

subulate, curved, 5–20 × 0.2–0.3 cm, margins scabrous, apex spiny; ligule densely ciliate. Staminate inflorescence of 2–5 clustered turbinate heads 5–10 × 6–8 cm; racemes 3–6 cm, bearing 5–10 loosely imbricate spikelets. Staminate spikelets lanceolate, 8–12 mm; glumes oblong-lanceolate, 7–9-veined, lower glume 1/2 spikelet length, upper glume 2/3 spikelet length; lower lemma 5-veined, 8–10 mm, palea with winged ciliate keels; upper lemma with unkeeled palea. Female inflorescence globose, 20–35 cm in diam.; racemes unispiculate with needle-like 10–18 cm rachis. Female spikelets lanceolate-oblong, 10–20 mm, acuminate; glumes oblong-lanceolate, low-

er glume many-veined, upper glume 7–9-veined; lower lemma ovate-lanceolate, 5-veined, palea absent; upper lemma lanceolate, yellowish. Fl. and fr. summer-autumn.

Sandy beaches, seashore dunes. Fujian, Guangdong, Guangxi, Hainan, Taiwan [Cambodia, India, Indonesia, Malaysia, Myanmar, Philippines, Sri Lanka, Thailand, Vietnam].

This species is an efficient sand binder, forming large colonies and stabilizing dunes. The female inflorescences act as tumbleweeds. The seeds within are dispersed as the spiky head is transported along the coast by wind and sea.

25. Tribe ISACHNEAE

柳叶箬族 liu ye ruo zu

Chen Shouliang (陈守良); Sylvia M. Phillips

Annuals or perennials. Leaf blades narrowly lanceolate to ovate; ligule a line of hairs, rarely absent. Inflorescence an open or contracted panicle. Spikelets all alike, florets 1 or 2, when 2 lower florets bisexual or male, upper floret bisexual or female, dorsally compressed, awnless, disarticulating above glumes and sometimes tardily between florets; glumes shorter than or equaling spikelet, membranous, deciduous or persistent; lemmas rounded on back, membranous to leathery, obscurely 0–7-veined, glabrous or pubescent, margins inrolled and clasping edges of palea. Caryopsis ellipsoid to plano-convex; hilum round to oval. Leaf anatomy: non-Kranz; microhairs slender or stout. $x = 10$.

Five genera and ca. 100 species: throughout the tropics, but mainly in Asia; three genera and 20 species (four endemic) in China.

- 1a. Upper lemma indurate 180. *Isachne*
- 1b. Upper lemma membranous.
 - 2a. Spikelets with 2 florets; glumes persistent 181. *Coelachne*
 - 2b. Spikelets with 1 floret; glumes deciduous 182. *Sphaerocaryum*

180. ISACHNE R. Brown, Prodr. 196. 1810.

柳叶箬属 liu ye ruo shu

Annual or perennial. Culms erect or decumbent or creeping, many-noded. Leaf blades narrowly lanceolate to ovate, margin frequently white and thickened; ligule a line of stiff hairs. Inflorescence an open or contracted panicle, branches and pedicels sometimes spotted with yellow glandular patches. Spikelets with 2 florets, florets both bisexual or lower floret bisexual or male and upper floret male or female, separated by a short internode or contiguous, disarticulating below each floret; glumes falling soon after florets, subequal, 3/4 to as long as spikelet, 5–9-veined; lower lemma variable, resembling the upper or of different size and texture; upper lemma orbicular to broadly elliptic, papery to leathery, glabrous or pubescent with short curved hairs, 5–7-veined, obtuse. Stamens 3. Caryopsis ellipsoid or subglobose.

About 90 species: throughout the tropics, but mainly in Asia; 18 species (four endemic) in China.

- 1a. Florets unequal in size and of different texture; lower floret longer, flatter and more delicate.
 - 2a. Upper floret 1/2 length of lower floret; panicle eglandular 1. *I. hainanensis*
 - 2b. Upper floret slightly shorter and broader than lower floret; panicle glandular.
 - 3a. Perennial; culms to 80 cm tall, nodes glabrous; leaf blades narrowly lanceolate, 3–11 cm 2. *I. globosa*
 - 3b. Annual; culms to 25 cm tall, nodes hispid; leaf blades ovate-amplexicaul, 2–3 cm 3. *I. pulchella*
- 1b. Florets equal in size or nearly so and of similar texture.
 - 4a. Spikelets 2 mm or more.
 - 5a. Panicle branches and pedicels glandular.
 - 6a. Leaf sheaths longer than internodes; nodes pubescent; glumes truncate 4. *I. truncata*
 - 6b. Leaf sheaths shorter than internodes; nodes glabrous; glumes obtuse to rounded.
 - 7a. Leaf blades linear, 0.3–1 cm wide, suberect; panicle 5–14 cm; spikelets globose 5. *I. himalaica*
 - 7b. Leaf blades lanceolate, 0.8–1.8 cm wide, ascending; panicle 17–25 cm; spikelets elliptic to obovate 6. *I. hoi*
 - 5b. Panicle branches and pedicels eglandular.
 - 8a. Lemmas densely ciliate along margins, otherwise glabrous; culms 30–60 cm tall 7. *I. ciliatiflora*
 - 8b. Lemmas not above; culms 5–25 cm tall.
 - 9a. Leaf blades ovate-lanceolate or lanceolate 1–1.8 cm wide; glumes densely scabrid-hispidulous, obtuse or subrounded 8. *I. repens*
 - 9b. Leaf blades narrowly lanceolate, 0.4–0.8 cm wide; glumes glabrous, subacute 9. *I. sikkimensis*

