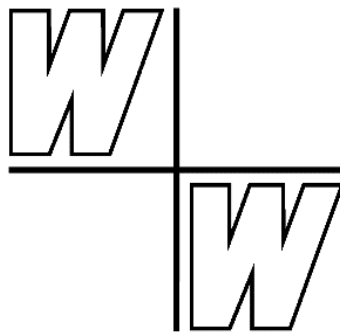


Data Collection on Intergeneric Hybrids and Basic Types: **PTERIDOPHYTA**

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Studiengemeinschaft Wort und Wissen
<https://www.wort-und-wissen.org/artikel/data-collection-basic-types/>

"PTERIDOPHYTA"

2 classes, 14 orders, 51 families, 340 genera, 11.800 species

extant ferns, horsetails and lycophytes

= rezente Farne, Schachtelhalme und Bärlappe

Now two distinct classes

29 intergeneric hybrids (+ many others which have been downgraded as interspecific, meanwhile)

13 preliminary basic types (average 7: 347)

Aspleniaceae 2: 740

Cystopteridaceae 3: 37

Dryopteridaceae Dryopterideae + Polysticheae 5: 1120

Equisetaceae 1: 15

Isoetaceae 1: 250

Lycopodiaceae 16: 388

Ophioglossaceae 10: 112

Osmundaceae 6: 18

Polypodiaceae 11: 375

Psilotaceae 2: 17

Selaginellaceae 1: 700

Thelypteridaceae Thelypteroideae Meniscieae 27: 700

Woodsiaceae 1: 40

Systematics according to Smith et al. 2006, updated by the Pteridophyte Phylogeny Group (PPG I) (2016) A community-derived classification for extant lycophytes and ferns. J. Syst. Evol. 54 (6)

<https://onlinelibrary.wiley.com/doi/full/10.1111/jse.12229>

Lycopodiopsida: 3 orders

Polypodiopsida: 4 subclasses, 11 orders

Equisetidae 1 order

Ophioglossidae 2 orders

Marattiidae 1 order

Polypodiidae 7 orders

Hybridization is rather common in ferns, and has been of great importance in their evolution, see e. g. Vida (1976) and Wagner (1983).

Fern hybrids known up to 1996 have been compiled by Knobloch (1996), see also Checklist of the Ferns and Lycophytes of the World 2025.

General references on Pteridophyta:

Christenhusz M et al. (2011) A linear sequence of extant families and genera of lycophytes and ferns. *Phytotaxa*. 19, 7–54. doi:10.11646/phytotaxa.19.1.2

Checklist of the Ferns and Lycophytes of the World → Hassler M

Hassler M (1994–2025): World ferns. Synonymic checklist and distribution of ferns and lycophytes of the world. Version 25.09; last update Sept. 23rd, 2025. Covering 13,202 accepted species, 814 hybrids. www.worldplants.de/ferns/ Valuable information

IPNI = International plant names index = www.ipni.org

Knobloch IW (1996) Pteridophyte hybrids and their derivatives. Dep. of Botany and Plant Pathology, Michigan State University, East Lansing. [Very valuable list of interspecific and intergeneric hybrids with hundreds of citations till 1996, but be aware that many species have been transferred into other genera, since!](#)

Liu H-M, Schuettpelz E & Schneider H (2020) Evaluating the status of fern and lycophyte nothotaxa in the context of the Pteridophyte Phylogeny Group classification (PPG I). *J. Syst. Evol.*

<https://onlinelibrary.wiley.com/doi/10.1111/jse.12641>

POWO = Plants of the World Online <https://powo.science.kew.org/>

PPG I = Pteridophyte Phylogeny Group (PPG I) (2016) A community-derived classification for extant lycophytes and ferns. *J. Syst. Evol.* 54 (6)

<https://onlinelibrary.wiley.com/doi/full/10.1111/jse.12229>

Schuettpelz E & Pryer KM (2007) Fern phylogeny inferred from 400 leptosporangiate species and three plastid genes. *Taxon* 56, 1037–1050.

<http://www.pryerlab.net/publication/fichier1085.pdf>

Smith AR, Pryer KM, Schuettpelz P, Korall H, Schneider H & Wolf G (2006) A classification for extant ferns. *Taxon* 55, 705–731.

<http://www.pryerlab.net/publication/fichier749.pdf>

Vida G (1976) The role of polyploidy in evolution. *Evol. Biol. (Praha)* 9, 267–294.

Wagner WH (1983) Reticulistics: the recognition of hybrids and their role in cladistics and classification. In Platnick NI & Funk VA (eds.): *Advances in Cladistics* 2, 63–79. New York: Columbia University Press.

Abbreviations:

° = taxa actually not accepted in the rank of a genus, e. g. *Cerasus*° (= *Prunus* p. p.)

10: 50 etc. The numbers behind the names of families etc. refer to extant genera and species

IS = interspecific hybrid. **IG** = intergeneric hybrid. **IST** = intersubtribal hybrid.

IT = intertribal hybrid. **ISF** = intersubfamilial hybrid. **IF** = interfamilial hybrid.

EC = embryo culture or ovule culture

SO = somatic hybrid by cell fusion; normally these hybrids are asymmetric

AS = asymmetric hybrids, they do not equally express maternal and paternal features

HY = assumed intergeneric hybridogeneous origin of a taxon.

nat. hyb. = natural hybrid **art. hyb.** = artificial hybrid

Colours within the crosses:

Red letters: intergeneric hybrids (incl. former IG).

Gray letters: hybridity unconfirmed or erroneous.

Green letters: notes on tribes, subfamilies etc. involved in the hybridization.

Yellow shaded: Notes concerning basic types.

Class

LYCOPODIOPSIDA

3 orders, 3 families, 18 genera, 1338 species

lycophytes = Bärlappflanzen

Lycopodiales 1 family

Lycopodiales: Lycopodiaceae 16: 388 + 1 extinct genus

clubmosses = Bärlappgewächse

Formerly, *Huperzia*, *Lycopodiella* etc. were sometimes included in *Lycopodium* s. l.

PPG I (2016): monophyletic, 3 subfamilies:

Lycopodielloideae 4: 54 *Lycopodiella*, *Pseudolycopodiella*, ...

Lycopodioidae 9: 58 *Austrolycopodium* 2, *Diphasiastrum* 6, *Diphasium* 4,

Lycopodiastrum 1 (separated by Chen et al. 2021 in an own subfamily

Lycopodiastroideae), *Lycopodium* 5, ...

Huperzioidae 3: 276 *Huperzia* 25, *Phlegmariurus* 250, *Phylloglossum* 1

IPNI 2009: 0 IG. *Diphasiastrum* 3 IS, *Huperzia* 8 IS, *Lycopodiella* 3 IS, *Lycopodium* 2 IS, *Phlegmariurus*° = *Lycopodium* p. p. 1 IS.

Checklist of the Ferns and Lycophytes of the World 2025: *Diphasiastrum* 7 IS, *Lycopodiella* 4 IS,

Possibly **basic type family Lycopodiaceae** (16: 388) as a well-defined monophyletic and isolated taxon, though intergeneric hybrids are unknown, so far.

(Fossil order **Rhizomorphales** = Bärlappbäume)

Junker R (1999) Konvergenzen und komplexe Stammform. Zur Phylogenie der Bärlappbäume. Stud. Integrale J. 6, 13–18.

