

7. PHYSOCHLAINA G. Don, Gen. Hist. 4: 470. 1837.

泡囊草属 pao nang cao shu

Belenia Decaisne; *Physochlaena* Miers.

Herbs perennial. Roots stout, fleshy; rhizomes thick, short. Stems erect, much branched. Leaves petiolate; leaf blade membranous, entire and sinuate or with a few deltate teeth. Inflorescences axillary or terminal, usually many flowered, paniculate or umbellate, usually pedunculate, rarely sessile, mostly bracteate. Flowers actinomorphic, 5-merous. Calyx tubular-campanulate, funnellform, or tubular-urceolate. Corolla campanulate or funnellform, basally contracted cylindric, slightly oblique at limb, lobes overlapping in bud, subequal. Stamens inserted in corolla tube, mostly exerted; anthers ovate, dehiscent longitudinally. Disc fleshy, ringlike, surrounding base of ovary. Ovary 2-locular. Style mostly exerted; stigma indistinctly 2-lobed. Fruiting calyx membranous or subleathery, enveloping capsule, with 10 longitudinal ribs and obvious netted veins, mostly open. Fruit a circumscissile, oblong or globose capsule, dehiscent slightly above middle. Seeds numerous, reniform, minutely pitted; embryo coiled.

About 11 species: Asia, six species in China.

- 1a. Inflorescences open, few flowered, with leaflike bracts or without bracts; capsules mostly more than 1 cm in diam.
 - 2a. Leaves mostly larger than 14×8 cm; fruiting calyx membranous, cup-shaped, hardly contracted at apex, inflated at base; corolla dark purple; inflorescences without bracts 3. *P. macrophylla*
 - 2b. Leaves mostly less than 12×7 cm; fruiting calyx thick papery, apex tubular, sometimes contracted, base appressed to capsule; corolla yellow with purple veins; inflorescences bracteate.
 - 3a. Leaves entire; calyx ca. 1/3 as long as corolla; fruiting calyx contracted at apex 1. *P. praealta*
 - 3b. Leaves with a few, coarse deltate teeth; calyx half as long as or longer than corolla; fruiting calyx terete, not contracted at apex 2. *P. macrocalyx*
- 1b. Inflorescences dense cymes or umbels, mostly with scalelike bracts; capsules less than 1 cm in diam.
 - 4a. Flowers subsessile; fruiting pedicel less than 3 mm; inflorescences capitate; stamens included 6. *P. capitata*
 - 4b. Flowers obviously pedicellate; fruiting pedicel more than 10 mm; inflorescences umbellate cymes; stamens included or slightly exerted.
 - 5a. Fruiting calyx funnellform, much longer than capsule; calyx teeth spreading; corolla yellow, tube pale purple; leaves subdeltate, with a few coarse deltate teeth 4. *P. infundibularis*
 - 5b. Fruiting calyx broadly ovoid or subglobose, about as long as capsule; calyx teeth slightly inflexed; corolla purple; leaves usually ovate, entire 5. *P. physaloides*

1. *Physochlaina praealta* (Decaisne) Miers, Ann. Mag. Nat. Hist. Ser. 2, 5: 473. 1850.

西藏泡囊草 xi zang pao nang cao

Belenia praealta Decaisne in Jacquemont, Voy. Inde 4: 114. 1844; *Hoscyamus praealtus* (Decaisne) Walpers; *Physochlaina grandiflora* Hooker; *P. urceolata* Kuang & A. M. Lu; *Scopolia praealta* (Decaisne) Dunal.

Plants 30–50 cm tall. Roots terete, ca. 2 cm in diam. Stems much branched, glandular pubescent. Petiole 1–6 cm; leaf blade ovate, ovate-elliptic, ovate-deltate, or deltate, 4–13×3–8 cm, sparsely glandular pubescent, base cuneate, cordate, or sometimes truncate, margin entire and sinuate, apex obtuse or somewhat acute. Inflorescences few flowered, paniculate; bracts leaflike, 0.5–1.5 cm. Pedicel 1–1.5 cm. Calyx short campanulate or tubular-urceolate, glandular pubescent, ca. 6×5 mm; lobes deltate, ca. 2 mm. Corolla yellow with purple veins, campanulate or tubular-campanulate, ca. 2–3 cm. Stamens somewhat unequal, exerted; anthers ca. 2 mm. Style exerted. Fruiting calyx thick, tubular to campanulate or urceolate, 2.5–3.5 cm, slightly inflated near base, contracted and tubular upwards, teeth erect, slightly spreading, subequal, ca. 3.5–6 mm. Capsules oblong, 1.2–1.5 cm. Seeds subreniform, somewhat compressed, ca. 3.5×2.5 mm. Fl. Jun-Jul, fr. Jul-Aug.

Slopes; 4200–4500 m. W and S Xizang [India (Kashmir), Pakistan].

2. *Physochlaina macrocalyx* Pascher, Repert. Spec. Nov. Regni Veg. 7: 167. 1909.

长萼泡囊草 chang e pao nang cao

Herbs 30–60 cm. Leaf blade base subhastate, subdeltate, sometimes attenuate into channeled petiole, lateral angles sometimes protracted. Calyx larger than 6×5 mm, tubular, not urceolate, not at all constricted distally. Corolla yellow, not at all violet, campanulate, gradually narrowed into a tube. Fruit not seen.

• Xizang.

This species is known to us only by Pascher's abbreviated original description.

3. *Physochlaina macrophylla* Bonati, Bull. Soc. Bot. Genève ser. 2, 5: 312. 1914.

