

## *Primulina duanensis* sp. nov. (Gesneriaceae) from Guangxi, China

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A new species of Gesneriaceae, *Primulina duanensis* Fang Wen & S. L. Huang is described and illustrated from Guangxi, China. It differs from *P. ronganensis* (D. Fang & Y. G. Wei) Mich. Möller & A. Weber in having broadly lanceolate bracts, being 1–3-flowered and possessing hairs on the upper part of the anthers where connected with the filaments; from *P. sclerophylla* (W. T. Wang) Yan Liu in having narrowly ovate to ovate leaf blade, leaf blade margin interrupted shallowly crenate, broadly lanceolate bracts, being 1–3-flowered and possessing hairs on the upper part of the anthers where connected with the filaments; from *P. shouchengensis* (Z. Y. Li) Z. Y. Li in having narrowly ovate to ovate leaf blade, leaf blade margin interrupted shallowly crenate, broadly lanceolate bracts and possessing hairs on the upper part of the anthers where connected with the filaments.

The family Gesneriaceae consists of about 133 genera, of which 40 occur in China (Weber et al. 2013). The genus *Primulina* Hance is a recently redefined genus of Asian Gesneriaceae and is mainly distributed in limestone areas, such as northwestern and southern China as well as northern Vietnam (Weber et al. 2011, Liang et al. 2014). Many new taxa of this genus have recently been discovered and described, such as: *P. guangxiensis* Yan Liu & W. B. Xu (Liu et al. 2011), *P. xiziae* Fang Wen, Yue Wang & G. J. Hua (Li et al. 2012), *P. purpurea* F. Wen, B. Zhao & Y. G. Wei (Wen et al. 2012), *P. guigangensis* L. Wu & Q. Zhang (Wu et al. 2012), *P. jianghuaensis* K. M. Liu & X. Z. Cai (Cai et al. 2013), *P. mabaensis* K. F. Chung & W. B. Xu (Chung et al. 2013), *P. debaoensis* Neng Jiang & Hong Li (Jiang and Li 2013), *P. bullata* S. N. Lu & Fang Wen (Lu et al. 2013), *P. huaijiensis* Z. L. Ning & J. Wang (Ning et al. 2013), etc.

In 2012, we found a flowering *Primulina* species during our field work in Du'an County, Guangxi Province, China. After thorough consultation of relevant literature (Wang et al. 1990, 1998, Wei et al. 2001, 2010, Li and Wang, 2004, Wang et al. 2011, Weber et al. 2013), we considered it to be a new species of *Primulina*. It is morphologically similar to *P. ronganensis* (D. Fang & Y. G. Wei) Mich. Möller & A. Weber, *P. sclerophylla* (W. T. Wang) Yan Liu and *P. shouchengensis* (Z. Y. Li) Z. Y. Li. The differences between the new species and similar species are described and illustrated below.

### *Primulina duanensis* Fang Wen & S. L. Huang sp. nov. (Fig. 1–2)

Differs from *P. ronganensis* (D. Fang & Y. G. Wei) Mich. Möller & A. Weber in having broadly lanceolate bracts,

being 1–3-flowered and possessing hairs on the upper part of the anthers where connected with the filaments; from *P. sclerophylla* (W. T. Wang) Yan Liu in having narrowly ovate to ovate leaf blade, leaf blade margin interrupted shallowly crenate, broadly lanceolate bracts, being 1–3-flowered and possessing hairs on the upper part of the anthers where connected with the filaments; from *P. shouchengensis* (Z. Y. Li) Z. Y. Li in having narrowly ovate to ovate leaf blade, leaf blade margin interrupted shallowly crenate, broadly lanceolate bracts and possessing hairs on the upper part of the anthers where connected with the filaments.

**Type:** China, Guangxi Zhuang Autonomous Region, Du'an County. Endemic to Guangxi, China, on moist tufa of limestone walls or in caves, 172 m a.s.l., 2 Apr 2012, Long-Fei Fu and Jian-Jun Li, 20140402 (holotype: IBK!, isotype: IBK!).

### Etymology

The specific epithet “*duanensis*” refers to Du'an County, Guangxi, China.

