

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

AMARANTHACEAE

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Gomphrena vaga (photo by P. Acevedo)

A predominantly tropical family of herbs, sub-shrubs, shrubs and rarely trees, some herbs or shrubs are scandent and a few species are twining lianas. Generally found in moist to humid areas below 1400 m elevation with a few species reaching 2700 m. The family is represented in the Neotropics by ca. 490 species of which 25 are consistently reported as climbers that reach two or more m in length. *Iresine*, contain several species that are scandent herbs; *Chamissoa* and *Pleuropetalum* a species each that are scandent shrubs; *Gomphrena*, *Hebanthe*, and *Pedersenia* have species that are twining lianas and sometimes scandent shrubs with elongated stems.

Diagnostics: In the absence of fertile material, climbing Amaranthaceae are sometimes confused with Asteraceae or Acanthaceae. However, woody Amaranthaceae, i.e., scandent shrubs and twining lianas, are easily identified by the cylindrical stems with successive rings of xylem and phloem and by the presence of

swollen nodes. The leaves are opposite or alternate depending on the genus, with entire margins, gland-less blades and petioles, and lack stipules. Fruits are circumscissile utricles.

General Characters

1. **STEMS.** Stems are cylindrical, herbaceous in *Iresine* or woody in *Chamissoa*, *Gomphrena*, *Hebanthe*, *Pedersenia*, and *Pleuropetalum*. Herbaceous stems usually are 5 mm or less in diam., and up to 3 m in length; stems of woody species are 1 to 3 cm in diam. and up to 15 m in length. Stems usually present a large medulla, and **successive** rings of xylem and phloem are known to occur in most genera, however, these are more conspicuous in woody taxa (fig. 1a, b). Barks are light colored, rough and with numerous round, light colored lenticels (fig. 1c). Taxa with opposite leaves usually have swollen nodes (fig. 2a).
2. **EXUDATES.** Exudates are odorless and **colorless** in all genera
3. **CLIMBING MECHANISM.** **Leaning** herbs (*Iresine*), **scandent** shrubs (*Alternanthera*, *Chamissoa*, *Gomphrena*, species of *Pedersenia*, and *Pleuropetalum*), or **twining** lianas (species of *Gomphrena*, *Hebanthe* and *Pedersenia*).
4. **LEAVES.** Leaves are simple, exstipulate, **alternate** or **opposite** (fig. 2a, c) with entire (seldom crenate) margins. Petioles are short to long (some species have sessile leaves), and lack extrafloral nectaries or glands; blades also lack extrafloral nectaries.
5. **INFLORESCENCES.** Inflorescences usually ascending, axillary or terminal, paniculate (fig. 2b), racemose, spiciform (fig. 2c) or glomerulate (fig. 3a).
6. **FLOWERS.** **Actinomorphic**, bisexual, 3–5-merous, usually < 5 mm long. Tepals light green, cream, or whitish (fig. 2b, c; 3a, b), subequal or the inner ones shorter, distinct or less often partly connate at base, in some genera (*Hebanthe*, *Pedersenia*) with long, straight or wooly trichomes at base; stamens as many as, and opposing the tepals (fig. 3b); filaments connate to form a short cup at base, these sometimes alternating with staminal appendages; gynoecium

superior, syncarpous, 2- or 3-carpellate, the style elongated or absent, the stigmas bilabiate, capitate or 2–3-branched; placentation basal, ovules solitary or several per carpel.

7. FRUITS. Small (hardly longer than the flower), of one to several-seeded circumscissile **utricles**.
8. SEEDS. Seeds lenticular, reniform or sub-rounded, exarillate, black and shiny or arillate in *Chamissoa*.



Figure 1. Woody stems in Amaranthaceae. **A.** Cross section of *Chamissoa altissima* (Jacq.) Kunth stem. **B.** Cross section of *Pedersenia volubilis* Borsch stem. **C.** Lenticellate bark of *Hebanthe eriantha* (Poir.) Pedersen. Photos by P. Acevedo.



