

GUIDE TO THE GENERA OF LIANAS AND CLIMBING PLANTS
IN THE NEOTROPICS

FERNS

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BLECHNACEAE

A nearly cosmopolitan family of 24 genera and about 265 species of terrestrial ferns, with erect, creeping, scrambling or trunk-like rhizomes. In the Neotropics, the family is represented by about 12 genera and 117 species, of which only the genera *Blechnum* and *Salpichlaena* have a few climbing ferns. For the most part, these are found in moist to wet forests.

Diagnosics: Root-climbing or twining ferns; leaves ascending or spreading, dimorphic, pinnatisect or 1-pinnate; pinnae in fertile leaves narrower than those of sterile leaves; sporangia in linear sori along both side of the midvein.

General Characters

1. CLIMBING MECHANISMS. Rhizomes elongated, with adventitious roots (*root-climbers*) or *twining* primary leaf rachis.
2. LEAVES. Dimorphic, pinnatisect, 1-pinnate or bipinnate; pinnae opposite in bipinnate leaves, alternate or opposite in 1-pinnate leaves, with entire margins, sometimes revolute.
3. SORI. Linear along both sides of midvein, with linear indusia opening inwardly (toward midvein).

KEY TO THE GENERA

1. Plants climbing by long rhizomes with adventitious roots; leaves 1-pinnate or pinnatifid;
rhizome scales denticulate*Lomaridium*
1. Plants climbing by long, twining leaf rachis; leaves bipinnate; rhizome scales
entire*Salpichlaena*

GENERIC DESCRIPTIONS

LOMARIDIUM C. Presl, Abh. Königl. Böhm. Ges. Wiss., ser. 5, 6: 514. 1851.



L. fragile (Sodirol) Gasper & V.A.O. Dittrich, photo by R. Moran

Terrestrial, slightly woody ferns, with erect, creeping or climbing rhizomes. Climbing species with elongated, stout, rhizomes with adventitious roots, reaching 2 or more m in length and densely covered with bicolored, subulate, undulate, denticulate or ciliate scales. Leaves dimorphic. Sterile leaves glabrous, pinnatisect or mostly pinnate in lower half and distally pinnatifid with acuminate or caudate apex, the base acute, with pinnae gradually reduced in size toward the base; pinnae adnate to the rachis or nearly sessile, 25–75 pairs, oblong or oblong-deltate, the apex acuminate, the margins entire, slightly revolute, sometimes with minute callus-like projections; veins free or bifurcate, numerous, parallel; stipe stout, long,

blackish or brown. Fertile leaves with much narrower pinnae than the sterile ones; pinnae 28–41 pairs, linear; sori linear, parallel to the midvein, indusia half as wide as the pinna.

Distinctive features: Root-climbing ferns with elongated, densely clothed rhizome with denticulate scales; leaves 1-pinnate, dimorphic.

Distribution: A pantropical genus of about 16 species, nine of which occur in the Neotropics, most of which are climbers that reach at least 2 m in length; Mexico to Bolivia and SE Brazil and the West Indies; wet forests; 0–1,200 m.

SALPICHLAENA J. Smith, J. Bot. (Hooker) 4: 168. 1841.



S. volubile (Kaulf.) J. Sm., photo by Mireya D. Correa

Terrestrial climbing ferns with twining frond rachides; rhizomes creeping, elongated, non-stoloniferous, clothed with dark brown, lanceolate, scales. Leaves bipinnate, with indeterminate growth, rachis elongate, twining, reaching 5–15 m in length; pinnae dimorphic (sterile and fertile), opposite, stipitate; pinnules opposite to alternate, elliptic-lanceolate with entire or crenulate margins, petiolulate; secondary veins numerous, parallel, simple or forked, perpendicular to the midvein and collected into a marginal vein. Fertile pinnae with much narrower pinnules than the sterile pinnae; sori linear, parallel to midvein; indusia linear, tubular, breaking away in strips from the midvein to expose the spores.

Distinctive features: Vines with twining leaf rachis with indeterminate growth; leaves bipinnate; pinnae once-pinnate, opposite; pinnules petiolulate, opposite to alternate, with entire or crenulate margins.

Distribution: A neotropical genus of four species; Belize, Honduras to Bolivia, Paraguay and SE Brazil; wet forests; 400–800 m.

DRYOPTERIDACEAE

A pantropical family of 40 to 45 genera and about 1,700 species of terrestrial, epiphytic, epilithic, erect or rarely climbing ferns. In the Neotropics, the family is represented by 19 genera and about 955 species, of which only the genera *Cyclodium*, *Mickelia* and *Polybotrya* have about 6 species of root-climbing ferns. For the most part, they are found in moist or wet, lowland forests.