- 4b. Spikelets less than 2 mm.
- 10a. Culms up to 30 cm tall, often much less; plant decumbent or mat-forming.
- 11a. Leaf blades linear-lanceolate, 2–6 cm; pedicels often glandular 10. *I. clarkei*
- 11b. Leaf blades lanceolate-ovate, 1–3.5 cm; pedicels eglandular.
- 12a. Panicle branches and pedicels minutely scaberulous; leaf blades 2–3.5 cm, abruptly acuminate 11. *I. nipponensis*
- 12b. Panicle branches and pedicels smooth; leaf blades 1–2 cm, acute.
- 13a. Spikelets 1–1.4 mm; panicle with 15–30 spikelets (fewer in depauperate specimens) ... 12. *I. myosotis*
- 13b. Spikelets 1.4–2 mm; panicle sparse, usually with fewer than 12 spikelets 13. *I. pauciflora*
- 10b. Culms 30–100 cm tall, erect or ascending; plant tufted.
- 14a. Panicle eglandular; spikelets 1–1.5 mm, whitish 14. *I. albena*
- 14b. Panicle glandular (sometimes sparsely); spikelets 1.2–2 mm, green, purplish or brownish.
- 15a. Leaf blades 1–2.5 cm, sheaths very short; panicle 1.5–4 cm, branches stiffly horizontal 15. *I. confusa*
- 15b. Leaf blades 3–20 cm, sheaths not short; panicle 4–22 cm, branches ascending or spreading.
- 16a. Leaf blades 3–10 × 0.4–0.8 cm; leaf sheaths glabrous (except margin).
- 17a. Glumes boat-shaped, usually glabrous, rarely hispidulous or scaberulous above middle; leaf sheaths shorter than internodes 2. *I. globosa*
- 17b. Glumes ovate-elliptic, hirtellous above middle; leaf sheaths about as long or longer than internodes 16. *I. guangxiensis*
- 16b. Leaf blades 9–20 × 1–2.4 cm; leaf sheaths hairy.
- 18a. Leaf sheaths densely hirsute; leaf blades 9–12 × 1.3–2.4 cm 17. *I. sylvestris*
- 18b. Leaf sheaths hispid with sharp patent hairs; leaf blades 12–20 × 1–1.2 cm 18. *I. scabrosa*

1. *Isachne hainanensis* P. C. Keng, Acta Phytotax. Sin. 10: 23. 1965.

海南柳叶箬 hai nan liu ye ruo

Annual. Culms slender, creeping, branching and rooting at lower nodes, 8–15 cm tall. Leaf sheaths shorter than internodes, papillose-hispid, outer margin ciliate; leaf blades ovate-elliptic, thin, 0.8–1.5 × 0.3–0.6 cm, subglabrous or abaxial surface papillose-hispid, base rounded, margins not thickened, ciliate, apex acute; ligule almost absent. Panicle ovate in outline, 2–3.5 cm, eglandular, moderately branched; branches and pedicels slender, pedicels mostly longer than spikelets. Spikelets 1.7–1.8 mm, greenish or purplish green; florets clearly dissimilar; lower floret male, upper floret raised on distinct internode, bisexual; glumes subequaling or shorter than spikelet, elliptic-lanceolate, 5–7-veined, glabrous, apex obtuse; lower lemma herbaceous, elliptic-oblong, dorsally flattened, smooth, glabrous; anthers 1.3–1.5 mm; upper lemma crustaceous, strongly plano-convex, 1/2 length of lower floret, densely pubescent. Fl. and fr. Oct–Dec.

- Valleys, moist places; 300–500 m. Guangdong, Hainan.

This species is very close to *Isachne pulchella*, but the whole plant is eglandular and has exceptionally small leaf blades and a small upper floret raised on a conspicuous internode. The anthers are also longer than in *I. pulchella*.

2. *Isachne globosa* (Thunberg) Kuntze, Revis. Gen. Pl. 2: 778. 1891.

柳叶箬 liu ye ruo

Perennial. Culms slender to moderately robust, erect or decumbent and rooting at lower nodes, up to 80 cm tall, nodes glabrous, eglandular or with glandular ring. Leaf sheaths shorter than internodes, glabrous except for ciliate outer margin; leaf blades narrowly lanceolate, 3–10 × 0.4–0.8 cm, glabrous, scabrid, base rounded, apex acute; ligule 1–2 mm. Panicle open,

ovate in outline, 4–11 cm, glandular, many-spiculate; branches and pedicels filiform, flexuose; pedicels variable in length, shorter or longer than spikelets. Spikelets elliptic-globose, 1.5–2(–2.2) mm, greenish or purplish brown; florets slightly to clearly dissimilar; lower floret male, upper floret female; glumes subequal, as long as or shorter than florets, broadly elliptic, 5–7(–9)-veined, usually glabrous, rarely hispidulous or scaberulous above middle, apex broadly rounded; lower lemma oblong, cartilaginous to subcrustaceous, shallowly convex, back sometimes sulcate, smooth, glabrous; anthers 0.8–1.3 mm; upper lemma crustaceous, shorter and more convex, slightly rough, back glabrous or puberulous, upper margins ciliate. Fl. and fr. summer to autumn. $2n = 60$.

Wet places, forming colonies, and as a weed of rice fields. Anhui, Fujian, Guangdong, Guangxi, Guizhou, Hebei, Henan, Hubei, Hunan, Jiangsu, Jiangxi, Liaoning, Shaanxi, Shandong, Taiwan, Yunnan, Zhejiang [Bangladesh, Bhutan, India, Indonesia, Japan, Korea, Malaysia, Nepal, New Guinea, Philippines, Sri Lanka, Thailand, Vietnam; Australia, Pacific Islands].