Junker R (2000) Samenfarne. Bärlappbäume. Schachtelhalme. Pflanzenfossilien des Karbons in evolutionstheoretischer Perspektive, Studium Integrale. Holzgerlingen: Hänsler.

Isoetales 1 extant family + 3 extinct families

Isoetales: Isoetaceae 1: 250 and 4 extinct genera

quillworts = Brachsenkräuter

PPG I: monophyletic 1: 250

Isoetes 250

POWO 2024: *Isoetes* 27 IS

Isoetes is a “living fossil” at least since the Triassic (Retallack 1997; 2013, <https://doi.org/10.1016/j.gr.2012.03.003>).

Probably **basic type family Isoetaceae** (1: 250) as a well-defined monogeneric and monophyletic taxon with numerous interspecific hybrids.

Selaginellales 1 family + very few extinct species

Selaginellales: Selaginellaceae 1: 700

spike mosses, lesser clubmosses = Moosfarne

Selaginella 700

POWO 2025: 2 IS, Knobloch 1996: 4 IS.

Probably **basic type family Selaginellaceae** (1: 700). A well-defined monogeneric taxon, though nearly no hybrids are known.

References:

- Retallack GJ (1997) Earliest Triassic origin of *Isoetes* and quillwort evolutionary radiation. *Journal of Paleontology* 71, 500–521. doi:10.1017/S0022336000039524
- Retallack GJ (2013) Permian and Triassic greenhouse crises. *Gondwana Research* 24, 90–103. <https://doi.org/10.1016/j.gr.2012.03.003>

Class

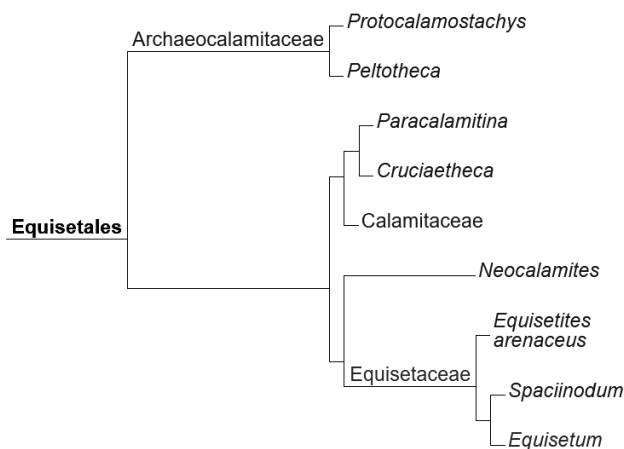
POLYPODIOPSIDA = FILICOPSIDA

4 subclasses, 11 orders, 48 families, 319 genera, 10.578 species

Subclass EUISETIDAE

1 extant order, 1 family, 1 genus, 15 species

Equisetales 1 extant family + several fossil families



Order Equisetales from en.wikipedia 2025, CC-BY-SA 4.0 (based on Elgorriaga et al. 2018, doi:10.1002/ajb2.1125)

Equisetales: Equisetaceae 1: 15 + some extinct taxa

horsetail family = Schachtelhalmgewächse

PPG I 2016: Monophyletic. *Equisetum* is an isolated genus of closely related and recently divergent species.

Equisetum 2–3 subgenera: *Hippochaete* 9, *Equisetum* 8, *Paramochaete* 1 (since 2019 excluded from subgenus *Equisetum*).

POWO 2024: *Equisetum* 23 IS

en.wikipedia 2024: 14 IS, 9 in subgenus *Equisetum* and 5 in subgenus *Hippochaete*.

Probably **basic type family Equisetaceae** (1: 15). Well-defined monogeneric family with closely related species. Hybrids are common, but hybridization has only been recorded within subgenera, as yet. – It is unknown if fossil horsetails (e. g. fossil *Equisetum* since Carboniferous, see Christenhusz et al. 2021) and *Calamites*-species belong to the same basic type, see Junker R (2000, p. 132).

References:

- Guillon J-M (2004) Phylogeny of horsetails (*Equisetum*) based on the chloroplast *rps4* gene and adjacent noncoding sequences. Syst. Bot. 29 (2), 251–259.
- Christenhusz MJM et al. (2021) Biogeography and genome size evolution of the oldest extant vascular plant genus, *Equisetum* (Equisetaceae). Ann. Bot. 17; 127(5), 681–695. doi: 10.1093/aob/mcab005 e. g. *Equisetum* subgenus *Paramochaete*
- Junker R (2000) Samenfarne. Bärlappbäume. Schachtelhalme“. Pflanzenfossilien des Karbons in evolutionstheoretischer Perspektive, Studium Integrale. Holzgerlingen: Hänsler.

Subclass OPHIOGLOSSIDAE

2 orders, 2 families, 12 genera, 129 species

Ophioglossales 1 family

Ophioglossales: Ophioglossaceae 10: 112

adder's-tongue family = Natternzungengewächse

4 subfamilies:

Botrychioideae 4: 53 *Botrychium* 35, *Sceptridium* 25, ...

Helminthioideae 1: 1

Mankyuoideae 1: 1

Ophioglossoideae 4: 47 *Cheiroglossa* 2, *Ophioglossum* 41, ...

POWO 2025: 0 IG. *Botrychium* 2 IS, *Ophioglossum* 3 IS, *Sceptridium* (sub *Botrychium*) 4 IS

Possibly **basic type family Ophioglossaceae** (10: 112) as an isolated taxon and sole family of the order Ophioglossales, though intergeneric hybrids are unknown.

Psilotales 1 family

Psilotales: Psilotaceae 2: 17

fork ferns, whisk ferns = Gabelblattgewächse

Psilotum 2, *Tmesipteris* 15

POWO 2025: 0 IG. *Psilotum* 1 IS, *Tmesipteris* 0 IS

Possibly **basic type family Psilotaceae** (2: 17) as an isolated taxon and sole family of the order Psilotales, though intergeneric hybrids are unknown.

Subclass MARATTIIDAE

1 order, 1 family, 6 genera, 111 species

Marattiales 1 family

Isolated family.

Marattiales: Marattiaceae 6: 111

Angiopteris 30 (incl. *Archangiopteris*^o etc.), *Christensenia* 2, *Danaea* 50, *Eupodium*, *Marattia* 7, ...

POWO 2025: *Angiopteris* 1 IS (*× itoi*).

Angiopteris × *Archangiopteris*^o (= *Angiopteris* p. p.) IS (→ *Angiopteris sparsisora*) (nat. hyb.) Ching & Wang 1982, Knobloch 1996

References

Ching RC & Wang ZR (1982) *Angiopteris sparsisora*, sp. nov. a putative bigeneric hybrid. Acta Phytotax. Sin. 20, 347–350.

Subclass POLYPODIIDAE

7 orders, 44 families, 300 genera, 10.323 species

Cyatheales 8 families, 13 genera, 713 species

tree ferns = Baumfarne

Cyatheales: Cyatheaceae 3: 643 + 4 extinct genera

scaly tree ferns = Baumfarne i. e. S.

PPG I 2016: 3 genera: *Alsophila* 275 (incl. *Nephelea* and *Gymnosphaera*), *Cyathea* 265 (incl. *Cnemidaria*[°], *Hemitelia*[°], *Hymenophyllopsis*[°], *Trichopteris*[°] = *Trichipteris*), *Sphaeropteris* 103 (incl. *Fourniera*[°]). Monophyletic.

