.). Circumscription sensu Gasper et al. (2016b). Monophyletic (Gasper et al., 2016a). Eight species.

Parablechnum C.Presl, *Epimel. Bot.*: 109. 1851. Lectotype (designated by Fée, *Mém. Foug.*, 5. Gen. Filic.: 82. 1852): *Parablechnum procerum* (G. Forst.) C.Presl (\equiv *Osmunda procera* G.Forst.). Circumscription sensu Gasper et al. (2016b). Monophyletic (Gasper et al., 2016a). 65 species.

Sadleria Kaulf., *Enum. Filic.*: 161. 1824. Type: *Sadleria cyatheoides* Kaulf. Circumscription sensu Perrie et al. (2014) and Gasper et al. (2016b). Monophyletic (Gasper et al., 2016a). Six species.

Struthiopteris Scop., *Fl. Carn.*: 168. 1760. Lectotype (designated by Weis, *Pl. Crypt. Fl. Gott.*: 286. 1770): *Struthiopteris spicant* (L.) Weis (\equiv *Lomaria spicant* L.). Circumscription sensu Gasper et al. (2016b). Includes: *Spicantopsis* Nakai. Monophyletic (Gasper et al., 2016a). Five species.

41. Family **Athyriaceae** Alston, *Taxon* 5: 25. 1956. Circumscription sensu Rothfels et al. (2012b). Monophyletic (Rothfels et al., 2012a). Three genera and an estimated 650 species.

Athyrium Roth, *Tent. Fl. Germ.* 3(1): 31. 1800. Lectotype (designated by J.Sm., *Hist. Fil.*: 327. 1875): *Athyrium filix-femina* (L.) Roth (\equiv *Polypodium filix-femina* L.). Circumscription equivalent to “athyriids” in Rothfels et al. (2012b). Includes: *Anisocampium* C.Presl; *Kuniwatsukia* Pic.Serm.; *Pseudocystopteris* Ching; *Neoathyrium* Ching & Z.R.Wang; \times *Cornoathyrium* Nakaike; *Cornopteris* Nakai. Monophyletic (Adjie et al., 2008; Rothfels et al., 2012a). About 230 species.

Deparia Hook. & Grev., *Icon. Filic.* 2(8): pl.154. 1830. Type: *Deparia macraei* Hook. & Grev. Circumscription sensu Kuo et al. (2016b). Includes: \times *Depazium* Nakaike; *Lunathyrium* Koidz.; *Dryoathyrium* Ching; *Parathyrium* Holttum; *Athyriopsis* Ching; *Dictyodroma* Ching; *Triblemma* (J.Sm.) Ching. Monophyletic (Kuo et al., 2016b). About 70 species.

Diplazium Sw., *J. Bot. (Schrader)* 1800(2): 4, 61. 1801. Lectotype (designated by J.Sm., *Hist. Fil.*: 325. 1875): *Diplazium plantaginifolium* (L.) Urb. (\equiv *Asplenium plantaginifolium* L.). Circumscription sensu Wei et al. (2013). Includes: *Allantodia* R.Br.; *Anisogonium* C.Presl; *Callipteris* Bory; *Monomelanium* Hayata. Monophyletic (Wei et al., 2013, 2015). About 350 species.

42. Family **Thelypteridaceae** Ching ex Pic.Serm., *Webbia* 24: 709. 1970. Circumscription sensu Smith & Cranfill (2002), He & Zhang (2012), and Almeida et al. (2016). Monophyletic (Smith & Cranfill, 2002; Rothfels et al., 2012a; Almeida et al., 2016). Two subfamilies, 30 genera, and an estimated 1034 species.

Subfamily **Phegopteridoideae** Salino, A.R.Sm. & T.E.Almeida, this classification (see below). Circumscription sensu Smith & Cranfill (2002), He & Zhang (2012), and Almeida et al. (2016). Monophyletic (Smith & Cranfill, 2002; He & Zhang, 2012; Rothfels et al., 2012a; Almeida et al., 2016). Three genera and an estimated 34 species.

Macrothelypteris (H.Ito) Ching, *Acta Phytotax. Sin.* 8(4): 308. 1963. Type: *Macrothelypteris oligophlebia* (Baker) Ching (\equiv *Nephrodium oligophlebium* Baker). Circumscription sensu Almeida et al. (2016). Monophyletic (Smith & Cranfill, 2002; He & Zhang, 2012; Almeida et al., 2016). 10 species.

Phegopteris (C.Presl) Fée, *Mém. Foug.*, 5. Gen. Filic.: 242. 1852. Lectotype (designated by Ching, *Acta Phytotax. Sin.* 8(4): 312. 1963): *Phegopteris polypodioides* Fée (\equiv *Polypodium phegopteris* L.). Circumscription sensu Almeida et al. (2016). Monophyletic (Smith & Cranfill, 2002; He & Zhang, 2012; Almeida et al., 2016). For discussion of the authority and typification, see McNeill and Pryer (1985). Four species.

Pseudophegopteris Ching, *Acta Phytotax. Sin.* 8(4): 313. 1963. Type: *Pseudophegopteris pyrhorachis* (Kunze) Ching (\equiv *Polypodium pyrhorachis* Kunze). Circumscription sensu Almeida et al. (2016). Monophyletic (Smith & Cranfill, 2002; He & Zhang, 2012; Almeida et al., 2016). 20 species.

Subfamily **Thelypteridoideae** C.F.Reed, *Phytologia* 17: 254. 1968. Circumscription sensu Smith & Cranfill (2002), He & Zhang (2012), and Almeida et al. (2016). Monophyletic (Smith & Cranfill, 2002; He & Zhang, 2012; Almeida et al., 2016). 27 genera and an estimated 1000 species.

Amauropelta Kunze, *Farnkräuter* 1: 86. 1843. Type: *Amauropelta breutelii* Kunze. Circumscription sensu Almeida et al. (2016). Monophyletic (Smith & Cranfill, 2002; Almeida et al., 2016). About 215 species.

Amblovenatum J.P.Roux, *Strelitzia* 23: 200. 2009. Replacement name for *Amphineuron* Holttum non *Amphineurion* (A.DC.) Pichon. Type: *Amblovenatum opulentum* (Kaulf.) J.P.Roux (\equiv *Aspidium opulentum* Kaulf.). Circumscription sensu Almeida et al. (2016). Monophyletic (He & Zhang, 2012; Almeida et al., 2016). 12 species.

Ampelopteris Kunze, *Bot. Zeitung (Berlin)* 6: 114. 1848. Type: *Ampelopteris elegans* Kunze. Circumscription sensu Almeida et al. (2016). Monotypic (He & Zhang, 2012; Almeida et al., 2016).

Chingia Holttum, *Blumea* 19(1): 31. 1971. Type: *Chingia ferox* (Blume) Holttum (\equiv *Aspidium ferox* Blume). Circumscription sensu Almeida et al. (2016). Monophyletic (Smith & Cranfill, 2002; He & Zhang, 2012; Almeida et al., 2016). 20 species.

Christella H.Lév., *Fl. Kouy-Tchéou* 472. 1915. Lectotype (designated by Holttum, *Taxon* 20: 534. 1971): *Christella parasitica* (L.) H.Lév. (\equiv *Polypodium parasiticum* L.). Circumscription sensu Almeida et al. (2016). Not monophyletic as circumscribed (Almeida et al., 2016). Perhaps 70 species.

Coryphopteris Holttum, *Blumea* 19(1): 33. 1971. Type: *Coryphopteris viscosa* (Baker) Holttum (\equiv *Nephrodium viscosum* Baker). Circumscription sensu Almeida et al. (2016). Includes: *Parathelypteris* Ching (pro parte). Monophyletic (Smith & Cranfill, 2002; Almeida et al., 2016). 47 species.

Cyclogramma Tagawa, *Acta Phytotax. Geobot.* 7(1): 52. 1938. Type: *Cyclogramma simulans* (Ching) Tagawa (\equiv *Thelypteris simulans* Ching). Circumscription sensu Almeida et al. (2016). Presumably monophyletic (He & Zhang, 2012; Almeida et al., 2016). Eight species.

Cyclosorus Link, *Hort. Berol.* 2: 128. 1833. Type: *Cyclosorus gongyloides* (Schkuhr) Link (\equiv *Aspidium gongyloides* Schkuhr). Circumscription sensu Almeida et al. (2016). Monophyletic (Almeida et al., 2016). Two species.

Glaphyopteridopsis Ching, *Acta Phytotax. Sin.* 8(4): 320. 1963. Type: *Glaphyopteridopsis erubescens* (Wall. ex Hook.) Ching (\equiv *Polypodium erubescens* Wall. ex Hook.). Circumscription sensu Holttum (1971). Presumably monophyletic (Almeida et al., 2016). Four species.