This is a widespread and very variable species. It includes several ill-defined entities that have been given specific rank in the past. The typical form, from Japan, has spikelets with the florets only slightly dissimilar, nearly equal in length and texture and the upper floret rounded on the back without a central groove. This form is the most common entity in China. Specimens from India usually have more clearly unequal florets, the lower one longer and thinner, with a deep, longitudinal groove on the back. This form may have a glabrous or pubescent upper floret, and the pubescent variant is the basis of the name *Isachne milicea*. In SE Asia this division breaks down, with many intermediate forms. Specimens in which the florets are nearly equal but the lower one is grooved also occur in China. There is much variation in habit and spikelet size unrelated to other characters.

This species is a forage grass, but also a troublesome weed of rice fields.

- 1a. Panicle open; lower lemma glabrous 2a. var. *globosa*
 1b. Panicle dense; lower lemma densely ciliate 2b. var. *compacta*

2a. *Isachne globosa* var. *globosa*

柳叶箬(原变种) liu ye ruo (yuan bian zhong)

Milium globosum Thunberg in Murray, Syst. Veg., ed. 14, 109. 1784; *Isachne australis* R. Brown; *I. globosa* var. *brevispicula* Ohwi; *I. miliacea* Roth ex Roemer & Schultes.

Panicle open; branches slender. Lower lemma glabrous; upper lemma puberulous.

Wet places, forming colonies, and as a weed of rice fields. Anhui, Fujian, Guangdong, Guangxi, Guizhou, Hebei, Henan, Hubei, Hunan, Jiangsu, Jiangxi, Liaoning, Shaanxi, Shandong, Taiwan, Yunnan, Zhejiang [Bangladesh, Bhutan, India, Indonesia, Japan, Korea, Malaysia, Nepal, New Guinea, Philippines, Sri Lanka, Thailand, Vietnam; Australia, Pacific Islands].

2b. *Isachne globosa* var. *compacta* W. Z. Fang ex S. L. Chen, Bull. Nanjing Bot. Gard. 1988–1989: 2. 1990.

紧穗柳叶箬 jin sui liu ye ruo

Panicle dense, cylindrical; branches stout, short. Lower lemma densely ciliate.

- Grasslands. Fujian (Xiamen Shi).

This taxon does not correspond well to *Isachne globosa* and may prove to be a different species when better known. Its characters are not, therefore, included in the species description.

3. *Isachne pulchella* Roth in Roemer & Schultes, Syst. Veg. 2: 476. 1817.

矮小柳叶箬 ai xiao liu ye ruo

Isachne dispar Trinius; *I. heterantha* Hayata; *Panicum bellum* Steudel, nom. illeg. superfl.; *Sphaerocaryum pulchellum* (Roth) Merrill; *Studelella pulchella* (Roth) Honda.

Annual. Culms very slender, straggling, branching and rooting at lower nodes, 10–25 cm tall, nodes hispid with a glandular ring below. Leaf sheaths shorter than internodes, papillose-hispid at base above node, otherwise pilose or subglabrous, outer margin ciliate; leaf blades ovate or ovate-lanceolate, 2–3 × 0.8–1 cm, scabrid to thinly hispid, base cordate-amplexicaul with pectinate margin, apex shortly acuminate; ligule ca. 2 mm. Panicle narrowly ovate to pyramidal in outline, 2.5–5 cm, glandular; primary branches inserted singly, stiffly and regularly spreading with branchlets to their base; pedicels mostly shorter than spikelets. Spikelets plumply elliptic, 1.3–1.8(–2) mm, gray-green or purplish green; florets clearly dissimilar; lower floret male, upper floret bisexual or female; glumes slightly shorter than lower floret; lower glume elliptic-oblong, 5-veined, upper glume broadly elliptic, 7-veined both glabrous, apex obtuse; lower lemma herbaceous, elliptic-oblong, dorsally flattened, smooth, glabrous; anthers 0.3–0.5 mm; upper lemma slightly shorter, crustaceous, strongly plano-convex, pubescent. Fl. and fr. May–Oct.

Marshy ground and shallow water, gregarious and forming patches. Anhui, Fujian, Guangdong, Guangxi, Guizhou, Hunan, Jiangxi, Taiwan, Yunnan, Zhejiang [Bangladesh, India, Malaysia, Nepal, Thailand, Vietnam].

The description in Roemer and Schultes (1817) was taken from the manuscript of Roth (Nov. Pl. Sp. 58. 1821).

This taxon grades into small, slender forms of *Isachne globosa* and is sometimes included within that species (as the synonym *I. dispar*). However, this creates an unacceptably wide range of variation within *I. globosa*. Typical forms of *I. pulchella* are quite different from typical forms of *I. globosa*. *Isachne pulchella*, as recognized here, comprises small, delicate plants with short, broad leaf blades, hairy nodes with a glandular ring below, small spikelets with clearly dissimilar florets, a soft, herbaceous lower floret lacking a dorsal groove, and a pubescent upper floret. The anthers are shorter than in small forms of *I. globosa*.

4. *Isachne truncata* A. Camus, Notul. Syst. (Paris) 2: 205. 1912.

平颖柳叶箬 ping ying liu ye ruo

Isachne chinensis Merrill; *I. truncata* var. *cordata* A. Camus; *I. truncata* var. *crispa* P. C. Keng; *I. truncata* var. *maxima* P. C. Keng.