Figure 2. **A.** *Hebanthe eriantha* with swollen nodes. **B.** *Pedersenia macrophylla* (R.E. Fr.) Holub with panicle inflorescence. **C.** *Chamissoa altissima* with spicate inflorescence. Photos by P. Acevedo.



Figure 3. Inflorescence and flowers in Amaranthaceae. **A.** *Gomphrena vega* Mart. with swollen nodes. **B.** *Pedersenia macrophylla* showing bisexual flowers. Photos by P. Acevedo.

Key to the climbing genera of Amaranthaceae

1. Leaves alternate; inflorescences racemose; tepals glabrous2
1. Leaves opposite; tepals densely covered with tufts of long hairs on the outer surface3
2. Anthers tetrasporiangate; utricle turning yellow at maturity; seeds numerous, black, shiny;
Costa Rica to Peru *Pleuropetalum*
2. Anthers bisporangiate; utricle turning white or rosy upon maturity; seed solitary, with white,
fleshy arillode; Neotropics *Chamissoa*
3. Flowers in globose or ovoid glomerules that are short- to long-pedicellate, these solitary or
part of a paniculate synflorescence4
3. Flowers solitary or in few-flowered clusters, dispersed or sometimes congested along the axis
of the panicle5
4. Filaments connate into a long tube; stigma of 2 elongated branches; Brazil..... *Gomphrena*
4. Filament connate only at base, alternating with interstaminal appendages; stigma capitate;
Mexico, Ecuador *Alternanthera*
5. Panicles with 3–5 verticillate secondary branches of similar lengths; tepals unequal with long
trichomes only on inner three tepals; Continental tropical America..... *Hebanthe*
5. Panicle with opposite branches or if verticillate, the lateral two, longer; tepals equal or
subequal, all with long trichomes6
6. Perianth trichomes on abaxial surface of tepals; stigma capitate to bilobed; Neotropics
..... *Pedersenia*
6. Perianth trichomes at the base of tepals; stigma of two, elongate, filiform branches; Neotropics
..... *Iresine*

GENERIC DESCRIPTIONS

ALTERNANTHERA Forssk., Fl. Aegypt.-Arab. 28. 1775.

Prostrate herbs with a long taproot, or less often sub-shrubs; *A. pubiflora* (Benth.)



A. pubiflora (photo by D. Culbert)

Kuntze is as a scandent herb and *A. grandis* Eliason a liana (scandent shrub?). Stems of climbers herbaceous, thin, and striate, 2-6 m long. Leaves opposite and entire, petiolate. Inflorescence of axillary, globose to sub-cylindrical heads on long peduncles. Bracts and bracteoles boat-shaped, much smaller than the tepals. Flowers bisexual. Tepals 5, free, glabrous or with short trichomes, subequal, or the outer longer; stamens five, alternating with triangular interstaminal appendages, filaments free or united into a

short tube at base; ovary nearly globose or obovoid, with a single ovule per carpel; style of variable lengths; stigma capitate. Fruit a thin-walled, flattened utricle, with persistent tepals, usually dispersed as a unit; seeds solitary, lenticular, smooth.

Distinctive features: Opposite leaves and inflorescences of simple heads.

Distribution: A predominantly neotropical genus, with about 150 species, with only 2 species reported as climbers. *Alternanthera pubiflora* from Mexico and *A. grandis* from Ecuador.

CHAMISSOA Kunth in Humboldt, Bonpland & Kunth, Nov. Gen. Sp. 2: 196. 1818. [quarto ed.]

Herbs, subshrubs or scandent shrubs. Stem of climbing species cylindrical, up to 3 cm in



diam. and up to 15 m in length; secondary growth with successive, continuous bands of interxylary phloem (fig. 1a). Leaves alternate, petiolate, with crenate margins. Flowers bisexual or functionally unisexual, clustered in cymules, which are arranged in axillary racemes or distal panicles. Tepals 5, ovate or lanceolate, free; stamens 5, the filaments united at the base to form a short staminal tube, anthers bisporiangular; interstaminal appendages absent; ovary superior, unilocular, uniovulate, the style short, with 2 or 3 stigmas. Fruit a membranaceous, circumscissile utricle; seed solitary, covered by a fleshy white arillode.

