MELASTOMATACEAE

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An almost exclusive tropical family of shrubs, trees, herbs, and lianas, represented by ~3,750 species and ~84 genera in the Neotropics. Of these, ~100 species in 12 genera are vines, lianas, or epiphytic climbers. Melastomataceae are most diverse in moist forests throughout the tropics, from sea level to above the tree line in the Andes and other tropical mountains. Vines and lianas are well represented from sea level to ~2,900 meters. Most genera contain only a few species of climbers, with the exception of *Adelobotrys* and *Phainantha*, where most species are climbers or sprawling herbs.

Diagnostics*:* In the absence of flowers, Melastomataceae climbers can be recognized by their leaves with acrodromous venation, lacking stipules. The vast majority of the species in the family have opposite leaves, but some climbers either are extremely anisophyllous (with one leaf in each pair highly reduced), or early caducous or missing altogether, given the appearance of alternate leaves.

General Characters

1. STEMS. Little has been published about the morphology or anatomy of the stems of climbing Melastomataceae. The few woody climbing species that have been studied have regular anatomical configuration with a large medulla, while there is no study on the stem of herbaceous climbers. According to Metcalfe & Chalk (1957) medullary bundles are present in many genera.
2. EXUDATES**.** Exudates are absent in all genera of Melastomataceae.
3. CLIMBING MECHANISMS**.** Lianas and vines are often twiners or scramblers. Additionally, the climbing members of *Adelobotrys*, *Boyania*, *Phainantha* and some

Miconia may have adventitious roots along the stem (Figure 174B) or restricted to the nodes.

4. LEAVES. Leaves in Melastomataceae are simple and usually opposite with acrodromous venation and lack stipules. However, in several climbing members of the family one of the leaves in each pair is conspicuously reduced or absent altogether, especially in some *Miconia* and *Phainantha*.
5. INFLORESCENCES. Inflorescences can be terminal, axillary, or in the leafless nodes of older stems. Terminal inflorescences are often paniculate, while axillary inflorescences are mostly cymose, fasciculate or solitary.
6. FLOWERS. Melastomataceae have 4–5(–9)-merous, usually diplostemonous flowers, with a well-developed hypanthium and free petals; ovary inferior to superior depending on the genus; stamens at anthesis, either around the style or displaced towards one side of the flower. Ovary position (and fruit type), as well as anther morphology are the most important characters in generic delimitations.
7. FRUITS. Fruits in Melastomataceae can be either capsules or fleshy berries with numerous seeds. Capsules develop from flowers with superior ovaries (in all climbing species) and usually are apically dehiscent, but occasionally the entire wall of the hypanthium breaks up and exposes the ovary. Berries develop from ovaries that are partly to completely inferior and often indistinguishable from the fleshy hypanthium wall. Seeds usually 0.5–2 mm long.

USES

The berries of most species of *Miconia* are edible, although they are not actively cultivated. The succulent stems of *Arthrostemma* are also edible.

Key to the genera of climbing Melastomataceae

1. Fruit fleshy, a multi-seeded berry; ovaries inferior or partly inferior 2

1. Fruit a capsule; ovaries usually superior 3

2. Inflorescences always axillary; flowers subtended by 2 pairs of persistent, conspicuous bracteoles that often are partly connate (Mexico to Bolivia, Jamaica) ..... ***Blakea***

2. Inflorescences terminal or axillary; flowers subtended by a pair of caduceus and/or inconspicuous bracteoles ..... ***Miconia***

3. Calyx hyaline and calyptrate, dehiscing at anthesis; anthers with a ring-like appendage around the connective (Guianas, Ecuador) ..... ***Phainantha***

3. Calyx regularly lobed, persistent, if calyptrate, then not hyaline; anthers lacking a ring-like appendage around the connective 4

