

**38. GYMNADENIA** R. Brown in W. T. Aiton, Hortus Kew., ed. 2, 5: 191. 1813.

手参属 shou shen shu

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*Nigritella* Richard.

Herbs, terrestrial, medium-sized, slender to robust. Tubers palmately lobed, fleshy, neck with several slender, slightly fleshy roots. Stem erect, terete, fleshy, glabrous, leafy. Leaves cauline, alternate, linear-ligulate to elliptic, basally conduplicate and sheathing stem. Inflorescence capitate to elongate, with a few lanceolate sterile bracts proximally and many flowers in a dense terminal raceme; floral bracts shorter than, equal to, or slightly longer than ovary. Flowers resupinate, small to medium-sized; ovary usually twisted, narrowly cylindrical or fusiform, glabrous. Sepals free, spreading; dorsal sepal concave; lateral sepals reflexed. Petals connivent with dorsal sepal and forming a hood, straight, slightly shorter than sepals; lip broadly rhombic to obovate, concave at base, spurred, conspicuously 3-lobed to entire; spur often slightly arcuate, cylindrical, longer or shorter than ovary, apex obtuse or bilobed. Column short; anther oblong or ovoid, 2-locular; pollinia 2, clavate, granular-farinaceous, sectile, each with a slender caudicle attached to a separate viscidium; viscidia naked, narrowly oblong to elliptic; rostellum small to elongate, inconspicuously 3-lobed; staminodes 2, small, subglobose, placed laterally at base of anther; stigma distinctly 2-lobed, rather large, placed at base of column. Capsule erect.

About 16 species: throughout Europe and parts of C and E Asia, the Himalayas, and Japan; five species (three endemic) in China.

- 1a. Spur 7–14 mm, ca. as long as or exceeding ovary.
  - 2a. Leaves linear-lanceolate, narrowly oblong, or lorate, 0.8–2(–2.5) cm wide; mid-lobe of lip usually smaller than lateral lobes ..... 1. *G. conopsea*
  - 2b. Leaves elliptic to elliptic-oblong, 2.5–4.5 cm wide; mid-lobe of lip equal to or slightly larger than lateral lobes ..... 2. *G. orchidis*
- 1b. Spur 2–5 mm, much shorter than ovary.
  - 3a. Plants 50–70 cm tall; flowers yellowish green; spur shallowly 2-lobed at apex ..... 5. *G. bicornis*
  - 3b. Plants 7–50 cm tall; flowers white or pink; spur undivided, apex obtuse.
    - 4a. Flowers pink, rarely tinged with white; lip broadly obovate, 3-lobed at apex ..... 3. *G. crassinervis*
    - 4b. Flowers white; lip rhombic-ovate, obscurely 3-lobed at apex ..... 4. *G. emeiensis*

**1. *Gymnadenia conopsea*** (Linnaeus) R. Brown in W. T. Aiton, Hortus Kew., ed. 2, 5: 191. 1813.

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*Orchis conopsea* Linnaeus, Sp. Pl. 2: 942. 1753; *Gymnadenia conopsea* var. *latifolia* Schlechter; *G. conopsea* var. *ussuriensis* Regel; *G. sibirica* Turczaninow ex Lindley; *Habenaria conopsea* (Linnaeus) Benth.

Plants slender to robust, 20–60 cm tall. Tubers ovoid, 1–3.5 cm, with many short, slender lobes. Stem stout, with 2 or 3 tubular sheaths at base and 3–5 cauline leaves. Leaves widely spaced or clustered, linear-lanceolate, narrowly oblong, or lorate, 5.5–20 × 0.8–2(–2.5) cm, apex acuminate to subobtuse. Inflorescence 11–26 cm, slender; peduncle with 1 to a few scattered, lanceolate bracts 1.5–6 cm; rachis 4–12 cm, densely many flowered; floral bracts lanceolate, often longer than ovary and flower, apex long acuminate-caudate. Flowers fragrant, pink, rarely pinkish white; ovary 5–8 mm including pedicel. Dorsal sepal broadly elliptic to broadly ovate-elliptic, 3.5–5 × 3–4 mm, 3-veined, slightly concave, apex acute; lateral sepals reflexed, obliquely ovate, 4–5.5 × 3–4 mm, 3-veined, margin revolute, apex acute. Petals obliquely ovate-triangular, 3.5–5 × 3–4 mm, 3-veined, apex acute; lip spreading, broadly cuneate-obovate, 4–5 × 4–5 mm, 3-lobed at apex; lateral lobes elliptic to broadly ovate, 1.8–3 mm wide, apex obtuse or occasionally truncate; mid-lobe triangular, 1–2 mm wide, usually smaller than lateral lobes, apex obtuse to acute; spur pendulous, curved

forward, 10–14 mm, exceeding ovary, slender. Column 1–1.5 mm; viscidia linear-oblong. Fl. Jul–Aug.  $2n = 30, 40, 42, 80, 100, 120$ .