Goniopteris C.Presl, *Tent. Pterid.*: 181, pl.7, f.9–11. 1836. Lectotype (designated by J.Sm., *Hist. Fil.*: 191. 1875): *Goniopteris crenata* (Sw.) C.Presl (\equiv *Polypodium crenatum* Sw.). Circumscription sensu Almeida et al. (2016). Monophyletic (Smith & Cranfill, 2002; He & Zhang, 2012; Almeida et al., 2016). About 120 species.

Meniscium Schreb., *Gen. Pl. ed. 8(a)* 2: 757. 1791. Type: *Meniscium reticulatum* (L.) Sw. (\equiv *Polypodium reticulatum* L.). Circumscription sensu Almeida et al. (2016). Monophyletic (Smith & Cranfill, 2002; He & Zhang, 2012; Almeida et al., 2016). 27 species.

Menisorus Alston, *Bol. Soc. Brot., sér. 2.* 30: 20. 1956. Type: *Menisorus pauciflorus* (Hook.) Alston (\equiv *Meniscium pauciflorum* Hook.). Circumscription sensu Holttum (1974a). Not yet included in a phylogenetic study. Monotypic.

Mesophlebion Holttum, *Blumea* 19(1): 29. 1971. Type: *Mesophlebion crassifolium* (Blume) Holttum (\equiv *Aspidium crassifolium* Blume). Circumscription sensu Holttum (1975). Monophyly uncertain (only one species sampled; Almeida et al., 2016). 15 species.

Mesopteris Ching, *Acta Phytotax. Sin.* 16(4): 21. 1978. Type: *Mesopteris tonkinensis* (C.Chr.) Ching (\equiv *Dryopteris tonkinensis* C.Chr.). Circumscription sensu Lin et al. (2013). Monotypic.

Metathelypteris (H.Ito) Ching, *Acta Phytotax. Sin.* 8(4): 305. 1963. Type: *Metathelypteris gracilescens* (Blume) Ching (\equiv *Aspidium gracilescens* Blume). Circumscription sensu Almeida et al. (2016). Monophyletic (Smith & Cranfill, 2002; He & Zhang, 2012; Almeida et al., 2016). 12 species.

Nannothelypteris Holttum, *Blumea* 19(1): 38. 1971. Type: *Nannothelypteris aoristora* (Harr.) Holttum (\equiv *Polypodium aoristorum* Harr.). Circumscription sensu Holttum (1971). Monophyly uncertain (only one species sampled; Almeida et al., 2016). Three species.

Oreopteris Holub, *Folia Geobot. Phytotax.* 4(1): 46. 1969. Type: *Oreopteris limbosperma* (All.) Holub (\equiv *Polypodium limbospermum* All.). Circumscription sensu Almeida et al. (2016). Monophyletic (Smith & Cranfill, 2002; He & Zhang, 2012; Almeida et al., 2016). Three species.

Parathelypteris (H.Ito) Ching, *Acta Phytotax. Sin.* 8: 300. 1963. Type: *Parathelypteris glanduligera* (Kunze) Ching (\equiv *Aspidium glanduligerum* Kunze). Circumscription sensu Holttum (1971). Not monophyletic as currently circumscribed (Almeida et al., 2016). About 15 species.

Plesioneuron (Holttum) Holttum, *Blumea* 22: 232. 1975. Type: *Plesioneuron tuberculatum* (Ces.) Holttum (\equiv *Nephrodium tuberculatum* Ces.). Circumscription sensu Holttum (1975). Monophyly uncertain (only one species sampled; Almeida et al., 2016). 30 species.

Pneumatopteris Nakai, Bot. Mag. (Tokyo) 47: 179. 1933. Type: *Pneumatopteris callosa* (Blume) Nakai (≡ *Aspidium callosum* Blume). Circumscription sensu Holttum (1971). Monophyly uncertain (only two species sampled; He & Zhang, 2012; Almeida et al., 2016). About 80 species.

Pronephrium C.Presl, Epimel. Bot.: 258. 1851. Lectotype (designated by Holttum, Novit. Bot. 1968: 48): *Pronephrium lineatum* (Blume) C.Presl (≡ *Aspidium lineatum* Blume). Circumscription sensu Holttum (1971). Includes: *Abacopteris* Fée; *Dimorphopteris* Tagawa & K.Iwats. Not monophyletic as circumscribed (Almeida et al., 2016). 68 species.

Pseudocyclosorus Ching, Acta Phytotax. Sin. 8(4): 322. 1963. Type: *Pseudocyclosorus tylodes* (Kunze) Ching (≡ *Aspidium tylodes* Kunze). Circumscription sensu Holttum & Grimes (1980). Not monophyletic as circumscribed (Almeida et al., 2016). 11 species.

Sphaerostephanos J.Sm., Gen. Fil. (Hooker): pl.24. 1840. Type: *Sphaerostephanos asplenioides* J.Sm. Circumscription sensu Holttum (1971). Not monophyletic as circumscribed (Almeida et al., 2016). About 185 species.

Stegnogramma Blume, Enum. Pl. Javae 2: 172. 1828. Type: *Stegnogramma aspidioides* Blume. Circumscription sensu Almeida et al. (2016). Includes: *Dictyocline* T.Moore; *Leptogramma* J. Sm. Monophyletic (Smith & Cranfill, 2002; He & Zhang, 2012; Almeida et al., 2016). 18 species.

Steiropteris (C.Chr.) Pic.Serm., Webbia 28: 449. 1973. Lectotype (designated by C.Chr., Kongel. Danske Vidensk. Selsk. Skr., Naturvidensk. Math. Afd., ser. 7, 1913: 164): *Steiropteris deltoidea* (Sw.) Pic.Serm. (≡ *Polypodium deltoideum* Sw.). Circumscription sensu Almeida et al. (2016). Includes: *Glaphyopteris* Fée. Monophyletic (Smith & Cranfill, 2002; He & Zhang, 2012; Almeida et al., 2016). 22 species.

Thelypteris Schmidel, Icon. Pl. 3: 45–48, pl.11, 13. 1763. Type: *Thelypteris palustris* Schott (≡ *Acrostichum thelypteris* L.). Circumscription sensu Almeida et al. (2016). Monophyletic (Smith & Cranfill, 2002; He & Zhang, 2012; Almeida et al., 2016). Two species.

Trigonospora Holttum, Blumea 19(1): 29. 1971. Type: *Trigonospora ciliata* (Benth.) Holttum (≡ *Aspidium ciliatum* Benth.). Circumscription sensu Holttum & Grimes (1980). Monophyly uncertain (only one species sampled; Almeida et al., 2016). Eight species.

Suborder **Polyodiineae** Dumort., Anal. Fam. Pl.: 67. 1829. Circumscription equivalent to “eupolypods I” in Smith et al. (2006b). Monophyletic (Schuettpeitz & Pryer, 2007; Rothfels et al., 2015). Nine families, 108 genera, and an estimated 4208 species.

43. Family **Didymochlaenaceae** Ching ex Li Bing Zhang & Liang Zhang, Taxon 64(1): 34. 2015. Circumscription sensu Zhang & Zhang (2015). Family consists of a single monotypic genus.

Didymochlaena Desv., Mag. Neuesten Entdeck. Gesammten Naturk. Ges. Naturf. Freunde Berlin 5: 303. 1811. Type: *Didymochlaena sinuosa* Desv. Circumscription sensu Zhang & Zhang (2015). Monotypic, although undescribed species may exist.

44. Family **Hypodematiaceae** Ching, Acta Phytotax. Sin. 13(1): 96. 1975. Circumscription sensu Zhang & Zhang (2015). Monophyletic (Zhang & Zhang, 2015). Two genera and an estimated 22 species.

Hypodematium Kunze, Flora 16(2): 690. 1833. Type: *Hypodematium onustum* Kunze. Circumscription sensu Kramer et al. (1990). Monophyletic (Zhang & Zhang, 2015). About 20 species.

Leucostegia C.Presl, Tent. Pterid.: 94, pl.4, f.11. 1836. Type: *Leucostegia immersa* C.Presl. Circumscription sensu Kramer (1990c). Monophyletic (Zhang & Zhang, 2015). Two species.

45. Family **Dryopteridaceae** Herter, Revista Sudamer. Bot. 9(1): 15. 1949. Circumscription sensu Liu et al. (2016). Monophyletic (Liu et al., 2016). Three subfamilies, 26 genera, and an estimated 2115 species.