4. Anthers with ventral appendages, with or without dorsal appendages 5

4. Anthers without ventral appendages, always with dorsal appendages 8

5. Inflorescences secund; flowers 5-merous (Guyana) ..... ***Boyania***

5. Inflorescences paniculate or cymose; flowers 4-merous 6

6. Leaves penninerved with the primary veins diverging from the midvein in a subopposite to irregularly alternate fashion at successive points above the blade base (Mexico–Central America) ..... ***Heterocentron***

6. Leaves 3–7-nerved with the primary veins all arising at or near the base of the blade 7

7. Flowers 4-merous (Mexico to Bolivia, Greater Antilles) ..... ***Arthrostemma***

7. Flowers 5-merous (Neotropics) ..... ***Chaetogastra***

8. Capsules and mature hypanthia with 8 or 10 conspicuous longitudinal ribs (N South America) ..... ***Macrocentrum***

8. Capsules and mature hypanthia terete 9

9. Anther's thecae oblong, the connective with dorsal caudate appendage at least twice as long as the thecae (Brazil).....***Huberia***

9. Anther's thecae subulate, the connective with a dorsal appendage less than 1 ½ times as long as the thecae 10

10. Anthers with a dorsal spur but lacking an ascending appendage (neotropical) ....***Graffenrieda***

10. Anthers with a dorsal spur and an ascending appendage (at least in the antisepalous stamens) 11

11. T-shaped trichomes present in stems, underside of the leaves or hypanthia; anther ascending appendage bifid and acute (Mexico to Bolivia, Jamaica)..... ***Adelobotrys***

11. T-shaped trichomes absent; anther ascending appendage not divided, rounded or blunt (South America) ..... ***Meriania***

ADELOBOTRYS de Candolle, Prodr. 3: 127. 1828.

Twining or root-climbing lianas, shrubs or rarely erect shrubs or trees; lianas reaching 2–12 m in length. Stems terete or obscurely quadrangular, occasionally flattened and often with adventitious roots, especially near the ground. T-shaped trichomes present in most species in young stems, petioles, leaf nerves on the abaxial surface and/or the hypanthium. Leaves isomorphic. Inflorescences terminal or axillary, often paniculate, more rarely cymose. Flowers 5-merous; petals pink', white, lilac, orange, or red-orange; stamens 10, isomorphic or dimorphic, the connective not prolonged below the thecae but with dorsal spur and a prolonged ascending appendage, often bifid and acute; ovary superior. Fruit a capsule.

Distinctive features: Lianas often with adventitious roots and T-shaped trichomes. Anther's connective with a dorsal spur and an ascending appendage; fruit capsular.

Distribution: A genus of ~34 species from Mexico to Bolivia and Jamaica, represented by only one species in the Atlantic Rain Forest of Brazil. Twenty-three species reported as lianas; moist lowland to mid elevation forests.

Figure 174. *Adelobotrys.* **A**. Flower at anthesis in *A. adscendens.* **B.** Adventitious roots in *A. scandens*. **C**. Panicle in *Adelobotrys adscendens*. Photos: A by R. Goldenberg; B by F. A. Michelangeli; C by P. Acevedo.

ARTHROSTEMMA Pavón ex D. Don, Mem. Wern. Nat. Hist. Soc. 4: 283, 298. 1823.

Sprawling or scrambling herbs; stems quadrangular and obviously to obscurely winged.

Arthrostemma ciliatum, photo by F. Michelangeli.

Leaves isomorphic. Inflorescence a terminal panicle. Flowers 4-merous; hypanthium green; petals pink to fuchsia; stamens 8, dimorphic; antisepalous stamens larger, connective prolonged below the thecae and with a ventral bifid or blunt appendage; ovary superior, 4-locular. Fruit a capsule.

Distinctive features: Quadrangular stems with four merous flowers and dimorphic anthers.

Distribution: A genus of four species distributed from Mexico and the Greater Antilles to Bolivia, usually at the edge of open or disturbed areas on moist soils. One species, *A. ciliatum* Pav. ex D. Don, can be a scrambling vine, although generally it grows as a scrambling herb or subshrub.

BLAKEA P. Browne, Civ. Nat. Hist. Jamaica 323. 1756.

