MARATTIACEAE  
合囊蕨科  he nang jue ke  
He Zhaorong (和兆荣)；Maarten J. M. Christenhusz  

Plants terrestrial (rarely epiphytic, sometimes in streams), evergreen. Rhizomes erect, ascending, or creeping, amylaceous (starchy), polycyclotetlyc dicotidystelic. Fronds monomorphic and long-lived or dimorphic and fertile ones short-lived (Danaea), simple or compound, 1–4-pinnate or (pedate)-palmate (Christensenia), small (ca. 20 cm) to very large (up to at least 6 m). Stipes fleshy, with a pair of stipulelike appendages at base, often with conspicuous lenticels. Pulvinii at base of fronds, at nodes, at bases of pinnae, and in some species at “naked” nodes (without pinnae) along stipe. Veins free, simple or bifurcate, or reticulate (Christensenia), false veins present between true veins or absent. Tissues mucilaginous. Indument of multicellular uniseriate hairs and basifixated or peltate scales. Sori lacking true indusia, usually with paraphyses, superficial, sunken or stalked, elongate along veins, bilateral or radial. Sporangia partially or completely fused into synangia, dehiscing by a slit or pore. Spores trilete or monolete, with bullate, muriform, or stellate ornamentation. Prothalli very large, thalloid, photosynthetic.

Six genera and ca. 100 species: pantropical, Danaea Smith, Eupodium J. Smith, and Marattia Swartz in the Neotropics, Angiopteris, Christensenia, and Ptisana in the Paleotropics; three genera and 30 species (17 endemic) in China.

The delimitation of certain species of Angiopteris is unclear.


About 20–25 species: widely distributed in the Paleotropics with the highest diversity in New Guinea, formerly often referred to the genus Marattia (a genus restricted to the Neotropics and Hawaii); one species in China.

1. Ptisana

He nang jue shu

1a. Fronds simple, pedately lobed to palmately compound; venation reticulate; synangium radial ................. 2. Christensenia
1b. Fronds pinnate (sometimes simple when plants juvenile); venation free, simple or bifurcate; synangium ovate.

2a. Sporangia fully fused into synangia, synangium bivalved .............................. 1. Ptisana
2b. Sporangia basally but free apically, synangium composed of globose sporangia ......................... 3. Angiopteris

1. PTISANA


合囊蕨属  he nang jue shu

Plants terrestrial. Rhizomes erect. Stipes with pulvini at base of pinnae and at nodes. Laminae 1–4-pinnate, evenly divided throughout, primary division generally (sub-)opposite, terminal segments usually with a prominent suture at point of attachment; pinna margins usually dentate, occasionally crenulate or entire. Venation free, simple or bifurcate. Scales peltate, often asymmetrical and appearing basifixated, larger scales stalked, scale cells elongate; hairs uniseriate, simple or branching. Sori on veins, marginal to medial. Sporangia fully fused into sessile synangia, outer walls composed of small, rounded cells, mature synangia not sulcate along septa; synangia comprised of 2 opposing rows of sporangia and subtended by rings of paraphyses or uniseriate hairs; synangium opening as a unit, deeply cut, bivalved; sporangia dehiscing by a vertical slit on inner surface of each sporangium valve. Spores monolete (rarely trilete or alete), exospores granular to rugose. 2 synangium opening as a unit, deeply cut, bivalved; sporangia dehiscing by a vertical slit on inner surface of each sporangium valve.

About 20–25 species: widely distributed in the Paleotropics with the highest diversity in New Guinea, formerly often referred to the genus Marattia (a genus restricted to the Neotropics and Hawaii); one species in China.


合囊蕨  he nang jue

Marattia pellucida C. Presl, Suppl. Tent. Pterid. 10. 1845; M. haenkeana C. Presl, M. vestita Christ.

