

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

POACEAE

By Mark T. Strong (Sep 2020)



Chusquea sp., photo by P. Acevedo

A widely distributed family of primarily herbaceous or less often ligneous plants found in arctic, temperate, subtropical, and tropical regions, with about 750 genera and ca. 12,000 species worldwide. Unarguably, the most important family of plants economically, from which cereals, breads, sugar, forage and other products are produced. There are 18 genera treated herein that have species considered climbing or vining plants for a total of 120 species. Fourteen of these genera represent bamboos, 11 in the tribe Bambuseae (woody bamboos) and 3 in the tribe Olyreae (herbaceous bamboos).

Diagnostics: In the absence of fertile material, climbing Poaceae species are easily distinguished from vines in similar families, especially from

Cyperaceae by terete, nodose, often hollow stem nodes; tubular sheaths that have free margins and bear a ligule at the adaxial junction of sheath and leaf blade; and primarily two-ranked leaves.

GENERAL CHARACTERS

1. **STEMS.** Stems are cylindrical in cross section, nodose, hollow or pithy, smooth, scabrous, or with thorns in *Guadua*. Some *Chusquea* spp. have a geniculate, arachnoid branching pattern (fig 1c).
2. **LEAVES.** Leaves are alternate, distichous, rarely spirally arranged, estipulate, with the petiole modified into a sheath (fig. 1a). Sheaths bearing an inner membranous or ciliate ligule and sometimes outer ligule at junction of sheath and blade (fig. 1a). Leaf blades are flat to inrolled, linear or less often ovate, parallel-veined, sometimes pseudopetiolate at base.
3. **CLIMBING MECHANISMS.** Climbing Poaceae are scramblers that climb over surrounding plants with branches hanging down. It has been suggested that at culm nodes, a well-developed promontory (a swelling beneath the bud where branching takes place), along with a persistent, rough, and thickened girdle, may be an adaptation for the climbing habit among Neotropical bamboos (Soderstrom and Londoño, 1988). Other characteristics aiding climbing bamboos are geniculate (angled) branches and strongly scabrous culm leaves, some *Chusquea* spp. and *Guadua* have developed thorns modified from culm branches which are often hooked (fig. 1b). Of the remainder of genera treated herein, *Ichnanthus* and *Lasiacis* are often mistaken for climbing bamboos because of similar habit, the culms of *Isachne* spp. can elongate to 6 m, clambering and climbing upwards over secondary vegetation, and *Melica sarmentosa*, is a species that climbs by means of its tendril-like filiform leaf tips.
4. **INFLORESCENCES.** Inflorescences terminal or axillary racemes or panicles, open to contracted, bearing reduced partial inflorescences (spikelets) that produce 1-several small inconspicuous florets. Spikelets consisting of a rachilla bearing two sterile bracts at base (glumes), the rachilla above the glumes bearing florets which consist of a subtending bract (lemma) and the first appendage of the floral axis (palea), these enclosing a reduced flower.
5. **FLOWERS.** Flower bisexual or unisexual, the perianth represented by 2-3 minute fleshy or scale-like tepals (lodicules). Stamens generally (1-)3-6; ovary unilocular, uniovulate; styles 2; stigmas (1-)2-3, hispid to plumose.
6. **FRUITS.** Fruit is a dry or sometimes fleshy caryopsis with adherent pericarp, rarely an achene.



Figure 1. Climbing bamboo characteristics. **A.** *Guadua tagoara* stem with sheaths showing base of leaf blades and oral setae. **B.** Stem of *Guadua tagoara* showing thorns produced from modified branches. **C.** *Chusquea sp.* stem showing culm node with verticillate, arachnoid branching pattern. **D.** *Chusquea sp.* scrambling habit. Photos by P. Acevedo.

USES

In the Neotropics, woody bamboo culms and leaves, particularly of *Guadua spp.*, are used for house and building construction, fencing, crafting musical instruments, and arts and crafts, e.g., basketry, furniture, screens, and fans. Medicinal properties of roots, shoots, and water in culms is used to treat a variety of ailments. Neotropical bamboos are not used as a primary food source but more for culinary purposes. Fruits and young shoots can be cooked and eaten, and water stored in the hollow culms can provide potable water for travelers. Dried culms and leaves are also used for fuel and the bulky network of rhizomes produced in shallow soil layers can aid in the control of erosion on agricultural lands. The herbaceous bamboos are used mostly for medicinal and ceremonial purposes but not to the extent of their woody relatives. The remaining genera treated, *Ichnanthus*, *Isachne*, *Lasiacis*, and *Melica* are of little or no economic importance.

