

## 28. PONERORCHIS H. G. Reichenbach, *Linnaea* 25: 227. 1852.

小红门兰属 *xiao hong men lan shu*

Chen Xinqi (陈心启 Chen Sing-chi); Phillip J. Cribb, Stephan W. Gale

*Chusua* Nevski.

Herbs, terrestrial, small to medium-sized, slender. Tubers subglobose, ovoid, or ellipsoid, not divided, fleshy. Stem usually erect, terete, glabrous, with 1–3 tubular sheaths near base and 1–5 leaves above. Leaves basal or cauline, alternate or rarely subopposite, basally contracted into clasping sheath, glabrous to sparsely pubescent. Inflorescence terminal, glabrous or pubescent; rachis laxly or densely 1- to many flowered; floral bracts lanceolate to ovate. Flowers resupinate, secund or not, small to medium-sized; ovary twisted, often slightly arcuate, glabrous or pubescent. Sepals free; dorsal sepal erect, often concave; lateral sepals spreading. Petals often connivent with dorsal sepal and forming a hood; lip entire or 3- or 4-lobed, spurred at base or rarely spurless; spur usually as long as ovary. Column stout; anther erect, base firmly adnate to apex of column, with 2 parallel locules; pollinia 2, granular-farinaceous, sectile, each attached to a viscidium by a slender caudicle; each viscidium enclosed in a sticky globe, both globes enclosed in a common bursicle formed by folding of rostellar arms; stigma concave, beneath rostellum; rostellum protruding, with 2 arms; auricles 2, usually prominent, one on each side of column. Capsule erect.

About 20 species: from the Himalayas through C and E China to Korea and Japan; 13 species (ten endemic) in China; one additional species (endemic) is incompletely known.

From observations of many fresh flowers of this genus in the field, we infer that the bursicle formed by the rostellar arms is solitary but later becomes separate.

- 1a. Plants always 1-leaved; leaf basal, cordate, ovate, or elliptic; leaf adaxially often marked with purple spots, abaxially purplish red.
  - 2a. Leaf adaxially with off-white lines along principal veins; rachis 1–3-flowered; spur short, saccate, ca. 1 mm ..... 1. *P. brevicarata*
  - 2b. Leaf lacking lines along veins; rachis 2- to more than 20-flowered; spur pendulous, cylindric, 4–12 mm.
    - 3a. Inflorescence and ovary pubescent; flowers often secund; lip obtriangular-flabellate, 5–6 × 5–6 mm; spur pendulous, slightly bent forward, 4–6 mm ..... 2. *P. monophylla*
    - 3b. Inflorescence and ovary glabrous; flowers not usually secund; lip broadly oblong-ovate, 10–11 × 8–9 mm; spur horizontal, straight or slightly curved upward, occasionally slightly curved downward, 8–12 mm ..... 3. *P. limprichtii*
- 1b. Plants usually 2–5-leaved; if 1-leaved (some plants of *P. tominagae*, *P. omeishanica*, and *P. chusua*) then leaf cauline, linear, lanceolate, oblong, or elliptic; leaves green, lacking purple spots.
  - 4a. Flowers whitish, creamy white, yellow, or yellowish green.
    - 5a. Leaves basal, subopposite; rachis 1-flowered; petals broadly ovate, 8.5–15 mm; spur 12–25 mm ..... 4. *P. chrysea*
    - 5b. Leaves cauline, alternate, widely spaced, or rarely clustered near base of stem; rachis (1 or)2–8-flowered; petals ovate or narrowly ovate-lanceolate, 4.5–6.5 mm; spur 4–7 mm.
      - 6a. Stem (1–)2–6 cm; rachis (1 or)2–4-flowered; floral bracts to 12 mm, shorter than to slightly exceeding ovary; lip 8–12 mm; spur 4–5.5 mm ..... 6. *P. tominagae*
      - 6b. Stem 8–12 cm; rachis 4–8-flowered; floral bracts to 20 mm, basal ones conspicuously exceeding flowers; lip 5–6 mm; spur ca. 7 mm ..... 8. *P. omeishanica*
  - 4b. Flowers pink, rose, purplish rose, purplish red, purple, or violet, rarely white.
    - 7a. Plants 3.5–6 cm tall; stem 1.5–2 cm; leaves basal, subopposite; lip not lobed ..... 5. *P. crenulata*
    - 7b. Plants (5–)8–45 cm tall; stem (2.5–)5–23 cm; leaves cauline, alternate, widely spaced; lip 3- or 4-lobed.
      - 8a. Petals glabrous.
        - 9a. Lip broadly oblong to obovate, lobed above middle; mid-lobe oblong, square, or ovate, 1.8–3.5(–5) × 2–3.5(–6) mm, usually longer than broad ..... 7. *P. chusua*
        - 9b. Lip obtriangular to suborbicular, lobed toward apex; mid-lobe transversely oblong to ovate, 4–8 × 4–8 mm, usually broader than long ..... 10. *P. kiraishiensis*
      - 8b. Petals papillose and/or with ciliate margins.
        - 10a. Floral bracts foliaceous, 20–40 mm, conspicuously exceeding flowers ..... 9. *P. pugeensis*
        - 10b. Floral bracts to 15 mm, shorter than to slightly exceeding ovary.
          - 11a. Stem and inflorescence green; rachis 2–6-flowered; ovary and pedicel 20–22 mm, densely minutely pubescent; sepals and petals densely minutely papillose on both surfaces ..... 11. *P. sichuanica*
          - 11b. Stem and inflorescence green with purple striations, purple, or purplish with dark striations; rachis 5–20-flowered; ovary and pedicel 6–15 mm, glabrous; sepals glabrous; petals glabrous apart from ciliate margins.