Rhizomes erect, globose, up to 40 cm tall. Fronds up to 2 × 1.5 m. Stipes shorter than laminae, ca. 2 cm in diam., covered with cortical spines and irregularly toothed, narrowly lanceolate brown scales. Laminae oblong in outline, tripinnate, herbaceous to papery; pinnae up to 60 cm; ultimate pinnules narrowly elliptic, 6–10 × 1–1.5 cm, bases cuneate, margins serrate, apices acuminate; veins free, 1.5–2 mm apart, simple, not forked; costaie with small, castaneous, thin scales with bullate bases. Synangia medial or supramedial, 1–2.2 mm, with up to 8- or 9-cellular uniseriate paraphyses, branched paraphyses rare.

Forests on slopes, very rare. Taiwan (Lan Yu) [Philippines].

2. CHRISTENSENIA


天星蕨属  tian xing jue shu

Plants terrestrial. Rhizomes creeping. Stipes with pulvini at base of segments. Laminae simple (and then usually pedately lobed) to palmately compound, bases rounded to pedate, margins simple to broadly crenate, apices acute to acuminate. Venation reticulate. Stomata large, raised, orbicular, permanently open, densely distributed on abaxial frond surfaces, visible to naked eye. Scales flattened, peltate with lobed margins on short stalks, hairs glandular, mixed with scattered uniseriate simple hairs. Sori ± in rows on either side of main veins, appearing scattered. Sporangia fully fused into circular, sessile synangia, sporangia dehiscing by a vertical slit on inside of synangium. Spores trilete (rarely monolete or alete), exospores granular to spinulose, spines simple or branched. $2n = 80, 160$.

One variable species: patchily distributed from NE India and SE Asia to the Solomon Islands.


天星蕨 tian xing jue

Aspidium aesculifolium Blume, Enum. Pl. Javae 2: 143. 1828; Christensenia assamica (Griffith) Ching; C. lobbiana (de Vriese) Rolleri; Kaulfussia aesculifolia (Blume) Blume; K. assamica Griffith; K. korthalsii de Vriese; K. lobbiana de Vriese.

Plants up to 80 cm tall. Rhizomes creeping (to suberect), short, fleshy, scaly; scales brown with red spots, large, rounded. Stipes up to 36(–50) cm. Laminae simple or pedately lobed to palmate, middle pinna largest, 9–25 × 3–15 cm, bases cuneate, margins entire to undulate, apices acute to acuminate, distal pinnae (if present) smaller, inequilateral and subrounded at base, margins entire, lobed, or broadly crenate, usually undulate, apices acute to acuminate. Synangia radially arranged, circular, made up of 8–12 sporangia.

On limestone. Yunnan [India, Indonesia, Malaysia, Myanmar, Papua New Guinea (Bismarck Archipelago), Philippines, Vietnam; Pacific islands (Solomon Islands)].


莲座蕨属 lian zuo jue shu

Archangiopteris Christ & Giesenhagen; Clementea Cavanilles; Macroglossum Copeland; Protangiopteris Hayata; Protomarattia Hayata; Psilodocea C. Presl.

Plants terrestrial (sometimes rooted in stream beds). Rhizomes erect, ascending, or creeping. Laminae 1–4-pinnate, usually evenly divided throughout, occasionally with irregular division of some segments (probably a result of stress during lamina development). Pulvini present at bases of segments, at naked nodes on stipe in juvenile fronds, generally absent at maturity, but present at maturity in some species with creeping rhizomes; primary pinnae alternate or subopposite; veins free, simple or bifurcate, false veins absent or present between veins of varying length and extending from margins toward costae; uniseriate simple hairs present, not glandular, scales peltate but generally appearing basifixed due to asymmetry. Sori borne on veins, marginal, submarginal, or medial; sporangia ± free, fused at base into receptacles, sessile, bilateral, each with 2 opposing rows of sporangia, those opening via a vertical slit on inner surface of each valve, apertures labiate, with distinct patch of specialized thick-walled cells at apex of each sporangium. Spores trilet (rarely monolete or alete), exosporo long spinulose, spines simple or branched. $2n = 80, 160$.

About 30–40 species (but most are currently poorly defined); widely distributed in the Paleotropics, from Madagascar to the S Pacific islands; introduced and naturalized in Hawaii, Jamaica, and Central America; 28 species (17 endemic) in China.