Forests, grasslands, waterlogged meadows; 200–4700 m. SE Gansu, Hebei, Heilongjiang, Jilin, Liaoning, Nei Mongol, Shaanxi, Shanxi, N and W Sichuan, SE Xizang, NW Yunnan [Japan, Korea, Russia; Europe].

The extensive extra-Chinese synonymy is not cited here.

**2. *Gymnadenia orchidis*** Lindley, Gen. Sp. Orchid. Pl. 278. 1835.

西南手参 xi nan shou shen

*Gymnadenia conopsea* (Linnaeus) R. Brown var. *yunnanensis* Schlechter; *G. cylindrostachya* Lindley; *G. delavayi* Schlechter; *G. himalayica* Schlechter; *G. microgymnadenia* (Kraenzlin) Schlechter; *G. souliei* Schlechter; *G. violacea* Schlechter; *Habenaria microgymnadenia* Kraenzlin; *H. orchidis* (Lindley) J. D. Hooker; *H. stoliczkae* Kraenzlin; *Orchis cylindrostachya* (Lindley) Kraenzlin; *Peristylus orchidis* (Lindley) Kraenzlin.

Plants robust, 15–50 cm tall. Tubers ovoid-ellipsoid, 1–3 cm, with many, slender, elongate lobes. Stem stout, with 2 or 3 tubular sheaths at base and 3–6 cauline leaves. Leaves widely spaced or clustered, elliptic to elliptic-oblong, 4–16 × 2.5–4.5 cm, apex obtuse to acute. Inflorescence 8–23 cm, stout; peduncle with 1–3 scattered, lanceolate bracts 2–5 cm; rachis 3–12

cm, densely many flowered; floral bracts lanceolate, apex acuminate, basal ones longer than flowers. Flowers fragrant, purplish red or pink, very rarely tinged with white; ovary 7–8 mm including pedicel. Dorsal sepal erect, ovate, 3–5 × 2–3.5 mm, 3-veined, apex obtuse; lateral sepals reflexed, ovate, oblique, 4–5 × 2.5–4 mm, 3-veined, margin revolute, apex obtuse. Petals straight, broadly ovate-triangular, oblique, 3–5 × 2.5–3.5 mm, 3-veined, apex obtuse; lip spreading, broadly obovate, 3.5–5.5 × 3–4.5 mm, 3-lobed at apex; lateral lobes ovate, 1–2 mm wide, apex obtuse; mid-lobe triangular, 1–2.2 mm wide, equal to or slightly larger than lateral lobes, apex obtuse to subacute; spur pendulous, slightly curved forward, 7–12 mm, equal to or exceeding ovary, slender. Column ca. 2 mm; viscidia lanceolate. Fl. May–Aug.

Forests, thickets, alpine grasslands; 2800–4100 m. SE Gansu, W Hubei, S Qinghai, S Shaanxi, W Sichuan, E and S Xizang, NW Yunnan [Bhutan, NE India, Kashmir, Nepal, Pakistan].

**3. *Gymnadenia crassinervis*** Finet, Rev. Gén. Bot. 13: 514. 1901.

短距手参 *duan ju shou shen*

Plants stout or slender, 7–20(–40) cm tall. Tubers ellipsoid, 1–2 cm, with a few slender lobes. Stem stout, with 2 or 3 tubular sheaths at base and 3–5 cauline leaves. Leaves clustered, rarely widely spaced, elliptic-oblong, 3.5–7(–11) × 0.8–2 cm, apex acute. Inflorescence 4–10(–26) cm, stout; peduncle with 1 or 2 lanceolate bracts 2–4(–5) cm; rachis 2–4(–7.5) cm, densely or laxly many flowered; floral bracts lanceolate to ovate-lanceolate, much longer than ovary, apex acuminate. Flowers pink, rarely tinged with white; ovary 5–7 mm including pedicel. Dorsal sepal erect, ovate-oblong to ovate-lanceolate, cymbiform, 2.8–3.5 × 1.2–2 mm, 3-veined, apex acute to obtuse; lateral sepals spreading, ovate-lanceolate, oblique, 3.5–4.5 × 1.5–2.2 mm, 3-veined, apex acute. Petals straight, broadly ovate, 3–4 × 1.8–2.5 mm, 2-veined, apex acute; lip spreading forward, broadly obovate, 3–3.5 × 2–2.8 mm, 3-lobed at apex; lateral lobes obovate-orbicular, 0.5–1 mm wide, apex obtuse-rounded or truncate; mid-lobe triangular, 0.8–1.5 mm wide, longer than lateral lobes, apex obtuse; spur pendulous, usually curved forward, 2–4 mm, much shorter than ovary, slightly dilated toward apex, apex obtuse. Column 0.8–1 mm; viscidia lanceolate. Fl. Jun–Jul, fr. Aug–Sep.

• *Rhododendron* thickets, crevices on rocky slopes; 2000–3800 m. W Sichuan, E and S Xizang, NW Yunnan.

