

116. PHRAGMITES Adanson, Fam. Pl. 2: 34, 559. 1763.

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Perennial reeds, rhizomatous. Culms tall, erect, leafy, hollow. Leaf blades all cauline, broadly linear, base rounded, deciduous; ligule membranous with ciliate margin. Inflorescence a large, plumose, copiously branched panicle with numerous, crowded, silky-hairy spikelets. Spikelets laterally compressed, with several loosely arranged florets, lowest floret masculine or empty, resembling glumes but longer, persistent, succeeding florets bisexual, rachilla disarticulating between bisexual florets; glumes shorter than lemmas, unequal, papery, 3–5-veined; floret callus linear, silky-plumose with long spreading hairs; lemmas of bisexual florets very narrow, hyaline, 1–3-veined, glabrous, entire, long caudate; palea short, hyaline. Stamens 2 or 3.

Four or five species: cosmopolitan; three species in China.

This is a genus of tall, aquatic or semiaquatic reeds found in nearly all parts of the world. The species are very variable, closely related, and indistinctly separated. Liu (*Phragmites* Resources, 1989) recognized five varieties in *Phragmites japonicus*, five varieties in *P. karka*, and 74 varieties in *P. australis*!

Arundo and *Neyraudia* have a similarly tall, reedy habit and plumose panicle, but both differ from *Phragmites* in the spikelet hairs arising on the lemmas and not on the floret callus. *Neyraudia* is further distinguished by its solid culms. *Arundo* generally has broader leaves cordate at the junction with the sheath.

Phragmites reeds provide a source of fiber, the rhizomes have medicinal uses, and the plants also aid soil retention. Reed beds can also be used for the purification of water.

- 1a. Lower glume 1/2–3/5 length of lowest lemma; stolons bent zigzag, nodes hirsute 1. *P. japonicus*
- 1b. Lower glume up to 1/2 length of lowest lemma; stolons if present straight, nodes glabrous.
 - 2a. Spikelets 10–18 mm; upper glume 6–9 mm; panicle branches usually spiculate to base; culms up to 2 m tall ... 2. *P. australis*
 - 2b. Spikelets 8–10 mm; upper glume 3.5–5 mm; panicle branches often bare around lowermost node; culms 4–6 m tall 3. *P. karka*

1. *Phragmites japonicus* Steudel, Syn. Pl. Glumac. 1: 196. 1854.

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Phragmites japonicus var. *prostratus* (Makino) L. Liu; *P. prostratus* Makino; *P. serotinus* Komarov.

Perennial with underground rhizomes and long overground stolons; stolons bent zigzag, nodes hirsute. Culms up to 2 m tall, 4–5 mm in diam., nodes pubescent. Leaf sheaths tinged purple upward; leaf blades 10–30 × 2–3 cm, margins scabrous, apex acuminate; ligule 0.2–0.6 mm, ciliate, hairs ca. 0.1 mm. Panicle 20–30 × 5–8 cm; axis puberulous; pedicels 6–7 mm, pilose, hairs soft, up to 2 mm. Spikelets purplish, 8–12 mm, florets 3–4; glumes acute, lower glume 1/2–3/5 length of lowest lemma, ca. 5 mm, upper glume ca. 5.5 mm; lowest lemma linear-lanceolate, 6–10 mm; floret callus bare in lower 1/3, upper 2/3 with silky hairs 3/4 length of lemma; bisexual lemmas very narrowly lanceolate, 6–9 mm, apex acuminate. *2n* = 48.

Swamps and lakesides; 200–1000 m. Heilongjiang, Jilin, Liaoning [Japan, Korea, Russia (Far East, Kuril Islands)].

2. *Phragmites australis* (Cavanilles) Trinius ex Steudel, Nomencl. Bot., ed. 2, 1: 143. 1840.

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Arundo australis Cavanilles, Anales Hist. Nat. 1: 100. 1799; *A. phragmites* Linnaeus; *Phragmites communis* Trinius.

Robust perennial from an extensive creeping rhizome; overground stolons sometimes present, straight, nodes glabrous. Culms up to 2 m or more tall, ca. 6 mm in diam., usually farinose below nodes, nodes glabrous or pubescent. Leaf sheaths light green, glabrous or thinly hairy; leaf blades usually droop-

ing, up to 50 × 1–3 cm, smooth or margins scabrous, tapering to a filiform apex; ligule a minute membranous rim, ciliate, hairs 0.2–0.6 mm. Panicle 20–50 × ca. 10 cm, branches of lowermost whorl usually spiculate to base, densely hirsute at insertion; pedicels 2–4 mm, glabrous or pilose only at base. Spikelets 10–18 mm, florets 2–5; glumes acute, lower glume up to 1/2 length of lowest lemma, 3–5 mm, upper glume 6–9 mm; lowest lemma linear-lanceolate, 8–15 mm; floret callus with hairs equal to lemma; bisexual lemmas very narrowly lanceolate, 9–16 mm, apex long attenuate. Fl. and fr. Jul–Nov. *2n* = 36, 44, 46, 48, 49, 50, 51, 52, 54, 84, 96, 120.

Moist places along river banks and lake margins, forming large colonies. Throughout China [cosmopolitan].

This is an extremely polymorphic, cosmopolitan reed with numerous chromosomal variants and ecotypes. Plants from the high Himalayas sometimes form short, leafy tufts with strongly distichous, short, pungent leaf blades. Similar variants occur elsewhere in the world in extreme conditions.

3. *Phragmites karka* (Retzius) Trinius ex Steudel, Nomencl. Bot., ed. 2, 1: 144. 1840.

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Arundo karka Retzius, Observ. Bot. 4: 21. 1786; *A. roxburghii* Kunth; *Phragmites cinctus* (J. D. Hooker) B. S. Sun; *P. roxburghii* (Kunth) Steudel; *Trichoon roxburghii* (Kunth) Wight.

Robust perennial from an extensive creeping rhizome. Culms very stout, often woody, 4–6 m tall, 1.5–2.5 cm in diam. Leaf sheaths greenish, glabrous; leaf blades erect-ascending, up to 80 × 2–3 cm, abaxial surface scabrous, apex stiff, long acuminate; ligule 0.5–1 mm, ciliate. Panicle 30–50 × 10–20 cm; branches of lowermost whorl bare of spikelets toward base, ± glabrous at insertion. Spikelets 10–12 mm, florets 4–6; glumes

lanceolate-elliptic, obtuse to acuminate, lower glume up to 1/2 length of lowest lemma, 2.5–4 mm, upper glume 3.5–5 mm; lowest lemma narrowly elliptic, 7–12 mm; floret callus with hairs 4–8 mm; bisexual lemmas linear-lanceolate, 8.5–10 mm, apex long attenuate. Fl. and fr. autumn. $2n = 24, 36, 38, 48$.

Warm swampy valleys and river banks; under 1000 m. Fujian, Guangdong, Guangxi, Hainan, Sichuan, Taiwan, Yunnan [Cambodia, India, Indonesia, Japan, Laos, Malaysia, Myanmar, New Guinea, Philippines, Sri Lanka, Thailand, Vietnam; Africa, N Australia, Pacific Islands].

This is a very robust species found in warm parts of the Old World. It has stiffer, more scabrous leaf blades and smaller spikelets with shorter callus hairs than *Phragmites australis*.

The name "*Arundo vallatoria* Linnaeus" (Herb. Amboin. 15. 1754) belongs here, but was not validly published (see Art. 34 Ex. 2 of the Saint Louis Code), and hence neither was the combination "*Phragmites vallatoria* (Linnaeus) Veldkamp" (Blumea 37: 233. 1992).

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