Species of Angiopteris differ chiefly in habit, size, and general appearance; herbarium specimens are therefore often difficult to identify, due to the lack of preserved characters.

The historical variation in species delimitation in Angiopteris has made nomenclature in this genus highly unstable. Moreover, the characters distinguishing species of Angiopteris are usually difficult to observe on herbarium specimens, which are fragmentary and usually lack information on stipule, stipe, frond size, and general habit. Therefore, many of the published names are difficult to interpret because type specimens are often small frond fragments. The majority of species listed here, therefore, may not be readily identifiable in herbaria. Most species are relatively scarce (or at least rarely collected), and it should, therefore, be noted that the majority of Chinese specimens probably belong to the following taxa: Angiopteris fokiensis, A. lygodiifolia, A. somae, and A. yunnanensis. The latter is part of the A. evecta complex, which needs further investigation. The diversity of this genus in Hainan and Yunnan is far from understood; it is possible that hybridization or allopolyplody plays a part in the complexity of Angiopteris. Molecular work and cultivation experiments are needed to solve the complex taxonomy of this genus, but the morphological diversity is far greater than the known genetic diversity in Angiopteris. Chloroplast DNA sequence data suggest that there may be only a small number of species with highly plastic morphology. Even though perhaps not satisfactory, the list of accepted species below should be seen as an approximate consensus.

Angiopteris crassipes Wallich ex C. Presl (Suppl. Tent. Pterid. 23. 1845) and A. neglecta Ching & Chu H. Wang (Acta Phytotax. Sin. 8: 159. 1959, described from Hainan), both accepted in the FRPS account, and A. nanchuanensis Z. Y. Liu (Bull. Bot. Res., Harbin 4(3): 2. 1984), described since from Sichuan, could not be treated here because no material was seen by the present authors.

Archangiopteris subintegra Hayata (Bot. Gaz. 67: 90. 1919, described from Vietnam near the border with China) has been confused with Angiopteris subintegra Ching (here treated as a synonym of A. caudipinnia). Its taxonomic status and presence within China need investigation.

1a. Rhizomes dorsiventral, long creeping; laminae of mature plants once pinnate, rarely bipinnate; stipes with 1–4(–7) naked pulvini in mature fronds; synangia medial, elongate.
A. cochinchinensis
A. confertinervia
A. caudatiformis
A. subrotundata
A. oblanceolata
A. dianyuecola
A. hainanensis
A. wallichiana
A. paucinervis
A. lygodiifolia
A. tonkinensis
A. hokouensis
A. sparsisora
A. helferiana
A. bipinnata
A. itoi
A. subrotundata
A. danaeoides
A. yunnanensis
26a. Pinnule apices long caudate ................................................................. 26. A. caudipinna
26b. Pinnule apices acuminata.

27a. Pinnule margins sharply dentate .......................................................... 27. A. acutidentata
27b. Pinnule margins entire, undulate .......................................................... 28. A. remota

二回莲座蕨 er hui lian zuo jue


Fronds 50–80 cm; stipes 60–70 cm, with 1 naked pulvinus, and 10–12 pairs of pinnae. Laminae once pinnate to bi-
pinnate; pinnae 16–19 × 6–7 cm; pinnules 0–7 pairs, broadly lanceolate, 7–10 × 2.5–2.8 cm, bases cuneate, margins suben-
tire, undulate, apices caudate. Veins obvious, false veins absent. Sori medial, 0.3–2 cm; paraphyses longer than sporangia. Exospores with spinose ornamentation.

- Forests; 1100–1300 m. Yunnan (Maguan, Malipo).

秦氏莲座蕨 qin shi lian zuo jue

Archangiopteris hokouensis Ching, Icon. Filic. Sin. 5: t. 204. 1958, not
Angiopteris hokouensis Ching (1959).