IPNI 2018: 1 IG (*Cyathidaria* with 5 nothospecies = *Cyathea* IS),
Alsophila 3 IS (× *boytelii*, × *fagildii*, × *medinae*), *Cyathea* 5 IS (× *bernardii*, × *lathamii* → *Sphaeropteris*, × *moralesiana*, × *smithiana*, × *stella-matutina* → *Alsophila*)
en.wikipedia 2018 sub *Cyathea* subgenus *Alsophila* 5 IS: × *boytelii*, × *confirmis*, × *dryopteroides*, × *fagildii*, × *marcescens*, sectio *Cyathea* 3 IS × *bernardii*, × *calolepis*, × *lewisii*, subgenus *Sphaeropteris* sectio *Sphaeropteris* × *lathamii*)
Checklist of the Ferns and Lycophytes of the World 2025: *Cyathea* 14 IS

The following hybrids are no longer intergeneric from a modern view of systematics.

Alsophila × *Nephelea*[°] (= *Alsophila* p. p.) IS (nat. hyb.) Conant 1975, 1985, Conant & Cooper-Driver 1980, Knobloch 1996

Cnemidaria[°] (= *Cyathea* p. p.) × *Cyathea* IS (→ × *Cyathidaria* Caluff 2002 Willdenowia 32 (2), 282) IS (nat. hyb.) Conant 1975, Tryon 1976, Proctor 1985, Knobloch 1996, IPNI 2008 (5 nothospecies, now all included in *Cyathea*)

Cnemidaria[°] *obtusum* (= *Cyathea* p. p.) × *Trichopteris*[°] (= *Cyathea*) *aspera* IS (nat. hyb.) Tryon 1976, Knobloch 1996

"*Cyathea*" (*Sphaeropteris*) × *Sphaeropteris* IS (→ *Sphaeropteris lathamii* (*S. brownii* × *S. princeps*)) (Holttum 1984 (nat. hyb.), Knobloch 1996 → Both parents are now considered to be part of *Sphaeropteris*)

References:

- Caluff MG (2002) × *Cyathidaria*, a new nothogenus in the Cyatheaceae (Pteridophyta). *Willdenowia* 32, 281–283.
- Conant DS (1975) Hybrids in American Cyatheaceae. *Rhodora* 77 (812), 441–455.
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- Conant DS & Cooper-Driver C (1980) Autogamous allohomoploids in *Alsophila* and *Nephelea* (Cyatheaceae): a new hypothesis for speciation in homoploid, homosporous ferns. *Amer. J. Bot.* 67, 1269–1288.

Korall P, Conant DS, Metzgar JS, Schneider H & Pryer KM (2007) A molecular phylogeny of scaly tree ferns (Cyatheaceae). *Amer. J. Bot.* 94, 873–886.
<http://www.amjbot.org/content/94/5/873.full.pdf+html>
Holtum RE (1984) A remarkable *Cyathea* hybrid. *Amer. Fern J.* 74, 19–21.
https://www.jstor.org/stable/1547106?seq=1#page_scan_tab_contents
Tryon RM (1976) A revision of the genus *Cyathea*. *Contr. Gray Herb.* 206, 19–98.

Gleicheniales 3 families, 12 genera, 175 species

Dipteridaceae 2: 11, Gleicheniaceae 8: 160, Matoniaceae 2: 4

Hymenophyllales 1 family

Hymenophyllales: Hymenophyllaceae 9: 434

filmy ferns and bristle ferns = **Hautfarngewächse**

2 subfamilies: Trichomanoideae 8: 184, Hymenophylloideae 1: 250

Osmundales 1 family

Osmundales: Osmundaceae 6: 18 + 12 extinct genera

royal fern family = **Königsfarngewächse**

Claytosmunda 1 (accepted by PPG, not by POWO), *Leptopteris* 6, *Osmunda* 4, *Osmundastrum* 1, *Plenasium* 4 (accepted by PPG, not by POWO), *Todea* 2

POWO 2025: *Leptopteris* 1 IS, *Osmunda* 4 IS, *Todea* 1 IS

Claytosmunda is a “living fossil” at least since middle Triassic (Bomfleur et al. 2017, 53).

Possibly **basic type family Osmundaceae** (6: 18). Isolated group. 3 of the 6 genera are connected by hybridization, but be aware that these 3 genera are closely related.

Claytosmunda × *Osmunda* (→ × *Osmuntonia* Hong M. Liu et al. 2020), Liu et al. 2020 (*C. claytoniana* × *O. regalis*). Wan & Zhang (2022) propose the name × *Osmunimunda*.

Osmunda × *Plenasium* (→ × *Osmunasium mildei* Hong M. Liu et al. 2020) Liu et al. 2020 (*O. japonica* × *P. vachelii* = *Osmunda bipinnata* Hooker)

References:

Bomfleur B, Grimm GW & McLoughlin S (2017) The fossil Osmundales (Royal Ferns)—a phylogenetic network analysis, revised taxonomy, and evolutionary classification of anatomically preserved trunks and rhizomes. PeerJ 5, e3433.

<https://peerj.com/articles/3433/>

Wang X & Zhang L-B (2022) Three new fern names of hybrid genera and four new combinations in Athyriaceae, Osmundaceae, and Thelypteridaceae. Phytotaxa 575 <https://doi.org/10.11646/phytotaxa.575.1.8>

Polypodiales 6 suborders, 26 families, 253 genera, 8.714 species

Polypodiales: Aspleniaceae 2: 740 (suborder Aspleniinae)

spleenworts = Streifenfarngewächse

Smith et al. 2006 and PPG I 2016 monophyletic: *Asplenium* 700 (incl. *Antigramma*°, *Camptosorus*°, *Ceterach*°, *Ceterachopsis*°, *Diellia*°, *Diplora*°, *Holodictyum*°, *Loxoscapha*°, *Phyllitis*°, *Pleurosorus*°, *Schaffneria*°, *Sinephropteris*°), *Hymenasplenium* 40.

Some authors accept a third genus *Hemidictyum* 1, which in PPG I 2016 is placed in a separate family Hemidictyaceae.

POWO 2025 includes Blechnaceae, Cystopteridaceae, Thelypteridaceae, Woodsiaceae etc.

POWO 2025 (Aspleniaceae s. str.) 0 IG, 4 ISG as synonyms of *Asplenium*. *Asplenium* 130 IS, *Hymenasplenium* 2 IS.

Erroneously, the nothotaxon × *Asplenicystopteris* is listed in POWO!

Checklist of the Ferns and Lycophytes of the World 2025: *Asplenium* .156, *Hymenasplenium* 3 IS.

For phylogenetic studies, see Murakami et al. 1999, Schneider et al. 2004, 2005, Bellefroid et al. 2010. Monophyletic.

Basic type family Aspleniaceae (2: 740) (Kutzelnigg 1993, 2025). More than hundred hybrids have been reported (see Knobloch 1996, POWO 2025) connecting all parts of the family, most of them within *Asplenium* s. str., and some 6 between subgenera which at that time were classified as genera. Later these subgenera were united to *Asplenium* s. l. and a second genus *Hymenasplenium* was established as sister group of the rest. But hybrids have been reported with this genus, too.