- 12a. Lip oblong to obovate, 3-lobed below middle, 6–10 × 6–8 mm; lateral lobes ovate to suboblong; mid-lobe oblong to obovate-oblong, longer than broad; spur 8–12 mm ..... 12. *P. takasagomontana*
- 12b. Lip ovate-orbicular, 3-lobed near middle, 9–15 × 8–12 mm; lateral lobes transversely oblong to subsquare; mid-lobe suborbicular, usually broader than long; spur 12–20 mm ..... 13. *P. taiwanensis*

**1. *Ponerorchis brevicealcarata*** (Finet) Soó, Acta Bot. Acad. Sci. Hung. 12: 353. 1966.

短距小红门兰 duan ju xiao hong men lan

*Hemipilia brevicealcarata* Finet, Bull. Soc. Bot. France 44: 420. 1898; *Chusua brevicealcarata* (Finet) P. F. Hunt; *Gymnadenia brevicealcarata* (Finet) Finet; *Orchis brevicealcarata* (Finet) Schlechter.

Plants 5–18 cm tall. Tubers elliptic or ovoid, 5–20 mm. Stem to 2.5 cm, with 1 or 2 tubular, membranous sheaths at base, 1-leaved. Leaf basal, abaxially often purplish red, adaxially deep green with off-white lines along 5–7 principal veins and dark purple spots between them, cordate to broadly ovate, 1–3 × 0.7–2 cm, adaxially sparsely minutely papillose, base subcordate, apex acute. Inflorescence erect or slightly curved, 4–14 cm, slender, glabrous; rachis 1–3.5 cm, laxly 1–3-flowered; floral bracts broadly ovate, 4–5 × 2.5–3 mm, much shorter than ovary, apex acuminate. Flowers often secund, deep purplish red, small to medium-sized; ovary cylindrical, 10–12 mm including pedicel, slender, glabrous. Dorsal sepal erect, concave, oblong, 5–6 × 2–3 mm, 1-veined, apex obtuse; lateral sepals ovate-oblong, oblique, 6–8 × 3–4 mm, 1-veined, often with pinnate veinlets, apex obtuse. Petals erect, forming a hood with dorsal sepal, obliquely ovate, 5–6 × 3–4 mm, glabrous, 1-veined, apex obtuse; lip spreading, with dark purple spots at base, cuneate-obovate, 3-lobed above middle, 10–11 × 10–11 mm, spurred, margin entire to slightly crenulate; lateral lobes elliptic to suborbicular, 1.8–4 × 3–4 mm, usually broader than mid-lobe, apex obtuse, truncate; mid-lobe subsquare, 2–3.8 × 2.2–3.8 mm, apex obtuse-rounded, occasionally emarginate; spur saccate, short, ca. 1 mm, apex obtuse. Fl. Jun–Jul.

• Open forests, grassy slopes; 1500–3400 m. SW Sichuan, NW Yunnan.

**2. *Ponerorchis monophylla*** (Collett & Hemsley) Soó, Acta Bot. Acad. Sci. Hung. 12: 353. 1966.

毛轴小红门兰 mao zhou xiao hong men lan

*Habenaria monophylla* Collett & Hemsley, J. Linn. Soc., Bot. 28: 134. 1890; *Chusua monophylla* (Collett & Hemsley) P. F. Hunt; *Orchis geniculata* Finet; *O. monophylla* (Collett & Hemsley) Rolfe; *Peristylus monophyllus* (Collett & Hemsley) Kraenzlin; *Sirindhornia monophylla* (Collett & Hemsley) H. A. Pedersen & Suksathan.

Plants 12–25 cm tall. Tubers oblong, 10–35 mm. Stem 1–3 cm, slender, with 2 tubular, membranous sheaths at base, 1-leaved. Leaf basal, abaxially purplish red, adaxially deep green with dark purple spots, cordate, ovate, or elliptic, 3–6 × 2.5–3.5 cm, sparsely pubescent on principal veins on both surfaces, apex acute. Inflorescence erect or slightly curved, 9–19 cm, with 2 or 3 lanceolate sterile bracts, pubescent; rachis 4–10 cm,

laxly several to subdensely more than 20-flowered; floral bracts ovate-lanceolate or ovate, 5–9 mm, usually shorter than ovary, margin ciliate, apex acuminate. Flowers often secund, pinkish white or purplish rose, small to medium-sized; ovary cylindrical, 6–10 mm including pedicel, slender, pubescent. Dorsal sepal erect, oblong, concave, 3.5–5 × 2–2.5 mm, 3-veined, apex sub-obtuse; lateral sepals obliquely ovate-elliptic, 4–5 × 2–3 mm, 3-veined, apex obtuse. Petals erect, forming a hood with dorsal sepal, marked with chestnut-colored spots, suboblong, 3.5–5 × 1.5–2.5 mm, glabrous, 2-veined, apex obtuse; lip spreading, obtriangular-flabellate, 5–6 × 5–6 mm, 3-lobed above middle, spurred, disk papillose, base narrowed and cuneate; lateral lobes obliquely subsquare, 1.2–2 × 1–2 mm, apical margin minutely crenulate, apex truncate; mid-lobe subsquare, 1–1.5 × 1–1.8 mm, apex obtuse-rounded, sometimes emarginate; spur pendulous, slightly bent forward, cylindrical, 4–6 mm, much shorter than to almost as long as ovary, apex obtuse. Fl. Jun–Aug.

