

PENTAPHRAGMATACEAE

五膜草科 wu mo cao ke

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Herbs perennial, ± succulent, without latex. Rhizome elongate, robust, often ± woody. Leaves alternate; leaf blade large, asymmetric at base. Inflorescence an axillary cyme or cincinnus, solitary or 2 or 3 together; pedicels short or absent. Flowers bisexual, actinomorphic except calyx. Calyx tube campanulate or tubular; calyx lobes 5, persistent, often white, unequal in width, often 2 wider and other 3 narrower. Corolla adnate to calyx as far as distal part of calyx, 5-cleft for more than halfway, or nearly fully divided and appearing petaloid, often white. Stamens 5, alternate with corolla lobes, inserted at proximal part of corolla tube; filament glabrous; anther ovoid or long ellipsoid, introrse or almost lateral due to connective being developed and exerted higher than anther cells. Ovary inferior, 2-loculed; ovules numerous; stigma capitate or conic, entire. Fruit an indehiscent berry. Seeds numerous, minute, ovoid or ovoid-globose; testa obviously reticulate.

One genus and ca. 25 species: S China, Indonesia, Malaysia, Papua New Guinea, Philippines, Singapore, Thailand, Vietnam; two species (one endemic) in China.

Pentaphragmataceae and Campanulaceae are not immediately related, although both are in the Asterales. *Pentaphragma* has quite different flowers, with no hint of the secondary pollen presentation that occurs throughout Campanulaceae s.l. Thus the inflorescence is cymose, usually scorpioid; the sepals are petaloid, with two large ones and three small ones; the corolla is ± deeply lobed; there are nectariferous cavities between septa joining hypanthium to ovary (unique in flowering plants); and the anthers are extrorse (introrse in all Campanulaceae s.l.). In addition, there is no latex; the leaves are distichous, with leaf blades strongly asymmetric; and the endosperm is starchy, the latter condition being extremely uncommon in Campanulaceae s.l.

Hong De-yuan. 1983. Campanulaceae (Pentaphragmatoideae). In: Hong De-yuan, ed., Fl. Reipubl. Popularis Sin. 73(2): 174–176.

1. PENTAPHRAGMA Wallich ex G. Don, Gen. Hist. 3: 731. 1834.

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Morphological characters and geographic distribution are the same as those of the family.

- 1a. Calyx longer than corolla; inflorescence strongly curved; flowers 2 in axil of bract 1. *P. sinense*
1b. Calyx shorter than corolla; inflorescence straight; flower 1 in axil of bract 2. *P. spicatum*

1. *Pentaphragma sinense* Hemsley & E. H. Wilson, Bull. Misc. Inform. Kew 1906: 160. 1906.

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Plants covered with glandular hairs and these mixed with stellate hairs on young stems, petioles, abaxial surface of leaf blade, inflorescence axis, bracts, pedicels, and calyx. Rhizome to 30 × 1 cm, ± woody. Fibrous roots ca. 3 mm in diam. Stem short but robust, with leaves borne at one side. Leaves petiolate; petiole 3–10 cm; leaf blade ovate, asymmetric, 10–20 × 5–12 cm, main veins arcuate, margin entire or obscurely verrucose denticulate. Inflorescences solitary or 2 together, pedunculate, strongly curved, bracteate; peduncle 2–4 cm; bracts ovate, with 2 flowers at axil; pedicels 1–2 mm. Calyx tube campanulate; calyx lobes broadly elliptic or linear-oblong, ca. 6 × 2–3 mm. Corolla white, 6–7 mm, cleft for more than halfway; lobes long elliptic. Stamens: connective higher than anther cells; anther cells long ellipsoid, almost laterally longitudinally dehiscent. Stigma conic, almost smooth. Berry obovoid, ca. 9 mm. Seeds ovoid, ca. 0.3 mm; testa yellow, obviously reticulate. Fl. and fr. May–Nov.

Forests, by streams, moist shady banks of ravines; [200–1500 m]. S Yunnan (Hekou, Pingbian, Xishuangbanna) [N Vietnam].

2. *Pentaphragma spicatum* Merrill, Philipp. J. Sci. 21: 511. 1922.

直序五膜草 zhi xu wu mo cao

Pentaphragma corniculatum Chun & F. Chun.

Plants rather densely covered with glandular hairs and these mixed with stellate hairs on young stems, petioles, abaxial surface of leaves, inflorescence axis, bracts, and abaxial surface of calyx. Rhizome oblique, elongate, robust, to 15 × 1.5 cm, ± woody. Fibrous roots ca. 2 mm in diam. Stem short, often with leaves at one side, usually with remains of petioles. Leaves petiolate; petiole 5–15 cm; leaf blade ovate or ovate-orbicular, asymmetric, 10–30 × 6–20 cm, margin entire or verrucose denticulate. Inflorescences solitary or 2 together, pedunculate, straight; peduncle with an involucre of bracts much smaller than leaves; bracts obovate, ca. 4 mm, with 1 flower at axil; pedicels 1–2 mm. Flowers ca. 1.6 cm. Calyx tube campanulate; calyx lobes ca. 5 mm, 3-veined, broader 2 ovate-orbicular, ca. 4 mm wide, other 3 long oblong, ca. 2 mm wide. Corolla white or yellow-green, ca. 9 mm, cleft for more than halfway; lobes slightly incurved, lanceolate, glabrous. Stamens: connective higher than anther cells. Stigma

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conic, almost without ribs. Berry ellipsoid, ca. 8 mm. Seeds ovoid, ca. 0.3 mm; testa dark brown, obviously reticulate. Fl. May–Jul, fr. Oct–Nov.

- Tropical forests in ravines, dense forests; ca. 1400 m. SW

Guangdong (Xinyi), S Guangxi (Daxin, Dongxing, Shiwan Dashan), Hainan (Baisha, Baoting).

Pentaphragma spicatum should be expected in N Vietnam. The type locality (Dongxing in Guangxi Province) is close to the border.