KEY TO THE GENERA

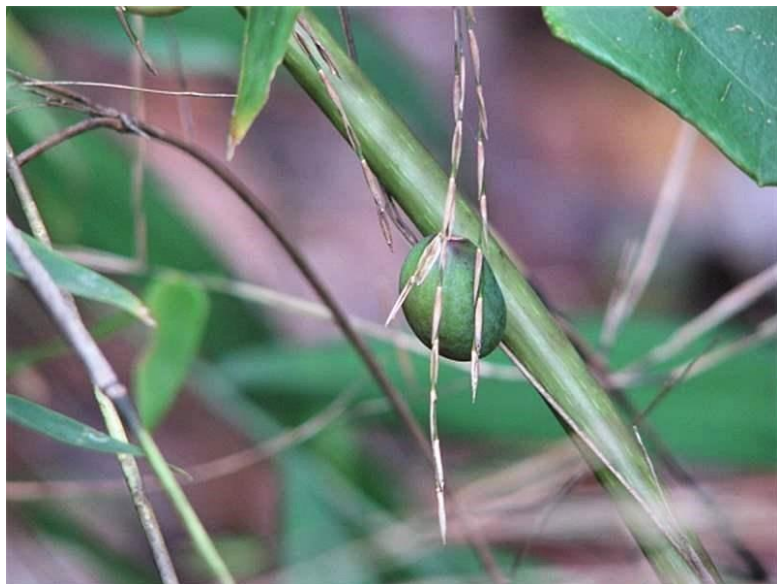
1. Culms woody; (1-)2-30 m long; leaves dimorphic, the culm leaves different from those of the branches which bear the foliage leaves; branches often short, whorled in the area of the nodes; summit of leaf sheath often bearing oral setae; Bambusoideae, tribe Bambuseae (woody bamboos)2
1. Culms herbaceous; leaves monomorphic, those of the culm similar to those of the branches; apex of the leaf sheath lacking setaceous appendages; branches short or elongate, alternate; Bambusoideae tribe Olyreae (herbaceous bamboos), Panicoideae (tribes Isachneae and Paniceae), and Pooideae (tribe Meliceae)12
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2. Branches without spines or thorns; culms without bands of short white hairs above and below the nodes or present only below the nodes3
3. Culms solid or essentially so.....4
3. Culms hollow6

4. Foliage leaves without oral setae at sheath summit; often in montane habitats above 1500 m *Chusquea*
4. Foliage leaves often with oral setae at sheath summit; in habitats well below 1500 m5.
5. Abaxial surface of foliage leaf blade pale green, with a narrow darker green stripe along one margin; florets blunt or acute; lemmas not pungent..... *Arthrostylidium*
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7. Culm leaf blades confluent with sheath apex, erect *Rhipidocaldum*
8. Culms with elongate internodes alternating with sets of 2-4 short internodes; foliage leaf blades strongly tessellate abaxially *Aulonemia*
8. Culms internodes equal or essentially so; foliage leaves not tessellate abaxially9
9. Culm leaf blades erect; fruit a fleshy, olive-sized, caryopsis*Alvimia*
9. Culm leaf blades divergent or reflexed; fruit a small, dry caryopsis with adherent pericarp10
10. Culm leaf sheaths with long, straight, usually erect oral setae at apex *Elytrostachys*
10. Culm leaf sheaths with inconspicuous oral setae, or if conspicuous, then spreading and slightly sinuous11
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12. Hermaphroditic perennials or annuals; spikelets with at least one bisexual floret15
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13. Glumes and floret disarticulating from the rachis as a unit; thickened internodes present between the glumes and filiform pedicels; hilum extending ½ to ¾ length of caryopsis.....14
14. Lemma and/or palea of pistillate florets foveolate (with small pits) only at apex...*Parodiolyra*
14. Lemma and palea of pistillate florets entirely foveolate *Taquara*

15. Spikelets laterally compressed, cuneate, divergent or nodding at apex of elongate erect pedicels which parallel axis of rachis; glumes lanceolate, widely spreading, with broad scarious margins..... ***Melica***
15. Spikelets biconvex, globose or subglobose, erect at apex of ascending pedicels; glumes ovate to broadly ovate, not widely spreading, escarious or essentially so on margins16
16. Spikelets set obliquely on pedicels, black at maturity; fertile lemma and palea wooly in shallow excavations at apex..... ***Lasiacis***
16. Spikelets set square on pedicels, green at maturity, the upper floret pale or stramineous; fertile lemma and palea pubescent or glabrous but not wooly at apex17
17. Spikelets biconvex, the lower glume dorsally rounded; upper lemma without minute scars or lanceolate appendages at base ***Isachne***
17. Spikelets globose or subglobose, the lower glume keeled, upper lemma with minute, paired scars or lanceolate appendages at base ***Ichnanthus***

GENERIC DESCRIPTIONS

ALVIMIA C.E. Calderón ex Soderstrom & Londoño, Amer. J. Bot. 75: 833. 1988.