Subfamily **Polybotryoideae** H.M.Liu & X.C.Zhang, Pl. Syst. Evol. 302: 330. 2016. Circumscription sensu Liu et al. (2016). Monophyletic (Moran & Labiak, 2015; Liu et al., 2016). Seven genera and an estimated 98 species.

Cyclodium C.Presl, Tent. Pterid.: 85, pl.2, f.20–21. 1836. Lectotype (designated by C.Chr., Index Filic. xxv. 1906): *Cyclodium meniscioides* (Willd.) C.Presl (≡ *Aspidium meniscioides* Willd.). Circumscription sensu Smith (1986) and Moran & Labiak (2015). Monophyletic (Moran & Labiak, 2015). About 10 species.

Maxonia C.Chr., Smithsonian Misc. Collect. 66(9): 3. 1916. Type: *Maxonia apiifolia* (Sw.) C.Chr. (≡ *Dicksonia apiifolia* Sw.). Circumscription sensu Christensen (1916) and Moran & Labiak (2015). Monotypic (Prado & Moran, 2016).

Olfersia Raddi, Opusc. Sci. 3: 283, t.11, f.b. 1819. Type: *Olfersia corcovadensis* Kaulf. ex Raddi. Circumscription sensu Moran (1986) and Moran

& Labiak (2015). Monophyletic (Moran & Labiak, 2015). Three species.

Polybotrya Humb. & Bonpl. ex Willd., Sp. Pl. 5(1): 99. 1810. Type: *Polybotrya osmundacea* Humb. & Bonpl. ex Willd. Circumscription sensu Moran (1987) and Moran & Labiak (2015). Monophyletic (Moran & Labiak, 2015). 35 species.

Polystichopsis (J.Sm.) C.Chr., Verdoorn, Man. Pterid.: 543. 1938. Lectotype (designated by C. Chr., Index Filic. Suppl. 3, 7. 1934): *Polystichopsis pubescens* (L.) C.V.Morton (\equiv *Polypodium pubescens* L.). Circumscription sensu Moran & Labiak (2015) and Prado & Moran (2016). Monophyletic (Moran & Labiak, 2015). Eight species.

Stigmatopteris C.Chr., Bot. Tidsskr. 29: 292. 1909. Type: *Stigmatopteris rotundata* (Willd.) C.Chr. (\equiv *Aspidium rotundatum* Willd.). Circumscription sensu Moran (1991) and Moran & Labiak (2015, 2016). Monophyletic (Moran & Labiak, 2016). 40 species.

Trichoneuron Ching, Acta Phytotax. Sin. 10(2): 118, pl. 22. 1965. Type: *Trichoneuron microlepioides* Ching. Circumscription sensu Liu et al. (2016). Monotypic (Liu et al., 2016).

Subfamily **Elaphoglossoideae** (Pic.Serm.) Crabbe, Jerm. & Mickel, Fern Gaz. 11: 154. 1975. Circumscription sensu Zhang et al. (2013b) and Liu et al. (2016). Monophyletic (Liu et al., 2016). 11 genera and an estimated 883 species.

Arthrobotrya J.Sm., Hist. Fil.: 141. 1875. Type: *Arthrobotrya articulata* (Fée) J.Sm. (\equiv *Polybotrya articulata* Fée). Circumscription sensu Moran et al. (2010a). Monophyletic (Labiak et al., 2014). Two species.

Bolbitis Schott, Gen. Fil.: pl.14. 1834. Lectotype (designated by C.Chr., Index Filic. xxvi. 1906): *Bolbitis serratifolia* (Mert. ex Kaulf.) Schott (\equiv *Acrostichum serratifolium* Mert. ex Kaulf.). Circumscription sensu Moran et al. (2010a). Includes: *Campium* C.Presl; *Cyrtogonium* J.Sm.; *Edanyoa* Copel.; *Egenolfia* Schott; *Heteroneuron* Fée; *Jenkinsia* Hook.; *Poecilopteris* C.Presl. Monophyletic (Moran et al., 2010a, 2010b). About 80 species.

Elaphoglossum Schott ex J.Sm., J. Bot. (Hooker) 4: 148. 1842. Lectotype (designated by J.Sm., Hist. Fil.: 125. 1875): *Elaphoglossum conforme* (Sw.) J.Sm. (\equiv *Acrostichum conforme* Sw.). Circumscription sensu Moran et al. (2010a). Includes: *Aconiopteris* C.Presl; *Dictyoglossum* Sm.; *Hymenodium* Fée; *Microstaphyla* C.Presl; *Peltapteris* Link; *Rhipidopteris* Schott ex Fée. Monophyletic (Rouhan et al., 2004; Lóriga et al., 2014). About 600 species.

Lastreopsis Ching, Bull. Fan Mem. Inst. Biol. Bot. 8 (4): 157. 1938. Type: *Lastreopsis recedens* (J.Sm. ex T.Moore) Ching (\equiv *Lastrea recedens* J.Sm. ex T. Moore). Circumscription sensu Tindale (1965) and Labiak et al. (2014, 2015b). Includes: *Coveniella* Tindale. See also Labiak et al. (2015b). Monophyletic (Labiak et al., 2014). 16 species.

Lomagramma J.Sm., J. Bot. (Hooker) 3: 402. 1841. Type: *Lomagramma pteroides* J.Sm. Circumscription sensu Moran et al. (2010a). Includes: *Cheilo-lepton* Fée. Monophyletic (Moran et al., 2010a). 15 species.

Megalastrum Holttum, Gard. Bull. Singapore 39(2): 161. 1986. Type: *Megalastrum villosum* (L.) Holttum (\equiv *Polypodium villosum* L.). Circumscription sensu Holttum (1986) and Liu et al. (2016). Monophyletic (Labiak et al., 2014). 91 species.

Mickelia R.C.Moran, Labiak & Sundue, Brittonia 62 (4): 338. 2010. Type: *Mickelia nicotianifolia* (Sw.) R.C.Moran, Labiak & Sundue (\equiv *Acrostichum nicotianifolium* Sw.). Circumscription sensu Moran et al. (2010a, 2010b). Monophyletic (Moran et al., 2010b). 10 species.

Parapolystichum (Keyserl.) Ching, Sunyatsenia 5: 239. 1940. Type: *Parapolystichum effusum* (Sw.) Ching (\equiv *Polypodium effusum* Sw.). Circumscription sensu Labiak et al. (2014, 2015b). Monophyletic (Labiak et al., 2014). See also Labiak et al. (2015b) and Sundue & Testo (2016). 28 species.

Pleocnemia C.Presl, Tent. Pterid.: 183, pl.7, f.12. 1836. Type: *Pleocnemia leuzeana* (Gaudich.) C.Presl (\equiv *Polypodium leuzeanum* Gaudich.). Circumscription sensu Holttum (1974b) and Liu et al. (2016). Monophyletic (Labiak et al., 2014). 20 species.

Rumohra Raddi, Opusc. Sci. 3: 290. 1819. Type: *Rumohra aspidioides* Raddi (\equiv *Polypodium adiantiforme* G.Forst.). Circumscription sensu Rakoton-drainibe (2010), Sundue et al. (2013), and Labiak et al. (2014). Monophyletic (Labiak et al., 2014). Eight species.

Teratophyllum Mett. ex Kuhn, Ann Mus. Bot. Lugduno-Batavi 4(10): 296. 1869. Lectotype (designated by Holttum, Gard. Bull. Straits Settlement. 5: 277. 1932): *Teratophyllum aculeatum* (Blume) Mett. ex Kuhn (\equiv *Lomaria aculeata* Blume). Circumscription sensu Moran et al. (2010a). Monophyletic (Moran et al., 2010a). 13 species.

Subfamily **Dryopteridoideae** Link, Fil. Spec.: 116. 1841 (Dryopterideae). Circumscription sensu Liu et al. (2016). Monophyletic (Liu et al., 2016). Six genera and an estimated 1128 species.

Arachniodes Blume, Enum. Pl. Javae 2: 241. 1828. Type: *Arachniodes aspidioides* Blume. Circumscription sensu He et al. (2013) and Liu et al. (2016). Includes: *Byrsopteris* C.V.Morton; *Leptorumohra* (H.Ito) H.Ito; *Lithostegia* Ching; *Phanerophlebiopsis* Ching. Assumed to be monophyletic (Liu et al., 2016). 60 species.

Ctenitis (C.Chr.) C.Chr., Man. Pteridol.: 544. 1938. Lectotype (designated by Ching, Bull. Fan Mem. Inst. Biol. Bot. 8(5): 275. 1938): *Ctenitis distans* (Brack.) Ching (\equiv *Lastrea distans* Brack.). Circumscription sensu Wang et al. (2014), Liu et al. (2016), and Duan et al. (2017). Includes: *Ataxipteris* Holttum; *Pseudotectaria* Tardieu. Monophyletic (Wang et al., 2014; Hennequin et al., pers. comm.). About 125 species.