Chamissoa altissima (photo by P. Acevedo)

Distinctive features: Alternate leaves with crenate margins; cross sections of stems with successive, continuous bands of interxylary phloem.

Distribution: A neotropical genus of two species, one of which (*C. altissima* (Jacq.) Kunth) is a robust scandent shrub that is widely distributed from Mexico to northern Argentina, including the Antilles.

GOMPHRENA Linnaeus, Sp. Pl. 224. 1753.

Prostrate or erect herbs, with two species reported as climbers. Stems nearly cylindrical,



G. vaga. a. successive bands of phloem; b. inflorescence (photos by P. Acevedo)

up to 1 cm in diam. and

up to 12 m in length;

secondary growth with

successive, continuous

bands of interxylary

phloem. Leaves

opposite, short-petiolate

or sessile, usually

clasping at base. Flowers

bisexual, nearly sessile, produced in terminal or axillary, globose or cylindrical heads; bracts and bracteoles membranous or nearly coriaceous, whitish; tepals 5, free or united at base, usually pubescent; stamens 5, the filaments fused into a long tube, each filament with 2 apical lobes; interstaminal appendages absent; ovary nearly globose, with one ovule, the style of variable length, the stigmas 2, erect or divergent. Utricle irregularly dehiscent, with a single lenticular seed.

Distinctive features: Opposite leave; cross sections of stems with successive, continuous bands of interxylary phloem; flowers grouped in heads; filament fused into a long tube.

Distribution: About 100 species, mostly native to tropical America. One species (*G. scandens* (R.E.Fr.) J.C. Siqueira) reported as a scandent shrub, and another species (*G. vaga* Mart.) as a twining liana; both species distributed in Brazil.

HEBANTHE Martius, Nov. Gen. Sp. Pl. 2(1) 42, t. 140-145. 1826.

Scandent shrubs or twining lianas. Stems nearly cylindrical, in some species up to 10 cm



in diam. and up to 15 m in length; secondary growth with successive, continuous bands of interxylary phloem. Leaves opposite, petiolate, with entire margins.

H. eriantha. a. cross section of stem; b. inflorescence (photos by P. Acevedo)

Flowers bisexual,

solitary or in glomerules along the axes of axillary or terminal panicles that have spicate secondary branches mostly disposed in verticels of 3 or 5; bracts and bracteoles persistent. Tepals 5, free, concave, unequal, the inner three with a long tuft of wooly hairs on the abaxial surface (only on half side of the middle tepal); stamens 5, the filaments united at the base to form a short staminal tube; interstaminal appendages well developed or absent; ovary unilocular, uniovulate, ovoid, the stigma capitate-bilobed, sessile or subsessile. Fruit an indehiscent utricle, covered by the perianth.

Distinctive features: Opposite leaves; cross sections of stems with successive, continuous bands of interxylary phloem; inflorescence's secondary units mostly 3- or 5-verticillate; inner tepals with long wooly hairs.

Distribution: A genus of eight species distributed in continental tropical America from Mexico to Bolivia. All species considered climbers.

IREGINE P. Browne, Civ. Nat. Hist. Jamaica 358. 1756.



I. diffusa (photo courtesy of CONABIO, Mexico)

Erect or clambering herbs, shrubs, and less frequently small trees or climbing shrubs. Leaves opposite or subopposite, petiolate; blades simple. Flowers unisexual or bisexual, pedicellate, clustered in cymes along axillary or terminal panicles; bracts and bracteoles persistent. Tepals 5, with a tuft of hairs at the base on the outer surface; stamens 5, the filaments united at the base to form a short staminal tube; interstaminal

appendages absent; ovary superior, uniovulate, rounded, the stigmas divided into 2 elongate, filiform branches, sessile or subsessile. Fruit a membranaceous, subglobose, circumscissile utricle. Seed solitary, globose or lenticular, shiny, naked.