Perennial, shortly rhizomatous. Culms erect from ascending base, 30–80 cm tall, internodes short, nodes pubescent. Leaf sheaths longer than internodes, overlapping, glabrous or pilose, outer margin ciliate; leaf blades lanceolate, regularly distichous, 5–11 × 0.8–1.4 cm, abaxial surface glabrous to densely pubescent, adaxial surface glabrous or puberulous, margins strongly thickened, base rounded to cordate, apex acuminate; ligule ca. 2 mm. Panicle open, finally ovate, 8–20 cm, glandular; lower primary branches in groups of 2 or 3, upper single, long naked below, scaberulous; pedicels 2 to several times longer than spikelets. Spikelets obovate or subglobose, (1.8–)2–2.2 mm, green or brownish; florets similar; glumes subequal or lower slightly shorter, very broadly ovate, 9–11-veined, glabrous or upper or both pubescent, apex subtruncate but margins incurving; lemmas subleathery, smooth, pilose toward apex especially on margins, and also at base of floret, otherwise glabrous. Fl. and fr. Aug–Oct.

Mountain slopes, forest margins. Fujian, Guangdong, Guangxi, Guizhou, Jiangxi, Sichuan, Yunnan, Zhejiang [Vietnam].

The habit of this species is distinctive, with closely overlapping leaf sheaths obscuring the culm, hairy nodes, and a glandular panicle with the lower branches often 2 or 3 together. The smooth florets are also characteristic.

5. *Isachne himalaica* J. D. Hooker, Fl. Brit. India 7: 23. 1896 [“1897”].

喜马拉雅柳叶箬 xi ma la ya liu ye ruo

Perennial. Culms slender, stiffly erect or with a shortly decumbent rooting base, 30–80 cm tall, paler below the nodes but not glandular. Leaf sheaths shorter than internodes, glabrous except for stiffly ciliate outer margin; leaf blades broadly linear, suberect to ascending, 5–15 × 0.3–1 cm, glabrous to thinly hispid, margins prominently thickened, apex acuminate; ligule 2–3 mm. Panicle open, elliptic to ovate in outline, 5–14 × 2–8 cm, glandular; primary branches inserted singly, obliquely spreading, scaberulous, branchlets and pedicels capillary, flexuose, smooth. Spikelets globose, 1.9–2.2 mm, pale; florets similar; glumes equaling spikelet or a little shorter, broadly ovate, deeply concave, 7–9-veined, papillose-hispid or with only a few api-

cal bristles or glabrous, apex rounded but margins incurling; lemmas strongly plano-convex, minutely roughened, subglabrous or pubescent with slightly longer hairs toward apex.

Swampy places; ca. 2000 m. Xizang [Afghanistan, Bhutan, N India, Nepal, Pakistan].

This is a Himalayan species with an erect habit and a loose, only moderately branched panicle of quite large, globose, often purple spikelets on flexuose, glandular pedicels. The leaf blades are narrower than in other similar species and are usually held fairly upright.

6. *Isachne hoi* P. C. Keng, Acta Phytotax. Sin. 10: 11. 1965.

浙江柳叶箬 zhe jiang liu ye ruo

Perennial. Culms decumbent at base, rooting and branching at lower nodes, ascending to 45–85 cm tall, nodes glabrous, indistinctly glandular. Leaf sheaths shorter than internodes, glabrous except for stiffly ciliate outer margin; leaf blades lanceolate, 8–14 × 0.8–1.8 cm, abaxial surface scabrid-pubescent with short stiff papillose-based hairs, adaxial surface scaberulous, base rounded, apex acuminate; ligule ca. 2 mm. Panicle very open, 17–25 cm; primary branches inserted singly, divaricate, spikelets scattered; branches slender, flexuose, scaberulous, with elongate glandular patches; pedicels shorter than spikelets (except where terminating branchlets), shortest ca. 0.5 mm. Spikelets elliptic or obovate, ca. 2 mm, green or purplish green; glumes ovate, slightly shorter than florets at maturity, 7–9-veined, short stiff papillose-based hairs toward apex on lower glume and over most of back on upper glume, apex obtuse; florets similar, pilose, upper slightly shorter. Fl. and fr. Sep–Nov.

- Moist valleys, hillside forests. Guangdong, Hunan, Zhejiang.

The leaf blades are obviously rough when stroked with a finger, but the sheaths are smooth (unlike *Isachne scabrosa*). The panicle branches are also rough, except along the elongate glandular patches, and the spikelets are borne on very short pedicels.

7. *Isachne ciliatiflora* Keng ex P. C. Keng, Acta Phytotax. Sin. 10: 13. 1965.

纤毛柳叶箬 xian mao liu ye ruo

Perennial. Culms loosely tufted, ascending, rooting at lower nodes, 30–60 cm tall, nodes eglandular. Leaf sheaths glabrous except for ciliate outer margin; leaf blades linear-lanceolate, 5–15 × 0.5–1 cm, smooth, glabrous, base rounded, apex acuminate; ligule ca. 1 mm. Panicle open, 5–15 cm, eglandular; primary branches laxly ascending, moderately branched with scattered spikelets, smooth; pedicels equaling or longer than spikelets. Spikelets oblong, ca. 2.5 mm; florets slightly dissimilar, lower floret bisexual, upper floret usually female; glumes similar, ovate-oblong, slightly shorter than spikelet, 5–7-veined, glabrous, obtuse; lower lemma elliptic-oblong, shallowly convex, cartilaginous, densely white-ciliate along whole length of margin, otherwise glabrous; upper lemma similar but slightly shorter and more ovate. Fl. and fr. Jun–Sep.

- Moist places; 1500–1800 m. Sichuan.

This species is related to *Isachne globosa*, but differs in having an eglandular panicle and densely ciliate lemma margins.

8. *Isachne repens* Keng, Sunyatsenia 1: 129. 1933.

匍匐柳叶箬 pu fu liu ye ruo

Isachne kunthiana (Wight & Arnott ex Steudel) Miquel subsp. *nudiglumis* (Hackel) T. Koyama; *I. kunthiana* var. *nudiglumis* (Hackel) T. Koyama; *I. myosotis* Nees var. *nudiglumis* Hackel.