Forests; ca. 1200 m. C and SE Yunnan [Myanmar].

**3. *Ponerorchis limprichtii*** (Schlechter) Soó, Acta Bot. Acad. Sci. Hung. 12: 353. 1966.

华西小红门兰 hua xi xiao hong men lan

*Orchis limprichtii* Schlechter, Repert. Spec. Nov. Regni Veg. Beih. 12: 330. 1922; *Chusua hui* (Tang & F. T. Wang) P. F. Hunt; *C. limprichtii* (Schlechter) P. F. Hunt; *O. hui* Tang & F. T. Wang; *Ponerorchis hui* (Tang & F. T. Wang) Soó.

Plants 4.5–23 cm tall. Tubers oblong or ovoid, 12–30 mm. Stem 1–3 cm, with 1 or 2 (or 3) tubular, membranous sheaths at base, 1-leaved. Leaf basal, abaxially purplish green, adaxially deep green and often marked with purple spots, cordate, ovate, or elliptic, 2.8–6.5 × 1.2–4.5 cm, glabrous, apex acuminate or acute. Inflorescence erect or slightly curved, 2–17 cm, glabrous; rachis to 7 cm, laxly 2–14-flowered; floral bracts lanceolate or ovate-lanceolate, 5–15 mm, shorter than ovary, apex acuminate. Flowers not usually secund, lilac to rose-purple, medium-sized; ovary cylindrical, 10–12 mm including pedicel, slender, glabrous. Dorsal sepal erect, suboblong, concave, 6–8 × 3–3.5 mm, 1-veined, apex subacute; lateral sepals spreading, obliquely ovate, 7–9 × 3.5–4 mm, 1-veined, apex acute. Petals erect, forming a hood with dorsal sepal, ovate-cymbiform, oblique, 5–7 × ca. 3 mm, glabrous, 1-veined, apex slightly obtuse; lip spreading, broadly oblong-ovate, slightly concave, 10–11 × 8–9 mm, disk papillose, spurred, 3-lobed at middle, margin slightly undulate, tinged white at base, dotted with deep lilac; lateral lobes transversely suboblong, 2–3 × 3–5.5 mm, apex obtuse-rounded; mid-lobe subsquare, 4–5 × 3–4 mm, longer than lateral lobes, apex obtuse-rounded, sometimes slightly emarginate or shortly apiculate; spur horizontal, straight or slightly curved upward, occasionally slightly curved downward, cylindrical, 8–12 mm, slightly swollen toward apex, apex obtuse. Fl. May–Jun.

• Forests, alpine grasslands; 1400–4000 m. SE Gansu, Henan,

Shaanxi, NW Sichuan, Yunnan.

**4. *Ponerorchis chrysea*** (W. W. Smith) Soó, Acta Bot. Acad. Sci. Hung. 12: 353. 1966.

黄花小红门兰 huang hua xiao hong men lan

*Habenaria chrysea* W. W. Smith, Notes Roy. Bot. Gard. Edinburgh 13: 204. 1921; *Chusua chrysea* (W. W. Smith) P. F. Hunt; *Orchis chrysea* (W. W. Smith) Schlechter.

Plants 4–10 cm tall. Tubers subglobose, 5–10 mm in diam. Stem 1–3 cm, with 1 or 2 tubular sheaths at base, 2-leaved. Leaves basal, subopposite, green, lacking purple spots, oblong to narrowly elliptic, 2–6.5 × 0.6–1.5 cm, glabrous, apex acuminate or subobtusely. Inflorescence erect, 1–3 cm, 1-flowered, glabrous; floral bract foliaceous, sheathing, oblanceolate, 18–45 mm, base contracted, apex acute to acuminate. Flower fragrant, creamy white or yellow, medium-sized; pedicel 10–15 mm; ovary fusiform, ca. 10 mm, glabrous. Dorsal sepal erect, oblong-lanceolate, concave, 9–15 × 3.5–4.5 mm, 1-veined, apex acuminate; lateral sepals falcate-lanceolate, oblique, 9–16 × ca. 3 mm, 1-veined, apex acuminate. Petals erect, forming a loose hood with dorsal sepal, broadly ovate, oblique, 8.5–15 × 4.5–7 mm, glabrous, 3-veined, apex obtuse; lip spreading, broadly ovate-triangular, slightly concave, simple to obscurely 3-lobed, ca. 12 × 8–12 mm, slightly fleshy, thickened along midvein, spurred, margin slightly crenulate; spur pendulous, cylindrical, 12–25 mm, slightly narrowed toward acuminate apex. Fl. Aug–Sep.