Diagnosics: Root-climbing ferns; rhizomes slightly flattened; leaves ascending or spreading, dimorphic, 1-pinnate or 2-pinnate; pinnules serrate or serrulate; pinnae in fertile leaves narrower than those of sterile leaves; sporangia indusiate or not indusiate.

General Characters

1. CLIMBING MECHANISMS. Scandent, **root-climbing** rhizomes, reaching 4–5 (15) m.
2. LEAVES. Dimorphic, 1-pinnate to 3-pinnate (e.g., *Polybothrya*); pinnae alternate with serrate or serrulate margins; veins pinnate or forking, free or variously anastomosing.
3. SORI. Sporangia in rounded sori or covering the entire abaxial surface.

KEY TO THE GENERA

1. Sporangia in rounded indusiate sori.....*Cyclodium*
1. Sporangia variously arranged, without indusia.....2
2. Sporangia covering the entire abaxial surface of pinnae *Mickelia*
2. Sporangia in round, oblong or linear sori, or occupying both surfaces of caudate pinnules.....*Polybotrya*

GENERIC DESCRIPTIONS

CYCLODIUM Presl, Tent. Pterid. 85. 1836.



C. akawaiorum, from D. Clark 12054 (US)

Terrestrial or hemiepiphytic ferns with short to long creeping rhizomes, *Cycloodium akawaiorum* A.R. Sm. is the only species with a climbing habit that has rhizomes which climb by means of adventitious roots and reach 5m in length. Rhizomes densely clothed near the apex with lanceolate or denticulate scales. Leaves dimorphic, 1-pinnate (in climbing species); pinnae with serrulate margins. Sterile leaves with 6–14 pairs of lateral asymmetrical pinnae, distal pinna gradually reduced to a pinnatifid apex; rachis and costae adaxially grooved; veins free except for the basal pair of a group that meet at or near the margin. Fertile leaves with up to 9 pairs of pinnae that are much narrower than the pinnae in sterile leaves. Sori in (1)2 rows along both sides of the midvein, discrete or

confluent; indusium reddish brown, entire, peltate, glabrous or glandular-ciliate on the margin, often caducous before the sporangia mature, sporangia long-stalked, often abscising at the tip of the stalk.

Distinctive features: Root-climbing ferns with elongated rhizomes that are densely clothed with lanceolate or denticulate scales; leaves dimorphic, 1-pinnate; fertile pinna about $\frac{1}{3}$ as wide as the sterile pinnae; sori rounded, indusiate, in 2 rows between the midvein and the margin.

Distribution: A neotropical genus of 10 species of which *C. akawaiorum* is the only climbing species; Venezuela and Guyana; wet montane forests; 1,000–1,500 m.

MICKELIA R.C. Moran, Labiak & Sundue, *Brittonia* 62: 338. 2010.



M. scandens, photo by Alex Popovki

Hemiepiphytic or terrestrial ferns, creeping or climbing. Rhizomes 2–5 m long, climbing by means of adventitious roots, densely clothed or with few scattered, brown to blackish scales near the apex. Leaves dimorphic, 1-pinnate, distal pinna similar to the lateral pinnae, articulate or continuous with rhizome; pinnae alternate, petiolulate, articulate and serrate (in climbing species); veins polygonally areolate without free veinlets (in climbing species). Fertile leaves with much narrower pinnae and longer petioles than the sterile leaves. Sori covering the entire abaxial surface of pinnae.

Distinctive features: Root-climbing ferns with elongated, compressed rhizome; leaves dimorphic, 1-pinnate, fertile leaves densely covered with sporangia.

Distribution: A neotropical genus of 11 species, with only four species of climbers. Among these, *Mickelia guianensis* (Aubl.) R.C. Moran, Labiak & Sundue, is more

widely distributed, found in Cuba, Hispaniola, Puerto Rico, and northern South America south to Bolivia and SE Brazil, the other three species (*M. pradoi* R.C. Moran et al., *M. scandens* (Raddi) R.C. Moran et al. and *M. x atrans* R.C. Moran et al. are found in S.E. Brazil; wet forests; 0–800 m.

POLYBOTRYA Humboldt & Bonpland ex Willdenow, Sp. Pl. 5: 99. 1810.