Slender trailing herb, annual or short-lived perennial. Culms stoloniferous with 1 or 2 wiry roots from lower nodes, flowering branches up to 25 cm tall, nodes pubescent. Leaf sheaths glabrous or hispid, outer margin ciliate becoming setose near ligule; leaf blades lanceolate, 5–7 × 1–1.8 cm, abaxial surface glabrous or papillose-hispid, adaxial surface glabrous or thinly pilose, base obtuse to rounded, apex acuminate; ligule 1–2 mm. Panicle elliptic to ovate in outline, 3–5.5 cm, eglandular; branches ascending to spreading, branches and pedicels stout, smooth, lateral pedicels shorter than spikelets. Spikelets broadly elliptic, 2.1–2.4 mm, green; florets similar; glumes equal to spikelet or upper slightly shorter, lower glume narrower, 7–9-veined, upper 9–11-veined, densely scabrid-hispidulous, spicules longer toward apex; lemmas pale, ovate to subrotund, weakly convex, leathery, smooth, pubescent on the inrolled margins toward apex; palea of upper floret puberulous. Fl. and fr. Oct–Dec.

Moist places in forests. Fujian, Guangdong, Guangxi, Hainan, Taiwan [Japan (S Ryukyu Islands)].

This species is very close to *Isachne schmidtii* Hackel, from Indonesia and peninsular Malaysia, which is somewhat smaller, with shorter leaf blades, a more contracted panicle, and especially differs in its glumes extending beyond the florets. *Isachne schmidtii* has often been confused in the literature with *I. kunthiana* (Wight & Arnott ex Steudel) Miquel, from India and Sri Lanka, which also has glumes longer than the florets, but differs by its underground rhizomes and glabrous or setose glumes.

9. *Isachne sikkimensis* Bor, Kew Bull. [4] 1949: 115. 1949.

锡金柳叶箬 xi jin liu ye ruo

Slender herb, annual or short-lived perennial. Culms decumbent, rooting at the base, branching, up to 20 cm tall, basal internodes wiry, purplish, nodes bearded or glabrous. Leaf sheaths purplish green, pubescent, outer margin ciliate; leaf blades narrowly lanceolate, 3–7 × 0.4–0.8 cm with the upper much longer than the lower, both surfaces but especially abaxial papillose-pilose, or subglabrous, margins scaberulous, base rounded, apex acute; ligule ca. 1.5 mm. Panicle open, 4–10 cm, eglandular; primary branches well spaced, smooth, slender, divaricate; pedicels longer than spikelets. Spikelets elliptic, 2–2.4 mm; florets similar; glumes equal to spikelet, herbaceous with broad scarious margins, slightly shining, prominently 5–9-veined, glabrous or rarely upper glume sparsely hirtellous, apex rounded but appearing subacute through incurling margins, lemmas pale creamy-brown, leathery, elliptic-oblong, weakly convex, 1.5–2 mm, glabrous or puberulous.

Streams, damp roadsides; 2200–2600 m. Xizang [Bhutan, India (Darjeeling, Sikkim), Nepal].

The spikelets are distinctive in being more elongate than usual, with slightly shining, green, glabrous glumes and only weakly convex lemmas.

10. *Isachne clarkei* J. D. Hooker, Fl. Brit. India 7: 24. 1896 ["1897"].

小柳叶箬 xiao liu ye ruo

Isachne beneckeii Hackel; *I. tenuis* Keng ex P. C. Keng.

Delicate annual. Culms very slender, laxly ascending, base often decumbent, rooting at lower nodes but not stoloniferous, 12–30 cm tall, panicles terminating main stem and also short lateral branches. Leaf sheaths pilose, sometimes sparsely, outer margin ciliate; leaf blades linear-lanceolate, thin, 2–6 × 0.3–0.7 cm, glabrous or pilose, margins firm, apex acute; ligule 1–1.5 mm. Panicle open, ovate to pyramidal in outline, 1.5–8 cm, many-spiculate when well developed; branches and pedicels regularly spaced, divaricate at maturity, capillary, smooth; pedicels longer than spikelets, often with a gland halfway along their length. Spikelets subglobose, 1–1.5 mm, green or purplish; florets similar; glumes subequal to spikelet, ovate, lower (3–)5-veined, upper 7-veined, hispidulous to setose above middle, margins broad, incurving at apex; lemmas whitish, strongly convex, leathery, densely pubescent. Fl. and fr. Jul–Nov.

Damp mountain grasslands, streams, valleys; 1300–2400 m. Fujian, Taiwan, Xizang, Yunnan [NE India, Indonesia, Malaysia, Myanmar, Philippines, Vietnam].

The specimens from India (Sikkim) cited by Hooker in the protologue are *Isachne sikkimensis*.

11. *Isachne nipponensis* Ohwi, Acta Phytotax. Geobot. 4: 30. 1935.

日本柳叶箬 ri ben liu ye ruo

Low herb forming loose mats. Culms slender, creeping, rooting and branching at nodes, flowering branches up to 15 cm tall. Leaf sheaths thinly pubescent, outer margin ciliate; leaf blades lanceolate-ovate, thin, 2–3.5 × 0.5–0.9 cm, abaxial surface glabrous or pilose, adaxial surface hispid with long scattered hairs, margins white, finely scabrid, base obtuse, apex shortly acuminate; ligule ca. 1 mm. Panicle broadly ovate in outline, 2–8 cm, eglandular, rather sparsely branched, spikelets 10–50; branches and pedicels widely spreading, very slender, scaberulous. Spikelets broadly elliptic, (1.3–)1.5–1.8 mm, green infrequently tinged purplish; florets similar; glumes equal to spikelet or lower slightly shorter, ovate-elliptic, shortly hispid above the middle, often with a few stout, sometimes overtopping bristles, apex obtuse, lower glume 3–5-veined, upper glume 5–7-veined; lemmas broadly elliptic, leathery, thinly pubescent near margins and apex. Fl. and fr. summer to autumn. $2n = 40$.