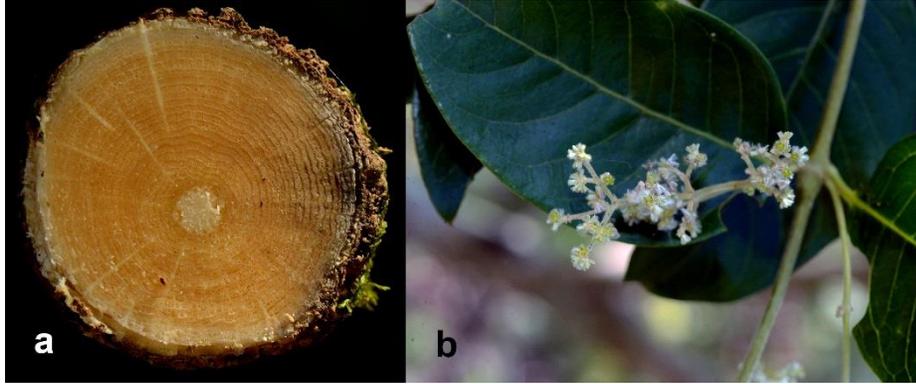
Distinctive features: Opposite leaves; perianth's indument long, wooly arising from the base of all tepals.

Distribution: A neotropical genus with approximately 40 species, seven of which are consistently reported as climbers.

PEDERSENIA Holub, Preslia 70(2): 181. 1998.

Trommsdorffia Martius, 1826; not Bernhardt, 1800.

Scandent shrubs, twining lianas and a few arborescent species. Stems nearly cylindrical,



P. microphylla. a. cross-section of stem; b. inflorescence (photos by P. Acevedo)

1- 2 cm in diam. and up to 15 m in length; secondary growth with successive, continuous bands of interxylary phloem. Leaves opposite, petiolate; blades simple. Flowers bisexual, arranged in

glomerules, along the axes of axillary or terminal panicles; bracts and bracteoles persistent.

Tepals 5, free, concave, subequal, all with a tuft of stiff hairs at the base on the abaxial surface; stamens 5, the filaments united at the base to form a short staminal tube; interstaminal appendages absent; ovary superior, unilocular, uniovulate, ovoid, the stigma capitate-bilobed, sessile or subsessile. Fruit an indehiscent utricle, with persistent perianth.

Distinctive features: Opposite leaves; cross sections of stems with successive, continuous bands of interxylary phloem; inflorescence's main axis dominating, secondary units mostly opposite; all tepals with long, stiff or wooly hairs.

Distribution: A neotropical genus with about ten species, ranging from Costa Rica to South America (south to Bolivia and Paraguay), and in Hispaniola, Puerto Rico, and the Lesser Antilles. Eight species are consistently reported as climbers.

PLEUROPETALUM Hooker f., London J. Bot. 5: 108. 1846.

Erect or scandent shrubs or herbs. Leaves alternate, petiolate, with crenate margins.



P. pleiogynum (photo by R. Aguilar)

Flowers bisexual, in racemes or panicles. Tepals 5, ovate or suborbicular, subequal, free, rigid, dorsally striate, glabrous; stamens 6–8, the filaments united at the base to form a short staminal tube; interstaminal appendages absent; ovary superior, unilocular, multiovulate, the style short, with 6 stigmas. Fruit a fleshy, circumscissile utricle, with numerous, black, naked, tiny seeds.

Distinctive features: Alternate leaves with crenate margins; six stamens; and numerous black tiny seeds.

Distribution: A neotropical genus of three species, one of which (*P. pleiogynum* (Kuntze) Standley) is a scandent shrub that reaches 3 m in length; distributed from Mexico to northern Colombia.

EXCLUDED TAXA

Celosia nitida Vahl. Although a clambering herb, this species is excluded from the current treatment because it does not reach the minimum length of 2 m to be included in this field guide.

Pfaffia spp. Previous circumscription of *Pfaffia* included lianas and scandent shrubs; however, these are now recognized in *Hebanthe* or *Pedersenia*.

RELEVANT LITERATURE

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