

55. GLYCERIA R. Brown, Prodr. 179. 1810, nom. cons.

甜茅属 tian mao shu

Hemibromus Steudel.

Perennial, usually rhizomatous. Culms erect, ascending or prostrate. Leaf sheaths with margins completely or partially fused; leaf blades linear; ligule membranous. Panicle open or contracted, sometimes racemelike when spikelets few. Spikelets with several to many florets, laterally compressed or terete; rachilla smooth or scabrid, disarticulating below each floret; glumes small to almost as long as adjacent lemma, membranous, 1-veined, apex acute or obtuse; floret callus small, glabrous, obtuse; lemmas overlapping, ovate to lanceolate or oblong, thinly herbaceous or thinly leathery, back rounded, smooth, granular or scaberulous, 5–11-veined, veins conspicuous, parallel, apex usually membranous, acute to broadly obtuse or denticulate; palea as long as, longer, or slightly shorter than lemma, keels sometimes narrowly winged. Stamens 2 or 3. $x = 10$.

About 40 species: temperate regions of the world, in wet habitats; ten species (one endemic) in China.

- 1a. Spikelets linear to narrowly oblong, terete, 1–4.2 cm; palea keels narrowly winged in upper half.
 - 2a. Spikelets 2.5–4.2 cm; palea distinctly longer than lemma 1. *G. acutiflora*
 - 2b. Spikelets 1–2.5 cm; palea as long as or only slightly longer than lemma.
 - 3a. Leaf blades 2–3 mm wide; lower panicle branches 2 per node, bearing 1(–3) spikelets 2. *G. chinensis*
 - 3b. Leaf blades 4–10 mm wide; lower panicle branches 3–5 per node, bearing up to 15 spikelets 3. *G. notata*
- 1b. Spikelets usually ovate to narrowly oblong, laterally compressed, up to 1(–1.4) cm; palea keels wingless.
 - 4a. Culms 20–50 cm tall, tufted or with slender rhizomes; leaf blades 1.5–3.5 mm wide.
 - 5a. Plant loosely tufted; lowest panicle branches bearing up to 14 spikelets; spikelets elliptic-oblong, 0.6–0.9 cm 4. *G. tonglensis*
 - 5b. Plant with filiform rhizomes; lowest panicle branches bearing 1–4 spikelets; spikelets linear, 0.8–1.4 cm 5. *G. leptorhiza*
 - 4b. Culms robust, 50–150 cm tall, with thick spreading rhizomes; leaf blades 3–16 mm wide.
 - 6a. Stamens 2, anthers 0.5–0.8 mm; plants mainly of swampy forest.
 - 7a. Culms hard, 5–8 mm in diam.; leaf blades firm; ligule 0.3–1 mm; spikelets pale green maturing yellowish brown 6. *G. leptolepis*
 - 7b. Culms soft, 3–5 mm in diam.; leaf blades soft, thin; ligule 2–3 mm; spikelets bright green or purple tinged 7. *G. lithuanica*
 - 6b. Stamens 3, anthers 1–2 mm; plants usually of wet meadows and other open wet habitats.
 - 8a. Leaf blades 3–5 mm wide; upper glume 3.5–4.5 mm, 3/4 as long as adjoining lemma or more, acuminate 8. *G. spiculosa*
 - 8b. Leaf blades 5–16 mm wide; upper glume 2–4 mm, 3/4 as long as adjoining lemma or less, obtuse or subacute.
 - 9a. Adaxial surface of leaf blades grayish green, minutely papillose; panicle open, branches spreading; upper glume 2–3 mm 9. *G. triflora*
 - 9b. Adaxial surface of leaf blades green, smooth; panicle somewhat contracted, branches obliquely ascending; upper glume 3–4 mm 10. *G. maxima*

1. *Glyceria acutiflora* Torrey subsp. **japonica** (Steudel) T. Koyama & Kawano, *Canad. J. Bot.* 42: 869. 1964.