Cyrtomium C.Presl, Tent. Pterid.: 86, pl.2, f.26. 1836. Lectotype (designated by J.Sm., Hist. Fil.: 204. 1875): *Cyrtomium falcatum* (L.f.) C.Presl (\equiv *Polypodium falcatum* L.f.). Circumscription sensu Lu et al. (2007), Zhang et al. (2013b), and Liu et al. (2016). Assumed to be monophyletic (Lu et al., 2007). 35 species.

Dryopteris Adans., Fam. Pl. 2: 20. 1763. Type: *Dryopteris filix-mas* (L.) Schott (\equiv *Polypodium filix-mas* L.). Circumscription sensu Zhang & Zhang (2012), Zhang et al. (2012), and Zhang et al. (2013b). Includes: *Acrophorus* C.Presl; *Acrorumohra* (H.Ito) H.Ito; *Adenoderris* J.Sm., in part; *Arthrobotrys* (C.Presl) Lindl.; *Dicalpe* Blume; *Dichasium* (A.Braun) Fée; *Diclisodon* T. Moore; *Dryopsis* Holttum & P.J.Edwards; *Filix Ség.*; *Lophodium* Newman; *Nephrodium* Marthe ex Michx.; *Nothoperanema* (Tagawa) Ching; *Peranema* D.Don; *Pycnopteris* T.Moore; *Revwattisia* D.L.Jones; *Stenolepia* Alderw. Monophyletic (Zhang et al., 2012; Sessa et al., 2012; Zhang & Zhang, 2012; McKeown et al., 2012; Kuo et al., 2016a). About 400 species.

Phanerophlebia C.Presl, Tent. Pterid.: 84, pl.2, f.19. 1836. Type: *Phanerophlebia nobilis* (Schltdl. & Cham.) C.Presl (\equiv *Aspidium nobile* Schltdl. & Cham.). Circumscription sensu Yatskievych et al. (1988) and Liu et al. (2016). Includes: *Ambliia* C. Presl. Monophyletic (Yatskievych et al., 1988). Eight species.

Polystichum Roth, Tent. Fl. Germ. 3(1): 31, 69–70. 1800. Lectotype (designated by J.Sm., Hist. Fil.: 217. 1875): *Polystichum aculeatum* (L.) Roth (\equiv *Polypodium aculeatum* L.). Circumscription sensu Zhang et al. (2013b) and Le Péchon et al. (2016). Includes: *Acropelta* T.Nakai; *Adenoderris* J.Sm., in part; *Cyrtogonellum* Ching; *Cyrtomidictyum* Ching; *Hemesteum* H.Lév.; *Hypopeltis* Michx.; *Papuapteris* C.Chr.; *Plecosorus* Fée;

Ptilopteris Hance; *Sorolepidium* Christ. Monophyletic (Le Péchon et al., 2016). About 500 species.

Subfamily placement uncertain.

Aenigmopteris Holttum, Blumea 30: 3. 1984. Type: *Aenigmopteris dubia* (Copel.) Holttum (\equiv *Dryopteris dubia* Copel.). Circumscription sensu Kramer et al. (1990). No molecular data available. Five species.

Dryopolystichum Copel., Ann. Cryptog. Phytopathol. 5 [Gen. Fil.]: 125. 1947. Type: *Dryopolystichum phaeostigma* (Ces.) Copel. (\equiv *Aspidium phaeostigma* Ces.). Circumscription sensu Christenhusz et al. (2011). Monotypic (Christenhusz et al., 2011).

46. Family **Nephrolepidaceae** Pic.Serm., Webbia 29(1): 8–11. 1975. Circumscription sensu Hovenkamp & Miyamoto (2012). Family consists of a single genus and an estimated 19 species.

Nephrolepis Schott, Gen. Fil.: 1, pl.3. 1834. Lectotype (designated by J.Sm., Hist. Fil. 226. 1875): *Nephrolepis exaltata* (L.) Schott (\equiv *Polypodium exaltatum* L.). Circumscription sensu Hennequin et al. (2010). Monophyletic (Hennequin et al., 2010; Zhang et al., 2016). 19 species.

47. Family **Lomariopsidaceae** Alston, Taxon 5(2): 25. 1956. Circumscription sensu Christenhusz et al. (2013). Monophyletic (Christenhusz et al., 2013; Zhang et al., 2016). Four genera and an estimated 69 species.

Cyclopeltis J.Sm., Bot. Mag. 72: 36. 1846. Type: *Cyclopeltis semicordata* (Sw.) J.Sm. (\equiv *Polypodium semicordatum* Sw.). Circumscription sensu Kramer et al. (1990). Monophyletic (Zhang & Zhang, 2015). Six species.

Dracoglossum Christenh., Thaiszia 17(1–2): 3–5. 2007. Type: *Dracoglossum plantagineum* (Jacq.) Christenh. (\equiv *Polypodium plantagineum* Jacq.). Circumscription sensu Christenhusz (2007). Monophyletic (Zhang et al., 2016). Two species.

Lomariopsis Fée, Mém. Foug., 2. Hist. Acrostich.: 10. 1845. Lectotype (designated by J.Sm., Hist. Fil.: 140. 1875): *Lomariopsis sorbifolia* (L.) Fée (\equiv *Acrostichum sorbifolium* L.). Circumscription sensu Rouhan et al. (2007) and Moran (2000). Monophyletic (Rouhan et al., 2007; Li et al., 2009). About 60 species.

Thysanosoria A.Gepp, Fl. Arfak Mts. (Gibbs): 193–194, pl.4. 1917. Type: *Thysanosoria dimorphophylla* A.Gepp. Circumscription sensu Kramer (1990h). Genus has yet to be included in a phylogenetic analysis. Monotypic.

48. Family **Tectariaceae** Panigrahi, J. Orissa Bot. Soc. 8: 41. 1986. Circumscription sensu Zhang et al. (2016). Monophyletic (Zhang et al., 2016). Seven genera and an estimated 250 species.

Arthropteris J.Sm. ex Hook.f., Fl. Nov.-Zel. 2: 43. 1855. Type: *Arthropteris tenella* (G.Forst.) J.Sm. ex Hook.f. (≡ *Polypodium tenellum* G.Forst.). Circumscription sensu Liu et al. (2013). Includes: *Psammiosorus* C.Chr. Monophyletic (Liu et al., 2013; Zhang et al., 2016). About 15 species.

Draconopteris Li Bing Zhang & Liang Zhang, Taxon 65(4): 732, f.1a–b, f.3a–d. 2016. Type: *Draconopteris draconoptera* (D.C.Eaton) Li Bing Zhang & Liang Zhang (≡ *Aspidium draconopterum* D.C.Eaton). Circumscription sensu Zhang et al. (2016). Monotypic.

Hypoderris R.Br. in Wall., Pl. Asiat. Rar. (Wallich) 1: 16. 1829. Lectotype (designated by J.Sm. in Hook. Gen. Fil.: t.1. 1838.): *Hypoderris brownii* J.Sm. Circumscription sensu Moran et al. (2014). Monophyletic (Moran et al., 2014; Zhang et al., 2016). Three species.

Malaifilix Li Bing Zhang & Schuettp., Taxon 65(4): 733, f.1e–f, f.3e–f. 2016. Type: *Malaifilix grandidentata* (Ces.) Li Bing Zhang & Schuettp. (≡ *Polypodium dilatatum* var. *grandidentatum* Ces.). Circumscription sensu Zhang et al. (2016). Presumably monotypic.

Pteridrys C.Chr. & Ching, Bull. Fan Mem. Inst. Biol. Bot. 5(3): 129. 1934. Type: *Pteridrys syrmatica* (Willd.) C.Chr. & Ching (≡ *Aspidium syrmaticum* Willd.). Circumscription sensu Christensen & Ching (1934). Monophyletic (Zhang et al., 2016). About 10 species.