Fronds 50–85 cm; stipes ca. 50 cm, with 4 or 5(–7) naked pulvini. Laminae once pinnate; pinnae 2 or 3 (sub-)opposite pairs, elliptic, 15–20 × 5–7 cm, bases cuneate, margins serrulate-crenulate, apices long caudate. Veins obvious, false veins absent. Sori medial, ca. 1 cm; paraphyses longer than sporangia.

- Forests; 100–500 m. Guangxi, Yunnan.

伊藤氏莲座蕨 yi teng shi lian zuo jue


Fronds ca. 150 cm; stipes 60–100 cm, with 1 naked pulvinus. Laminae once pinnate; pinnae 9–12 pairs, oblong, 25–30 × 3–3.5 cm, bases cuneate, margins undulate, apices caudate. Veins obvious, false veins short (or absent). Sori medial, ca. 1 cm, with 40–90 sporangia; multicellular paraphyses present. Exospores with spinulose ornamentation.

- Extremely rare; 400–600 m. C and N Taiwan (Nantou, Taibei).

According to reviewer Ralf Knapp, the false veins are missing in some plants of C Taiwan.

4. Angiopteris subrotundata (Ching) Z. R. He & Christenhusz, comb. nov.
圆基莲座蕨 yuan ji lian zuo jue


Fronds 50–120 cm; stipes 18–70 cm, with 1 naked pulvinus. Laminae once pinnate; pinnae 4–6 pairs, alternate, elliptic, 10–30 × 2.5–7.5 cm, bases cuneate, margins entire-undulate, apices caudate. Veins obvious, false veins absent. Sori medial, 0.3–2 cm; paraphyses longer than sporangia. Exospores with forked rod-like ornamentation.

- Yunnan (Maguan, Malipo, Xichou).

5. Angiopteris danaeoides Z. R. He & Christenhusz, nom. nov.
尾叶莲座蕨 wei ye lian zuo jue


Fronds 50–85 cm; stipes 20–50 cm, with 1 naked pulvinus. Laminae once pinnate; pinnae 2 or 3 (sub-)opposite pairs, elliptic, 10–25 × 4–5 cm, bases cuneate, margins serrulate-crenulate, apices long caudate. Veins obvious, false veins absent. Sori medial, ca. 1 cm; paraphyses longer than sporangia.

- Guangxi.

尖叶莲座蕨 jian ye lian zuo jue

Protomarattia tonkinensis Hayata, Bot. Gaz. 67: 88. 1919; Archangiopteris tamdaoensis Hayata; A. tonkinensis (Hayata) Ching; Protangiopteris tamdaoensis (Hayata) Hayata.

Fronds 50–85 cm; stipes 40–45 cm, with 1 naked pulvinus. Laminae once pinnate; pinnae 2–4 alternate pairs, elliptic, 20–25 × 4–5 cm, bases cuneate, margins sharply serrate, apices caudate. Veins obvious, false veins absent. Sori medial, 0.7–1 cm; paraphyses shorter than sporangia. Exospores with rodlike ornamentation.

- Hainan [N Vietnam].

7. Angiopteris latipinna (Ching) Z. R. He, W. M. Chu & Christenhusz, comb. nov.
阔羽莲座蕨 kuo yu lian zuo jue


Fronds 40–85 cm; stipes 30–60 cm, with 1 naked pulvinus. Laminae once pinnate; pinnae 2–4 alternate pairs, elliptic, 17–30 × 4.5–6.5 cm, bases cuneate, margins dentate, apices caudate to acuminate. False veins absent. Sori medial, 0.5–2 cm, composed of up to 160 sporangia; paraphyses present, longer than sporangia.

Archangiopteris somae Hayata, Icon. Pl. Formosan. 5: 256. 1915 ["somai"]; A. henry Christ & Giesenhagen var. somae (Hayata) Tagawa; Protagiopteris somae (Hayata) Hayata.

Fronds 50–85 cm; stipes 20–70 cm, with 1 or 2 naked pulvinus. Laminae once pinnate; pinnae 4–6, alternate to subopposite, (ob-)lanceolate, (15–)22–25(–28) × 3–6.5 cm, bases cuneate, margins undulate, crenate to dentate, apices caudate to acuminate. False veins absent. Sori median, 1–2 cm, composed of up to 170 sporangia; paraphyses present, longer than sporangia.