甜茅 tian mao

Hemibromus japonicus Steudel, *Syn. Pl. Glumac.* 1: 317. 1854; *Glyceria japonica* (Steudel) Miquel.

Perennial. Culms ascending from long prostrate base, rooting at lower nodes, 40–70 cm tall, 1.5–3 mm in diam. Leaf sheaths keeled, smooth, longer than internodes; leaf blades flat, flaccid, 5–15 cm × 4–5 mm, slightly scaberulous, apex acute; ligule 4–7 mm. Panicle narrow, 15–30 cm, base often included in uppermost leaf sheath; branches 2 at lower nodes, unequal with one very short, erect, unbranched, bearing only one spikelet, panicle racemelike toward apex. Spikelets linear, cylindrical, 2.5–4.2 cm, florets 7–14, pale green; glumes oblong to lanceolate, membranous, 1-veined, lower glume 2.5–4 mm, upper glume 4–6 mm, apex subacute; lemmas lanceolate, 7–9 mm,

herbaceous, 7-veined, scaberulous, apex membranous, acute or slightly tridentate; palea longer than lemma by 0.7–1.4 mm, keels thick, narrowly winged, hyaline between keels down midline, exposed apex 2-toothed. Stamens 3, anthers 0.8–1.3 mm. Fl. Mar–Jun. $2n = 20$.

Rice fields, streams, ditches, forming colonies; 400–1000 m. Anhui, Fujian, Guizhou, Henan, Hubei, Hunan, Jiangsu, Jiangxi, Sichuan, Yunnan, Zhejiang [Japan, Korea; North America].

Glyceria acutiflora subsp. *acutiflora* occurs in E North America. It is tetraploid ($2n = 40$) and can be distinguished morphologically by its longer anthers (1.5–1.8 mm), narrower, membranous lemma apex, and frequently longer palea (extended up to 2 mm beyond lemma apex).

2. *Glyceria chinensis* Keng ex Z. L. Wu, *Acta Phytotax. Sin.* 30: 174. 1992.

中华甜茅 zhong hua tian mao

Perennial. Culms soft, decumbent at base, rooting at lower

nodes, 30–60 cm tall, 1.5–2 mm in diam. Leaf sheaths smooth, longer or lower shorter than internodes; leaf blades flat or folded, flaccid, 5–12 cm × 2–3 mm, smooth or adaxial surface scabrid, apex acute; ligule 5–6 mm. Panicle narrow, 15–19 cm, base included in uppermost leaf sheath or shortly exerted; branches 2 at lower nodes, suberect, bearing 1–3 spikelets, panicle racemelike toward apex. Spikelets linear-oblong, 1–1.6 cm, florets 5–9, green; glumes oblong-ovate, membranous, 1-veined, lower glume 1.7–2 mm, apex acute, upper glume 2.7–3 mm, apex obtuse; lemmas lanceolate-oblong, 4–4.5 mm, herbaceous, smooth or scaberulous, 7-veined, veins scaberulous, apex membranous, obtuse; palea as long as or slightly longer than lemma, keels narrowly winged, apex emarginate. Stamens 3, anthers 0.7–1 mm.

- Damp places. SW Guizhou (Xingyi), E Yunnan.

3. *Glyceria notata* Chevallier, Fl. Env. Paris 174. 1827.

蔗甜茅 zhe tian mao

Glyceria fluitans (Linnaeus) R. Brown var. *plicata* Fries; *G. plicata* (Fries) Fries; *G. turcomanica* Komarov.

