

1. PHRYMA Linnaeus, Sp. Pl. 2: 601. 1753.

透骨草属 tou gu cao shu

Leptostachia Adanson (1763), not *Leptostachya* Nees (1832, nom. cons. prop.).

Herbs, perennial, erect. Stems 4-angular. Stipules absent. Leaves simple, opposite; leaf blade margin serrate. Inflorescences a terminal [or axillary] spike. Flowers perfect, each with a bract and a bracteole. Calyx connate, tubular, 5-ribbed; limb 2-lipped; abaxial lip with 2 short triangular lobes; adaxial lip with 3 apically \pm hooked long subulate lobes. Corolla connate, tubular-funnelform; limb 2-lipped; abaxial lip larger, patent, with 3 imbricate lobes; adaxial lip erect, margin subentire but apically emarginate or shallowly 2-lobed. Stamens 4, inserted in corolla tube, anterior 2 longer; filaments filiform; anthers dorsifixed, cells parallel, not convergent at apex, longitudinally dehiscent. Gynoecium pseudomonomerous (2-carpellate with 1 carpel reduced developmentally); ovary superior, 1-locular, with basal placentation and 1 orthotropous ovule; style single, apical, elongate; stigma 2-lipped. Fruit an achene, enveloped in persistent calyx, 1-seeded. Seeds with an oblong embryo; endosperm thin, with 2 layers of cells.

One species: E and S Asia, E North America.

1. *Phryma leptostachya* Linnaeus subsp. ***asiatica*** (H. Hara) Kitamura, Acta Phytotax. Geobot. 17: 7. 1957.

透骨草 tou gu cao

Phryma leptostachya var. *asiatica* H. Hara, Enum. Sperm. Jap. 1: 297. 1948; *P. asiatica* (H. Hara) O. Degener & I. Degener; *P. esquirolii* H. Léveillé; *P. humilis* Koidzumi; *P. leptostachya* var. *humilis* (Koidzumi) H. Hara; *P. leptostachya* var. *melanostachya* Kitagawa; *P. leptostachya* var. *nana* (Koidzumi) H. Hara; *P. leptostachya* var. *oblongifolia* (Koidzumi) Honda; *P. nana* Koidzumi; *P. oblongifolia* Koidzumi.

Herbs, perennial, (10–)30–80(–100) cm tall. Stems simple or sometimes with apical branches bearing inflorescences, erect, 4-angular, apically pubescent or rarely subglabrous. Leaves petiolate or sometimes apical ones sessile; petiole to 4 cm, puberulent; leaf blade ovate-oblong, ovate-lanceolate, ovate-elliptic, ovate-triangular, or broadly ovate, 1–16 \times 1–8 cm, herbaceous, both surfaces puberulent and sometimes more densely so along veins, secondary veins 4–6 on each side of midvein, base cuneate, rounded, or truncate but often decurrent for middle and basal leaves, margin serrate, dentate, or crenulate, apex acuminate, acute, or rarely subrounded. Spikes terminal or axillary, puberulent; peduncle 3–20 cm; inflorescence axis 10–30 cm; bracts subulate to linear, 1–2.5 mm. Pedicel short, erect at anthesis but later reflexed; bracteoles 2, at base of pedicel, subulate to linear, 0.5–2 mm. Calyx tubular, 5-ribbed, puberulent outside; tube 2.5–3.2 mm at anthesis; abaxial teeth 2, triangular, ca. 0.3 mm; adaxial teeth 3, subulate, 1.2–2.3 mm, apex \pm hooked. Corolla light purplish, pale red, to white, tubular-funnelform, 6.5–7.5 mm, glabrous outside; tube 4–4.5 mm, ca. 1.5 mm broad at mouth, inside anteriorly puberulent; limb 2-lipped; abaxial lip 2.5–3 mm, apex 3-lobed with central lobe larger; adaxial lip erect, 1.3–2 mm, apex 2-lobed. Stamens inserted in corolla tube 2.5–3 mm from base, glabrous; filaments filiform, 1.5–1.8 mm, anterior 2 longer; anthers reniform-spherical, 0.3–0.4 \times ca. 0.5 mm. Gynoecium glabrous; ovary obliquely oblong-lanceolate, 1.9–2.2 mm; style 3–3.5 mm; stigma 2-lipped, basal lip longer and oblong. Achene long ellipsoid, enveloped in persistent clavate calyx; persistent calyx tube 4.5–6 mm. Fl. Jun–Oct, fr. Aug–Dec.

Moist ravines, forests, roadsides, mountain slopes, hillsides; 300–2800 m. Anhui, Chongqing, Fujian, S Gansu, Guangxi, Guizhou, Hebei, Heilongjiang, Henan, Hubei, Hunan, Jiangsu, Jiangxi, Jilin, Liaoning,

Nei Mongol, Shaanxi, Shandong, Shanxi, Sichuan, Taiwan, Xizang (Bomi, Gyirong), Yunnan, Zhejiang [Bhutan, N India, Japan, Kashmir, Korea, Nepal, N Pakistan, Russia (Far East), N Vietnam].

Phryma leptostachya subsp. *leptostachya* occurs in North America, from SE Canada to SE United States, W to South Dakota. The two intercontinental subspecies are morphologically highly similar, with the North American typical subspecies different in general from subsp. *asiatica* by having calyx tube 2–2.2 mm, adaxial calyx teeth nearly as long as calyx tube at anthesis, and adaxial corolla lip entire or emarginate. Yet they are genetically highly distinct (Z. Nie et al., Amer. J. Bot. 93: 1343–1356. 2005).