云南莲座蕨 yun nan lian zuo jue

Angiopteris badia Ching; A. evecta (G. Forster) Hoffmann var. alata Christ; A. pingviensis Ching.

Fronds 2–5 m; stipes with deep groove on upper surface; rachises with narrow wings. Laminae bipinnate; pinnae 60–80 × 20–25 cm, with 15–30 pairs of pinnules; pinnules 7–20 × 1.5–3.5 cm, bases cordate, truncate, or rounded, margins shallowly serrate, apices acuminate to obtuse. Veins obvious, false veins obvious (and longer than sori) or absent. Sori close to margin, composed of 13–15 sporangia. Spores spherical or near spheroidal, trilete, one fissure of spore long, other two fissures short.

Forests, often on limestone soil; 100–1200 m. Guangxi, Yunnan [N Vietnam].

This species belongs to the unresolved complex surrounding the morphologically diverse Angiopteris evecta. Further studies are needed to unravel this complex.


疏脉莲座蕨 shu mai lian zuo jue

Fronds 1–2 m; stipes smooth. Laminae bipinnate; pinnae 55–65 × 60–70 cm, with 12–15 pairs of pinnules; pinnules 13–16 × 1–3 cm, often obviously reduced flabellate on basal part of stipe, without midvein, margins crenulate. Veins sparse, lateral veins more than 1 mm apart, false veins absent. Sori ca. 1 mm from margin, 1–2 mm, composed of 8–14 sporangia. Spores trilete.

Forests; 200–300 m. Guangxi (Luocheng).

The name Angiopteris paucinervis was originally published by Chu and He (Acta Bot. Yunnan. 22: 399. 2000) but not validly so because the type was not explicitly indicated (Melbourne Code, Art. 40.6). Later, Jin and Chen (loc. cit.) cited “W. M. Chu et al. ... 18358. (Typus: PYU)” provided a full and direct reference to He’s Latin description and diagnosis, and ascribed the name to “W. M. Chu et Z. R. He ex Z. R. He” thereby validly publishing the name, which should be attributed to W. M. Chu & Z. R. He (Art. 46.2 and Note 2).


食用莲座蕨 shi yong lian zuo jue

Angiopteris acuta Ching; A. parvifolia Ching & Fu.

Fronds 2–4.5 m; stipes smooth. Laminae bipinnate, sometimes tripinnate at base; pinnae 50–60 × ca. 20 cm, with 20–30 pairs of spreading pinnules; pinnules lanceolate, 7–15 × 1–1.8 cm, base cuneate, margins serrate, apices acute. Veins sparse, ca. 10 per cm, false veins absent. Sori almost marginal, with 6–8 sporangia.

Forests; 1500–2000 m. SE Xizang (Mêdog), Yunnan.


法斗莲座蕨 fa dou lian zuo jue

Fronds 85–130 × 60–70 cm, with up to 4 pairs of pinnae; stipes smooth. Laminae pinnate to bipinnate; pinnae 45–65 × 18–70 cm, with 7–15 pairs of spreading pinnules; pinnules lanceolate, 7–16 × 1.5–2.5 cm, bases cuneate, margins serrate to crenulate, apices acute. Veins sparse, less than 10 per cm, false veins absent (or obscure). Sori 1–3 mm from margin, 1–2 mm, with 5–16 sporangia.

Broad-leaved or open forests; 1500–1600 m. Yunnan (Xichou).

It has been suggested that Angiopteris sparsisora is of hybrid origin because it putatively is intermediate between Angiopteris and the formerly independent Archangiopteris, but this has not yet been proven to be the case. This species is, however, one of the reasons why it is difficult to draw a clear morphological distinction between the two genera, and (apart from the molecular evidence provided by Murdock, Amer. J. Bot. 95: 626–641. 2008) it is a further reason to merge Archangiopteris with Angiopteris.