Perennial, forming loose patches. Culms spongy, ascending from prostrate base, rooting at lower nodes, 30–100 cm tall, 3–6 mm in diam. Leaf sheaths keeled, scabrid in upper part, longer than internodes; leaf blades flat or folded, flaccid, green or gray-green, 6–30 cm × 4–10 mm, abaxial surface smooth or scabrid, adaxial surface scabrid, apex acute; ligule 3–6 mm. Panicle lanceolate at first, ovate at maturity, up to 30 cm; branches 3–5 at lower nodes, finally widely spreading, longer branches bearing up to 15 spikelets. Spikelets linear-oblong, cylindrical or slightly laterally compressed, 1–2.5 cm, florets 5–16, grayish green or purplish; glumes ovate, membranous, 1-veined, lower glume 1.4–2.3 mm, upper glume 2.5–4 mm, apex rounded; lemmas broadly elliptic or obovate-oblong, 3.5–4.5 mm, firmly herbaceous, scabrid, 7-veined, apex membranous, broadly obtuse; palea as long as lemma, keels narrowly winged, apex 2-denticulate. Stamens 3, anthers 0.8–1.4 mm. Fl. Jun–Aug. $2n = 40$.

Moist grassy places, ditches, shallow water; 700–1900 m. Xinjiang [Afghanistan, Kazakhstan, Kyrgyzstan, Pakistan (Karachi), Russia, Tajikistan, Uzbekistan; N Africa, SW Asia, Europe; introduced in North America and Australia].

4. *Glyceria tonglensis* C. B. Clarke, J. Linn. Soc., Bot. 15: 119. 1876.

卵花甜茅 luan hua tian mao

Glyceria kashmiriensis Kelso; *G. ovatiflora* Keng ex P. C. Keng; *G. tonglensis* var. *ovatiflora* (Keng ex P. C. Keng) P. C. Keng.

Perennial, tufted or shortly creeping. Culms ascending, 10–50(–75) cm tall, 1–2 mm in diam. Leaf sheaths slightly keeled, smooth or scaberulous, upper shorter than internodes; leaf blades flat or folded, 6–15 cm × 2–3(–5) mm, smooth or scaberulous, abruptly acute; ligule 0.7–1(–3) mm. Panicle narrow and contracted when young, later open, 10–27 cm; branch-

es 2–4 at lower nodes, erect at first, later spreading or deflexed, smooth, longest bearing up to 14 spikelets. Spikelets narrowly elliptic-oblong, 6–9 mm, florets 4–8, gray-green or tinged purplish brown; glumes ovate to ovate-oblong, membranous, 1-veined, lower glume 1–2 mm, upper glume 1.8–2.8 mm, apex acute; lemmas ovate-oblong, 2.8–3.6 mm, firmly papery, minutely granular, 7-veined, veins scaberulous, apex membranous, obtuse, often slightly crenulate; palea as long as lemma, keels thick, wingless, scabrid. Stamens 3, anthers 0.85–1 mm. Fl. and fr. Jul–Sep.

Marshy ground in forests, wet grassy places under shrubs, streams, ditches; 1500–3600 m. Anhui, Guizhou, Jiangxi, Sichuan, Xizang, Yunnan [Bhutan, India, Kashmir, Myanmar, Nepal].

The name *Glyceria tonglensis* has been misapplied to *G. ischyro-neura* Steudel, which occurs from Japan and S Korea northward to the S Kuril Islands. This is a very similar species, distinguished by its shorter (2–2.8 mm), ovate lemmas, shorter anthers (0.5–0.7 mm), more strongly convex palea keels, and strongly sinuous rachilla. It has been reported in the literature from NE China, but its presence there has not been confirmed.

5. *Glyceria leptorhiza* (Maximowicz) Komarov, Trudy Imp. S.-Peterburgsk. Bot. Sada 20: 307. 1901.

细根茎甜茅 xi gen jing tian mao

Glyceria fluitans (Linnaeus) R. Brown var. *leptorhiza* Maximowicz, Prim. Fl. Amur. 320. 1859.