Mossy rocks in forests, grassy slopes; 3400–4200 m. S and SW Xizang, NW Yunnan [Bhutan].

**5. *Ponerorchis crenulata*** Soó, Acta Bot. Acad. Sci. Hung. 12: 353. 1966.

齿缘小红门兰 chi yuan xiao hong men lan

*Orchis crenulata* Schlechter, Repert. Spec. Nov. Regni Veg. 19: 373. 1924, not Gilibert (1792); *Chusua crenulata* (Soó) P. F. Hunt; *Ponerorchis schlechteri* Perner & Y. B. Luo, nom. illeg. superfl.

Plants 3.5–6 cm tall. Tubers ellipsoid, 5–10 mm. Stem 1.5–2 cm, with 1 or 2 membranous, tubular sheaths at base, 2-leaved. Leaves basal, subopposite, green, lacking purple spots, linear-oblong, 1.3–3 × 0.2–0.6 cm, glabrous, apex acute. Inflorescence erect, 1–2 cm, 1-flowered, glabrous; floral bract linear-lanceolate to linear, 7–12 mm, exceeding ovary, apex acute. Flower purplish rose, medium-sized; pedicel 8–10 mm; ovary fusiform, 6–8 mm, slender, glabrous. Dorsal sepal erect, concave, lanceolate-oblong, 6–8 × 3–3.5 mm, 3- or 5-veined, apex obtuse; lateral sepals spreading or reflexed, ovate-lanceolate, oblique, 8–9 × 4–5 mm, 3- or 5-veined, base attenuate, apex obtuse. Petals erect, obliquely ovate, 6–7 × 3–3.5 mm, glabrous, 3-veined, apex subobtusely; lip spreading, broadly ovate to suborbicular, 6–7 × 7–8 mm, base contracted and subcordate, spurred, not lobed, margin irregularly erose-crenulate, apex rounded to slightly emarginate and apiculate at center; spur pendulous, parallel to ovary, cylindrical-conic, slightly curved, 8–9 mm, ca. as long as to slightly exceeding ovary, slightly dilated at mouth, apex obtuse. Fl. Jun.

• Forests on slopes, moist limestone rubble; 3400–3700 m. NW

Yunnan.

**6. *Ponerorchis tominagae*** (Hayata) H. J. Su & J. J. Chen, Fl. Taiwan, ed. 2, 5: 1029. 2000 [“*tominagai*”].

白花小红门兰 bai hua xiao hong men lan

*Gymnadenia tominagae* Hayata, Icon. Pl. Formosan. 6: 93. 1916; *Amitostigma tominagae* (Hayata) Schlechter; *Chusua kunihikoana* (Masamune & Fukuyama) P. F. Hunt; *Orchis kiraishiensis* Hayata f. *leucantha* Masamune; *O. kiraishiensis* var. *leucantha* (Masamune) Masamune; *O. kuanshanensis* S. S. Ying; *O. kunihikoana* Masamune & Fukuyama; *O. taolooii* S. S. Ying; *O. tominagae* (Hayata) Soó; *Ponerorchis kiraishiensis* (Hayata) Ohwi var. *leucantha* (Masamune) A. T. Hsieh; *P. kuanshanensis* (S. S. Ying) S. S. Ying; *P. kunihikoana* (Masamune & Fukuyama) Soó; *P. taolooii* (S. S. Ying) T. P. Lin.

Plants 3.5–18 cm tall. Tubers ovoid to subglobose, 5–10 × 4–9 mm. Stem green, (1–)2–6 cm, with 1 or 2 tubular sheaths at base, 1–3-leaved. Leaves cauline, alternate and widely spaced, or rarely clustered near base of stem, green, lacking purple spots, lanceolate to linear-oblong, 2–7 × 0.5–0.8 cm, glabrous, apex acute. Inflorescence erect, green, 2–10 cm, glabrous; rachis 1–2 cm, (1 or)2–4-flowered; floral bracts lanceolate to ovate-lanceolate, 5–12 × 2–3 mm, shorter than to slightly exceeding ovary, apex acuminate. Flowers secund, whitish or with purple or red dots on lip, medium-sized; ovary cylindrical-fusiform, 8–10 mm including pedicel, glabrous. Dorsal sepal erect, oblong to elliptic, 5.5–7 × 2–3 mm, 3-veined, apex obtuse or subacute; lateral sepals ovate-oblong, oblique, 7–9 × 3–4 mm, 3-veined, apex obtuse or acute. Petals erect, forming a hood with dorsal sepal, ovate, oblique, 5–6.5 × ca. 3 mm, glabrous, 3-veined, apex obtuse; lip obtriangular to obovate, 8–12 × 7–11 mm, 3- or 4-lobed above middle, margin subentire to irregularly serrate, spurred, disk pubescent on midvein, tinged greenish at base, sometimes spotted with rose; lateral lobes subtriangular to ovate, ca. 3 × 3 mm, apex obtuse or subacute; mid-lobe ovate-quadrangular, 3–5 × 4–5 mm, margin slightly undulate, apex truncate, shallowly to deeply emarginate and forming 2 lobules, often apiculate between lobules; spur pendulous, straight, cylindrical to conic-cylindrical, 4–5.5 mm, much shorter than ovary, apex obtuse. Fl. Jul–Aug.