Topobea Aubl. (1775).

Trees, shrubs, and twining vines (occasionally root climbers), often epiphytic or hemiepiphytic. Leaves isomorphic to markedly dimorphic. Inflorescences axillary, often fasciculate; flowers subtended by a pair of bracteoles, with the two bracts of a given pair variously fused. Flowers 6-merous; anthers 12 or more rarely 6, free from each other or the thecae laterally connate, in that case either forming a ring or a semi-circle around the style, connective not prolonged below the thecae and without appendages or with a dorsal caudate appendage or spur; ovary inferior or partially inferior. Fruit a berry.

Blakea ciliata, photo by F. Michelangeli.

Distinctive features: Lateral inflorescences; flowers 6-merous, subtended by two pairs of bracts (persistent in fruit); fruit a berry. Many species are very plastic in habit, varying from trees to lianas or woody, scrambling epiphytes.

Distribution: A widely distributed neotropical genus of ~190 species in low and mid elevation humid forests (but present only in Jamaica in the Greater Antilles and absent in the Brazilian Atlantic Forest). Many species are epiphytes or hemiepiphytes with long branches, but often the same species may be found rooted on the ground or even growing as a tree. Forty-six species have been reported as climbers, but the number is surely higher. It is most diverse in southeastern Central America and the Chocó biogeographic region.

BOYANIA Wurdack, Mem. New York Bot. Gard. 10 (5): 160. 1964.

Trailing or stoloniferous herbs, sometimes climbing, up to 2 m tall, with terete stems and often with adventitious roots. Leaves isomorphic or nearly so. Inflorescence terminal, long pedunculate, scorpioid or verticillate. Flowers 5-merous; stamens 10, isomorphic, the connective not prolonged below the thecae, but with both a dorsal spur and a ventral ascending appendage; ovary superior. Fruit an apically dehiscent capsule.

Boyania ayangannae, photo by F. Michelangeli.

Distinctive features: Herbs with long-pedunculate inflorescences; flowers 5-merous; anthers isomorphic and with both dorsal and ventral appendages, fruit capsular.

Distribution: A northern South America genus of two species of which only *Boyania ayangannae* Wurdack from Guyana is a climber in addition to being a trailing herb.

CHAETOGASTRA Prodr. 3: 131 .1828.

Trees, shrubs, and occasionally twining vines. Leaves usually isomorphic or nearly so. Flower 4-5(-8) merous; hypanthium lacking peltate scales; stamens 8-10(-16), dimorphic or isomorphic, the connective prolonged below the thecae and with paired ventral appendages, usually cream or yellow; ovary superior. Fruit an apically dehiscent capsule with persistent calyx.

Chaetogastra mariae, photo by F. Michelangeli.

Distinctive features: Anthers with paired short ventral appendages, usually with the thecae and/or appendages yellow to cream. Fruits capsular, the calyx persistent.

Distribution: A neotropical genus of ~120 species, mostly from mid and high elevation cloud forests, but occasionally also in lowland forests and secondary vegetation. At least two species in the Andes are twining vines and several others seem to be facultative climbers on slopes of the Andes and southern Central America.

GRAFFENRIEDA de Candolle, Prodr. 3: 105. 1828.

Trees, shrubs and more rarely twining vines. Leaves isomorphic. Inflorescence terminal, often paniculate, more rarely cymose. Flowers 4–6-merous, diplostemonous; calyx calyptrate or opening either regularly or irregularly at anthesis; petals often acute, more rarely emarginated, usually white, more rarely yellow; anthers isomorphic or slightly dimorphic, usually white or more rarely yellow, the connective not prolonged below the thecae, with a dorsal acute spur; ovary superior. Fruit a capsule.

Graffenrieda patens, photo by C. Zartman.

Distinctive features: Anthers with an acute dorsal spur; fruit a capsule.

Distribution: A neotropical genus of ~70 species**,** with three species of Amazonia and southern Central America reported as climbers.