Perennial, rhizomatous; rhizomes filiform. Culms ascending, 20–50 cm tall, 1–2 mm in diam. Leaf sheaths smooth, upper shorter than internodes; leaf blades flat, thin, 7–10 cm × 1.5–3.5 mm, smooth; ligule 1–3 mm. Panicle narrow, contracted, 6–25 cm, base included in uppermost leaf sheath; branches 1–3 per node, erect, appressed to main axis, smooth, bearing 1–4 spikelets. Spikelets linear, 8–14 mm, florets 5–9, pale green or pinkish; glumes ovate-oblong, 1-veined, lower glume 2–3 mm, upper glume 3–4 mm, apex obtuse; lemmas oblong, 3–4 mm, smooth, 7-veined, upper margins and apex narrowly membranous, apex obtuse; palea slightly longer than lemma, keels wingless, apex emarginate. Stamens 3, anthers 1–1.7 mm. Fl. and fr. Jul–Aug. $2n = 20$.

River banks, shallow water, swampy grasslands. N Heilongjiang [Russia (Far East, E Siberia)].

Reports of this species in Japan refer to *Glyceria depauperata* Ohwi (*G. leptorhiza* subsp. *depauperata* (Ohwi) T. Koyama), which differs from *G. leptorhiza* in having spikelets to 25 mm, florets 7–15, and anthers 0.5–0.7 mm.

6. *Glyceria leptolepis* Ohwi, Bot. Mag. (Tokyo) 45: 381. 1931.

假鼠妇草 jia shu fu cao

Glyceria ussuriensis Komarov.

Perennial, rhizomatous; rhizomes long, thick. Culms robust, hard, 80–110 cm tall, 5–8 mm in diam. Leaf sheaths not prominently keeled, lower sheaths scabrid, with transverse veinlets; leaf blades flat or margins inrolled, firm, up to 40 cm × 5–12 mm, abaxial surface smooth, adaxial surface scabrid,

transverse veinlets present, apex abruptly acute; ligule 0.3–1 mm. Panicle ovate in outline, 15–25 cm, exserted, spikelets many; branches 2 or 3 per node, ascending, scabrid. Spikelets elliptic to ovate-oblong, 6–8 mm, florets 4–7, pale green, yellowish brown at maturity; glumes ovate-oblong, membranous, 1-veined, lower glume 1.5–2 mm, upper glume 1.8–2.5 mm, apex obtuse; lemmas lanceolate-oblong, thinly herbaceous, 3–3.5 mm, minutely granular, 7-veined, veins finely scabrid, margins and apex membranous, apex subacute; palea as long as or slightly longer than lemma, keels wingless, scaberulous, apex emarginate. Stamens 2, anthers 0.6–0.8 mm. Fl. and fr. Jul–Sep. $2n = 20$.

Swampy forests, watersides of streams, lakes, ditches. Anhui, Gansu, Heilongjiang, Henan, Hubei, Jiangxi, Nei Mongol, Shaanxi, Shandong, Taiwan, Zhejiang [Japan, Korea, Russia (Ussuri)].

Species nos. 6–10 belong to *Glyceria* sect. *Hydropoa* Dumortier, characterized by a strongly rhizomatous habit, rounded leaf sheaths, large panicle with many spikelets, short, laterally compressed spikelets, and wingless palea keels.

Glyceria formosensis Ohwi (Acta Phytotax. Geobot. 2: 164. 1933) was placed in synonymy under *G. leptolepis* in Taiwanese literature, but it is excluded from that species by its soft habit, scabrid panicle branches, and especially by the presence of 3 stamens. While clearly a member of *G. sect. Hydropoa*, it has not been possible to assign it to another species. It is apparently known only from the type gathering.

7. *Glyceria lithuanica* (Gorski) Gorski, Icon. Bot. Char. Cyper. Gram. Lith. t. 20. 1849.

两蕊甜茅 liang rui tian mao

Poa lithuanica Gorski in Eichwald, Naturhist. Skizze 117. 1830; *Glyceria aquatica* (Linnaeus) J. Presl & C. Presl subsp. *debilior* (Trinius ex Fr. Schmidt) T. Koyama; *G. aquatica* var. *debilior* Trinius ex Fr. Schmidt; *G. debilior* (Trinius ex Fr. Schmidt) Kudo; *G. orientalis* Komarov.