Asplenium × *Camptosorus*° IS (→ × *Asplenosorus* Wherry 1937 Amer. Fern J. = *Asplenium* p. p.) Wherry 1925, Braun 1939, Wagner 1954, 1962, Morton 1956, Meyer 1969a, Mickel 1974, Bennert & Meyer 1972, Lovis 1973, Moran 1981, Reichstein 1984, Knobloch 1996 (7 nothospecies), IPNI 2011 (13 nothospecies)

Asplenium montanum × *Camptosorus*° *rhizophyllum* × *Phyllitis*° *scolopendrium*

(trisubgeneric hybrid) IS Wagner 1972, Wagner & Hagenah 1989, Knobloch 1996

Asplenium × *Ceterach*° IS (→ × *Asplenoceterach* D. E. Mey. 1957 Ber. Deutsch. Bot. Ges. 70, 61) Knobloch 1996 (3 nothospecies), IPNI 2011 (3 nothospecies) (notice, that × *Asplenoceterach badense* turned out to be a monstrous form of *C. officinarum*, see Rasbach & al. 1989 and Reichstein 1981; but that *A. majoricum* × *C. officinarum* and *A. cf. trichomanes* × *C. aureum* remain as nothospecies).

~~*Asplenium* × *Cystopteris*~~ *Aspleniaceae* × *Cystopteridaceae* interfamilial IF erroneous (→ × *Asplenicycstopteris* P. Fournier 1934 Quatre Fl. France 10) IPNI 2011 (2 nothospecies) → obviously only aberrant forms of *Cystopteris fragilis* and *Dryopteris filix-mas*, Knobloch 1996 he notes: no type species acc. to Badre , <http://www2.dijon.inra.fr/flore-france/as.htm>, erroneously in POWO 2025, not accepted by Liu et al. 2020

Asplenium × *Hymenophyllum* see Knobloch et al. 1996 (*A. ceterach* × *H. cheilosorum* Bir 1963; *A. tripteropus* × *H. unilaterale* Bir 1960, Mehra 1961)

Asplenium × *Phyllitis*° (= *Asplenium* p. p.) IS (→ × *Asplenophyllitis* Alston 1940 Proc. Linn. Soc. London 152: 139 = *Asplenium* p. p.) (nat. hyb. + art. hyb.) Alston 1940, Vida 1963, 1970, Emmott 1963, 1964, Girard & Lovis 1968, Meyer 1969b, Lovis & Vida 1969, Knobloch 1996 (7 nothospecies), IPNI 2011 (7 nothospecies)

Asplenium × *Pleurosorus*° IS (nat. hyb. Meyer 1963 (*A. glandulosum* = *trichomanes* × *P. pozoii*), Vida 1965, Lovis 1973, Reichstein 1981, Knobloch 1996 (*A. petrarchae* × *P. hispanicus*))

Camptosorus° *rhizophyllum* × *Phyllitis*° *scolopendrium* IS (nat. hyb.) Wagner 1963, Knobloch 1996

Ceterach° (= *Asplenium* p. p.) × *Phyllitis*° IS (→ × *Ceterophyllitis* Pic. Serm. 1979; = „*Phyllitopsis hybrida*“ Reichstein) (nat. hyb.) Milde 1864, Alston 1940, Vida 1976 (*Asplenium javorkeanum* = *C. officinarum* p. p. × *P. sagittata*), Pichi-Sermolli 1979, Knobloch 1996

References:

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Polypodiales: Athyriaceae 3: 650 (suborder Aspleniinae)

lady fern family = Frauenfarngewächse

Athyrium 230 (incl. *Cornopteris*°), *Deparia* 70 (incl. *Triblemma*°), *Diplazium* 350, *Pseudathyrium* 1 (= *Athyrium distentifolium*, in PPG I 2016 still included in *Athyrium*).

POW0 2025 (sub Aspleniaceae): 0 IG. *Athyrium* s. l. 71 IS, *Deparia* 10 IS, *Diplazium* 21 IS

In **Athyriaceae** probably at least the members of the 3 genera *Athyrium* + *Pseudathyrium* 231, *Deparia* 70, and *Diplazium* 350) belong to the same basic type, each, due to the high number of interspecific hybrids. The family is monophyletic, and attempts to divide it into subgroups are controversial. Thus, possibly the whole family might represent a basic type.

Athyrium × *Cornopteris*° IS (→ × *Cornoathyrium* Nakaike 1992 New Fl. Japan, Pterid, 840) (nat. hyb.) Knobloch 1996, IPNI 2009 (3 nothospecies), Liu et al. 2020.

Athyrium × *Pseudathyrium* (→ × *Schnellerathyrium* Hong M. Liu et al. 2020), Liu et al. 2020 (= *Athyrium* × *reichsteinii* = *A. filix-femina* × *Pseudathyrium distentifolium*, nat. hyb. Central Europe), Wan & Zhang (2022) propose the new name ×°*Apseudathyrium*.

Deparia × “*Diplazium*” *subsINUatum* IS (→ × *Depazium* Nakaike 1992 New Fl. Japan, Pterid, 840; *Deparia* p. p.) (nat. hyb.) IPNI 2009 (3 nothospecies: *De. lobatocrenata*; *De. tomitaorana*: according to Sano et al. 2000 one of the putative intergeneric hybrids: *Deparia petersenii* × *Diplazium subsINUatum* is only interspecific because *Diplazium subsINUatum* is better placed in *Deparia*).

Deparia × *Neotriblemma*° IS (→ × *Neotribleparia* Nakaike 2004 J. Nippon Fernist Club 3 (Suppl. 2): 128; *Deparia* p. p.) IPNI 2011

References:

Sano R et al. (2000) *Diplazium subsINUatum* and *Di. tomitaroanum* should be moved to *Deparia* according to molecular, morphological, and cytological characters. J. Plant Res. 113, 157. <https://doi.org/10.1007/PL00013922>

Wang X & Zhang L-B (2022) Three new fern names of hybrid genera and four new combinations in Athyriaceae, Osmundaceae, and Thelypteridaceae. Phytotaxa 575 <https://doi.org/10.11646/phytotaxa.575.1.8>

Polypodiales: Blechnaceae 24: 265 (excl. Onocleaceae) (suborder Apteniinae)

hard-fern family, chain-fern family = Rippenfarngewächse

3 subfamilies:

Blechnoideae 18: 238

Stenochlaenoideae 24: 265

Woodwardioideae 3: 15

POWO 2025: 0 IG. *Blechnum* 6 IS.

Blechnoideae 18: 238

Blechnum 30, *Doodia* 19, *Oceanopteris* 8, *Struthiopteris* 5, ...

Doodia × *Oceanopteris* *Doodieae* (→ × *Oceanidoodia* Hong M. Liu et al. 2020) Liu et al. 2020. The 2 genera are closely related.

Polypodiales: Cystopteridaceae 3: 37 (suborder Aspleniinae)

bladder fern family = Blasenfarngewächse

Formerly part of Woodsiaceae s. l.

PPG I 2016: *Acystopteris* 3, *Cystopteris* 26, *Gymnocarpium* 8. monophyletic.

Probably **basic type family Cystopteridaceae** (3: 37): The two main and most distant (Rothfels et al. 2013, Fig. 4; FOTL v1.7.0) genera are connect by hybridization though they diverged from each other some 60 million years ago.