HETEROCENTRON W.J. Hooker & Arnott, Bot. Beechey's Voyage 290. 1838.

Shrubs and herbs, commonly scrambling. Stems quadrangular or winged, rarely terete.

Heterocentron elegans, photo by F. Michelangeli.

Leaves usually isophyllous, the venation acrodromous and plinerved or with pinnate venation, the secondaries arching towards the apex. Flowers 4-merous, diplostemonous; calyx lobes free and persistent; stamens dimorphic, the antisepalous whorl larger and with the connective conspicuously prolonged below the thecae and with a ventral, horizontal bifid appendage, the antipetalous whorl smaller, the connective barely prolonged below the thecae and with a reduced ventral appendage; ovary superior, the apex with 4 scales, 4-locular. Fruit a capsule.

Distinctive features: Stems quadrangular or winged. Leaves acrodromous and plinerved or with pinnate venation, the secondaries arching towards the apex. Flowers 4-merous; stamens dimorphic, the antisepalous whorl with the connective conspicuously prolonged below the thecae and with a ventral, horizontal bifid appendage; fruit a capsule.

Distribution: A genus of 15 species from Central America and southern Mexico, mostly of shrubs and sprawling herbs; four species are reported as climbing up to 6 m.

HUBERIA de Candolle, Prodr. 3: 167. 1828.

Dolichoura Brade (1959).

Small trees or erect or scrambling shrubs, sometimes twining. Leaves isophyllous.

Huberia bradeana, photo by F. Michelangeli.

Flowers 4–6-merous; anthers isomorphic, the thecae oblong, the connective not prolonged but often with a caudate dorsal appendage; ovary superior. Fruit a capsule.

Distinctive features: Flowers 6-merous; petals purple; anthers purple with a long caudate dorsal connective appendage; fruit a capsule.

Distribution: A genus of 34 species, 30 endemic to the Atlantic Forests and rock outcrops of Eastern Brazil, *H. bradeana* Bochorny & R. Goldenb. from the state of Espírito Santo is the only climbing species.

MACROCENTRUM J.D. Hooker in Bentham & J.D. Hooker, Gen. Pl. 1: 732, 756. 1867.

Terrestrial or epiphytic herbs, or subshrubs, occasionally scrambling. Leaves isomorphic to strongly dimorphic. Inflorescence solitary and axillary or terminal few-flowered secund cymes. Flower 4–5-merous with the hypanthium 8–10-costate; calyx lobes oblate to lanceolate or aristate, persistent; stamens isomorphic or nearly so, connective slightly prolonged below the thecae, and with a dorsal acute, descending tooth; ovary superior usually 3-locular. Fruit a ridged capsule.

Macrocentrum fasciculatum, photo by P. Acevedo.

Distinctive features: Inflorescence solitary and axillary or terminal with few-flowered secund cymes. Flower 4–5-merous; hypanthium 8- or 10-costate; fruit a ridged capsule.

Distribution: South American genus of ~25 species from moist and cloud forests, mostly in the Guiana Shield, with one species in the foothills of the Peruvian Andes and the Coastal Cordillera of Venezuela. Two species reported as occasionally climbing at low and mid elevations in the Guiana Shield.

MERIANIA Swartz, Fl. Ind. Occid. 1: tab. XV. 1797.

Trees, shrubs or rarely twining or scrambling vines. T-shaped trichomes absent. Leaves isomorphic or only slightly dimorphic. Flowers 4–6(–8)-merous, diplostemonous; calyx calyptrate and opening irregularly or lobate and regular; petals round to emarginate, 2–12 cm long, usually pink or fuchsia, but also white or orange; stamens isomorphic or only slightly dimorphic, the connective not prolonged below the thecae but with a dorsal spur and commonly a blunt dorsal ascending appendage (at least in the antisepalous stamens); ovary superior. Fruit a capsule.