Wet shady places; below 1000 m. Fujian, Guangdong, Guangxi, Guizhou, Hunan, Jiangxi, Sichuan, Taiwan, Zhejiang [Japan, Korea (Cheju Island)].

Isachne nipponensis is very close to *I. myosotis*, but has a rather looser growth, larger leaves and spikelets, and a broader, very open panicle with slender, scaberulous branches.

Isachne nipponensis var. *kiangsiensis* P. C. Keng (Acta Phytotax. Sin. 10: 21. 1965), described from Jiangxi, has smooth, glandular panicle branches and pedicels and may represent a different species.

12. *Isachne myosotis* Nees, Hooker's J. Bot. Kew Gard. Misc. 2: 98. 1850.

荏弱柳叶箬 ren ruo liu ye ruo

Isachne micrantha Merrill; *I. myosotis* var. *micrantha* (Merrill) Jansen; *I. myosotis* var. *minor* Honda; *I. nipponensis* var. *minor* (Honda) Nemoto.

Small mat-forming annual. Culms very slender, prostrate, branching and rooting at nodes, flowering branches up to 10 cm tall. Leaf sheaths thinly to densely hispid with spreading hairs, or hairs confined to margins; leaf blades lanceolate-ovate, 1–2(–3) × 0.2–0.5 cm, both surfaces hispid, densely or sometimes inconspicuously appressed-hairy, base rounded, apex acute; ligule ca. 0.7 mm. Panicle ovate or contracted, 1.5–5 cm, eglandular, spikelets usually 15–30 (fewer in depauperate specimens); branches spiculate to base, with short stiff branchlets and pedicels, smooth. Spikelets subglobose, 1–1.4 mm, tinged purplish; florets similar; glumes equal to spikelet, separated by a short internode, ovate-oblong, 5(–7)-veined, hispid usually above middle, occasionally hispid almost to base or almost glabrous, apex obtuse; lemmas strongly convex, leathery, puberulous to densely pubescent. Fl. and fr. May–Oct. $2n = 20$.

Wet ground, shallow water in ditches. Fujian, Taiwan [Indonesia, New Guinea, Philippines].

This small species is recognizable on account of its delicate, mat-forming habit, small, broad leaf blades, smooth panicle branches, and tiny spikelets. It is barely separable from *Isachne pauciflora*.

13. *Isachne pauciflora* Hackel, Publ. Bur. Sci. Gov. Lab. 35: 80. 1906.

瘦脊柳叶箬 shou ji liu ye ruo

Isachne beneckeii Hackel var. *depauperata* Hackel ex Merrill; *I. debilis* Rendle; *I. depauperata* (Hackel ex Merrill) Merrill; *I. pauciflora* var. *depauperata* (Hackel ex Merrill) Jansen.

Low mat-forming herb, probably annual. Culms very slender, prostrate, branching and rooting at nodes, flowering branches up to 15 cm tall. Leaf sheaths subglabrous to hispid, outer margin ciliate; leaf blades ovate-lanceolate, 0.6–2 × 0.3–0.4 cm, thinly appressed-hispid, base cordate, apex acute; ligule ca. 0.7 mm. Panicle 1.5–2 cm, sparsely branched, eglandular, spikelets 4–12(–17); branches and pedicels short, stiff, smooth. Spikelets elliptic or obovate, 1.4–2 mm, tinged purplish brown; florets similar; glumes equal to spikelet, separated by a short internode, ovate-oblong, 5–7-veined, hispid above middle, sometimes sparsely or glabrous, obtuse but appearing acute because of incurved margins; lemmas strongly convex, leathery, puberulous. Fl. and fr. Apr–May.

Wet soils. Taiwan [Philippines].

Isachne pauciflora intergrades with *I. myosotis*, differing only in its rather looser habit and fewer, slightly larger spikelets borne in a sparse panicle.

14. *Isachne albens* Trinius, Sp. Gram. 1(8): t. 85. 1828.

白花柳叶箬 bai hua liu ye ruo

Isachne albens var. *magna* (Merrill) Jansen; *I. arisanensis* Hayata; *I. beneckeii* Hackel var. *magna* Merrill; *I. magna* (Merrill) Merrill; *Panicum albens* (Trinius) Steudel.

Perennial. Culms erect or decumbent at base, branching and rooting at basal nodes, 30–100 cm tall. Leaf sheaths glabrous or outer margin often ciliate; leaf blades narrowly lanceolate, firm, 7–15 × 0.8–1.8 cm, abaxial surface glabrous, strongly veined, adaxial surface glabrous to hispidulous, margins thickened, apex acuminate; ligule 1–2 mm. Panicle open, effuse, ovate-elliptic or pyramidal in outline, 9–30 cm, eglandular; primary branches smooth or almost so with capillary branchlets; pedicels varying in length. Spikelets elliptic-globose, 1–1.5 mm, whitish green; florets similar, lower floret usually bisexual, upper floret usually female; glumes herbaceous with inflexed scarious margins, 5–7(–9)-veined, usually glabrous, occasionally with a few stiff bristles above middle, obtuse, lower glume equal to spikelet, upper glume slightly shorter; lower lemma very slightly longer than upper, leathery, globose to elliptic-ovate, puberulous or subglabrous, obtuse, upper lemma hairier. Fl. and fr. summer–autumn. $2n = 60$.

Rocky mountainsides, streams, forest margins, other moist open places; 500–2600 m. Fujian, Guangdong, Guangxi, Guizhou, Sichuan, Taiwan, Xizang, Yunnan [Bhutan, N India, Indonesia, Myanmar, Nepal, Thailand, Vietnam].