• Mossy rocks in alpine forests, alpine grasslands, scree slopes; 2700–3800 m. Taiwan.

**7. *Ponerorchis chusua*** (D. Don) Soó, Acta Bot. Acad. Sci. Hung. 12: 352. 1966.

广布小红门兰 guang bu xiao hong men lan

*Orchis chusua* D. Don, Prodr. Fl. Nepal. 23. 1825; *Amitostigma beesianum* (W. W. Smith) Tang & F. T. Wang; *Chusua donii* Nevski; *C. nana* (King & Pantling) Pradhan; *C. pauciflora* (Lindley) P. F. Hunt; *C. pulchella* (Handel-Mazzetti) P. F. Hunt; *C. roborowskyi* (Maximowicz) P. F. Hunt var. *delavayi* (Schlechter) P. F. Hunt; *C. roborowskyi* var. *giraldiana* (Kraenzlin) P. F. Hunt; *C. roborowskyi* var. *nana* (King & Pantling) P. F. Hunt; *C. roborowskyi* var. *tenii* (Schlechter) P. F. Hunt; *C. roborowskyi* var. *unifoliata* (Schlechter) P. F. Hunt; *C. secunda* Nevski; *Gymnadenia chusua* (D. Don) Lindley; *G. chusua* var. *nana* (King & Pantling) Finet; *G. pauciflora* Lind-

ley; *Habenaria chusua* (D. Don) Benth; *Orchis beesiana* W. W. Smith; *O. chusua* var. *delavayi* (Schlechter) Soó; *O. chusua* var. *nana* King & Pantling; *O. chusua* var. *pulchella* (Handel-Mazzetti) Tang & F. T. Wang; *O. chusua* var. *tenii* (Schlechter) Soó; *O. delavayi* Schlechter; *O. girdiana* Kraenzlin; *O. mairei* H. Léveillé; *O. nana* (King & Pantling) Schlechter; *O. parvifloroides* Handel-Mazzetti; *O. pulchella* Handel-Mazzetti; *O. secunda* (Nevski) Voroschilov; *O. tenii* Schlechter; *O. unifoliata* Schlechter; *Ponerorchis beesiana* (W. W. Smith) Soó; *P. chusua* var. *delavayi* (Schlechter) Soó; *P. chusua* var. *girdiana* (Kraenzlin) Soó; *P. chusua* subsp. *nana* (King & Pantling) Soó; *P. chusua* var. *tenii* (Schlechter) Soó; *P. chusua* var. *unifoliata* (Schlechter) Soó; *P. nana* (King & Pantling) Soó; *P. pauciflora* (Lindley) Ohwi; *P. pulchella* (Handel-Mazzetti) Soó.

Plants (5–)8–45 cm tall. Tubers oblong or globose, 10–20 × ca. 10 mm. Stem (2.5–)5–23 cm, with 1–3 tubular sheaths at base, (1 or)2–5-leaved. Leaves cauline, alternate, widely spaced, green, lacking purple spots, linear, oblong-lanceolate, or elliptic, 3–15 × 0.2–3 cm, becoming smaller and bractlike above, glabrous, apex acute or acuminate. Inflorescence erect or slightly curved, 2–20 cm, glabrous; rachis 1.5–9 cm, (1 or)2–20-flowered; floral bracts lanceolate to ovate-lanceolate, 7–22 mm, lower ones foliaceous and exceeding flower, apex acuminate. Flowers often secund, pink, purplish red, or purple, medium-sized; ovary fusiform, 7–15 mm including pedicel, glabrous. Dorsal sepal erect, oblong or ovate-oblong, concave, 5–7(–8) × 2.5–4(–5) mm, 3-veined, apex subobtusate or acute; lateral sepals reflexed, ovate-lanceolate, oblique, 6–8(–9) × 3–5 mm, 3-veined, apex subobtusate to acuminate. Petals erect, forming a hood with dorsal sepal, narrowly ovate, broadly ovate, or narrowly ovate-oblong, oblique, 5–6(–7) × 3–4 mm, glabrous, 3-veined, apex obtuse; lip broadly oblong to obovate, 7–12(–15) × 7–13(–17) mm, spurred, 3- or 4-lobed above middle, margin crenulate, disk tinged white at base, marked with deep purple blotches; lobes variable; lateral lobes broadly oblong to subtriangular, falcate, 2–3(–5) × 2.5–5(–7) mm, apex obtuse or acute; mid-lobe oblong, square, or ovate, 1.8–3.5(–5) × 2–3.5(–6) mm, usually longer than broad, apex truncate to obtuse-rounded, subentire to distinctly notched and forming 2 lobules, often apiculate between 2 lobules; spur slightly pendulous or horizontal, sometimes distinctly curved upward toward apex, cylindrical to cylindrical-conic, often slightly attenuate, 7–15(–19) mm, usually slightly longer than ovary. Fl. Jun–Aug.

Forests, *Rhododendron* scrub, alpine grasslands, limestone outcrops, scree; 500–4500 m. E Gansu, Heilongjiang, Henan, SE and W Hubei, Jilin, Nei Mongol, Ningxia, E Qinghai, S Shaanxi, Sichuan, S and SE Xizang, NE and NW Yunnan [Bhutan, N India, Japan, Korea, N Myanmar, Nepal, Russia (Far East, Siberia)].