Alvimia sp., photo by R.P. Oliveira (UFBA)

Rhizomatous perennials; rhizome pachymorph. Culms hollow and thin-walled, slender, climbing and often hanging over secondary vegetation, nodes with a promontory just above the nodal line, the midculm nodes with 2-many divergent branches. Leaves dimorphic, those of the culm different from those of the branches; culm leaves leathery, the blades erect, strongly nerved, continuous with the summit of the

sheath; foliage leaves with short pseudopetioles, fimbriate, the blades linear to broadly lanceolate. Synflorescences paniculate with several to many pseudospikelets, these extremely elongate and slender, lax, subtended by 1-several small bracts, with numerous fertile florets and a terminal sterile bristle or rudimentary floret; florets membranous, elliptic to lanceolate, slightly inflated; lemma apiculate, somewhat equaling length of palea; stamens 2(-3); stigmas 2, plumose. Fruit a fleshy, olive-sized, caryopsis, the rachis internodes disarticulating with the lemma, palea, and caryopsis as a unit.

Unique features: The fruit is an olive-sized, fleshy caryopsis and the rachis internodes disarticulate with the lemma, palea, and caryopsis falling as a unit.

Distribution: A woody bamboo genus of 3 species endemic to coastal white sand forests (restinga) in Bahia, Brazil at 40-100 m elevation.

ARTHROSTYLIDIUM Ruprecht, Mém. Acad. Imp. Sci. Saint-Petersbourg, sér. 6, Sci. Math.,
Seconde Pt. Sci. Nat. 3(2): 117. 1839.



A. sarmentosum Pilg., photo by P. Acevedo.

Rhizomatous perennials with pachymorph and sympodial rhizomes. Culms erect initially, becoming scandent to clambering, cylindrical, lignified, hollow, elongate, midculm nodes with one main branch per node borne from a promontory. Leaves dimorphic, those of the culm different from those of the branches; culm leaves erect, with inconspicuous to prominent oral setae, the blades often confluent with summit of the sheath; foliage leaves with internal and external ligules; sheaths with oral setae at summit, the abaxial surface pale green, with a narrow darker green stripe along one margin. Synflorescences of spicate racemes, lacking bracts, the rachis straight or flexuous. Spikelets sessile, with 1 or several fertile florets, deciduous along with the rachilla when mature; glumes 1-3, several

nerved, about as half as long as the length of the spikelet; lemma and palea somewhat equal in length, lanceolate to ovate, acute or sometimes awned; stamens 3; stigmas 2. Fruit a dry caryopsis with adherent pericarp.

Unique features: Abaxial surface of foliage leaf blade pale green, with a narrow darker green stripe along one margin.

Distribution: A woody bamboo genus of 29 species, 24 of which are climbers, distributed from southern Mexico, Central America, South America south to Bolivia, and in the Antilles. Grows in a variety of habitats from sea-level to 3700 m elevation.

ATHROOSTACHYS Benth in G. Bentham & J.D. Hooker, Gen. Pl. 3: 1208. 1883.



A. capitata (Hook.) Benth., photo by P. Acevedo

Rhizomatous perennials; rhizome pachymorph and short-necked. Culms scandent to clambering over secondary vegetation, 3-8 m long with hollow, thick-walled, terete internodes; branch complement with 1-3 main branches, mid-culm nodes with well-developed promontories which bear a single bud, the young internodes with tomentose-velvety trichomes. Leaves dimorphic, those of the culm different from those of the branches; culm leaf blades linear to narrowly lanceolate, short-petiolate at base at junction of sheath and blade, hirtellous-hispid on girdle of culm leaves and nodal line of foliage leaves, becoming reflexed; foliage leaves lanceolate-oblong, with long oral setae at summit of sheath; sheaths ciliate on margins, ligule membranous, eciliate.

Synflorescences capitate; spikelets short-stalked, with 2 subequal glumes, the rachis elongating, terminating in a small rudimentary floret; fertile florets one; glumes ovate with acute apex, 7-nerved, awned; lemma ovate, 7-nerved, pubescent, acuminate at apex, awnless; palea 2-nerved, ciliate on keels; anthers 3; stigmas 2. Fruit not seen.

Unique features: The inflorescence, termed a “synflorescence” in bamboo taxonomy, is capitate.

Distribution: A woody bamboo genus of two species endemic to coastal white sand forests (restinga) of Brazil at 30-270 m elevation.

ATRACTANTHA McClure, Smithsonian Contr. Bot. 9: 42. 1973.