This widespread species is distinguished by its relatively tall habit and large, eglandular panicle of numerous small, pale spikelets. Specimens of *Isachne scabrosa* without obvious glands may key out here, but they can be distinguished by their papillose-hispid leaf sheaths.

15. *Isachne confusa* Ohwi, Bull. Tokyo Sci. Mus. 18: 14. 1947.

紊乱柳叶箬 wen luan liu ye ruo

Perennial. Culms stiffly erect, 35–45 cm tall, unbranched, nodes widely spaced, glabrous. Leaf sheaths very short, much shorter than internodes and shorter than blade, slightly inflated, glabrous or setose; leaf blades lanceolate-ovate, thick, tough, 1–2.5 × 0.3–0.7 cm, veins many, riblike, abaxial surface minutely papillose, adaxial surface scabrid or hispidulous on veins, margins pectinate-setose, apex acuminate; ligule absent. Panicle broadly pyramidal, 1.5–4 cm, glandular; branches stiff, horizontally spreading, close-set, smooth; pedicels stout, shorter than or equaling spikelets. Spikelets globose, 1.2–1.3 mm, brownish green; florets similar; glumes shorter than florets, thickly membranous with broad scarious margins, lower glume 3-veined, upper glume 5-veined, densely hispid with thick hairs, apex rounded; lemmas strongly plano-convex, leathery, back minutely white-granular, margins scurfy-pubescent, lower lemma very slightly longer and narrower.

Shallow soil over rocks, swampy grasslands, lake and stream margins, sometimes in shallow water. Hong Kong [India (Nicobar Islands), Indonesia, Malaysia, Myanmar, New Guinea, Thailand, Vietnam; Australia].

This is a distinctive species with remarkably short leaf sheaths, exposing long lengths of internode, and a small, stiff panicle of horizontally tiered branches.

16. *Isachne guangxiensis* W. Z. Fang, Acta Phytotax. Sin. 22: 306. 1984.

广西柳叶箬 guang xi liu ye ruo

Isachne albens Trinius var. *glandulifera* P. C. Keng.

Perennial. Culms slender, branching and rooting at lower nodes, ca. 40 cm tall, nodes slightly swollen, puberulous. Leaf sheaths loose, slightly longer to slightly shorter than internodes, glabrous except for ciliate outer margin; leaf blades linear-lanceolate, 5–9 × 0.6–0.8 cm, abaxial surface puberulous, adaxial surface glabrous, margins slightly thickened, base subrounded, apex acuminate; ligule ca. 2 mm. Panicle open, ovate in outline, 6–10 cm, glandular; branches 1–2 per node, scaberulous, lower part naked, pedicels slender, equaling or longer than spikelets. Spikelets elliptic, 1.5–1.9 mm, yellowish green; florets similar, lower male or bisexual, upper bisexual; glumes ovate-elliptic, equaling or slightly longer than florets, hirtellous above middle, obscurely 7–9-veined, acute; lemmas subleathery, glabrous. Fl. and fr. autumn.

• Damp and shady places. Fujian, Guangxi, Hong Kong.

Isachne hirsuta (J. D. Hooker) P. C. Keng var. *angusta* W. Z. Fang (Acta Phytotax. Sin. 22: 308. 1984), described from Hunan, and *I. hirsuta* var. *yongxiouensis* W. Z. Fang (loc. cit.), described from Jiangxi, appear to match this species except that they have hairy leaves. The types have not been seen. They are excluded from *I. sylvestris* (of which *I. hirsuta* is a synonym) because they lack the glandular, nodal ring found in that species, and also the leaf blades are smaller.

17. *Isachne sylvestris* Ridley, J. Straits Branch Roy. Asiat. Soc. 44: 206. 1905.

刺毛柳叶箬 ci mao liu ye ruo

Isachne albens Trinius var. *hirsuta* J. D. Hooker; *I. albens* var. *sylvestris* (Ridley) Jansen; *I. hirsuta* (J. D. Hooker) P. C. Keng.

Perennial. Culms ascending or decumbent, rooting at lower nodes, 35–65 cm tall, a brown glandular ring below each node. Leaf sheaths densely papillose-hirsute; leaf blades lanceolate to broadly lanceolate, 9–12 × 1.3–2.4 cm, abaxial surface puberulous to tomentose with scattered bristles, adaxial surface glabrous or setose, margins thickened and papillose-setose toward ligule, apex acute; ligule ca. 3 mm. Panicle elliptic in outline, 18–22 cm, glandular, many-spiculate; branches inserted singly, smooth. Spikelets elliptic or ovate-elliptic, 1.3–1.9 mm, grayish green or purple tinged; florets nearly similar, bisexual or rarely lower male and upper female; glumes equal or subequal to spikelet, 7-veined, papillose-hispidulous especially above middle, obtuse; lemmas leathery, lower lemma glabrous, flatter and slightly longer than upper; upper lemma pubescent. Fl. and fr. Aug–Dec.

Valley grasslands; 500–800 m. Fujian, Guangdong [Bangladesh, NE India, Indonesia, Malaysia].

This species is recognized by the combination of broad leaf blades with hirsute sheaths and a glandular panicle of small spikelets.

18. *Isachne scabrosa* J. D. Hooker, Fl. Brit. India 7: 23. 1896 [“1897”].