Tectaria Cav., Anales Hist. Nat. 1(2): 115. 1799. Type: *Tectaria trifoliata* (L.) Cav. (≡ *Polypodium trifoliatum* L.). Circumscription sensu Zhang et al. (2016). Includes: *Amphiblestra* C.Presl; *Aspidium* Sw.; *Bathmium* C.Presl ex Link; *Camptodium* Fée; *Chlamydogramme* Holttum; *Cionidium* T.Moore; *Ctenitopsis* Ching ex Tardieu & C.Chr.; *Dictyoxiphium* Hook.; *Dryomenis* Fée ex J.Sm.; *Fadyenia* Hook.; *Grammatosorus* Regel; *Hemigramma* Christ; *Heterogonium* C.Presl; *Lenda* Koidz.; *Luerssenia* Kuhn ex Luerssen; *Microbrochis* C.Presl; *Phlebiogonium* Fée; *Podopeltis* Fée; *Polydictyum* C.Presl; *Psomiocarpa* C.Presl; *Quercifilix* Copel.; *Sagenia* C.Presl; *Stenosemia* C.Presl; *Tectaridium* Copel. Monophyletic (Zhang et al., 2016), but molecular data is lacking for *Amphiblestra*, *Camptodium*, *Chlamydogramme*, *Dryomenis*, *Grammatosorus*, *Lenda*, *Luerssenia*, *Microbrochis*, *Phlebiogonium*, and *Polydictyum* (tentatively included here based on morphology). About 200 species.

Triplophyllum Holttum, Kew Bull. 41(2): 239. 1986. Type: *Triplophyllum protensum* (Afzel. ex Sw.) Holttum (≡ *Aspidium protensum* Afzel. ex Sw.). Circumscription sensu Holttum (1986). Monophyletic (Prado & Moran, 2008). About 20 species.

49. Family **Oleandraceae** Ching ex Pic.Serm., Webbia 20 (2): 745. 1965. Circumscription sensu Smith et al. (2006b). Family consists of a single genus and an estimated 15 species.

Oleandra Cav., Anales Hist. Nat. 1(2): 115. 1799. Type: *Oleandra neriiformis* Cav. Circumscription sensu Kramer (1990n). Monophyletic (Zhang & Zhang, 2015). At least 15 species.

50. Family **Davalliaceae** M.R.Schomb., Reis. Br.-Guiana 3: 883. 1848. Circumscription sensu Smith et al. (2006b). Family consists of a single genus and an estimated 65 species.

Davallia Sm., Mém. Acad. Roy. Sci. (Turin) 5: 414, pl. 9, f. 6. 1793. Lectotype (designated by Fée, Mém. Foug., 5. Gen. Filic.: 328. 1852): *Davallia canariensis* (L.) Sm. (≡ *Trichomanes canariense* L.). Circumscription sensu Tsutsumi et al. (2016). Includes: *Araiostegia* Copel.; *Araiostegiella* M.Kato & Tsutsumi; *Davallodes* (Copel.) Copel.; *Humata* Cav.; *Scyphularia* Fée; *Wibelia* Bernh. Monophyletic (Tsutsumi & Kato, 2006; Tsutsumi et al., 2016). About 65 species.

51. Family **Polypodiaceae** J.Presl & C.Presl, Delic. Prag.: 159. 1822. Circumscription sensu Smith et al. (2006b). Includes: *Loxogrammeaceae* Ching ex Pic.Serm.; *Grammitidaceae* Newman; *Platyneriaceae* Ching; *Drynariaceae* Ching. Monophyletic (Schuettpelz & Pryer, 2007). Six subfamilies, 65 genera, and an estimated 1652 species.

Subfamily **Loxogrammoideae** H.Schneid. in Christenhusz et al., Phytotaxa 19: 18. 2011. Circumscription equivalent to “loxogrammoid clade” in Kreier & Schneider (2006a). Monophyletic (Kreier & Schneider, 2006a). Two genera and an estimated 32 species.

Dictymia J.Sm., Companion Bot. Mag. 72: 16. 1846. Type: *Dictymia attenuata* J.Sm. Circumscription sensu Kreier & Schneider (2006a). Monophyletic (Kreier & Schneider, 2006a). No published generic revision available. About two species.

Loxogramme (Blume) C.Presl, Tent. Pterid.: 214–215, pl.9, f.8. 1836. Lectotype (designated by J.Sm., Hist. Fil.: 156. 1875): *Loxogramme lanceolata* (Sw.) C.Presl (≡ *Grammitis lanceolata* Sw.). Circumscription sensu Kreier & Schneider (2006a). Includes: *Anarthropteris* Copel. Monophyletic (Kreier & Schneider, 2006a). No published generic revision available. 30 species.

Subfamily **Platyserioideae** B.K.Nayar, Taxon 19: 233. 1970. Circumscription sensu Hennipman et al. (1990). Monophyletic (Kreier & Schneider, 2006b). Two genera and an estimated 70 species.

Platyserium Desv., Mém. Soc. Linn. Paris 6(3): 213. 1827. Lectotype (designated by Pfeiff., Nomencl. Bot. 2: 746. 1873): *Platyserium alcicorne* Desv. Circumscription sensu Hennipman et al. (1990). Monophyletic (Kreier & Schneider, 2006b). 18 species.

Pyrrosia Mirb., Hist. Nat. Veg. 3: 471. 1803. Type: *Pyrrosia chinensis* Desv. Circumscription sensu Hennipman et al. (1990). Includes: *Drymoglossum* C.Presl. Assumed to be monophyletic (Kreier & Schneider, 2006b), but paraphyly relative to *Platyserium* has not yet been definitively excluded. At least 52 species.

Subfamily **Drynarioideae** Crabbe, Jermy & Mickel, Fern Gaz. 11: 156. 1975. Circumscription sensu Christenhusz et al. (2011). Monophyletic (Schneider et al., 2008). Six genera and an estimated 148 species.

Aglaomorpha Schott, Gen. Fil.: t.19. 1836. Type: *Aglaomorpha meyeniana* Schott. Circumscription newly proposed in this classification. Includes: *Christiopteris* Copel., *Drynaria* J.Sm., *Dryostachyum* J.Sm., *Merinthosorus* Copel., *Photinopteris* J.Sm., *Pseudodrynaria* C.Chr., *Thayeria* Copel. Monophyletic (Schneider et al., 2008). 50 species.

Arthromeris (T.Moore) J.Sm., Hist. Fil.: 110. 1875. Type: *Arthromeris wallichiana* (Spreng.) Ching (≡ *Polypodium wallichianum* Spreng.). Circumscription sensu Hennipman et al. (1990). Assumed to be monophyletic (Schneider et al., 2008), but comprehensive analysis is lacking to date. Perhaps a few more species, if a narrower species concept is used. Eight species.

Gymnogrammitis Griff., Icon. Pl. Asiat. 2: t.129, f.1. 1849. Type: *Gymnogrammitis dareiformis* (Hook.) Ching ex Tardieu & C.Chr. (≡ *Polypodium dareiforme* Hook.). Circumscription sensu Kramer (1990c). Monotypic.

Paraselliguea Hovenkamp, Blumea 45(2): 376. 2000. Type: *Paraselliguea leucophora* (Baker) Hovenkamp (≡ *Polypodium leucophorum* Baker). Circumscription sensu Hovenkamp (1997). Monotypic.

Polypodiopteris C.F.Reed, Amer. Fern J. 38: 87. 1948. Type: *Polypodiopteris proavita* (Copel.) C.F. Reed (≡ *Polypodium proavatum* Copel.). Circumscription sensu Hennipman et al. (1990). Assumed to be monophyletic, but only one species has been sampled to date. Three species.

Selliguea Bory, Dict. Class. Hist. Nat. 6: 587–588. 1824. Type: *Selliguea feei* Bory. Circumscription sensu Schneider et al. (2008). Includes: *Crypsinus* C.Presl; *Himalayopteris* W.Shao & S.G.Lu; *Phymatopsis* J.Sm.; *Pichisermollodes* Fraser-Jenk. & Challis. Not monophyletic as circumscribed (Schneider et al., 2008; Li et al., 2012a); *Selliguea* appears to be polyphyletic relative to *Arthromeris*, *Gymnogrammitis*, and *Polypodiopteris*, but additional study is needed. At least 85 species.

Subfamily **Microsoroideae** B.K.Nayar, Taxon 19(2): 233. 1970. Circumscription equivalent to “microsoroids” in Kreier et al. (2008b). Monophyletic (Schneider et al., 2004c). 12 genera and an estimated 183 species.

Goniophlebium (Blume) C.Presl, Tent. Pterid.: 185, pl.7, f.13–14. 1836. Lectotype (designated by Rödl-Linder, Zijlstra & Tryon, Taxon 39(1): 105. 1990): *Goniophlebium subauriculatum* (Blume) C.Presl (≡ *Polypodium subauriculatum* Blume). Circumscription sensu Kreier et al. (2008b). Includes: *Metapolypodium* Ching; *Polypodiastrium* Ching; *Polypodiodes* Ching. Monophyletic (Kreier et al., 2008b). 25 species.

Lecanopteris Reinw. ex Blume, Enum. Pl. Javae 2: 120. 1828. Type: *Lecanopteris carnososa* (Reinw.) Blume (≡ *Onychium carnosum* Reinw.). Circumscription sensu Hennipman et al. (1990). Monophyletic (Kreier et al., 2008b). 13 species.