A. aureolanata Judz., photo by Pedro Lage

Rhizomatous perennials;
rhizome pachymorph and short-necked.
Culms scandent to clambering over
secondary vegetation, slender, solid or
occasionally hollow, mid-culm nodes
with a single branch borne on a
promontory, (2-)3(-5) main branches
which re-branch to form many smaller
branchlets. Leaves dimorphic, those of
the culm different from those of the
branches; culm leaf blades erect, linear
to narrowly lanceolate; foliage leaf
blades linear to lanceolate-ovate;
sheaths with a thickened flangelike
girdle, sometimes strongly to slightly
auricled on the basal margin, with oral
setae at summit, broader than the
pseudopetiolate blade, both inner and
outer ligules present. Synflorescences

racemose or capitate, the spikelet florets in fan-shaped, capitate, or scorpioid clusters; florets spindle-like with pungent lemmas, only one fertile; lemma 7-11-nerved, mucronate to short-awned; stamens 3; stigmas 2. Fruit a dry caryopsis.

Unique features: florets very slender and spindle-like, the lemmas sharply pointed.

Distribution: A South American, small, woody bamboo genus of 5 species, with only the Brazilian species *A. aureolanata* Judz. reported as a climber; found in the seasonally semi-deciduous and wet forests of the Atlantic coast.

AULONEMIA Goudot, Ann. Sci. Nat., Bot., sér. 3, 5: 75. 1846.



A. soderstromii P.L. Viana et al., photo by Pedro Lage

Rhizomatous perennials; rhizome pachymorph. Culms erect or scandent, hollow, with elongate internodes or alternating with sets of 2-4 short internodes, spreading and sinuous; midculm nodes with a single bud and strongly divergent branch and sometimes several lateral branches. Leaves dimorphic, those of the culm different from those of the branches; culm leaves lacking a sheath girdle, the blades pseudopetiolate above sheath summit; sheaths of foliage leaves purple spotted, fimbriate on upper margins, the summit with elongate oral setae, both inner and outer ligules present; foliage leaf blades often ovate or linear to lanceolate, sometimes broadly rounded or cordate at base, often reflexed, minutely but strongly

tessellate on the undersurface. Synflorescence terminal, paniculate, with several to many spikelets; spikelets with several fertile and sterile florets above the basal two glumes, these unequal, the lowermost one 1-3-nerved, conspicuously shorter than 5-7-nerved upper one; fertile lemmas 7-9-nerved, lanceolate to ovate, obtuse, mucronate, or aristate; stamens 3; stigmas 2. Fruit a dry caryopsis.

Unique features: The internodes of the culm are elongate and alternate with sets of 2-4 short internodes and foliage leaf blades are strongly tessellate abaxially.

Distribution: A Neotropical woody bamboo genus of 47 species, 13 of which are known to be climbers, these found in Colombia and Brazil; in wet, usually montane forests and paramos. Andean species typically occur at 2000-3600 m elevation while Brazilian taxa from sea level to 2000 m.

CHUSQUEA Kunth, Syn. Pl. Aequin. 1: 254. 1822.



Chusquea scandens, photo by P. Acevedo

Rhizomatous perennials; rhizome pachymorph or sometimes amphimorph or leptomorph. Culms lignified, solid or occasionally hollow, erect or more commonly scandent or clambering and hanging, 1-18 m long, cylindrical, 0.2-6 cm diam., with numerous branches per node, promontory weakly to moderately well developed. Leaves dimorphic, those of the culm different from those of the branches; culm leaves erect, sometimes reflexed; sheaths papery; girdle essentially absent to well-developed; foliaceous leaves with internal and external ligules; sheaths lacking setose appendages, sometimes with small tufts of hair at apex; auricles absent; leaf blades pseudopetiolate, needlelike to well-developed, tapering at base, abaxially green or waxy, lacking a marginal green stripe,

tessellate or not, adaxially smooth and etessellate. Synflorescences terminal, of dense to open panicles or less frequently racemes or capitate. Spikelets lanceolate or ovate, 5-20 mm long, with only one fertile floret; glumes 4, the lower two often scale-like, sterile; distal flower fertile; lemma apiculate to short-awned; palea bicarinate; stamens 3; stigmas 2. Fruit a dry caryopsis with adherent pericarp.

Unique features: The foliage leaves lack oral setae and spikelets only have one fertile floret.

Distribution: A Neotropical woody bamboo genus of 190 species, 40 of which have been reported as climbers, these distributed in Panama, Colombia, Ecuador, Brazil and a single disjunct species in the Greater Antilles. Primarily of montane habitats 1500 to 4000 m elevation.

COLANTHELIA McClure & E.W. Smith, *Smithsonian Contr. Bot.* 9: 77. 1973.