### Description

Perennial acaulescent herb. Rhizome cylindrical 1–8 cm long, 0.5–1.5 cm in diameter. Leaves 5–18, basal; petiole compressed, 0.5–5.0 × 0.5–1.0 cm, pubescent; leaf blade narrowly ovate to ovate, rarely elliptic, 2–8 × 1–4 cm, dark green, slightly succulent, thickly chartaceous when dried; apex acute; base attenuate; margin interrupted shallowly crenate; lateral veins 3–5 on each side of the midrib, inconspicuous adaxially and prominent abaxially. Cymes axillary, 1–5, 1–3-flowered or more; peduncle red to green, 8–15 cm long, ca 2.5 mm in diameter, densely erectly pubescent

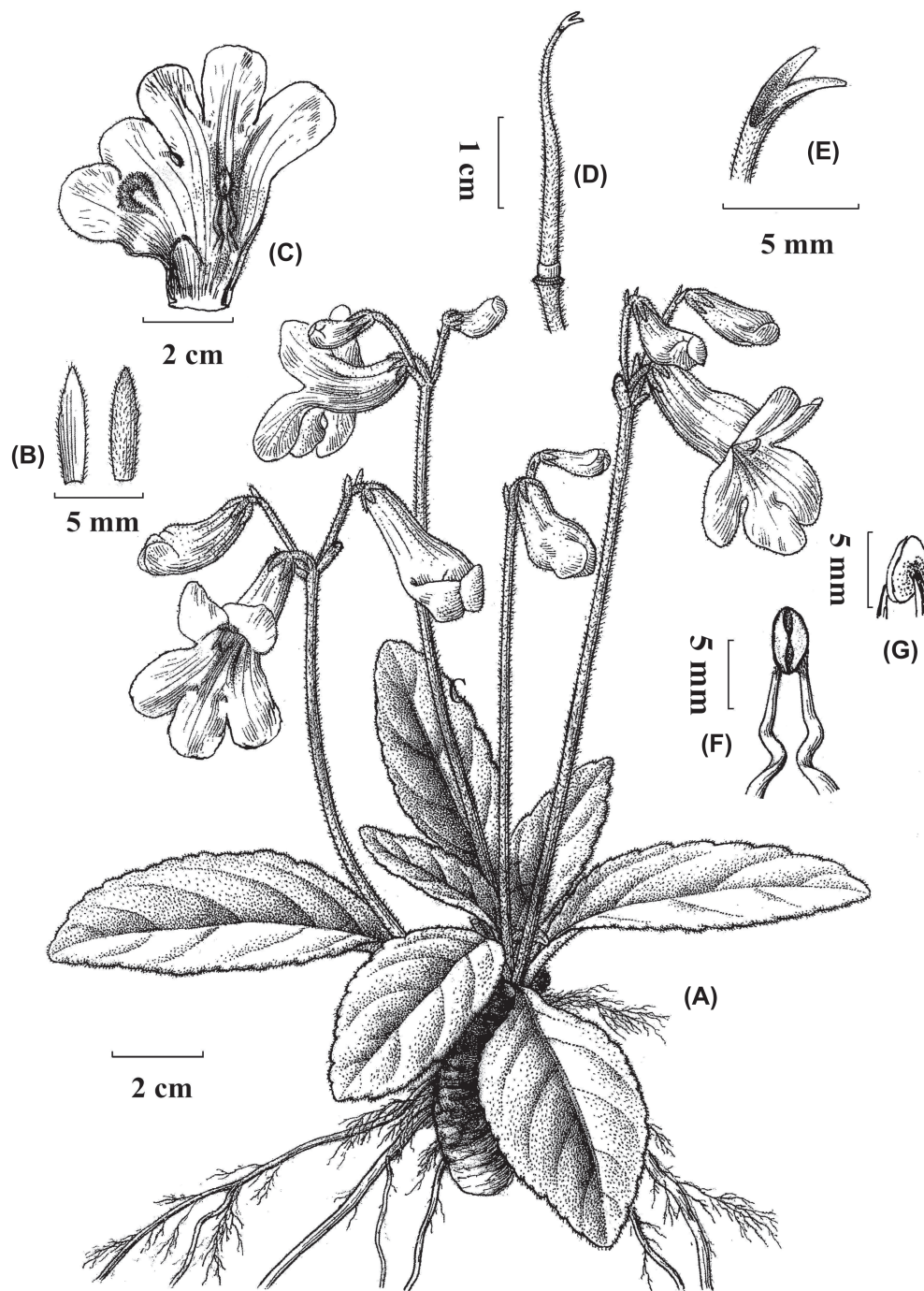


Figure 1. *Primulina duanensis* sp. nov. (A) habit, (B) bracts, (C) opened corolla exposing stamens and staminodes, (D) pistil, (E) stigma, (F) stamen, (G) lateral view of anther showing the pubescence. Drawn from the holotype by S. Q. He and F. Wen.

from 0.4–1.0 mm long, red hairs; bracts 2, opposite, broadly lanceolate, persistent till flowering,  $0.5\text{--}1.2 \times 0.15\text{--}0.3$  cm; adaxially and abaxially pubescent, with entire margin and acute apex; bracteoles 2, linear,  $2\text{--}5 \times 1\text{--}2$  mm. Pedicel 2–12 mm long, densely erect pubescent. Calyx 5-parted from the base; segments nearly equal, linear, ca 5 mm long, erect pubescent outside, glabrous inside, with entire margin and acute apex. Corolla 4.5–5.5 cm long, with orifice ca 1.3 cm in diameter, bluish purple, the colour of the throat same as corolla with two yellow stripes, the upper part of the interior

of the corolla with two brownish swollen lines, connected above; outside with sparsely reddish–purple and extremely short strigose hairs, inside glabrous; tube nearly tubular, 2.3–2.6 cm long; limb distinctly 2-lipped; adaxial lip 2-parted from the base, with lobes  $8\text{--}12 \times 10\text{--}16$  mm, oblong to elliptic; abaxial lip 3-parted from the middle, with lobes oblong (rarely ovate),  $1.2\text{--}1.8 \times 0.7\text{--}1.6$  cm. Stamens 2, adnate to ca 1.3 cm above the corolla base, anthers elliptical, 4.5–5.5 mm long, constricted at the middle, the upper part where connected with filaments with pubescence; filaments