Perennial, rhizomatous. Culms soft, 60–150 cm tall, 3–5 mm in diam. Leaf sheaths not prominently keeled, lower sheaths scabrid; leaf blades flat, soft, thin, up to 30 cm × 4–9 mm, scabrid, apex acute; ligule 2–3 mm. Panicle ovate in outline, 15–30 cm, exserted, spikelets many; branches 2–4 per node, spreading, often flexuous, sometimes nodding, filiform, scabrid. Spikelets elliptic to ovate-oblong, 5–8 mm, florets 3–6, bright green or purple tinged; rachilla densely scabrid; glumes ovate, membranous, 1-veined, lower glume 1.2–1.8 mm, upper glume 1.7–2.5 mm, apex subobtuse; lemmas lanceolate-oblong, 2.5–4 mm, thinly herbaceous, often minutely granular or scaberulous, 7-veined, veins scabrid, apex membranous, obtuse; palea as long as or slightly longer than lemma, keels wingless, scaberulous, apex emarginate. Stamens 2, anthers 0.5–0.8 mm. Fl. Jun–Aug. $2n = 20$.

Swampy forests, forest margins, streamsides; 600–1800 m. Jilin, Liaoning [Japan, Korea, Mongolia, Russia; SW Asia (Caucasus), C and N Europe].

This is a generally more slender species than *Glyceria leptolepis*, the other species in China with only 2 anthers. The basal culm internodes are not hard and canelike as in *G. leptolepis*, but flatten on pressing.

8. *Glyceria spiculosa* (F. Schmidt) Roshevitz in B. Fedtschenko, Fl. Zabaik. 1: 85. 1929.

狭叶甜茅 xia ye tian mao

Scolochloa spiculosa F. Schmidt, Reis. Amur-Land., Bot. 201. 1868; *Glyceria longiglumis* Handel-Mazzetti; *G. paludificans* Komarov.

Perennial, rhizomatous. Culms erect, rooting and sometimes branching from lower nodes, 50–120 cm tall, 2–7 mm in diam. Leaf sheaths smooth or slightly scabrid; leaf blades flat or margins rolled, stiff, 20–30 cm × 3–5 mm, abaxial surface green, smooth, adaxial surface grayish green, scabrid, apex acuminate; ligule 0.8–3 mm. Panicle somewhat contracted before flowering, becoming laxer, 10–25 cm, exserted; branches 2–4 per node, obliquely ascending, slender, smooth or sparsely scabrid. Spikelets elliptic to ovate, 4–8(–10) mm, florets 5–8, yellowish green, whitish gray or purplish; glumes lanceolate, membranous, 1-veined, lower glume 2.7–4 mm, upper glume 3.5–4.5 mm, ca. 3/4 as long as adjacent lemma or more, acuminate; lemmas narrowly oblong-lanceolate, 3.5–4.8 mm, thinly herbaceous, often minutely granular, 7-veined, veins scabrid, apex membranous, acute; palea as long as or slightly shorter than lemma, keels wingless, scabrid. Stamens 3, anthers 1–2 mm. Fl. Jun–Jul. $2n = 40$.

Wet meadows, lake shores, swamps. Heilongjiang, Liaoning, Nei Mongol [N Korea, Russia (Far East, E Siberia)].

9. *Glyceria triflora* (Korshinsky) Komarov, Fl. URSS 2: 459. 1934.

东北甜茅 dong bei tian mao

Glyceria aquatica (Linnaeus) Wahlberg var. *triflora* Korshinsky, Trudy Imp. S.-Peterburgsk. Bot. Sada 12: 418. 1892; *G. arundinacea* Kunth subsp. *triflora* (Korshinsky) Tzvelev; *G. effusa* Kitagawa; *G. kantschatica* Komarov; *G. maxima* (Hornberg) Hartman subsp. *triflora* (Korshinsky) Hultén; *G. triflora* var. *effusa* (Kitagawa) Z. L. Wu.