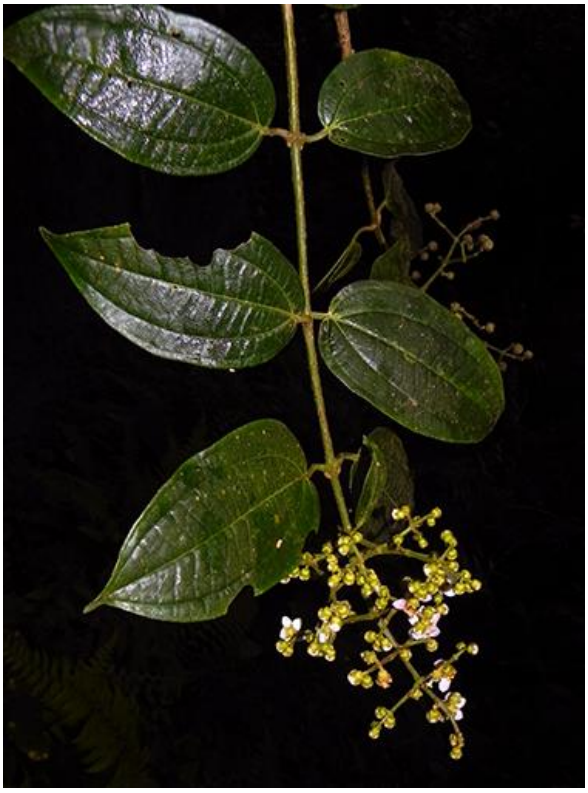
Distinctive features: T-shaped trichomes absent; petals 2–12 cm long, anther connective not prolonged but with a dorsal spur and commonly a blunt dorsal ascending appendage (at least in the antisepalous stamens); fruit a capsule.

Distribution: A neotropical genus of ~120 species, mostly from mid and high elevation cloud forests, but occasionally also in lowland forests. At least two species in the western slope of the Andes are lianas and several others seem to be facultative climbers in the slopes of the Andes.

MICONIA Ruiz & Pavón, Fl. Peruv. Prodr. 60. 1794 (nom. cons.).

Clidemia D. Don (1823); *Leandra* Raddi (1820); *Ossaea* DC. (1828); *Pleiochiton* A. Gray (1854); *Tococa* Aubl (1775).

Terrestrial, erect or creeping herbs or shrubs, rarely twining or root-climbing vines, or epiphytes. Leaves isomorphic to strongly dimorphic (often in the climbing species). Inflorescence terminal or lateral Flowers 4–6(–8)-merous, diplostemonous; petals acute, round to emarginated; stamens isomorphic or only slightly dimorphic, the connective not prolonged below the thecae; ovary inferior or partially inferior. Fruit a berry.



Miconia loreyoides, photo by M. Alvear.

Distinctive features: Flowers not subtended by two pair of bracts, stamens without a prolonged connective (or barely prolonged); fruit a berry.

Distribution: A widely distributed neotropical genus present in most humid to seasonal environments, with ~1,950 species, 52 of which are lianas, vines or scrambling shrubs.

PHAINANTHA Gleason, Bull. Torrey Bot. Club 75: 539. 1948.

Terrestrial herbs, scrambling shrubs, root-climbing vines, or epiphytes; usually with adventitious roots at the nodes. Leaves isomorphic, opposite or in whorls of 3, but often appearing alternate by abortion of one leaf per node. Inflorescences axillary or terminal, cymose-paniculate or umbelliform. Flowers 4-merous; calyx hyaline and calyptriform, dehiscing at

Phainantha laxiflora, photo by F. Michelangeli.

anthesis; stamens 8, isomorphic or slightly dimorphic, connective not prolonged or only shortly so, with a cordiform or pandurate basal appendage; ovary superior, 4-locular. Fruit a capsule.

Distinctive features: Flowers 4-merous. Calyx hyaline and calyptriform; stamens 8, connective with a cordiform or pandurate basal appendage; fruit capsular.

Distribution: A South American genus of five species, three of which have been reported as vines, restricted to the Guyana highlands and surrounding forests, with one disjunct species found in the Cordillera del Condor in southern Ecuador.