C. cf. kinoshitae, photo by Pedro Lage

Rhizomatous perennials; rhizome short, pachymorph. Culms erect to scandent or high climbing, delicate and weak, hollow, promontory poorly developed or absent, midculm nodes bearing a single, divergent branch. Leaves dimorphic, those of the culm different from those of the branches; culm leaves with a prominent girdle, the blades pseudopetiolate, triangular, becoming reflexed; foliage leaves short-fimbriate, sometimes on auricles, the blades small, narrowly to broadly lanceolate. Synflorescences terminal, small and



C. cf. kinoshitae, photo by Pedro Lage

sometimes reduced to a single spikelet, racemose or paniculate, with few to many-flowered spikelets; spikelets slender; glumes 2-3, unequal, few-nerved; lemmas of fertile florets many-nerved, lanceolate to ovate, obtuse, mucronate, or aristate; rudimentary florets one to several; stamens 3; stigmas 2. Fruit a dry caryopsis with adherent pericarp.

Unique features: The culms are very slender and delicate with promontories absent or poorly developed and the mid culm nodes bear a single, divergent branch.

Distribution: A South American woody bamboo genus of 11 species, 2 of which (*C. burchellii* (Munro) McClure, and *C. kinoshitae* Santos-Gonç. et al.) are reported as climbers in the

Neotropical area of SE Brazil, in semi-deciduous and wet forests from 0-1300 m, rarely at higher elevations.

ELYTROSTACHYS McClure, J. Washington Acad. Sci. 32: 173. 1942.



Elytrostachys sp., photo by Teresa Espinoza

Rhizomatous perennials; rhizome short, pachymorph. Culms erect to scandent or high climbing, hollow, promontory weakly developed or absent, midculm nodes bearing a single, larger branch and a smaller lateral branch on each side. Leaves dimorphic, those of the culm different from those of the branches; culm leaf sheaths with long, straight, usually erect oral setae at apex, the blades small, narrow, attenuate, strongly reflexed; foliage leaves short-fimbriate, sometimes on auricles, the blades lanceolate. Synflorescences lateral with short branches and sometimes appearing capitate; pseudospikelets few, composed of two glume-like bracts, and above these, 1-2 fertile florets; lemmas of fertile florets many-nerved, lanceolate to ovate, obtuse,

mucronate, or aristate; rudimentary florets one to several; stamens 6; stigmas 2, hispid. Fruit a dry caryopsis with adherent pericarp.

Unique features: The sheaths of the culm leaves have elongated, straight, usually erect oral setae at apex and synflorescences are borne on short-branched lateral shoots, these appearing as capitate clusters at the nodes of the culm.

Distribution: A small, woody climbing bamboo genus of 2 species occurring in Guatemala to Colombia and northwestern Venezuela in wet to seasonally dry forests at 0-800 m, rarely to 1500 m elevation.

GUADUA Kunth, J. Phys. Chem. Hist. Nat. Arts 95: 150. 1822.



G. tagoara (Nees) Kunth, photo by P. Acevedo.

Rhizomatous clump-forming perennials.

Rhizome pachymorph or if amphimorph, then culms solid. Culms erect to scandent, hollow or solid, with band of short white hairs present both above and below the nodes, branches armed with sharp thorns, rarely smooth, midculm nodes with a single large branch, rarely producing smaller branchlets. Leaves dimorphic, those of the culm different from those of the branches; culm leaf sheaths contiguous with blade or nearly so, leaf blades triangular, with auricles and/or oral setae present or absent; foliage leaf blades linear to lanceolate-ovate, pseudopetiolate. Synflorescence terminal, consisting of several to many-flowered pseudospikelets; pseudospikelets often pedicellate, generally comprising a single bract, prophyll, and several gemmiparous bracts at base, 1-several

glumes above these, several fertile florets, and 1 rudimentary floret; florets lanceolate to ovate; lemmas many nerved, apiculate; paleas with two inconspicuous to prominently winged keels; stamens (3-)6; ovary glabrous to pubescent; stigmas 3, plumose. Fruit a dry caryopsis, rarely fleshy.

Unique features: The branches are armed with spines or thorns and the culms have bands of short white hairs above and below the nodes.

Distribution: A woody bamboo genus of 33 species widespread in the Neotropics from Mexico, Central America, and South America. However, only the Brazilian species *G. ciliata* Londoño & Davidse and *G. tagoara* (Nees) Kunth are known to be climbers. Found in lowland to middle elevations in wet to humid forests, gallery forests, varzea and igapó forests.

ICHNANTHUS P. Beauvois, Ess. Agrostogr. 56. 1812.