Perennial, rhizomatous; rhizomes long, thick. Culms stout, 50–150 cm tall, 4–8 mm in diam. Leaf sheaths smooth, lower sheaths with transverse veinlets; leaf blades flat, 15–25 cm × 5–10 mm, abaxial surface green, smooth or scaberulous, adaxial surface grayish green, finely papillose, apex acuminate; ligule 2–4 mm, margin cuspidate in middle. Panicle open, obovate in outline, 20–30 cm, shortly exserted, spikelets many; branches 3–4 per node, ascending or spreading, smooth or slightly scabrid. Spikelets elliptic or oblong, 5–8 mm, florets 3–8, green or purplish at maturity; glumes ovate, membranous, 1-veined, lower glume 1.5–2 mm, upper glume 2–3 mm, obtuse or subacute; lemmas elliptic-oblong, 2–3.5 mm, thinly herbaceous, 7-veined, veins finely scabrid, apex hardly membranous, obtuse; palea as long as or slightly shorter than lemma, keels wingless, scabrid, apex truncate. Stamens 3, anthers 0.9–1.5 mm. Fl. and fr. Jun–Sep. $2n = 20$.

Swamps, marshy ground near streams and lakes; 200–3300 m. Hebei, Heilongjiang, Nei Mongol, Shaanxi, ?Sichuan, ?Yunnan [Kazakhstan, Korea, Mongolia, Russia (Far East, Siberia); Europe (Ural Mountains)].

This species is an Asian element of the *Glyceria arundinacea* complex and is sometimes included as a subspecies of the latter. *Glyceria arundinacea* Kunth s.s. occurs in C Europe and the Caucasus and is distinguished by its densely scabrid adaxial leaf surface and panicle branches, and shorter glumes. The North American species *G. grandis* S. Watson, with slightly smaller glumes and anthers, also belongs to this complex.

The records from Sichuan and Yunnan have not been confirmed.

10. *Glyceria maxima* (Hartman) Holmberg, Bot. Not. 1919: 97. 1919.

水甜茅 shui tian mao

Molinia maxima Hartman, Handb. Skand. Fl. 56. 1820; *Glyceria aquatica* (Linnaeus) Wahlberg (1820), not (Linnaeus) J. Presl & C. Presl (1819); *G. spectabilis* Mertens & Koch; *Poa aquatica* Linnaeus.

Perennial, rhizomatous; rhizomes long, thick. Culms stout, erect, 80–200 cm tall, up to 10 mm in diam. Leaf sheaths smooth or scabrid toward blade; leaf blades flat, light green, 25–50 cm × 8–16 mm, with transverse veinlets, abaxial surface scabrid, adaxial surface smooth or sparsely scabrid, apex acute; ligule 2–4 mm. Panicle ovate to oblong in outline, usually laxly contracted, 20–40 cm, exserted, spikelets many; branches 4–10 per node, obliquely ascending, relatively thick, scabrid. Spikelets narrowly oblong, 5–12 mm, florets 5–10, yellowish green or purple tinged; rachilla internodes smooth; glumes narrowly ovate, 1-veined, lower glume 2–3 mm, upper glume 3–4 mm, subacute; lemmas oblong, 3–4 mm, thinly herbaceous, 7-veined, veins scabrid, apex membranous, broadly obtuse; palea as long as lemma, keels wingless, scabrid. Stamens 3, anthers 1.2–1.8 mm. Fl. May–Jul. $2n = 28, 56, 60$.

Marshy floodlands, stream and lake banks. Xinjiang [Kazakhstan, Russia (W Siberia westward); Europe; introduced in North America and Australia].

Glyceria aquatica (Linnaeus) J. Presl & C. Presl is a synonym of *Catabrosa aquatica*.

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