糙柳叶箬 cao liu ye ruo

Perennial, leaf sheaths and internodes sometimes flushed purple. Culms rambling, hard, 60–100 cm tall, often a glandular ring below some nodes. Leaf sheaths shorter than internodes, papillose-hispid with sharp patent hairs toward mouth, outer margin pectinate-ciliate; leaf blades linear-lanceolate, 12–20 × 1–1.2 cm, scabrid, glabrous or thinly hispid, base narrowly rounded, apex acuminate; ligule 3–5 mm. Panicle open, elliptic to broadly ovate in outline, 10–20 cm, much branched, glandular but sometimes very sparsely so; primary branches inserted singly, slender, loosely spreading, branchlets and pedicels smooth; pedicels shorter or longer than spikelets. Spikelets plumply elliptic, 1.5–1.7(–2.2) mm, pale or purple tinged; flo-

rets similar; glumes equal to spikelet, 5–7-veined, glabrous or sparsely setose, with broad incurving margins, subacute, lower glume elliptic, upper glume broader; lemmas smooth, glabrous or puberulous above the middle, minutely ciliate along upper margins.

Marshes and slow streams, forming colonies; ca. 1100 m. Xizang [NE India, Nepal].

Isachne scabrosa has been confused with *I. himalaica*, but the former species has a more rambling habit, glandular nodes, hispid leaf sheaths, somewhat larger leaf blades, and a panicle with more spikelets and less obviously glandular pedicels. However, the two species are very similar and may intergrade.

181. COELACHNE R. Brown, Prodr. 187. 1810.

小丽草属 xiao li cao shu

Low-growing annuals or perennials. Culms slender, ascending or decumbent. Leaf blades small, linear to lanceolate; ligule a line of hairs. Inflorescence an open or contracted panicle. Spikelets 2-flowered, florets dissimilar, the lower bisexual, the upper female, separated by a slender rachilla internode; glumes persistent, subequal, shorter than the spikelet, 1–7-veined, broadly obtuse; lemmas both membranous, veinless or obscurely veined, glabrous or pubescent, obtuse, the upper a little shorter than the lower; palea similar to lemma. Stamens 2–3. Caryopsis ovate-elliptic.

Eleven species: tropics of the Old World, in marshy places and on streamsides; one species in China.

1. *Coelachne simpliciuscula* (Wight & Arnott ex Steudel) Munro ex Benth, J. Linn. Soc., Bot. 19: 93. 1881.

小丽草 xiao li cao

Panicum simpliciusculum Wight & Arnott ex Steudel, Syn. Pl. Glumac. 1: 96. 1854.

Annual. Culms slender, prostrate and mat-forming, rooting at lower nodes, 10–20 cm tall. Leaf sheaths loose, glabrous or upper margins ciliate; leaf blades soft, lanceolate, 1–3 × 0.2–0.5 cm, glabrous or hirtellous along veins; ligule hairs 0.1–0.5 mm. Panicle linear, loosely spiciform, 3–8 × 0.5–1 cm, spike-

lets borne on short erect branches. Spikelets green or often purplish, 2–3 mm; rachilla internode 0.6–0.8 mm; glumes broadly ovate, herbaceous with membranous margins, lower glume 0.9–1.2 mm, 1–3(–5)-veined, upper glume ca. 1.5 mm, 5–7-veined; lemmas lanceolate, lower lemma 2–2.3 mm, glabrous or puberulous, lower palea equal to lemma; upper lemma 1.6–1.7 mm, pubescent below middle on center back and margins. Anthers 2–3, ca. 0.3 mm. Caryopsis brown at maturity, ca. 1.2 mm. Fl. and fr. Sep–Dec.

Streams, wet valley bottoms. Guangdong, Guizhou, Sichuan, Yunnan [Bhutan, Cambodia, India, Myanmar, Nepal, Sri Lanka, Thailand, Vietnam].

182. SPHAEROCARYUM Nees ex J. D. Hooker, Fl. Brit. India 7: 246. 1896 [“1897”].

稗菴属 bai jin shu

Graya Arnott ex Steudel (1854), not Endlicher (1841).

Annual. Culms trailing, many-noded. Leaf blades ovate, amplexicaul, with obscure cross veins; ligule a line of hairs. Inflorescence a panicle; pedicels glandular. Spikelets 1-flowered, floret bisexual; glumes deciduous, veinless or 1-veined, obtuse; lemma membranous, 1-veined, pubescent, obtuse; palea equal to lemma. Stamens 3. Caryopsis ovate.

One species: India to SE Asia including S China.

1. *Sphaerocaryum malaccense* (Trinius) Pilger, Repert. Spec. Nov. Regni Veg. 45: 2. 1938.

稗菴 bai jin

Panicum malaccense Trinius, Gram. Panic. 204. 1826; *Sphaerocaryum elegans* Nees ex Steudel.

Culms very slender and delicate, trailing, forming loose mats, rooting at lower nodes, sometimes a glandular ring below the nodes, 10–30 cm tall. Leaf sheaths papillose-hispid, margins ciliate; leaf blades ovate-cordate, 1–1.5 × 0.6–1 cm, ± hispidulous, margins ciliate-serrulate, apex acute. Panicle shortly ex-

serted from uppermost sheath, 2–5 × 1–2 cm, ovate with many spikelets on 1–3 mm capillary glandular pedicels. Spikelets ovate to subglobose, ca. 1 mm, glumes falling before the floret; glumes hyaline, glabrous, the lower 2/3 spikelet length, veinless, the upper equal to spikelet or slightly shorter, 1-veined; lemma equal to spikelet, pubescent; palea similar to lemma. Anthers yellow, ca. 0.3 mm. Caryopsis brownish at maturity, ca. 0.7 mm. Fl. and fr. autumn. $2n = 18$.

Damp swampy places; below 1500 m. Anhui, Fujian, Guangdong, Guangxi, Jiangxi, Taiwan, Yunnan, Zhejiang [India, Indonesia, Malaysia, Myanmar, Philippines, Sri Lanka, Thailand, Vietnam].