I. bambusiflorus, photo by Claudio N. de Fraga

Annual or perennial, bamboo-like herbs. Culms straggling, rambling or climbing. Leaves well-developed; sheaths bearing a membranous ligule at adaxial junction of sheath and blade; blades ovate to lanceolate, asymmetrical at base, often cross veined. Inflorescence terminal or sometimes axillary, paniculate; spikelets laterally compressed to terete, elliptic, ovate, or lanceolate, acute to attenuate, green at maturity; glumes 2, the lowermost one $\frac{1}{2}$ to as long as spikelet, several-nerved, keeled, separated from the upper one by a distinct internode, the upper one 5-7-nerved; florets 2, the lowermost one sterile or staminate, the upper one fertile, pale to stramineous; lemmas elliptic to lanceolate, indurate, involute, glabrous or rarely pubescent, the upper one with minute, paired scars or lanceolate appendages at basal margins; stamens 3; stigmas 2. Fruit a caryopsis with adherent pericarp.

Unique features: The upper lemma of the floret has minute, paired scars or lanceolate appendages at basal margins.

Distribution: A primarily Neotropical genus of 30 species with one species occurring in the tropics of Africa, Asia, Malesia, and Australia. Only *I. bambusiflorus* (Trin.) Döll and *I.*

brevicrobs Döll are known to be climbers. Occurring along forest edges, stream banks, savanna, dry thickets, and cultivated areas from sea level to 2200 m elevation.

ISACHNE R. Br., Prodr. Fl. Nov. Holland.: 196. 1810.



I. arundinacea (Sw.) Griseb., photo by EOL

Annuals or stoloniferous perennials. Culms erect or scandent. Leaves primarily cauline; sheaths bearing a membranous, ciliate or eciliate ligule or fringe of hairs at adaxial junction of sheath and blade; blades linear to linear-lanceolate or ovate, often cross-veined. Inflorescence an open terminal or sometimes axillary panicle; spikelets biconvex, 2-flowered; glumes 2, the uppermost one as long as spikelet, many-nerved, the lower one shorter and several-

nerved; florets 2, the lower staminate or bisexual, the upper pistillate or bisexual, pale to stramineous, disarticulating above the glumes; internodes between glumes and lemmas evident; lower fertile lemmas chartaceous to indurate, elliptic to oblong-elliptic or ovate, involute, glabrous or pubescent; palea well-developed, 2-keeled; stamens 2 or 3; stigmas 2. Fruit a caryopsis with adherent pericarp.

Unique features: There is no articulation at the pedicel apex below the glumes, thus the flowers (florets) disarticulate above the glumes.

Distribution: A pantropical genus of 105 species with *I. angustifolia* Nash, *I. arundinacea* (Sw.) Griseb., *I. disperma* (Lam.) Döll., *I. ligulata* Swallen, *I. polygonoides* (Lam.) Döll., *I. pubescens* Swallen, and *I. rigens* (Sw.) Trin. reported as climbing or scrambling herbs in the Neotropics. Occurring in swamps, marshes, stream and pond margins, seasonally flooded savanna, mountain and tepui summits from sea level to 2500 m elevation.

LASIACIS (Grisebach) Hitchcock, Contr. U.S. Natl. Herb. 15: 16. 1910.



L. divaricata, photo by S. Maldonado Silvestrini

Culms cylindrical, lignified and erect or elongate, scandent, arching or climbing, freely branched. Leaves monomorphic; sheaths rounded, smooth, lacking setaceous appendages; ligules membranaceous; blades linear to ovate, asymmetrical at base.

Inflorescence and open to contracted panicle, the primary branches divaricate, the rachis with a spikelet on the distal portion; spikelets 2(-3)

flowered, adaxial, cylindrical or globose,

obovate or elliptic, obliquely set on pedicel, disarticulating below glumes; glumes and sterile lemmas abruptly apiculate, turning shiny black at maturity, woolly at apex; glumes 2, the lowermost one shorter than spikelet, 5-13-nerved, saccate at base, with overlapping margins; upper glume and sterile lemma 7-15-veined; fertile lemma broadly elliptic to obovate, obtuse, indurate, with inrolled margins, dark brown at maturity; palea gibbous dorsally, concave ventrally, indurate, with lobed margins; stamens 3; styles 2, separate at base. Fruit a plano-convex caryopsis.

Unique features: The spikelets are obliquely set on pedicel and turn black at maturity and the apex of the fertile lemma and palea are woolly in shallow excavations.

Distribution: A primarily Neotropical genus of 15 species, with 4 species reported as scrambling herbs. These occurring from Mexico to northern South America, Brazil and the West Indies; in forest margins and openings, secondary vegetation, and roadsides from sea level to 2000 m elevation.

MELICA L., Sp. Pl. 66. 1753, (nom. cons.).