**8. *Ponerorchis omeishanica*** (Tang, F. T. Wang & K. Y. Lang) S. C. Chen, P. J. Cribb & S. W. Gale, **comb. nov.**

峨眉小红门兰 e mei xiao hong men lan

Basionym: *Orchis omeishanica* Tang, F. T. Wang & K. Y. Lang, Acta Phytotax. Sin. 18: 416. 1980.

Plants 14–22 cm tall. Tubers ovoid, 8–12 mm. Stem 8–12 cm, with 1 or 2 tubular sheaths at base, 1- or 2-leaved above

middle. Leaves cauline, alternate, widely spaced, green, lacking purple spots, narrowly oblong, oblong, or elliptic, 4.5–5 × 1.2–2.8 cm, glabrous, apex acute or shortly acuminate. Inflorescence erect, ca. 6.5 cm, with 1 foliaceous, ovate sterile bract, glabrous; rachis 2.5–3 cm, subdensely 4–8-flowered; floral bracts ovate-lanceolate, to 20 mm, basal ones conspicuously exceeding flowers, apex acuminate. Flowers pale yellowish green, small to medium-sized; ovary and pedicel fusiform, 10–14 mm, glabrous. Sepals similar, ovate-lanceolate, 6–7 × 2–2.8 mm, 3-veined, apex shortly aristate; dorsal sepal erect; lateral sepals spreading, oblique. Petals spreading, not forming a hood with dorsal sepal, narrowly ovate-lanceolate, 4.5–5 × ca. 1.8 mm, slightly shorter than sepals, margin ciliate; lip spreading, suborbicular, 5–6 × 6–7 mm, disk papillose, margin ciliate, base contracted, spurred, 3-lobed toward apex; lateral lobes triangular or rectangular, ca. 2 mm, apex obtuse, truncate; mid-lobe triangular or oblong, ca. 2 mm, apex shortly apiculate; spur pendulous, cylindrical, shorter than ovary, ca. 7 mm, apex obtuse. Fl. Jul–Aug.

• Rocky places along streams, grasslands at forest margins; ca. 2800 m. SC Sichuan (Emei Shan).

**9. *Ponerorchis pugeensis*** (K. Y. Lang) S. C. Chen, P. J. Cribb & S. W. Gale, **comb. nov.**

普格小红门兰 pu ge xiao hong men lan

Basionym: *Orchis pugeensis* K. Y. Lang, Acta Phytotax. Sin. 25: 403. 1987.

Plants ca. 30 cm tall. Tuber oblong, ca. 20 × 0.8 mm. Stem ca. 10 cm, with 2 tubular sheaths at base, 2-leaved. Leaves cauline, alternate, widely spaced, green, lacking purple spots, oblong to oblong-lanceolate, 7.5–10.5 × 2–2.7 cm, glabrous, apex acute or acuminate. Inflorescence erect or slightly curved, ca. 15 cm, glabrous; rachis ca. 7 cm, subdensely 13-flowered; floral bracts foliaceous, ovate-lanceolate, 20–40 mm, conspicuously exceeding flowers, apex acuminate. Flowers purple, medium-sized; ovary cylindrical-fusiform, 12–13 mm including pedicel, glabrous. Dorsal sepal erect, elliptic, ca. 5.5 × 2.5 mm, 3-veined, apex obtuse; lateral sepals spreading, obliquely ovate, ca. 7 × 3.5 mm, 3- or 4-veined, apex obtuse. Petals spreading, obliquely ovate, ca. 5 × 2.5 mm, inner surfaces finely papillose, 3-veined, margin ciliate, apex obtuse; lip reflexed, ovate, ca. 8 × 6 mm, thickened along midvein, disk finely papillose, margin ciliate, spurred, 3-lobed at middle; lateral lobes obliquely rhombic, falcate, ca. 2 × 2 mm, apex obtuse; mid-lobe oblong, 3.5–4 × 2–3 mm, apex acute; spur pendulous, cylindrical, ca. 10 mm, shorter than ovary, apex obtuse. Fl. Jul–Aug.

• Alpine grasslands, slopes; ca. 2800 m. SW Sichuan (Puge).

**10. *Ponerorchis kiraishiensis*** (Hayata) Ohwi, Acta Phytotax. Geobot. 5: 146. 1936.

奇莱小红门兰 qi lai xiao hong men lan

*Orchis kiraishiensis* Hayata, Icon. Pl. Formosan. 9: 116. 1920; *Chusua kiraishiensis* (Hayata) P. F. Hunt; *O. nanhutanensis* S. S. Ying.