Asplenium × *Cystopteris* **Aspleniaceae** × **Cystopteridaceae** interfamilial IF erroneous (→ × *Asplenicystopteris* P. Fournier 1934 Quatre Fl. France 10) IPNI 2011 (2 nothospecies) → obviously only aberrant forms of *Cystopteris fragilis* and *Dryopteris filix-mas*, see Kew VPFG, Knobloch 1996, <http://www.tela-botanica.org/eflore/BDNFF/4.02/nn/7497/synonymie>, <http://www2.dijon.inra.fr/flore-france/as.htm>

Cystopteris × *Gymnocarpium* (→ × *Cystocarpium* [Fraser-Jenk.](#) 2008 [Taxon. Revis. Indian Subcontinental Pteridophytes](#) 207) (nat. hyb.) (French Pyrenees: *C. fragilis* × *G. robertianum* → × *Cystocarpium roskamianum*) Rothfels et al. 2015, Liu et al. 2020 (accepted).

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Polypodiales: Dennstaedtiaceae 10: 265 (suborder Dennstaedtiinae)

bracken family = Adlerfarngewächse

Dennstaedtia 70, *Pteridium* 4, ...

Polypodiales: Dryopteridaceae 26: 2115 (suborder Polypodiinae)

wood fern family = Wurmfarngewächse

excl. Woodsiaceae (= Athyriaceae) and excl. Tectariaceae.

POWO includes the family in Polypodiaceae.

3 subfamilies:

Dryopteridoideae 6: 1128

Elaphoglossoideae 11: 883

Polybotryoideae 7: 98

POWO 2025 (sub Polypodiaceae s. l.): 2 IG ($\times$ *Dryostichum*, $\times$ *Cyclobotrya*).

Arachniodes 19 IS, *Bolbitis* 3 IS, *Dryopteris* 95 IS, *Polystichum* 70 IS, ...

For manifold interspecific hybrids and hybridogeneous species in *Dryopteris* see e.g.

https://en.wikipedia.org/wiki/North_American_Dryopteris_hybrid_complex, and

https://theses.cz/id/6m2bli/Hornyach_PhD_online.pdf

In **Dryopteridoideae**, many hybrids are known. Of special interest are in **subfamily Dryopteridoideae** hybrids between the two large genera *Dryopteris* (400) and *Polystichum* (500) connecting at least the tribes **Dryopteridoideae + Polysticheae** to a basic type (5: 1120), see the figure below. There are no hybrids connecting the monotypic tribe Ctenidoideae, so far.

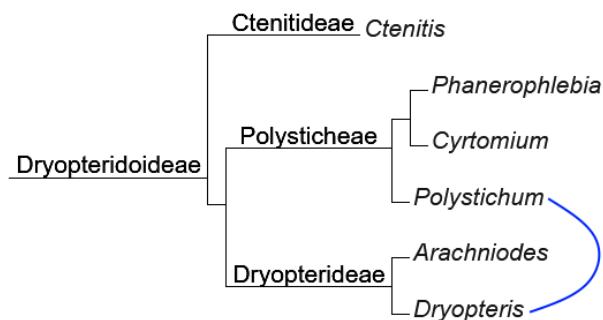
Dryopteridoideae 6: 1128

3 tribes (en.wikipedia 2025):

Ctenidoideae 1: 125 *Ctenis* 125

Dryopteridoideae 2: 460 *Arachniodes* 60, *Dryopteris* 400

Polysticheae 3: 660 *Cyrtomium* 35, *Phanerophlebia* 125, *Polystichum* 500



Subfamily Dryopteridoideae: Hybridization within a phylogeny (cf. Nitta JH et al. 2022.

doi:10.3389/fpls.2022.909768)

Arachniodes $\times$ *Leptorumohra*^o (= *Arachniodes* p. p.) **IS** **Dryopteridoideae** ($\rightarrow$

$\times$ *Leptoarachniodes* Nakaike 1992, New Fl. Japan, Pterid., 841; *Arachniodes* p. p.)

Nakaike 2001, IPNI 2009 (2 nothospecies),

Dryopteris $\times$ *Polystichum* **IT** **Dryopteridoideae** $\times$ **Polysticheae** ($\rightarrow$ $\times$ *Dryostichum* W. H.

Wagner 1992 in Canad. J. Bot 70 (2): 247). – Three nothospecies have been reported:

1. *D. goldiana* $\times$ *P. lonchitis* $\rightarrow$ $\times$ *D. singulare* (nat. hyb.) Wagner 1988, Kubitzki 1990,

Wagner et al. 1991/1992, Knobloch 1996, IPNI 2011, Liu et al. 2020.

2. *D. filix-mas* $\times$ *P. aculeatum* ($\rightarrow$ " $\times$ *Dryopolystichum*" recorded by Domin 1942 is doubted by Fraser-Jenkins & Reichstein 1984, p. 169 and Liu et al. 2020.

3. *Dryopteris pseudocaenopteris* (= *Diacalpe*^o *aspidioides*) $\times$ *Polystichum squarrosus* ($\rightarrow$ $\times$ *Polysticalpe mirabile* Fraser-Jenk. 1997, New Sp. Syndrome Indian Pteridol., 300)

IPNI 2009. After Liu et al. 2020 this hybrid must be transferred to $\times$ *Dryostichum*, see also Singh et al. 2025.

~~*Dryopteris filix-mas*~~ × *Thelypteris* (= *Oreopteris* = "*Dryopteris*") *limbosperma*

Dryopteridaceae × Thelypteridaceae IF interfamilial (→ *Dryopteris* "×*digenea*"

Domin 1935/36) Domin 1929, Ewan 1944] → **erroneous**; according to Taylor 1953 this is *Thelypteris limbosperma*, see also Fraser-Jenkins & Reichstein 1984, p. 169

Polybotryoideae 7: 98

Cyclodium 10, *Polybotrya* 39, ...

***Cyclodium* × *Polybotrya* Polybotryoideae** (→ × *Cyclobotrya*) Engels et al. 2017 (*C. meniscoides* × *P. goyazensis*, nat. hyb.), Schwartsburd et al. 2018 (*C. meniscoides* × *P. osmundacea*, nat. hyb.). The 2 genera are closely related. 2 nothospecies.

References:

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Polypodiales: Lindsaeaceae 7: 234 (suborder Lindsaeinae)

formerly part of Dennstaedtiaceae or Dryopteridaceae

Lindsaea 180, *Odontosoria* 23, ...

Lindsaea ensifolia × *Odontosoria chinensis* (→ × *Lindsaeosoria* W. H. Wagner 1993 Contr. Univ. Michigan Herb. 19: 72) (nat. hyb., sterile) Wagner 1988, Knobloch 1996, IPNI 2011, Lehtonen 2018 (confirmed by molecular analysis), Liu et al. 2020. The 2 genera are closely related.

References:

Lehtonen S (2018) ×*Lindsaeosoria flynnii* (Lindsaeaceae), Another confirmed example of deep hybridization among the ferns. Amer. Fern J. 108, 7–18.
Wagner WH Jr (1988) Status of the Hawaiian fern flora. Fiddlehead Forum 15 (2), 11–15.

Polypodiales: Polypodiaceae 65: 1652 (suborder Polypodiinae) polypody family = Tüpfelfarngewächse

Monophyletic. POWO 2025 includes family Dryopteridaceae.

6 subfamilies (PPG I 2016):

Drynarioideae 6: 148 *Aglaomorpha* 50 (incl. *Drynaria*°), *Arthromeris* 8, *Selliguea* 85, ...