M. sarmentosa, image from Earth.com

Rhizomatous perennial herbs; rhizomes short or slender. Culms erect or ascending, in one species, climbing by tendril-like filiform leaf tips, profusely branching and bending, elongating to 4 m. Leaves soft, primarily cauline; sheaths with fused margins, bearing a

membranous, ciliate ligule at adaxial junction of sheath and blade; blades filiform or linear to linear-lanceolate, with or without cross-veins. Inflorescence a spreading or narrow raceme-like panicle; spikelets laterally compressed, cuneate, divergent to reflexed at end of pedicels, with 1-3 lower fertile lemmas and 2-several distal sterile ones that convolute together into a club-shaped mass; glumes 2, large and unequal, papery, 3-5-nerved, with broad scarious margins, widely spreading at maturity; lemmas firm, convex, 7-13-nerved, with scarious margins, awnless or awned below the bifid apex; palea shorter than lemmas, the nerves nearly marginal; stamens 3; stigmas 2. Fruit a caryopsis with adherent pericarp.

Unique features: The distal sterile lemmas of the spikelet are convolute together and form a club-shaped mass.

Distribution: A genus of 90 species wide ranging in temperate and subtropical regions worldwide, excluding Australia. There is a single climbing species, *Melica sarmentosa* Nees, that occurs from Bolivia to northern Argentina and southeastern and southern Brazil in forest margins and openings, secondary vegetation, riparian forest, riverbanks, and roadsides from sea level to 1000 m elevation.

MEROSTACHYS Sprengel, Syst. Veg. 1: 132, 249. 1824.



Merostachys sp., photo by Pedro Lage

Rhizomatous perennials; rhizome pachymorph. Culms hollow, rarely solid, erect basally, becoming scandent and climbing into trees, the branches often hanging down, midculm nodes with a single bud, the branches numerous, in fan-shaped or triangular clusters. Leaves dimorphic, those of the culm

different from those of the branches; culm leaves pseudopetiolate, the leaf blades constricted at base, narrower than sheath summit, often reflexed; foliage leaves in complements; sheaths with inner and outer ligules and oral setae; leaf blades lanceolate to narrowly so, pseudopetiolate. Synflorescences terminating leafy branches, racemose, the spikelets crowded, densely 1-sided; glumes 2, unequal, shorter than spikelet; fertile floret 1, rarely 2 or more, subinflated, the rachis prolonged beyond florets as a minute bristle or rudimentary floret; lemmas lanceolate to ovate, acute, many-nerved, clasping the short palea at base; palea strongly 2-keeled; stamens 3; stigmas 2, hispid to subplumose. Fruit an achene-like caryopsis, the pericarp free.

Unique features: The culm leaves are reflexed and constricted at base and the synflorescence is racemose with crowded spikelets that are 1-sided and appear comb-like.

Distribution: A woody bamboo genus of 53 species, with 12 Brazilian species reported as climbers. These occurring along the Atlantic coastal forest from Bahia to Rio Grande do Sul in semi-deciduous or wet forests from sea level to 1500 m.

OLYRA Linnaeus, Syst. Nat. ed. 10, 2: 1261. 1759.



Olyra sp., photo by P. Acevedo.

Monoecious perennial herbs, caespitose, rhizome short or absent. Culms erect, creeping, or climbing. Leaves with well developed auricles; ligule membranaceous, ciliate or eciliate; blades broad, lanceolate or ovate. Synflorescences paniculate, solitary or numerous at the upper nodes of the stem, the pistillate spikelets terminal, staminate ones below; spikelets with a single flower; pistillate spikelets usually with a claviform pedicel, separating as a unit or the florets separating above the glumes, the glumes acuminate or aristate, membranaceous, pluriveined, subequal, longer than the flower; florets lanceolate or ovate, the lemma indurate, smooth or pitted, whitish, maturing mottled with brown, persistent; staminate spikelets smaller than the pistillate ones, linear or lanceolate, hyaline, deciduous, the glumes usually absent; stamens 3; stigmas 2, plumose. Fruit a caryopsis with adherent pericarp, the hilum extending the entire length of caryopsis.

Unique features: The glumes of the spikelet are deciduous, disarticulating separately from the floret and there are no thickened internodes between the glumes and filiform pedicels. The caryopsis has a hilum that extends its entire length.

Distribution: An herbaceous bamboo genus of 15 species, 2 of which are considered climbers, these distributed from Mexico to northern South America and the West Indies. In a variety of moist forest habitats from sea level to rarely above 1000 m.

PARODIOLYRA Soderstrom & Zuloaga, *Smithsonian Contr. Bot.* 69: 64. 1989.



P. ramosissima (Tri.) Soderstr. & Zuloaga, photo by A. Popovkin

Monoecious scrambling perennials with short rhizome. Culms weak, scandent, clambering over secondary vegetation, branching profusely, sometimes rooting from the middle and upper nodes, internodes terete.