Lemmaphyllum C.Presl, Abh. Koenigl. Böhm. Ges. Wiss. Ser. 5 6: 517–518. 1851. Lectotype (designated by Copel., Ann. Cryptog. Phytopathol. 5 [Gen. Fil.]: 189. 1947): *Lemmaphyllum spathulatum* C.Presl. Circumscription sensu Wang et al. (2010). Includes: *Caobangia* A.R.Sm. & X.C.Zhang; *Lepidogrammitis* Ching; *Weatherbya* Copel. Monophyletic (Wang et al., 2010). At least two species.

Lepidomicrosorium Ching & K.H.Shing, Bot. Res. Academia Sinica 1(1): 1–14, pl.1–5. 1983. Type: *Lepidomicrosorium subhastatum* (Baker) Ching (≡ *Polypodium subhastatum* Baker). Circumscription sensu Wang et al. (2010). Apparently monotypic (Wang et al., 2010).

Lepisorus (J.Sm.) Ching, Bull. Fan Mem. Inst. Biol. Bot. 4(3): 47, 56–58. 1933. Type: *Lepisorus nudus* (Hook.) Ching (≡ *Pleopeltis nuda* Hook.). Circumscription sensu Wang et al. (2010). Includes: *Belvisia* Mirb.; *Drymotaenium* Makino. Monophyletic (Wang et al., 2010). 80 species.

Leptochilus Kaulf., Enum. Filic.: 147, pl.1, f.10. 1824. Type: *Leptochilus axillaris* (Cav.) Kaulf. (≡ *Acrostichum axillare* Cav.). Circumscription sensu Kreier et al. (2008b). Includes: *Colysis* C.Presl; *Kontumia*

S.K.Wu & K.L.Phan. Monophyletic (Kreier et al., 2008b). 10 species.

Microsorium Link, Hort. Berol. 2: 110. 1833. Type: *Microsorium irregulare* Link. Circumscription sensu Kreier et al. (2008b). Includes: *Dendroconche* Copel.; *Kaulinia* B.K.Nayar; *Phymatosorus* Pic. Serm. Not monophyletic as circumscribed (Kreier et al., 2008b); *Microsorium* is apparently paraphyletic relative to *Lecanopteris*, *Leptochilus*, *Neocheiropteris*, *Neolepisorus*, and *Tricholepidium*, but further study is needed. 40 species.

Neocheiropteris Christ, Bull. Soc. Bot. France 52 (Mém. 1): 21. 1905. Type: *Neocheiropteris palmatopedata* (Baker) Christ (≡ *Polypodium palmatopedatum* Baker). Circumscription sensu Wang et al. (2010). Monophyletic (Kreier et al., 2008b; Wang et al., 2010; Du & Cheng, 2011). Two species.

Neolepisorus Ching, Bull. Fan Mem. Inst. Biol. Bot. 10(1): 11–12. 1940. Type: *Neolepisorus ensatus* (Thunb.) Ching (≡ *Polypodium ensatum* Thunb.). Circumscription sensu Wang et al. (2010). Monophyletic (Wang et al., 2010). The generic affinities have not been evaluated for all species possibly belonging here. At least five species.

Paragramma (Blume) T.Moore, Index Filic. xxxii. 1857. Lectotype (designated by J.Sm., Hist. Fil.: 114. 1875): *Paragramma longifolia* (Blume) T. Moore (≡ *Grammitis longifolia* Blume). Circumscription sensu Wang et al. (2010). Only the type species has been sampled to date; the second species is highly distinct and may ultimately be resolved elsewhere. Perhaps two species.

Thylacopteris Kunze ex J.Sm., Hist. Fil.: 87. 1875. Type: *Thylacopteris papillosa* (Blume) J.Sm. (≡ *Polypodium papillosum* Blume). Circumscription sensu Hennipman et al. (1990). Assumed to be monophyletic, but only the type species has been sampled to date. Two species.

Tricholepidium Ching, Acta Phytotax. Geobot. 29 (1–5): 41. 1978. Type: *Tricholepidium normale* (D. Don) Ching (≡ *Polypodium normale* D. Don). Circumscription sensu Wang et al. (2010). Monotypic (Wang et al., 2010), but in need of further evaluation.

Subfamily **Polypodioideae** Sweet, Hort. Brit.: 460. 1826. Newly circumscribed in this classification. Paraphyletic relative to the Grammitidoideae (Schneider et al., 2004c). Nine genera and an estimated 305 species.

Campyloneurum C.Presl, Tent. Pterid.: 189. 1836. Lectotype (designated by J.Sm., Hist. Fil.: 95. 1875): *Campyloneurum repens* (Aubl.) C.Presl (≡ *Polypodium repens* Aubl.). Circumscription sensu

León (1995), Schneider et al. (2004c), and Kreier et al. (2007). Includes: *Hyalotricha* Copel.; *Hyalotrichopteris* W.H.Wagner. Monophyletic (Schneider et al., 2004c). About 50 species.

Microgramma C.Presl, Tent. Pterid.: 213. 1836. Type: *Microgramma persicariifolia* (Schrad.) C. Presl (≡ *Polypodium persicariifolium* Schrad.). Circumscription sensu Salino et al. (2008). Includes: *Solanopteris* Copel. Monophyletic (Salino et al., 2008). A generic revision is lacking. About 30 species.

Niphidium J.Sm., Hist. Fil.: 99. 1875. Type: *Niphidium americanum* (Hook.) J.Sm. (≡ *Polypodium americanum* Hook.). Circumscription sensu Hennipman et al. (1990). Monophyletic (Salino et al., 2008). 10 species.

Pecluma M.G.Price, Amer. Fern J. 73(4): 109. 1983. Type: *Pecluma pectinata* (L.) M.G.Price (≡ *Polypodium pectinatum* L.). Circumscription sensu Assis et al. (2016). Monophyletic (Assis et al., 2016). 40 species.

Phlebodium (R.Br.) J.Sm., J. Bot. (Hooker) 4: 58. 1841. Lectotype (designated by J.Sm., Hist. Fil.: 94. 1875): *Phlebodium aureum* (L.) J.Sm. (≡ *Polypodium aureum* L.). Circumscription sensu Mickel & Smith (2004). Monophyletic (Assis et al., 2016). Four species.

Pleopeltis Humb. & Bonpl. ex Willd., Sp. Pl., ed. 4, 5: 211. 1810. Type: *Pleopeltis angusta* Humb. & Bonpl. ex Willd. Circumscription sensu Smith & Tejero-Díez (2014). Includes: *Cheilogramma* Maxon; *Dicranoglossum* J.Sm.; *Eschatogramme* Trevis.; *Lepicystis* (J.Sm.) J.Sm.; *Marginaria* Bory; *Marginariopsis* C.Chr.; *Microphlebodium* L.D. Gómez; *Neurodium* Fée; *Paltonium* C.Presl; *Pseudocolysis* L.D.Gómez. Monophyletic (Otto et al., 2009). In need of a generic revision. About 90 species.

Pleurosoriopsis Fomin, Izv. Kievsk. Bot. Sada 11: 8. 1930. Type: *Pleurosoriopsis makinoidi* (Maxim. ex Makino) Fomin (≡ *Gymnogramma makinoidi* Maxim. ex Makino). Circumscription sensu Hennipman et al. (1990). Monotypic (Assis et al., 2016).

Polypodium L., Sp. Pl. 2: 1082. 1753. Lectotype (designated by J.Sm., Hist. Fil.: 88. 1875): *Polypodium vulgare* L. Circumscription sensu Sigel et al. (2014) and Assis et al. (2016). Presumably monophyletic (Sigel et al., 2014; Assis et al., 2016). Perhaps 40 species.

Serpocaulon A.R.Sm., Taxon 55(4): 924–927, f. 3–4. 2006. Type: *Serpocaulon loriceum* (L.) A.R.Sm. (≡ *Polypodium loriceum* L.). Circumscription

sensu Smith et al. (2006a). Monophyletic (Smith et al., 2006a; Kreier et al., 2008a). About 40 species.

Subfamily **Grammitidoideae** Parris & Sundue, this classification (see below). Circumscription equivalent to “grammitids” in Sundue et al. (2014). Monophyletic (Ranker et al., 2004; Schneider et al., 2004c; Sundue et al., 2014). 33 genera and an estimated 911 species.

Acrosorus Copel., Philipp. J. Sci. 1(Suppl. 2): 158–159. 1906. Lectotype (designated by Copel., Univ. Calif. Publ. Bot. 16: 108. 1929): *Acrosorus exaltatus* (Copel.) Copel. (≡ *Davallia exaltata* Copel.). Circumscription sensu Parris (1990) and Sundue et al. (2014). Assumed to be monophyletic, but only one species sampled to date (Sundue et al., 2014). Nine species.