Grammitoideae 33: 911 *Acrosorus* 9, *Adenophorus* 10, *Cochlidium* (incl. *Xiphopteris*°) *Grammitis* 43, *Prosaptia* (incl. *Ctenopteris*°)

Loxogrammoideae 2: 32 *Dictymia* 2, *Loxogramma* 30

Microsoroideae 12: 183 *Lepisorus* 80, *Leptochilus* 10, *Microsorium* 40, ...

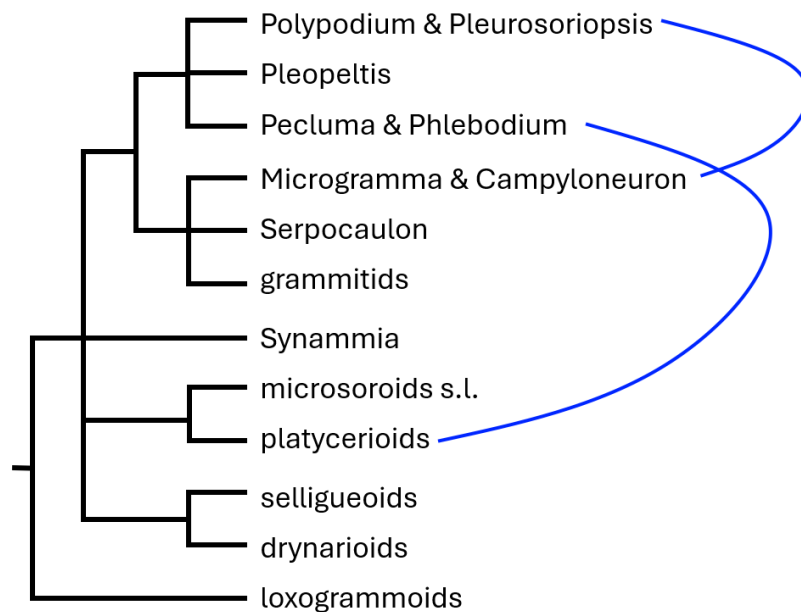
Platycterioideae 2: 70 *Platycterium* 18, *Pyrrosia* 52

Polypodioideae 9: 305 *Campyloneurum* 50, *Microgramma* 30, *Niphidium* 10, *Pecluma* 40, *Phlebodium* 4, *Pleopeltis* 90 (incl. × *Pleopodium*), *Pleurosoriopsis* 1, *Polypodium* 40, *Serpocaulon* 40

POWO 2025: 1 IG: × *Phlebosia*.

Adenophorus 2 IS, *Pleopeltis* 12 IS, *Polypodium* 12 IS, ...

In **Polypodiaceae** many hybrids exist, most of them within the subfamilies. Of special interest is the interfamilial hybrid × *Phlebosia* (= *Phlebodium* × *Pyrrosia*, see the list below) connecting subfamilies Polypodioideae + Platycterioideae (11: 375). According to cladogram below the subfamily Loxogrammoideae (2: 32) is possibly not included in the same basic type as the rest of family Polypodiaceae (65: 1652).



Family Polypodiaceae: Hybridization within a phylogeny (cf. Janssen T et al. 2007. Brittonia 59, 159–181. [https://doi.org/10.1663/0007-196X\(2007\)59\[159:OADOAF\]2.0.CO;2](https://doi.org/10.1663/0007-196X(2007)59[159:OADOAF]2.0.CO;2))

Aglaomorpha coronans × *Drynaria*^o *rigidula* (= *Aglaomorpha* p. p.) **IS Drynarioideae** (→ × *Aglaonaria* Hoshiz. 1991 Amer. Fern J. 81 (2), 38; *Aglaomorpha*!) (nat. hyb.) Hoshizaki 1991, Knobloch 1996, IPNI 2009

Arthromeris × *Selliguea* **Drynarioideae** (→ × *Sellimeris* Fraser-Jenkins et al. 2018) Fraser-Jenkins et al. 2018 Annot. Checkl. Ind. Pterid. 2: 448, Liu et al. 2020 (accepted), POWO 2025 (IS, synonym of *Selliguea khasiana*)

Colysis^o (= *Leptochilus* p. p.) × *Microsorium* **Microsoroideae** Morishige et al. 2008

Ellipinema^o (= *Lepisorus* p. p.) × *Lepisorus* **IS Microsoroideae** (→ × *Lepinema*) Zhang & Zhang 2020a (*Ellipinema* has been described in 2020 as a new genus as a segregate of *Lepisorus*), Zhang & Zhang 2020b propose the new name × *Ellipisorus*)

Grammitis × *Prosaptia* (= *Ctenopteris*^o) **Grammitoideae** Kubitzki 1990 (4 nothospecies: *C. heterophylla* × *G. billardii* Parris 1977, *C. heterophylla* × *G. magellanica* Parris & Barnett, in prep., *C. longiceps* × *G. sumatrana* Parris 1984, *C. curtisii* (= “*Polypodium decrescens*”) × *G. fasciata* [→ *G. × loheriana*] Copeland 1952, 1960), Knobloch 1996

Grammitis × *Xiphopteris*^o (= *Cochlidium*) **IS Grammitidoideae** (nat. hyb.) Kubitzki 1990 (*G. subfasciata* × *X. conjunctisora* Parris 1983)

Microgramma lycopodioides × *Polypodium plesiosorum* **Polypodioideae** (nat. hyb.) Gomez 1975, Knobloch 1996, Checklist of the Ferns and Lycophytes of the World 2025 (*Microgramma × moraviana*) Remark: Since both parents are accepted this hybrid must be intergeneric!

Phlebodium aureum × *Pyrrosia lingua* **ISF Polypodioideae × Platycerioideae** (→ × *Phlebosia louisiana* Viane & Pompe in Fern Gaz. 21, 107 (2020). (Found accidentally in 2014 by JJ Georgusis in his greenhouse. Fertile. Allotetraploid. Meanwhile it is widespread as an ornamental plant. The 2 genera are “separated for at least 35 million years”) POWO 2025

Pleopeltis macrocarpa × *Pleopeltis* (= „*Polypodium*”) *thyssanolepis* **IS Polypodioideae** (→ × *Pleopodium* E. A. Schelpe & N. C. Anthony (nat. hyb.) Anthony & Schelpe 1985

(but *Pl. macrocarpa* × *Po. polypodioides* is obviously no hybrid, see <http://plants.jstor.org/flora/ftea005296>), Mickel & Beitel 1987, Kubitzki 1990, Kew VPGF, Tryon & Stolze 1993, Knobloch 1996, IPNI 2009 (5 nothospecies) (Attention: several species of *Polypodium* have been transferred to *Pleopeltis* by some authors; so they include the nothogenus × *Pleopodium* in *Pleopeltis*).

References:

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Polypodiales: Pteridaceae 53: 1211 (suborder Pteridinae)

maidenhair fern family, break family = Saumfarngewächse

5 subfamilies:

Cheilanthes 23: 426. The subdivision of this monophyletic group has changed, and many species have been placed in very different genera.

PPG I: *Astrolepis* 8, *Cheilanthes* 100, *Hemionitis* 5, *Myriopteris* 45, *Notholaena* 30, *Pellaea* 40, ... – Alternatively, POWO 2025 places all genera in the single genus *Hemionitis*, see also the reclassification of Schuettpelz et al. 2025.

Cryptogrammoideae 3: 31 *Coniogramme* 20, *Cryptogramma* 10, *Llavea* 1

Parkerioideae 2: 9 *Acrostichum* 3, *Ceratopteris* 6

Pteridoideae 13: 400 *Jamesonia* (incl. *Eriosorus*°) 50, *Pityrogramma* (incl. *Trismeria*) 20, ...