莲座蕨 lian zuo jue

Polypodium evectum G. Forster, Fl. Ins. Austr. 81. 1786; Angiopteris acrocarpa de Vriese; A. alata Nadeaud; A. communata C. Presl; A. diurvilleana de Vriese; A. oldhamii Hieronymus; A. palmiformis (Cavanilles) C. Christensen; Clementea palmiformis Cavanilles.

Fronds 2–5 m; stipes smooth. Laminae bipinnate; pinnae 65–70 × 70 cm, with 15–30 pairs of spreading pinnules; pinnules 7–20 × 0.9–3.5 cm, bases cordate, rounded to cuneate, margins crenulate to serrate, apices acuminate to caudate. Veins obvious, false veins obvious, extending nearly to costule. Sori marginal to ca. 1 mm from margin, ca. 2 mm, with 8–10 sporangia.

Broad-leaved forests, rain forests in valleys, roadsides, slopes, usually on volcanic soils; 100–1200 m. Taiwan (Lan Yu) [New Guinea, Philippines; Australia, S Pacific islands; naturalized in Costa Rica, Hawaii, Jamaica, and possibly elsewhere].

Because this is the first species described in the genus Angiopteris, it has found a very broad application in the past. The species is
here treated in its strict sense with a Pacific distribution (see Christenhusz & Toivonen, Biol. Invas. 10: 1215–1228. 2008), and it can be recognized by its very obvious false veins and its rather large leaves to 5 m. This remains a species complex, however, and more studies at population level and possibly horticultural experiments will be needed to resolve this.


西藏莲座蕨 xi zang lian zhao jue

Type: Nepal. 1821, Wallich 1874 (lectotype, designated here, K! [barcode 000784939]).

Angiopteris fibrillosa Ching & Y. X. Lin; A. henryi Hieronymus; A. lobulata Ching; A. medogensis Ching & Y. X. Lin.

Fronds 1–3 m; stipes smooth, streaked. Laminae bipinnate; pinnae 35–70 × 15–30 cm, with 15–18 pairs of pinnules; pinnules lanceolate, 8–15 × 1–2 cm, bases rounded to cuneate, margins crenulate-entire to serrate, apices acuminate. Veins obvious, sparse, ca. 1 lateral vein per cm; false veins present, usually longer than sori, extending halfway from margin to costule. Sori 0.3–0.5 mm from margin, 1–14 mm, with 12–14 sporangia.

Forests along streams; 300–1500 m. SE Xizang (Mêdog), Yunnan (Yingjiang) [N India, Nepal].

This and the next two species (Angiopteris lygodifolia and A. hainanensis) share numerous characters and are often difficult to tell apart. It appears that they form a grade from larger plants (up to 3 m) with submarginal sori in the Himalaya (A. wallichiana) to smaller plants with near-medial sori in Taiwan and Japan (A. lygodifolia). There are intermediate specimens known from Hainan, and, therefore, it may be difficult to maintain these taxa as distinct. They were maintained here because A. lygodifolia is in common use and would be diverted into synonymy if these species were merged, and they may be separated on the basis of geography. Further studies at the population level are needed to resolve this species complex.

Angiopteris fauriei Hieronymus var. formosana Hieronymus (Hedwigia 61(3): 274. 1919) was included as a synonym of A. henryi in FRPS (2: 36. 1959). If correct, this would add Taiwan to the distribution of A. wallichiana.


金沙叶莲座蕨 hai jin shi ye lijiao zu jue

Angiopteris formosa Ching; A. rabaensis Ching; A. sakuraii Hieronymus; A. taiwanensis Ching.

Fronds ca. 2 m; stipes green, cylindrical, stipes and rachises without deep groove, smooth, streaked. Laminae bipinnate; pinnae 35–70 cm; pinnules 5–15 cm, usually 1–1.2 cm wide, margins serrate. Veins simple or once forked; false veins obvious, long, extending halfway to costule. Sori ca. 1.5 mm, ca. 1 mm from margin.

Ravines, stream banks. Taiwan [Japan].

Angiopteris lygodifolia is possibly conspecific with A. wallichiana (see comments under the latter species).