P. caudata Kunth, from B.R. Chambi et al. 694. Atrium®

Hemiepiphytic or terrestrial ferns, creeping or climbing. Climbing ferns terrestrial, with rhizomes 2–5 (15) m long, climbing by means of adventitious roots, densely clothed with variously colored, translucent, peltate scales with denticulate or erose margins. Leaves strongly dimorphic, 1-pinnate, 1-pinnate-pinnatifid to 3-pinnate. Sterile leaves with distal portion of blade and sometimes of pinnae, pinnatifid, long-petiolate; pinnae alternate, petiolulate, contiguous with the rachis, crenate to serrate; pinnules serrulate; veins pinnate or bipinnate, sometimes anastomosing to neighbor clusters of veins. Fertile leaves commonly further pinnate, with much narrower pinnae and longer petioles than the sterile leaves; pinnae

reduced to a narrow tissue along the primary veins. Sori indusiate, round, oblong or linear by coalescence, or occupying both surfaces of caudate pinnules

Distinctive features: Root-climbing ferns; rhizomes densely covered with variously colored, translucent, peltate scales with denticulate or erose margins; leaves strongly dimorphic, 1–3-pinnate; fertile leaves with very narrow and short pinnules; cross section of rhizomes with 5–12 circularly arranged meristemes that are sheathed by a black sclerenchymatous tissue.

Distribution: A neotropical genus of 35 species most diverse in the Andes, and the Atlantic forest in SE Brazil. All species except for *P. fractiserialis* (Baker) J. Sm. and *P. sorbifolia* Kunth are reported as climbers; southern Mexico to SE Brazil, Cuba, Jamaica and Hispaniola; 0–2,500 m.

LINDSAEACEAE

A pantropical family of 6 genera and about 242 species of terrestrial, erect or less often scrambling ferns. In the Neotropics, the family is represented by three genera and about 67 species, of which only the genus *Odontosoria* has species of scrambling ferns. Since *Odontosoria* is the only genus in the family with climbers, the current treatment is solely based on this genus. For the most part, they are found in moist to wet forests.

Diagnosics: Scrambling ferns to several m long, leaves often armed with prickles, pinnae alternate, sori in marginal pockets, containing three sporangia without indusia.

General Characters

1. CLIMBING MECHANISMS. Scramblers, leaves sometimes aided by prickles.
2. LEAVES. Monomorphic, 2–5-pinnate; pinnae alternate; pinnules flabellate.
3. SORI. In apical pockets.

GENERIC DESCRIPTION

ODONTOSORIA Fée, Mém. Fam. Fougères 5 (Gen. Filicum): 325. 1852.



O. aculeata (L.) J. Sm., photo by P. Acevedo

Clambering ferns, terrestrial with short, slender, creeping rhizomes, covered with scales. Leaves monomorphic, elongate, clambering, usually armed with prickles and often reaching 2–5 m in length; blades narrowly triangular to linear, 2–5-pinnate; pinnae and pinnules forming a right angle with the axis or rachis; pinnules linear to flabellate. Sori in marginal pockets, containing three sporangia; indusia absent.

Distinctive features: Scrambling ferns often armed with prickles, alternate pinnae and sori in marginal pockets.

Distribution: A pantropical genus of 32 species, 10 of which are distributed in the Neotropics from Mexico to Colombia and the West Indies. Most species scandent although sometimes less than 2 m in length; moist or wet forest; 400–2,800 m.

LOMARIOPSIDACEAE

A pantropical family of 4 genera and about 69 species of terrestrial, scrambling or less often erect ferns. In the Neotropics, the family is represented by 3 genera and about 16 species, of which only the genus *Lomariopsis* has species of climbing ferns. Since *Lomariopsis* is the only genus in the family with climbers, the current treatment is solely based on this genus. For the most part, they are found in lowland, moist to wet forests.

Diagnosics: Root-climbing ferns; rhizomes slightly flattened; leaves ascending or spreading, dimorphic, 1-pinnate; pinnae in fertile leaves narrower than those of sterile leaves; sporangia covering the entire abaxial surface of pinnae.

General Characters

1. CLIMBING MECHANISMS. *Root-climbing* rhizomes.
2. LEAVES. Dimorphic, 1-pinnate; pinnae alternate with serrate or serrulate margins and free, simple or bifurcate venation.
3. SORI. Sporangia covering the entire abaxial surface.

GENERIC DESCRIPTION

LOMARIOPSIS Fée, Mém. Fam. Fougères 2 (Hist. Acrostich.): 10. 1845.