Vittarioideae incl. *Adiantaceae* 12: 345 *Adiantum* 225, ...

POWO 2025: 0 IG. *Adiantum* 7 IS, *Hemionitis* (sensu subfam. *Cheilanthes*) 27 IS

Astrolepis (= *Cheilanthes*) *cochinensis* × *Astrolepis* (= *Notholaena*) *sinuata* IS

Cheilanthes (→ *A. windhamii* (nat. hyb.) Knobloch 1996

“*Cheilanthes skinneri* × *Hemionitis subcordata*” IS *Cheilanthes* (→ × *Hemionanthes* Mickel 1992 in Fl. Novo-Galiciana 17, 286; = *Cheilanthes gryphus* Mickel 1988) (nat. hyb.) Knobloch 1996, IPNI 2007 (sub *Adiantaceae*), Liu et al. 2020: incertae sedis. This hybrid has actually been published in 2025 under the name *Ynesmexia* × *gryphus* (Mickel) Fauskee & Windham in Taxon 74 (= *Y. fournieri* × *Y. subcordata*) Fauskee et al. 2025. – The authors add: “*Y. skinneri* s.str. is an allotetraploid between members of the “*subcordata*” and “*seemannii*” subclades.

“*Cheilanthes covillei* × *Notholaena newberryi*” IS *Cheilanthes* (→ *Cheilanthes* × *fibrillosa*, *Myriopteris* × *fibrillosa*) (nat. hyb., sterile) Lellinger 1985 (Smith), Knobloch 1996. This taxon is placed in *Myriopteris* as *M. × fibrillosa* in the Checklist of the Ferns and Lycophytes of the World 2025.

Coniogramme intermedia × *Dictyogramme*° (= *Coniogramme*) *japonica* IS

Cryptogrammoideae (→ × *Coniodictyogramme fauriei* Nakai 1949 in Bull. Natl. Sci. Mus. 27, 22; *Coniogramme faurei*) (nat. hyb.) Nakai 1949, IPNI (sub *Adiantaceae*: *C. fraxinea* × *D. japonica*)

Eriosorus° (= *Jamesonia* p. p.) × *Jamesonia* IS *Pteridoideae* (→ × *Eriosonia* Pic. Serm. 1977 in Webbia 31: 242; *Jamesonia*) (nat. hyb.) Tryon 1970, Kubitzki 1990, Knobloch 1996 *Hemionitis subcordata* × *Pellaea skinneri* IS *Cheilanthes* (nat. hyb.) Mickel 1984, 1992, Knobloch 1996. This assumed hybrid is identical with × *Hemionanthes*, see “*Cheilanthes skinneri* × *Hemionitis subcordata*”

Pityrogramma × *Trismeria*° (= *Pityrogramma* p. p.) IS *Pteridoideae* (→ × *Pityromeria* L. D. Gomez 1979 in Brenesia 16, 96; *Pityromeria*!) (nat. hyb.) IPNI 2007 (sub *Adiantaceae*)

References:

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Polypodiales: Tectariaceae 7: 250 (suborder Polypodiinae)

formerly part of Dryopteridaceae

halberd fern family = Halbmondfarnverwandte

Dictyoxiphium[°] (= *Tectaria*) *panamense* × *Tectaria incisa martinicensis* **IS** (→ × *Pleuroderris michleriana*) (hybridogeneous taxon = **HY**) Maxon 1934, Wagner et al. 1978, Knobloch 1996, IPNI 2011 (attention: confusingly the basionym of the hybrid is “Dennstaedtiaceae *Lindsaea* × *michleriana* D. C. Eaton 1860 *Mem. Amer. Acad. Arts n. s.* 8: 213”)

Quercifilix[°] (= *Tectaria* p. p.) × *Tectaria* **IS** Manton & Sledge 1954, Knobloch 1996

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Polypodiales: Thelypteridaceae 36: 1200 (suborder Aspleniinae)

marsh fern family = Sumpffarngewächse

POWO 2025 includes the family in a very broad family Aspleniaceae s. l. Attempts of a subdivision of the monophyletic family Thelypteridaceae are controversial. APG 2016 accepts 2 subfamilies:

Phegopteroideae 3: 34 *Macrothelypteris* 10, *Phegopteris* 4, *Pseudophegopteris* 20

Thelypteroideae 33: 1000

Thelypteroideae (1–)33: 1000

The subdivision has been a matter of debate since a long time. Generic names have very often changed. POWO 2025 lumps all taxa in one genus *Thelypteris* s. l., while PPG 2016 accepts as much as 33 genera in 5 tribes. *Thelypteris* s.str. remain only 2 species.

Amauropelteae 3: 300 *Amauropelta* 232, *Coryphopteris* 70, *Metathelypteris*

Leptogrammeae 3: 31 *Cyclogramma* 9, *Leptogramma* 15, *Stegnogramma* 7

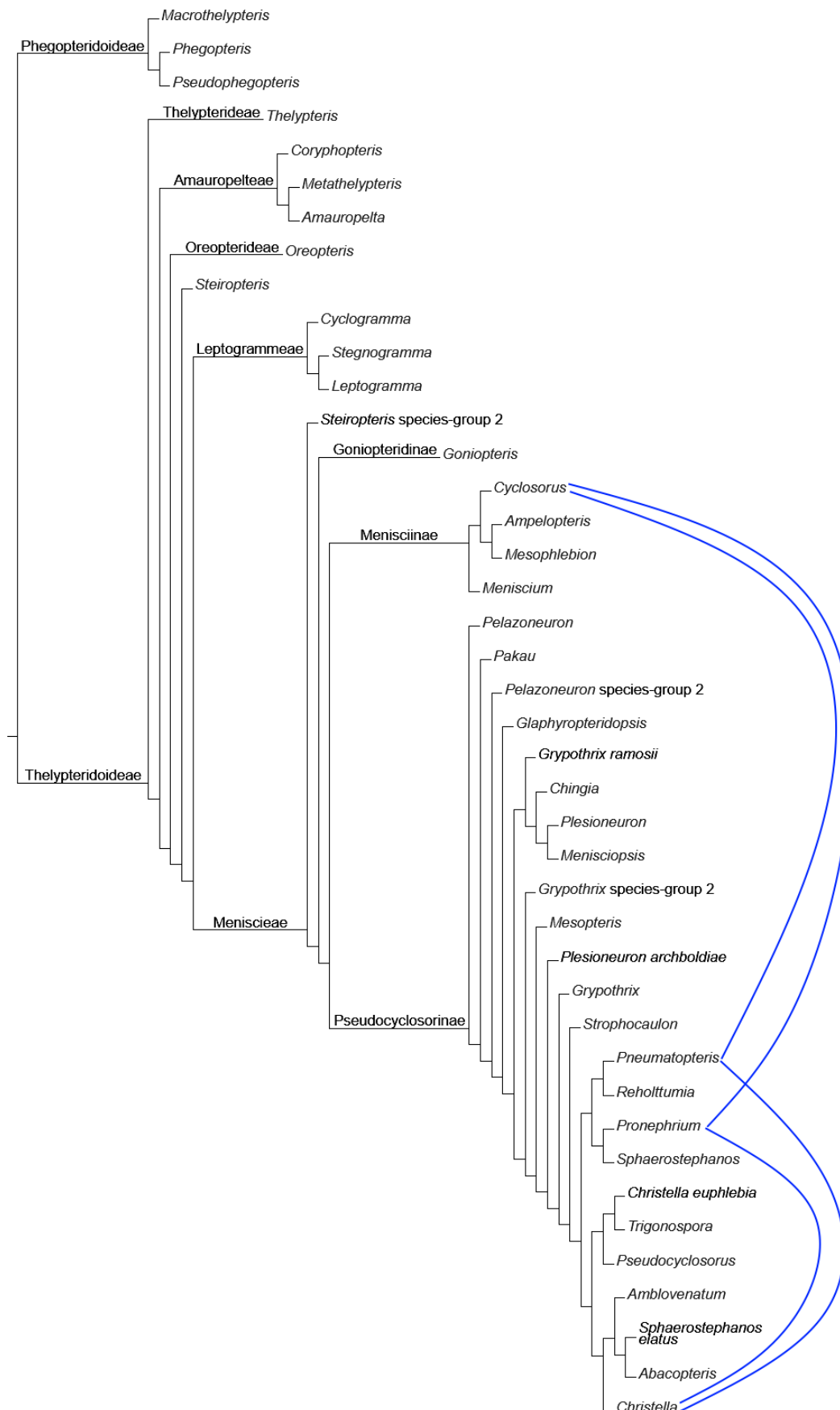
Meniscieae 27: 700 *Abacopteris* 14 (restored 2022), *Amblovenatun*, *Christella* 70, *Cyclosorus* 18, *Glaphyopteridopsis* 12, *Goniopteris* 135, *Grypothrix* 12 (restored 2022), *Menisciopsis* 7, *Meniscium* 27, *Pelazoneuron* 16, *Pneumatopteris* 5, *Pronephrium* 43, *Strophocaulon* (restored 2022), *Trigonospora*, ...