Plants 10–18 cm tall. Tubers subglobose or ovoid, 5–10

mm. Stem pale green, 4–12 cm, with 1 or 2 tubular, membranous sheaths at base, 2- or 3-leaved. Leaves cauline, alternate, clustered to widely spaced, green, lacking purple spots, linear to linear-lanceolate, 4–5 × 0.7–0.8 cm, glabrous, apex acute or acuminate. Inflorescence erect, pale green, 4–10 cm, glabrous; rachis 1–3 cm, 1–3-flowered; floral bracts green or purple, lanceolate, 7–20 mm, lower one usually exceeding ovary, apex acuminate. Flowers purple or rose, medium-sized; ovary fusiform, 10–15 mm including pedicel, glabrous. Dorsal sepal erect, oblong, concave, 6–9 × 3–4 mm, apex acute; lateral sepals ovate-oblong, oblique, 8–11 × 3.5–5 mm, apex acute. Petals forming a loose hood with dorsal sepal, very rarely pure white, ovate-oblong, slightly oblique, 6–8 × 3–3.5 mm, glabrous, margin entire to irregularly serrate, apex obtuse; lip obtriangular to suborbicular, 12–15 × 15–16 mm, spurred, 3- or 4-lobed toward apex, disk white or pale yellow at base, spotted with purple; lateral lobes ovate or triangular, 2–4 × 2–3 mm, apex obtuse, truncate; mid-lobe transversely oblong to ovate, 4–8 × 4–8 mm, usually broader than long, apex truncate, emarginate to distinctly notched and forming 2 lobules, often apiculate between lobules; spur pendulous, cylindrical-conic, 7–13 × 2–3 mm, apex obtuse. Fl. Jul–Aug.

- Alpine grasslands, scree slopes; 3000–3900 m. Taiwan.

This species is clearly closely related to *Ponerorchis chusua* and in need of critical review.

**11. *Ponerorchis sichuanica*** (K. Y. Lang) S. C. Chen, P. J. Cribb & S. W. Gale, **comb. nov.**

四川小红门兰 si chuan xiao hong men lan

Basionym: *Orchis sichuanica* K. Y. Lang, Acta Phytotax. Sin. 25: 401. 1987.

Plants 19–32 cm tall. Tubers oblong or ellipsoid, 10–20 × 5–10 mm. Stem green, 7.5–9 cm, stout, with 2 tubular sheaths at base, 2- or 3-leaved. Leaves cauline, alternate, widely spaced, green, narrowly oblong, oblong, or ovate, lowest one 3.5–7 × 1–4 cm, becoming smaller above, glabrous, apex acute or acuminate. Inflorescence erect, green, 12–17 cm, glabrous; rachis 4.5–11 cm, 2–6-flowered; floral bracts ovate-lanceolate, to 15 mm, shorter than ovary, apex acuminate. Flowers violet, medium-sized; ovary cylindrical, 20–22 mm including pedicel, densely minutely pubescent. Sepals minutely papillose on both surfaces, margin sometimes finely ciliate; dorsal sepal erect, elliptic, 8–10 × 3–4 mm, 3-veined, apex obtuse; lateral sepals reflexed, obliquely ovate, 9–11 × ca. 5 mm, 3- or 4-veined, apex obtuse to acute. Petals erect, forming a hood with dorsal sepal, obliquely ovate, shorter than dorsal sepal, both surfaces densely minutely papillose, 3-veined, margin conspicuously ciliate, apex acute; lip reflexed, broadly obovate, 12–15 × 10–12 mm, both surfaces densely minutely papillose, spurred, margin ciliate, 3-lobed near middle; lobes variable; lateral lobes recurved, broadly ovate to transversely elliptic, 2.5–3 × 4.5–7 mm, apex obtuse-rounded or obtuse; mid-lobe oblong, square, ovate, or obovate, 3.5–6 × 2–3.8 mm, apex acute, truncate, or emarginate and sometimes apiculate at center; spur pendulous, cylindrical, stout, 18–22 × 2–3 mm, nearly as long as to slightly exceeding ovary, apex obtuse. Fl. May–Jul.

- Alpine grasslands, slopes; 2400–2500 m. W Sichuan (Baoping, Ebian).

**12. *Ponerorchis takasagomontana*** (Masamune) Ohwi, Acta Phytotax. Geobot. 5: 146. 1936 [*“takasago-montana”*].

高山小红门兰 gao shan xiao hong men lan

*Orchis takasagomontana* Masamune, Trop. Hort. 3: 45. 1933 [*“takasago-montana”*]; *Chusua takasagomontana* (Masamune) P. F. Hunt; *O. chingshuishania* S. S. Ying.

Plants 14–33 cm tall. Tubers globose or ovoid, 10–20 mm. Stem purplish, often with dark striations, 8–17 cm, with 1 or 2 tubular sheaths at base, 2–5-leaved. Leaves cauline, alternate, widely spaced, green, lacking purple spots, linear-lanceolate or oblong-lanceolate, 3–9 × 0.5–1.4 cm, becoming smaller and bractlike above, glabrous, apex acute or acuminate. Inflorescence erect, purplish, often with dark striations, 4–13 cm, glabrous; rachis 2–10 cm, 5–17-flowered; floral bracts green or purple, lanceolate, 10–15 mm, shorter than to slightly exceeding ovary, apex acuminate. Flowers pale purple or rose, rarely white, medium-sized; pedicel and ovary fusiform, 6–15 mm. Dorsal sepal ovate or elliptic, concave, 4–5 × 2–3 mm, apex acute or obtuse; lateral sepals ovate-falcate, oblique, 5–6 × 2–4 mm, apex obtuse. Petals forming a loose hood with dorsal sepal, ovate or elliptic, oblique, 4–5 × 2–3 mm, margin ciliate, apex obtuse; lip tinged pale yellow toward base and spotted with purple, oblong to obovate, 6–10 × 6–8 mm, spurred, 3-lobed below middle; lateral lobes ovate to suboblong, 2–4 × 2–3 mm, apex obtuse; mid-lobe oblong to obovate-oblong, 4–6 ×

3.5–4.5 mm, longer than narrow, ridged at base, apex truncate, entire to shallowly emarginate; spur pendulous, cylindrical, 8–12 × 2.5–3 mm, usually shorter than ovary. Fl. Apr.