Adenophorus Gaudich., Ann. Sci. Nat. (Paris) 3: 508. 1824. Lectotype (designated by J.Sm., Hist. Fil.: 187. 1875): *Adenophorus tripinnatifidus* Gaudich. Circumscription sensu Ranker (2008) and Sundue et al. (2014). Includes: *Amphoradenium* Desv. Monophyletic (Sundue et al., 2014). 10 species.

Alansmia M.Kessler, Moguel, Sundue & Labiak, Brittonia 63(2): 238. 2011. Type: *Alansmia lanigera* (Desv.) Moguel & M.Kessler (≡ *Polypodium lanigerum* Desv.). Circumscription sensu Kessler et al. (2011) and Sundue et al. (2014). Monophyletic (Sundue et al., 2014). 26 species.

Archigrammitis Parris, Fern Gaz. 19(4): 135–136. 2013. Type: *Archigrammitis friderici-et-pauli* (Christ) Parris (≡ *Polypodium friderici-et-pauli* Christ). Circumscription sensu Parris (2013). No molecular data available. Seven species.

Ascogrammitis Sundue, Brittonia 62(4): 361. 2010. Type: *Ascogrammitis athyrioides* (Hook.) Sundue (≡ *Polypodium athyrioides* Hook.). Circumscription sensu Sundue (2010) and Sundue et al. (2014). Monophyletic (Sundue et al., 2014). 17 species.

Calymmodon C.Presl, Tent. Pterid.: 203–204, pl.9, f.1. 1836. Type: *Calymmodon cucullatus* (Nees & Blume) C.Presl (≡ *Polypodium cucullatum* Nees & Blume). Circumscription sensu Parris (1990) and Sundue et al. (2014). Includes: *Plectopteris* Fée. Monophyletic (Sundue et al., 2014). 65 species.

Ceradenia L.E.Bishop, Amer. Fern J. 78(1): 2. 1988. Type: *Ceradenia curvata* (Sw.) L.E.Bishop (≡ *Polypodium curvatum* Sw.). Circumscription sensu Bishop (1988) and Sundue et al. (2014). Monophyletic (Sundue et al., 2014). About 73 species.

Chrysogrammitis Parris, Kew Bull. 3(4): 909. 1998. Type: *Chrysogrammitis glandulosa* (J.Sm.) Parris (≡ *Ctenopteris glandulosa* J.Sm.). Circumscription sensu Parris (1998) and Sundue et al. (2014). Monophyletic (Sundue et al., 2014). Two species.

Cochlidium Kaulf., Berlin. Jahrb. Pharm. Verbundenen Wiss. 21: 36. 1820. Lectotype (designated by Copel., Ann. Cryptog. Phytopathol. 5 [Gen. Fil.]: 213. 1947): *Cochlidium graminoides* (Sw.) Kaulf. (≡ *Acrostichum graminoides* Sw.). Circumscription sensu Bishop (1978) and Sundue et al. (2014). Includes: *Xiphopteris* Kaulf.; *Micropteris* Desv.; *Pleurogramme* Blume. Monophyletic, but nested within *Grammitis* (Sundue et al., 2014). *Grammitis* s.s. was found to be paraphyletic with regards to *Cochlidium* in Sundue et al. (2014), but the type, *Grammitis marginella*, has not been sampled. We prefer to maintain both genera as they are circumscribed until additional data becomes available. 18 species.

Ctenopterella Parris, Gard. Bull. Singapore 58(2): 234. 2007. Type: *Ctenopterella blechnoides* (Grev.) Parris (≡ *Grammitis blechnoides* Grev.). Circumscription sensu Parris (2007) and Sundue et al. (2014). Only one species sampled to date (Sundue et al., 2014). 24 species.

Dasygrammitis Parris, Gard. Bull. Singapore 58(2): 238. 2007. Type: *Dasygrammitis mollicoma* (Nees & Blume) Parris (≡ *Polypodium mollicomum* Nees & Blume). Circumscription sensu Parris (2007) and Sundue et al. (2014). Monophyletic (Sundue et al., 2014). 12 species.

Enterosora Baker, Timehri 5: 218. 1886. Type: *Enterosora campbellii* Baker. Circumscription sensu Bishop & Smith (1992) pro parte and Sundue et al. (2014). Monophyletic, but nested within *Zygophlebia* (Sundue et al., 2014). This could be resolved by placing *Zygophlebia* in synonymy. However, this would be premature since the type of *Enterosora* has not yet been sampled and its placement is not certain. 11 species.

Galactodenia Sundue & Labiak, Syst. Bot. 37(2): 340. 2012. Type: *Galactodenia delicatula* (M. Martens & Galeotti) Sundue & Labiak (≡ *Polypodium delicatulum* M.Martens & Galeotti). Circumscription sensu Sundue et al. (2012, 2014). Monophyletic (Sundue et al., 2014). Five species.

Grammitis Sw., J. Bot. (Schrader) 2: 3, 17. 1801. Lectotype (designated by C.Chr., Index Filic. xlix. 1906): *Grammitis marginella* (Sw.) Sw. (≡ *Polypodium marginellum* Sw.). Circumscription sensu Bishop (1977) pro parte and Sundue et al. (2014).

Grammitis s.s. is paraphyletic relative to *Cochlidium* (Sundue et al., 2014), but the type, *G. marginella*, has not been sampled. We prefer to maintain both genera as they are circumscribed until additional data become available. 43 species.

Lellingeria A.R.Sm. & R.C.Moran, Amer. Fern J. 81 (3): 76. 1991. Type: *Lellingeria apiculata* (Kunze ex Klotzsch) A.R.Sm. & R.C.Moran (\equiv *Polypodium apiculatum* Kunze ex Klotzsch). Circumscription sensu Labiak (2013) and Sundue et al. (2014). Monophyletic (Sundue et al., 2014). 49 species.

Leucotrichum Labiak, Taxon 59(3): 915. 2010. Type: *Leucotrichum organense* (Gardner) Labiak (\equiv *Grammitis organensis* Gardner). Circumscription sensu Labiak et al. (2010), Rouhan et al. (2012), and Sundue et al. (2014). Monophyletic (Sundue et al., 2014). Six species.

Lomaphlebia J.Sm., Hist. Fil.: 182. 1875. Type: *Lomaphlebia linearis* (Sw.) J.Sm. (\equiv *Grammitis linearis* Sw.). Circumscription sensu Sundue et al. (2014). Assumed to be monophyletic, but only one species sampled to date (Sundue et al., 2014). Two species.

Luisma M.T.Murillo & A.R.Sm., Novon 13(3): 313–316, f. 1. 2003. Type: *Luisma bivascularis* M.T. Murillo & A.R.Sm. Circumscription sensu Murillo & Smith (2003). Monotypic.

Melpomene A.R.Sm. & R.C.Moran, Novon 2(4): 426. 1992. Type: *Melpomene moniliformis* (Lag. ex Sw.) A.R.Sm. & R.C.Moran (\equiv *Polypodium moniliforme* Lag. ex Sw.). Circumscription sensu Lehnert (2013) and Sundue et al. (2014). Monophyletic (Sundue et al., 2014). 29 species.

Micropolypodium Hayata, Bot. Mag. (Tokyo) 42 (449): 341. 1928. Type: *Micropolypodium pseudotrichomanoides* (Hayata) Hayata (\equiv *Polypodium pseudotrichomanoides* Hayata). Circumscription sensu Smith (1992) pro parte, Hirai et al. (2011), and Sundue et al. (2014). Monophyletic (Sundue et al., 2014). Three species.

Moranopteris R.Y.Hirai & J.Prado, Taxon 60(4): 1127. 2011. Type: *Moranopteris basiattenuata* (Jenman) R.Y.Hirai & J.Prado (\equiv *Polypodium basiattenuatum* Jenman). Circumscription sensu Hirai et al. (2011) and Sundue et al. (2014). Monophyletic (Sundue et al., 2014). 31 species.

Mycopteris Sundue, Brittonia 66(2): 175, f.1–2. 2013. Type: *Mycopteris taxifolia* (L.) Sundue (\equiv *Polypodium taxifolium* L.). Circumscription sensu Sundue (2013) and Sundue et al. (2014). Monophyletic (Sundue et al., 2014). 21 species.

Notogrammitis Parris, New Zealand J. Bot. 50(4): 465. 2012. Type: *Notogrammitis billardierei* (Willd.) Parris (\equiv *Grammitis billardierei* Willd.). Circumscription sensu Perrie and Parris (2012). Monophyletic (Sundue et al., 2014). 16 species.