大叶泡囊草 da ye pao nang cao

Plants ca. 80 cm tall. Stems glabrescent. Petiole 3–7 cm, glabrous; leaf blade broadly ovate to elliptic, 14–22×8–12 cm, glabrescent, base broadly cuneate, margin entire, sinuate, or with a few irregular deltate teeth, apex acute or short acuminate. Inflorescences ebracteate racemose panicles; peduncle 4–6 cm, densely glandular pubescent. Pedicel 1–2 cm. Calyx campanulate, 1.3–1.7×1–1.5 cm, divided halfway; lobes deltate-lanceolate, 6–7 mm, ciliate. Corolla purple, campanulate, 2–2.5×1.5–2 cm; lobes subdeltate, ciliate. Stamens slightly exerted; anthers ca. 3 mm. Style

included. Fruiting calyx inflated, cup-shaped, $2 \times 1.7-2$ cm, lobes ca. 1 cm. Capsules subglobose, ca. 1 cm in diam. Seeds gray-yellow, ca. 2 mm. Fl. Jun-Jul, fr. Jul-Aug.

- Forests; 1900–2400 m. W Sichuan.

4. *Physochlaina infundibularis* Kuang, Acta Phytotax. Sin. 12: 410. 1974.

漏斗泡囊草 lou dou pao nang cao

Plants 20–60 cm tall, glandular pubescent except for leaves. Roots fleshy, terete, 1.5–2 cm in diam. Rhizomes stout, terete. Stems mostly branched. Petiole 2–7(–13) cm; leaf blade deltate or ovate-deltate, sometimes ovate, 4–9 \times 4–8 cm, base cordate, truncate or decurrent into petiole, with a few, coarse deltate teeth, apex acute, glabrescent. Inflorescences terminal or axillary, umbellate; bracts scalelike. Pedicel 3–5 mm. Calyx funnelform to campanulate, ca. 6 \times 4 mm. Corolla green-yellow, pale purplish at base, funnelform to campanulate, ca. 1 cm; lobes ovate, ca. 1/3 as long as tube. Stamens somewhat unequal, included. Style nearly as long as corolla. Fruiting calyx inflated, funnel-form, 1–1.8 \times 1–1.5 cm, membranous, with 10 indistinct longitudinal veins. Capsules subglobose, ca. 5 mm in diam. Seeds pale orange-yellow, reniform, somewhat compressed. Fl. Mar-May, fr. Apr-Jun.

- Valleys, forests; 800–1600 m. S and W Henan, Shaanxi (Qinlin mountains), S Shanxi.

A source of tropane alkaloids.

5. *Physochlaina physaloides* (Linnaeus) G. Don, Gen. Hist. 4: 470. 1837.

泡囊草 pao nang cao

Hyoscyamus physaloides Linnaeus, Sp. Pl. 1: 180. 1753 (as *physalodes*); *Physochlaena dahurica* Miers; *Physochlaena physaloides* (Linnaeus) Miers; *Physochlaina pseudophysaloides* Pascher; *Scopolia physaloides* (Linnaeus) Dunal.

Plants 30–50 cm tall. Stems glandular pubescent, glabrescent. Petiole 1–4 cm; leaf blade ovate, 3–8 \times 2.5–5 cm, glandular pubescent, glabrescent, base broadly cuneate, decurrent into petiole, margin entire and sinuate, apex acute. Inflorescences umbellate; bracts scalelike. Pedicel 5–10 mm, glandular pubescent. Calyx narrowly tubular-campanulate, 6–8 \times 4 mm; lobes ca. 2 mm, ciliate. Corolla purple, funnelform, more than twice as long as calyx; tube pale purple. Stamens slightly exerted. Style obviously exerted. Fruiting calyx inflated, ovoid or globose, 1.5–2.5 \times 1–1.5 cm, mouth contracted, not closed. Capsules ca. 8 mm in diam. Seeds yellow, compressed reniform, ca. 3 \times 2.5 mm. Fl. Apr-May, fr. May-Jul.

Grassy slopes, forest edges; 1000 m. Hebei, Heilongjiang, Nei Mongol, Xinjiang [Kazakhstan, Mongolia, Russia].

Medicinal herb used for relieving muscular spasm and pain. The flowers and stems can be used as a haemostatic.

6. *Physochlaina capitata* A. M. Lu, Fl. Reipubl. Popularis Sin. 67(1): 159. 1978.

伊犁泡囊草 yi li pao nang cao

Plant 50–70 cm tall. Root to 3.5 cm in diam. Rhizomes terete, ca. 4 mm in diam. Stems glandular pubescent, mostly unbranched. Petiole 3–7 cm; leaf blade elliptic or ovate-elliptic, 4–8 \times 2–4 cm, puberulent along veins abaxially, base

truncate, broadly cuneate, or broadly cordate, margin entire, sinuate, or rarely with 1 or 2 pairs of coarse deltate teeth, apex acute or obtuse. Inflorescences terminal, few-flowered capitate clusters. Flowers subsessile. Calyx funnelform, ca. 6 mm; lobes deltate, half as long as tube, glandular pubescent abaxially, ciliate. Corolla yellow, pale purple on tube, funnelform, ca. 1.3 cm; lobes ovate-deltate, ca. 3 mm. Stamens inserted in middle of corolla tube, slightly exerted; anthers ovoid, ca. 1 mm. Style included. Fruiting pedicel 1–3 mm. Fruiting calyx campanulate, 1.3–1.6 \times 1–1.2 cm, sparsely glandular pubescent, with 10 indistinct longitudinal ribs, persistent; lobes short deltate, equal, ca. 4 mm, spreading. Capsules globose, 5–6 mm in diam. Seeds orange-yellow, reniform, ca. 2.5 \times 1.5 mm. Fl. Apr-May, fr. May-Jun.

- Grassy slopes, rock fissures. Xinjiang (Xinyuan Xian and Gongliu Xian).