- 1a. Plants short, stout, 7–20 cm tall; leaves clustered; inflorescence 4–10 cm; rachis 2–4 cm, densely many flowered ..... 3a. var. *crassinervis*  
1b. Plants slender, ca. 40 cm tall; leaves widely spaced; inflorescence ca. 26 cm; rachis ca. 7.5 cm, laxly many flowered ..... 3b. var. *elatio*r

**3a. *Gymnadenia crassinervis* var. *crassinervis***

短距手参(原变种) *duan ju shou shen* (*yuan bian zhong*)

*Hermidium chiwui* Tang & F. T. Wang.

Plants 7–20 cm tall, stout. Leaves clustered, 3.5–7 cm. Inflorescence short, 4–10 cm; rachis 2–4 cm, densely many flowered.

• *Rhododendron* thickets, crevices on rocky slopes; 2000–3800 m. W Sichuan, E and S Xizang, NW Yunnan.

**3b. *Gymnadenia crassinervis* var. *elatio*r** Tang & F. T. Wang, Bull. Fan Mem. Inst. Biol. Bot. 7: 131. 1936.

高大手参 *gao da shou shen*

Plants ca. 40 cm tall, slender. Leaves widely spaced, to 11 cm. Inflorescence elongate, ca. 26 cm; rachis ca. 7.5 cm, laxly 20-flowered.

• “Western China.”

Only the type material for this taxon has been examined. Floral features agree with the typical variety, but the habit is quite different.

**4. *Gymnadenia emeiensis*** K. Y. Lang, Acta Phytotax. Sin. 20: 182. 1982.

峨眉手参 e mei shou shen

Plants robust, 30–50 cm tall. Tubers ellipsoid, 1–3.5 cm, with 4 or 5 elongate lobes. Stem stout, with 3 or 4 tubular sheaths at base and 5 or 6 cauline leaves. Leaves widely spaced, narrowly elliptic to oblong-lanceolate, 9–11 × 2–3 cm, apex subobtuse to acuminate. Inflorescence ca. 14 cm, stout; peduncle with 2 lanceolate bracts 2–4 cm; rachis 6–7 cm, densely many flowered; floral bracts ovate-lanceolate, apex long acuminate, basal ones longer than flowers. Flowers white; ovary 8–9 mm including pedicel. Dorsal sepal erect, ovate, slightly concave, ca. 3 × 2 mm, 3-veined, apex obtuse; lateral sepals spreading, elliptic, oblique, ca. 4 × 2 mm, 3-veined, apex obtuse. Petals straight, broadly rhombic-ovate, oblique, ca. 3 × 2.5 mm, 2-veined, apex obtuse; lip spreading, rhombic-ovate, ca. 3 × 2–2.5 mm, obscurely 3-lobed at apex, apex slightly reflexed; lateral lobes shallow, rounded; mid-lobe ca. 1.5 mm wide, apex obtuse; spur pendulous, curved slightly forward, cylindrical, tapering slightly toward apex, 4–5 mm, much shorter than ovary, apex obtuse. Column ca. 1.5 mm; viscidia lanceolate. Fl. May–Jun.

- Thickets, alpine grasslands; ca. 3100 m. SW Sichuan.

**5. *Gymnadenia bicornis*** Tang & K. Y. Lang, Acta Phytotax. Sin. 16(4): 126. 1978.

角距手参 jiao ju shou shen

Plants somewhat robust, 50–70 cm tall. Tubers ellipsoid, 3–5 cm, with a few slender, elongate lobes. Stem stout, with 2 or 3 tubular sheaths at base and 6–8 cauline leaves. Leaves widely spaced, elliptic, narrowly elliptic, or lanceolate, 9–13 × 2–4 cm, apex acuminate. Inflorescence elongate, ca. 25 cm; peduncle with 2 lanceolate bracts to 5 cm; rachis 8–11.5 cm, densely many flowered; floral bracts ovate-lanceolate to lanceolate, apex acuminate, basal ones longer than flowers. Flowers pale yellowish green, relatively small; ovary 6–7 mm including pedicel. Dorsal sepal erect, broadly ovate, slightly concave, ca. 2.5 × 2 mm, 3-veined, apex obtuse; lateral sepals recurved, broadly ovate, ca. 3 × 2.3 mm, 3-veined, apex obtuse. Petals rhombic-ovate, oblique, ca. 3 × 2.3 mm, 3-veined, apex obtuse; lip rhombic-ovate, ca. 3 × 2.5 mm, almost entire; lateral lobes much reduced; mid-lobe ovate-orbicular, ca. 2 mm wide, apex obtuse; spur pendulous, slightly curved forward, 3–3.5 mm, much shorter than ovary, slender, shallowly 2-lobed at apex. Column ca. 0.8 mm. Fl. Jul–Aug.

- Shrubby slopes; 3200–3600 m. E and SE Xizang.