Leaves with a short

petiole-like extension; sheath auricles absent; ligule membranous, sometimes ciliolate; leaf blades linear-lanceolate to ovate, acuminate, apiculate at apex, truncate at base, firm to somewhat leathery, often asymmetrical. Synflorescence of lax and diffuse panicles from the uppermost nodes, proximal branches with staminate spikelets, distal branches with both proximal staminate and distal pistillate spikelets or entirely of pistillate spikelets; staminate spikelets shorter than pistillate, lanceoloid, early deciduous; pistillate spikelets with filiform peduncle, ellipsoid, glabrous, turning black at maturity, the glumes and floret disarticulating from the rachis as a unit; glumes 2, subequal, with a pulvinate internode, several-nerved, acute to acuminate, equaling length of spikelet; florets stipitate, indurate, acute to obtuse; lemma 5- to 7-nerved, obtuse or acute, apiculate; palea membranous, not involute, 2-veined without keels; stamens 3; stigmas 2. Fruit an elliptical caryopsis with adherent pericarp, the hilum short extending $\frac{1}{2}$ to $\frac{3}{4}$ length of the caryopsis.

Unique features: The lemma and/or palea of the pistillate florets are foveolate only at apex.

Distribution: A small, herbaceous climbing bamboo genus of 4 species wide ranging from Central America, Colombia, Ecuador, Peru, Venezuela, Guianas, Bolivia and Brazil in lowland to lower montane forests, sometimes in dry savanna from sea level to 1200m, rarely to 1800m.

RHIPIDOCLADUM McClure, Smithsonian Contr. Bot. 9: 101. 1973.



Rhipidocladum sp. photo by D. Janzen

Rhizomatous perennials; rhizome short, pachymorph and sympodial. Culms scandent and clambering over secondary vegetation, sometimes hanging or drooping distally, hollow, thin-walled and weak, midculm nodes with a single bud, the branches numerous, in fan-shaped or triangular clusters. Leaves dimorphic, those of the culm different from those

of the branches; culm leaves triangular to narrowly so, papery to stiff, petiolate, deciduous; sheaths lacking auricles and often oral setae; ligule membranous, ciliate or eciliate; blades erect, confluent with sheath summit; foliage leaves with both inner and outer ligules; oral setae present but usually not prominent, the blades shortly pseudopetiolate, linear to lanceolate, rarely ovate-lanceolate, lacking a conspicuous midvein. Synflorescence spicate-racemose, loosely flowered, the spikelets often one-sided along axis; spikelets slender, sessile or essentially so, several-flowered; glumes 2-3(-5), awl-shaped; fertile florets several, linear to broadly lanceolate; lemmas 5-7-nerved, obtuse to acute or awned; stamens 3; stigmas 2. Fruit an achene-like caryopsis, the pericarp free

Unique features: The culm leaf blades are erect and confluent with the sheath apex and the bud and branch complements are fan-shaped or triangular.

Distribution: A woody bamboo genus of 20 species, 5 of which are reported as climbers, these occurring in Colombia and Venezuela in humid forest or along forest edges at elevations 150 to 2900m.

TAQUARA I.L.C. Oliveira & R.P. Oliveira, Bot. J. Linn. Soc. 192: 78. 2020.

Monoecious perennials with short rhizomes. Culms erect or becoming scandent on secondary vegetation, branching from the upper nodes; nodes compressed, glabrous to pubescent, the internodes cylindrical, hollow and glabrous. Leaf sheaths glabrous to densely pubescent, with or without auricles at apex; ligules membranous-ciliate; leaf blades oblong-lanceolate or ovate-lanceolate, acuminate, truncate or subcordate and asymmetric or symmetric at base, the margins ciliate, scabrous, or glabrous. Synflorescences terminal panicles, lax, open, or diffuse, the rachis scaberulous to hispid; spikelets unisexual; branches with staminate spikelets proximal and pistillate ones distal; pistillate spikelets ovoid to ellipsoid, acuminate to aristate, disarticulating below the glumes; glumes 3-5-nerved, scabrous to hispid, the florets ovoid or ellipsoid, foveolate; lemma 5-nerved, pilose or glabrous; male spikelets fusiform to lanceolate; lemma acuminate or aristate, scabrous; palea 2-nerved, scabrous. Fruit a caryopsis with adherent pericarp; the hilum short extending $\frac{1}{2}$ to $\frac{3}{4}$ length of the caryopsis.

Unique features: The lemma and palea of the pistillate florets are entirely foveolate.

Distribution: A small, herbaceous climbing bamboo genus of 2 species one of which is endemic to the Araracuara region of Colombia occurring in sandy paramos, the other widespread in South America from Colombia and Venezuela to the Atlantic coast of Brazil and south to northern Argentina and Paraguay in forest and forest edges.

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