Oreopterideae 1: 2 *Oreopteris* 2

Thelypterideae 1: 2 *Thelypteris* 2

POWO 2025: *Thelypteris* s. l. 20 IS.

Probably **basic type family Thelypteridaceae subfamily Thelypteroideae tribe Meniscieae** (27: 700). Many and even very distant genera are connected via hybridization (except *Goniopteris*). Only the most distant of them are entered in the figure below. Outside of tribe Meniscieae no intergeneric hybrids are known in the family, but possibly the whole family corresponds to the same basic type (33: 1000).



Thelypteridaceae: Cladogram after Nitta et al. 2022, from en.wikipedia 2025 (CC BY-SA 4.0), and known cases of most distant hybridization. A few hybrids have to be added in the figure, but they are not important for the basic type question.

Attention: many names in the list below have been changed since the first date of publication

Abacopteris × *Amblovenatum* see Tseng et al. 2024

Abacopteris × *Christella* (→ × *Abacopterella* T. E. Almeida & A. R. Field in *Austrobaileya* 13: 43 (2023)) 2 nothospecies: Almeida et al. 2023 (*A. aspera* × *C. queenslandica* → × *A. altifrons*), Feng 2025 (*A. nudata* × *C. procera* → × *Abacopterella* × *jerdoni*, basionym *Cyclosorus jerdonii*)

Amblovenatum × *Christella* see Tseng et al. 2024

Amblovenatum × *Strophocaulon* see Tseng et al. 2024

Christella × *Grypothrix* see Tseng et al. 2024, Feng 2025 (→ × *Chririx* Z. H. Feng, nothogen. nov. 2025, *C. procera* × *G. triphylla* → × *Chririx gogoi*, basionym *Thelypteris* × *gogoi*; *C. parasitica* × *G. triphylla* → × *Chririx thwaitesii*, basionym: *Meniscium* × *thwaitesii*)

Christella × *Menisciopsis* (→ × *Christelliopsis* Miles K. Thomas in *Amer. Fern J.* 113: 215 (2023), see Tseng et al. 2024, Feng 2025 (*C. dentata* × *M. penangiana* → × *Christelliopsis nepalensis*, Basionym: *Thelypteris* × *nepalensis*)

Christella × *Pelazoneuron* Knobloch 1996 (2 nothospecies: “*Thelypteris augescens* × *T. ovata*”, sterile; “*T. invis*a × *puberula*”)

Christella × *Pneumatopteris* (→ × *Chrismatopteris* Quansah & D. S. Edwards) (nat. hyb.) Quansah 1985, Knobloch 1996, IPNI 2009 (*C. dentata* × *P. afra*), Liu et al. 2020, Feng 2025 (*C. hispidula* × *P. afra* → × *Chrismatopteris varieevenulosa*, basionym *Thelypteris* × *varieevenulosa*)

Cyclosorus × *Pronephrium* (→ × *Chrinephrium* Nakaike 1992 *New Fl. Japan*, Pterid., 839) see *Christella* × *Grypothrix* (→ × *Chririx*)

~~*Dryopteris* × *Thelypteris*~~ erroneous: see *Dryopteridaceae*

Glaphyopteridopsis × *Menisciopsis* see Tseng et al. 2024, Feng 2025 (*G. erubescens* × *M. penangiana* → × *Glaphyronisciopsis occulta*, Basionym *Nephrodium occultum*)

Glaphyopteridopsis × *Pseudocyclosorus* (= *Cyclosorus* p. p.) (→ × *Glaphypseudosorus*) (*G. erubescens* × *P. esquirolii*) see Liu et al. 2020, see Tseng et al. 2024

Meniscium × *Trigonospora* Knobloch 1996 (*M. thwaitesii* = *triphyllum* × *Trigonospora ciliata* = *tenera*, nat. hyb. Holttum 1971)

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Polypodiales: Woodsiaceae 1–2: 40 (suborder Aspleniinae)

cliff fern family = Wimperfarngewächse

Formerly the family was much larger, including Athyriaceae and Cystopteridaceae. *Woodsia* 40 (incl. *Physematium*)

POWO 2024 *Woodsia* s. l. 5 IS. Checklist of the Ferns and Lycophytes of the World 2025: *Physematium* 2 IS, *Woodsia* 3 IS.

Probably basic type **family Woodsiaceae** (1: 40). The 1 or 2 genera are connected by hybridization.

Physematium × *Woodsia* (→ × *Woodsimatium* Li Bing Zhang, N. T. Lu & X. F. Gao) Lu et al. 2020 (*P. scopulinum* × *W. ilvensis*)

References:

Lu NT et al. (2020). A global plastid phylogeny of the cliff fern family Woodsiaceae and a two-genus classification of Woodsiaceae with the description of

×*Woodsimatium* nothogen. nov. Taxon 68, 1149–1172.

<https://doi.org/10.1002/tax.12180>

Salviniales 2 families, 5 genera, 82 species

Salviniales: Marsileaceae 3: 61

water ferns = Kleefarngewächse

Marsilea 55, *Pilularia* 5, *Regnellidium* 1

POWO 2025: *Marsilea* 1 IS, *Pilularia* 0 IS

For hybridization experiments see: Buchholz JT & Selett JW (1941) The hybridization of water ferns – *Marsilea* and *Pilularia*. The American Naturalist 75 (756), 90–93.

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Salviniales: Salviniaceae 2: 21

floating fern family = Schwimmpfarngewächse

Salvinia 12, *Azolla* 9

POWO 2024: *Salvinia* 1 IS, *Azolla* 0 IS

Schizaeales 3 families, 4 genera, 190 species.