海南莲座蕨 hai nan lian zhao jue

Fronds 2–3 m; stipes smooth. Laminae bipinnate; pinnae 50–60 × 15–20 cm, with 16–18 pairs of pinnules; pinnules patent, lanceolate, 10–12 × ca. 2 cm, margins nearly entire. Veins sparse, lateral veins ca. 1 mm apart, false veins extending nearly to sori. Sori near margin or 0.3–0.5 mm from margin, ca. 1 mm, with 12–18 sporangia. Spores subspheroidal, trilet.

Hainan (Danzian).

Angiopteris hainanensis is possibly conspecific with A. wallichiana (see comments under the latter species).


三脉莲座蕨 san mai lian zhao jue

Angiopteris crassifolia Ching (1959), not de Vriese (1852); A. crassiuscula Ching; A. magna Ching ex C. Christensen & Tardieu; A. majuscula Ching; A. megaphylla Ching; A. multijuga Ching; A. muda Ching; A. pinnata Ching; A. vasta Ching.

Fronds 2–4 m; stipes smooth. Laminae bipinnate; pinnae 60–110 × 20–40 cm, with 14–18 pairs of pinnules; pinnules 15–25 × 1.5–3 cm, bases cordate, rounded, or truncate, margins serrate aculeate to acuminate. Veins dense; false veins present, rarely absent. Sori 1–2 mm from margin, 2–3 mm, composed of 12–18 sporangia.

Rain forests, broad-leaved forests; 100–1200 m. Guangxi, Yunnan [E Myanmar, Vietnam].


楔基莲座蕨 xie ji lian zhao jue

Angiopteris latemarginata Ching; A. subcuneata Ching.

Fronds 2–3 m; stipes smooth. Laminae bipinnate; pinnae 60–80 × 20–30 cm, with 15–20 pairs of pinnules; pinnules 10–20 × 2–6 cm, bases cuneate, margins serrate to sharply serrate, apices acuminate to caudate. Veins dense; false veins absent. Sori 2–3 mm from margin, 1.5–3 mm, composed of 14–26 sporangia.

Seasonal rain forests, broad-leaved forests; 900–1400 m. Guangxi, Yunnan [Bhutan, India, Myanmar, Nepal].


密脉莲座蕨 mi mai lian zhao jue


Fronds 1.5–2 m; stipes tuberculate. Laminae bipinnate; pinnae 60–80 × 20–30 cm, with 15–20 pairs of pinnules; pinnules 15–25 × 1.5–3 cm, bases cuneate, margins serrate, apices acuminate to caudate. Veins sparse, ca. 10 per cm; false veins absent. Sori 2–3 mm from margin, 1.5–3 mm, composed of 12–18 sporangia.

Forests; 100–200 m. Yunnan (Hekou) [N Vietnam].

王氏莲座蕨 wang shi lian zuo jue

Fronds dark green, 1–2 m; stipes tuberculate. Laminae bipinnate; pinnae narrowly ovate, 40–60 × 15–18 cm, with 25–27 pairs of pinnules; pinnules 12–15 × 3–5 cm, bases rounded to truncate, margins regularly serrate, apices acuminate, curved acroscopically. Veins obvious, false veins absent. Sori 0.5–1 mm from margin, 2–4 mm, composed of 18–20 sporangia.

- Broad-leaved forests; 400–1600 m. Guangxi, Yunnan.


福建莲座蕨 fu jian lian zuo jue


Fronds 2–4 m; stipes tuberculate. Laminae bipinnate; pinnae 50–60 × 20–60 cm, with 35–40 pairs of pinnules; pinnules lanceolate, 7–9 × 1–1.8 cm, bases rounded to truncate, margins regularly serrate, apices acuminate, acroscopically curved. Veins obvious, false veins absent. Sori 0.5–1 mm from margin, ca. 1 cm, composed of 8–10 sporangia.

- Broad-leaved forests; 400–1600 m. Fujian, Guangdong, Guangxi, Guizhou, Hainan, Hunan, Jiangxi, Sichuan, Yunnan, Zhejiang.