Oreogrammitis Copel., Philipp. J. Sci. 12: 64. 1917. Type: *Oreogrammitis clemensiae* Copel. Circumscription sensu Parris (2007) and Sundue et al. (2014). Not monophyletic and in need of redefinition (Sundue et al., 2014). *Themelium* is monophyletic in Sundue et al. (2014), but nested within a clade containing polyphyletic *Oreogrammitis* and *Radiogrammitis*. The types of *Oreogrammitis* and *Themelium* remain to be sampled, and thus we recommend maintaining these genera pending further research. 156 species.

Prosaptia C.Presl, Tent. Pterid.: 165–166, pl.6, f.19, 25. 1836. Lectotype (designated by J.Sm., Hist. Fil.: 86. 1875): *Prosaptia contigua* (G.Forst.) C. Presl (\equiv *Trichomanes contiguum* G.Forst.). Circumscription sensu Parris (2010a, 2010b) and Sundue et al. (2014). Includes: *Ctenopteris* Blume ex Kunze; *Cryptosorus* Fée. Monophyletic (Sundue et al., 2014). 87 species.

Radiogrammitis Parris, Gard. Bull. Singapore 58 (2): 240. 2007. Type: *Radiogrammitis setigera* (Blume) Parris (\equiv *Polypodium setigerum* Blume). Circumscription sensu Parris (2007) and Sundue et al. (2014). Not monophyletic and in need of redefinition (Sundue et al., 2014). *Themelium* is monophyletic in Sundue et al. (2014), but nested within a clade containing polyphyletic *Oreogrammitis* and *Radiogrammitis*. The types of *Oreogrammitis* and *Themelium* remain to be sampled, and thus we recommend maintaining these genera pending further research. 36 species.

Scleroglossum Alderw., Bull. Jard. Bot. Buitenzorg, ser. 2, 2(7): 37–39. 1912. Lectotype (designated by Copel., Ann. Cryptog. Phytopathol. 5 [Gen. Fil.]: 213. 1947): *Scleroglossum pusillum* (Blume) Alderw. (\equiv *Vittaria pusilla* Blume). Circumscription sensu Parris (1990) and Sundue et al. (2014). Includes: *Nematopteris* Alderw. Monophyletic (Sundue et al., 2014). Seven species.

Stenogrammitis Labiak, Brittonia 63(1): 141, f.1A–M, 2A–F. 2011. Type: *Stenogrammitis myosuroides* (Sw.) Labiak (\equiv *Polypodium myosuroides* Sw.). Circumscription sensu Labiak (2011) and Sundue et al. (2014). Monophyletic (Sundue et al., 2014). 31 species.

Terpsichore A.R.Sm., Novon 3(4): 479. 1993. Type: *Terpsichore asplenifolia* (L.) A.R.Sm. (\equiv *Polypodium asplenifolium* L.). Circumscription sensu

Smith (1993) pro parte and Sundue et al. (2014). Monophyletic (Sundue et al., 2014). 12 species.

Themelium (T.Moore) Parris, Kew Bull. 52(3): 737. 1997. Type: *Themelium tenuisectum* (Blume) Parris (\equiv *Polypodium tenuisectum* Blume). Circumscription sensu Parris (1997, 2004, 2010b) and Sundue et al. (2014). *Themelium* is monophyletic in (Sundue et al., 2014), but nested within a clade containing polyphyletic *Oreogrammitis* and *Radioogrammitis*. The types of *Oreogrammitis* and *Themelium* remain to be sampled, and thus we recommend maintaining these genera pending further research. 29 species.

Tomophyllum (E.Fourn.) Parris, Gard. Bull. Singapore 58(2): 245. 2007. Lectotype (designated by Parris, Gard. Bull. Singapore 58(2): 245. 2007): *Tomophyllum subsecundodissectum* (Zoll.) Parris (\equiv *Polypodium subsecundodissectum* Zoll.). Circumscription sensu Parris (2007) and Sundue et al. (2014). Monophyletic (Sundue et al., 2014). 42 species.

Xiphopterella Parris, Gard. Bull. Singapore 58(2): 249. 2007. Type: *Xiphopterella hieronymusii* (C. Chr.) Parris (\equiv *Polypodium hieronymusii* C. Chr.). Circumscription sensu Parris (2007) and Sundue et al. (2014). Monophyletic (Sundue et al., 2014). 11 species.

Zygophlebia L.E.Bishop, Amer. Fern J. 79(3): 107. 1989. Type: *Zygophlebia sectifrons* (Kunze ex Mett.) L.E.Bishop (\equiv *Polypodium sectifrons* Kunze ex Mett.). Circumscription sensu Bishop (1989) and Sundue et al. (2014). Paraphyletic relative to *Enterosora* (Sundue et al., 2014). This could be resolved by placing *Zygophlebia* in synonymy. However, this would be premature since the type of *Enterosora* has not yet been sampled and its placement is not certain. 20 species.

Subfamily placement uncertain.

Synammia C.Presl, Tent. Pterid.: 212, t.9, f.11. 1836. Lectotype (designated by Copel., Ann. Cryptog. Phytopathol. 5 [Gen. Fil.]: 212. 1947): *Synammia triloba* (Cav.) C.Presl. Circumscription sensu Schneider et al. (2006). Monophyletic (Schneider et al., 2006). Three species.

Nomenclatural novelties

Aspleniineae H.Schneid. & C.J.Rothf., **stat. nov.** \equiv Aspleniaceae Newman, Hist. Brit. Ferns 6. 1840. Type: *Asplenium* L. (1753)—Polypodiales.

Claytosmunda (Y.Yatabe, N.Murak. & K.Iwats.) Metzgar & Rouhan, **stat. nov.** \equiv *Osmunda* subg. *Claytosmunda* Y.Yatabe,

N.Murak. & K.Iwats., Acta Phytotax. Geobot. 56(2): 127–128. 2005. Type: *Claytosmunda claytoniana* (L.) Metzgar & Rouhan (\equiv *Osmunda claytoniana* L.).

Claytosmunda claytoniana (L.) Metzgar & Rouhan, **comb. nov.** \equiv *Osmunda claytoniana* L., Sp. Pl. 2: 1066. 1753.

Dennstaedtiineae Schwartsb. & Hovenkamp, **subord. nov.** Type: *Dennstaedtia* Bernh. (1801) [1800]. Type: Dennstaedtiaceae—Polypodiales.

Rhizome generally dorsiventral and long-creeping, covered with hairs or proto-scales (true scales absent); sori marginal or sub-marginal, generally protected by marginal pseudo-indusia or by laminar true indusia (sometimes both are present), rarely fully exindusiate.

Grammitidoideae Parris & Sundue, **stat. nov.** \equiv Grammitidaceae Newman, Hist. Brit. Ferns 7. 1840, as “Grammitideae”. Type: *Grammitis* Sw. (1801) [1800]—Polypodiaceae.

Lindsaeineae Lehtonen & Tuomisto, **subord. nov.** Type: *Lindsaea* Dryand. ex J.Sm. (1793), as Lindsaeaceae—Polypodiales.

Rhizome short- to long-creeping (rarely ascending), covered with non-clathrate scales or rarely hairs; petioles with one or rarely two (or several fusing into two in the upper part of stipe) vascular bundles; sori marginal to sub-marginal, generally protected by laminar true indusia or rarely by marginal pseudo-indusia or both.

Mankyuoideae J.R.Grant & B.Dauphin, **subfam. nov.** Type: *Mankyua* B.Y.Sun, M.H.Kim & C.H.Kim—Ophioglossaceae.

Based on the diagnosis associated with *Mankyua* B.Y.Sun, M.H.Kim & C.H.Kim, Taxon 50(4): 1020, f. 1. 2002.

Phegopteridoideae Salino, A.R.Sm. & T.E.Almeida, **subfam. nov.** Type: *Phegopteris* (C.Presl) Fée (1852)—Thelypteridaceae.

Laminae bipinnate-pinnatifid or more divided, or laminae bipinnatifid or tripinnatifid; costae adaxially lacking grooves; veins free, not reaching the margins; chromosome base numbers $x = 30$ or 31 .

Pteridineae J.Prado & Schuettp., **stat. nov.** \equiv Pteridaceae E.D. M.Kirchn., Schul-Bot. 109. 1831. Type: *Pteris* L. (1753)—Polypodiales.

Saccolomatineae Hovenkamp, **subord. nov.** Type: *Saccoloma* Kaulf. (1820)—Saccolomataceae.

Rhizome erect, covered with multistratose, non-clathrate scales, in cross-section with two concentric rings of meristemes, sori cup-shaped, spores trilete, tetrahedral.

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