Terrestrial ferns, climbing by aerial roots, or less often erect and short. Rhizomes elongate



L. marginata (Schrad.) Kuhn, photo by Alex Popovki

reaching 2 to 15 m in length, somewhat compressed, covered with ferruginous scales. Leaves short-stipitate, dimorphic, the fertile ones with narrower pinnae than the sterile ones, pinnate; pinnae membranaceous, with

serrate or serrulate margins and free, simple or bifurcate venation; lateral pinnae alternate, deciduous by means of a basal articulation, the terminal pinna not articulate. Fertile leaves densely covered with sporangia on the lower surface; indusia absent.

Distinctive features: Root-climbing ferns with elongated, compressed, densely clothed rhizome; leaves 1-pinnate, dimorphic, fertile leaves densely covered with sporangia.

Distribution: A pantropical genus of 45 to 60 species, with 15 species in the Neotropics, most of which are climbers that reach at least 2 m in length; Mexico to Bolivia and SE Brazil and the West Indies; wet forests; 0–1,200 m.

LYGODIACEAE

A tropical and subtropical family extending into subtemperate zones, with a single genus of twining ferns. Twenty-nine species worldwide, six of which are found in the Neotropics.

Diagnosics: Fern with twining leaf rachis and indeterminate growth; pinna bifurcate, pinnula alternate with sporangia on marginal projections of the blade.

General Characters

1. CLIMBING MECHANISM. Twining leaf rachis, reaching up to 2–8 (20) m in length.
2. LEAVES. Monomorphic, or dimorphic, with indeterminate growth; pinnae bifurcate; secondary pinnules alternate, with free veins or areolate.
3. SPORANGIA. Pear-shaped, with an apical annulus, arranged in 2 rows on marginal projections of the blade.

GENERIC DESCRIPTION

LYGODIUM Swartz, J. Bot. (Schrader) 1800 (2): 7, 106. 1801, (nom. cons.).



L. volubile Sw., photo by P. Acevedo

Terrestrial climbing ferns, with twining frond rachides; rhizomes creeping, short, branched, pubescent. Leaves monomorphic or dimorphic, with indeterminate growth, bipinnate, rachis elongate, twining, reaching 2–8 (20) m in length; pinnae bifurcate, with a latent shoot at the apex of the petiolule; pinnules alternate, with

free or areolate veins. Sporangia pear-shaped, with an apical annulus, individual (not clustered in sori), borne at the apices of the veins, arranged in 2 rows on marginal projections of the blade.

Distinctive features: Twining ferns, sporangia marginal.

Distribution: A pantropical genus of 29 species, six (4 native, 2 exotic) of which are found in the Neotropics; Mexico to northern Argentina and the West Indies; moist habitats; 125–2,400 m.

OLEANDRACEAE

A pantropical family with a single genus. Twenty-five species worldwide, nine species in the Neotropics, moist or wet forests.

Diagnosics: Root-climbing ferns with elongated aerial rhizomes densely covered with scales; leaves simple, monomorphic, articulate; sori rounded, adjacent to the veins.

General Characters

1. CLIMBING MECHANISM. Elongated rhizomes with adventitious roots.
2. LEAVES. Monomorphic, simple with entire or undulate margins; stipe articulate.
3. SPORANGIA. Pear-shaped, arranged in circular sori with a central, peltate, circular or reniform indusium, adjacent to the midvein and along secondary veins.

GENERIC DESCRIPTION

OLEANDRA Cavanilles, Anales Hist. Nat. 1: 115. 1799.



O. articulata (Sw.) C. Presl, photo by P. Acevedo

Epiphytic, root-climbing ferns, rarely terrestrial and erect. Rhizomes flexible, densely clothed with ferruginous awl-shaped scales, elongated in climbing species, reaching up to 5 m in length and ca. 5 mm in diam. Leaves monomorphic, pendulous, membranaceous, simple with entire or undulate margins and acute, acuminate or caudate apex; midvein abaxially prominent, secondary veins, numerous, free and parallel, forming an acute angle with midvein; stipe up to $\frac{1}{3}$ the length of the blade, sometime absent, articulate. Sori circular, light brown, distributed along both sides of the midvein; indusia circular or reniform, peltate.

Distinctive features: Root-climbing ferns with elongated densely clothed rhizomes; leaves hanging, simple with

sori adjacent to the midvein.

Distribution: A pantropical genus of 25 species, 11 species in the Neotropics of which only 8 are climbing epiphytes that sometimes reach 2–5 m in length; Mexico to SE Brazil, including the West Indies; moist forests; 300–1,800 m.

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