河口莲座蕨 he kou lian zuo jue


Fronds light green, 2–4 m; stipes tuberculate. Laminae bipinnate; pinnae 60–70 cm, up to 30 cm wide, with 12–14 pairs of (sub-) opposite pinnules; pinnules oblong, 12–18 × ca. 2 cm, bases rounded, margins densely shallowly crenate, apices acuminate. Veins obvious abaxially, obscure adaxially; false veins short, just surpassing sori. Sori 0.3–0.5 mm from margin, 0.5–0.7 mm, composed of 10–12 sporangia.

- Forests. Hainan.


琼越莲座蕨 qiong yue lian zuo jue

Angiopteris howii Ching & Chu H. Wang.

Fronds 1–2.5 m; stipes tuberculate. Laminae bipinnate; pinnae 40–70 × 15–35 cm, with 10–15 pairs of pinnules; pinnules lanceolate, 12–18 × 1.5–2.8 cm, bases rounded to cuneate, margins dentate to shallowly crenate (to nearly entire), apices acute to cuneate. Veins usually obvious, sometimes obscure adaxially, 10–15 lateral veins per cm; false veins short, not surpassing sori or up to 1/3 toward costule. Sori 0.3–0.5 mm from margin, 0.5–1.5 mm, composed of 7–15 sporangia.

- Forests; 900–1200 m. Guangxi, Hainan [Vietnam].

Angiopteris cochinchinensis may be expanded in the future to include a few other very similar taxa such as A. acutidentata, A. caudi- pianna, and A. remotula. Further studies are needed to establish if these taxa are phenotypes of a single species or separate species in their own right.


滇越莲座蕨 dian yue lian zuo jue


Fronds 2–4 m; stipes tuberculate. Laminae bipinnate; pinnae ovate-lanceolate, 100–240 × 100–150 cm, with 15–25 pairs of (sub-)opposite pinnules; pinnules oblong, ovate-lanceolate, or oblongate, 5–8 × 1–2 cm, bases rounded to cuneate, margins serrate, apices shortly acuminate to caudate. Veins obvious abaxially, false veins present. Sori 2–4 mm from margin, 1–6 mm, composed of 14–20 sporangia.

- Forests; ca. 100 m. Yunnan (Hekou) [Vietnam].


长尾莲座蕨 chang wei lian zuo jue

Angiopteris subintegrata Ching; A. venulosa Ching.

Fronds 1–2 m; stipes tuberculate. Laminae bipinnate; pinnae 40–50 × 15–20 cm, with 11 or 12 pairs of pinnules; pinnules 10–13 × 2.5–3.5 cm, bases rounded, margins sharply serrate, apices long caudate. Veins obvious; false veins long, ± halfway from margin to costule. Sori 0.3–0.5 mm from margin, ca. 1 mm, composed of 7–17 sporangia. Exospores with reticulate ornamentation.

- Forests by streams. Hainan.


尖齿莲座蕨 jian chi lian zuo jue
Fronds 1–2 m; stipes tuberculate. Laminae bipinnate; pinnae 50–60 × 20–25 cm, with 16–18 pairs of pinnules; pinnules 10–20 × 1.5–2 cm, bases asymmetrical, rounded, margins sharply serrate, apices acuminate. Veins obvious, up to 15 lateral veins per cm; false veins long, ± halfway from margin to costule. Sori ca. 0.5 mm from margin, ca. 1 mm, composed of 10–12 sporangia. Exospores with reticulate ornamentation.

● Hainan.


Fronds 1–2 m; stipes tuberculate. Laminae bipinnate; pinnae ca. 60 × 15–22 cm, with ca. 15 pairs of pinnules; pinnules 13–15 × 1.5–2 cm, bases rounded, margins nearly entire, slightly undulate, apices acuminate. Veins obvious, up to 15 lateral veins per cm; false veins long, up to ± halfway from margin to costule. Sori ca. 0.5 mm from margin, ca. 1 mm, composed of 10–12 sporangia.

● Hainan.