• Cliffs, crevices in limestone rocks; 1500–2000 m. C and E Taiwan.

**13. *Ponerorchis taiwanensis*** (Fukuyama) Ohwi, Acta Phytotax. Geobot. 5: 146. 1936.

台湾小红门兰 tai wan xiao hong men lan

*Orchis taiwanensis* Fukuyama, Bot. Mag. (Tokyo) 49: 290. 1935; *Chusua taiwanensis* (Fukuyama) P. F. Hunt; *Orchis taitungensis* S. S. Ying; *O. taitungensis* var. *alboflorens* S. S. Ying; *Ponerorchis taitungensis* (S. S. Ying) S. S. Ying; *P. taitungensis* var. *alboflorens* (S. S. Ying) S. S. Ying.

Plants 9–25(–40) cm tall. Tubers ellipsoid or subglobose, 5–30 × 5–20 mm. Stem green with purple striations or purple, ca. 12.5 cm, with 1 or 2 tubular sheaths at base, 2–5-leaved. Leaves cauline, alternate, widely spaced, green, lacking purple spots, linear to linear-lanceolate, 4–9(–15) × 0.4–2 cm, becoming smaller and bractlike above, glabrous, apex acuminate. Inflorescence erect, green with purple striations or purple, 5–12

cm, glabrous; rachis 3–10 cm, 5–20-flowered; floral bracts erect, green or purple, lanceolate, 10–15 mm, almost as long as ovary, apex acuminate. Flowers secund, pale purple or rose, rarely white, medium-sized; ovary purple or green spotted with purple, cylindrical, 10–15 mm including pedicel, glabrous. Dorsal sepal erect, elliptic, concave, 5–7 × 2.5–4 mm, apex obtuse; lateral sepals ovate to oblong, oblique, 6–7 × 3–3.5 mm, apex obtuse. Petals erect, forming a loose hood with dorsal sepal, obliquely elliptic, 5–6 × 2.5–4 mm, margin ciliate, apex obtuse; lip ovate-orbicular, 9–15 × 8–12 mm, spurred, 3-lobed near middle, margin subentire to irregularly serrate, disk tinged white or pale yellow at base, with red or purple dots or patches; lateral lobes transversely oblong to subsquare, oblique, ca. 1.8 × 2 mm, apex obtuse, truncate; mid-lobe suborbicular, 4–5.5 × 4–6 mm, usually broader than long, margin irregularly undulate-serrate, apex obtuse or slightly emarginate; spur pendulous, cylindrical, 12–20 mm, ca. as long as to slightly exceeding ovary, inside pubescent, apex obtuse. Fl. Jul–Aug.

• Cliffs, crevices of rocks, alpine grasslands; 1500–3400 m. C and S Taiwan (Hualian, Nantou, Taidong).

#### Incompletely known species

***Ponerorchis exilis*** (Ames & Schlechter) S. C. Chen, P. J. Cribb & S. W. Gale, **comb. nov.**

细茎小红门兰 xi jing xiao hong men lan

Basionym: *Orchis exilis* Ames & Schlechter, Repert. Spec. Nov. Regni Veg. Beih. 4: 40. 1919.

Plants 20–35 cm tall. Tubers oblong. Stem ca. 10 cm, 2- or 3-leaved. Leaves cauline, alternate, widely spaced, linear to linear-ligulate, 5–10 × 0.5–0.8 cm, glabrous, apex acute. Inflorescence to 10 cm, with 1 or 2 foliaceous sterile bracts; rachis laxly 5–12-flowered; floral bracts suberect, lanceolate, nearly as long as ovary, apex acuminate. Flowers purplish red, small to medium-sized; ovary cylindrical, ca. 8 mm including pedicel, glabrous. Dorsal sepal erect, elliptic, ca. 4 mm, apex obtuse; lateral sepals reflexed, oblique, elliptic-oblong, ca. 5 mm, apex obtuse. Petals erect, forming a hood with dorsal sepal, oblong-ovate, oblique, slightly shorter than dorsal sepal, margin ciliate, apex obtuse; lip 3-lobed above middle, ca. 6.5 × 6 mm, disk minutely papillose, base broadly cuneate; lateral lobes obliquely rhombic, apex obtuse; mid-lobe spreading, ovate-triangular, larger than lateral lobes, margin subentire, apex obtuse; spur pointing backward, cylindrical, ca. 8 × 1.5 mm, ca. as long as ovary. Fl. unknown.

• C and NE Yunnan (Dongchuan, Kunming).

Although we accept this species, it is known only from the protologue; the type has not been seen by us.