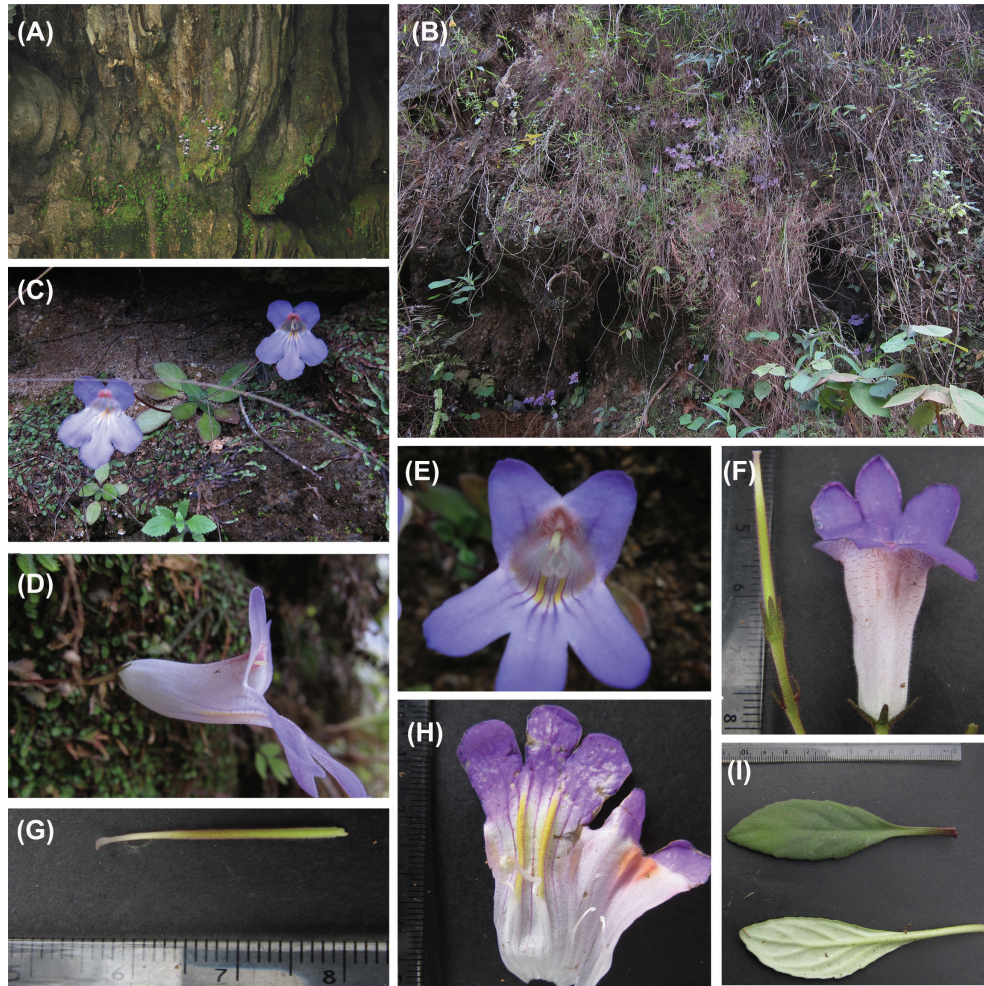


Figure 2. *Primulina duanensis* sp. nov. (A)–(B) habitat, (C) habit, (D) lateral view of corolla, (E) frontal view of corolla, (F) top view of the corolla, (G) pistil, (H) opened corolla, (I) abaxial and adaxial surfaces of leaf. Photo by L. F. Fu and F. Wen.

ca 1.3 cm long, geniculate near the base, glabrous; stamens 2, linear, 6–7 mm long, adnate to ca 0.7 cm above the corolla base, glabrous with small capitate apex; disc annular, ca 1.5 mm high. Pistil 2.4–3.0 cm long; boundary of ovary and style ambiguous. Stigma 2-lobed, 3–4 mm long. Capsule linear, 5–6 × 0.25–0.40 cm, straight.

#### Phenology

Flowering occurs in March and April and fruiting in May and June.

#### Distribution, ecology and conservation status

*Primulina duanensis* is known only from the type locality in Du'an County, Guangxi. It grows on shaded moist tufa of limestone walls or in caves, at an elevation of about 172 m a.s.l. At present, only two sites in one locality is known, with about 1000 individuals (one site about 950, another one about 50). Because they are protected from tourists and local people by their special location which is very difficult to approach, we propose that *P. duanensis* should be provisionally considered as

‘Endangered’ (EN C2a) according to IUCN red list criteria (IUCN 2012).

#### Similar species

A morphological comparison between *P. duanensis* and the three most closely similar taxa, *P. ronganensis*, *P. sclerophylla* and *P. shouchengensis*, is provided in Table 1, Fig. 2 and 3 (Wang et al. 1990, 1998, Wei et al. 2001, 2010).

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Table 1. Morphological comparison of *Primulina duanensis* sp. nov., *P. ronganensis*, *P. sclerophylla* and *P. shouchengensis*.

Character	<i>P. duanensis</i>	<i>P. ronganensis</i>	<i>P. sclerophylla</i>	<i>P. shouchengensis</i>
Leaf blade (cm)	narrowly ovate to ovate, rarely elliptic, 2–8 × 1–4	narrowly ovate to ovate, rarely elliptic, 3.5–5.0 × 1.5–2.5	elliptic or ovate, 7.5–10.0 × 4.2–5.2	oblanceolate, 2–3 × 0.5–1.0
Leaf blade margin	interrupted shallowly crenate broadly lanceolate	interrupted shallowly crenate narrowly oblong to narrowly elliptic	shallowly crenate linear-lanceolate	entire oblong linear
Bracts (cm)	0.7–1.2 × 0.2–0.3	0.4–0.7 × 0.10–0.25	ca 0.14 × 0.10	0.4–0.6 × 0.1
Number of flowers per inflorescence	1–3	4–13	5–10	1
Filaments	ca 1.3 cm long, glabrous	ca 0.4 cm long, glabrous	ca 1.3 cm, glandular puberulent	ca 1.1 cm, glabrous
Anthers	pubescent on upper part	bearded	pubescent	woolly
Flowering time	March to April	April	April to May	April to June

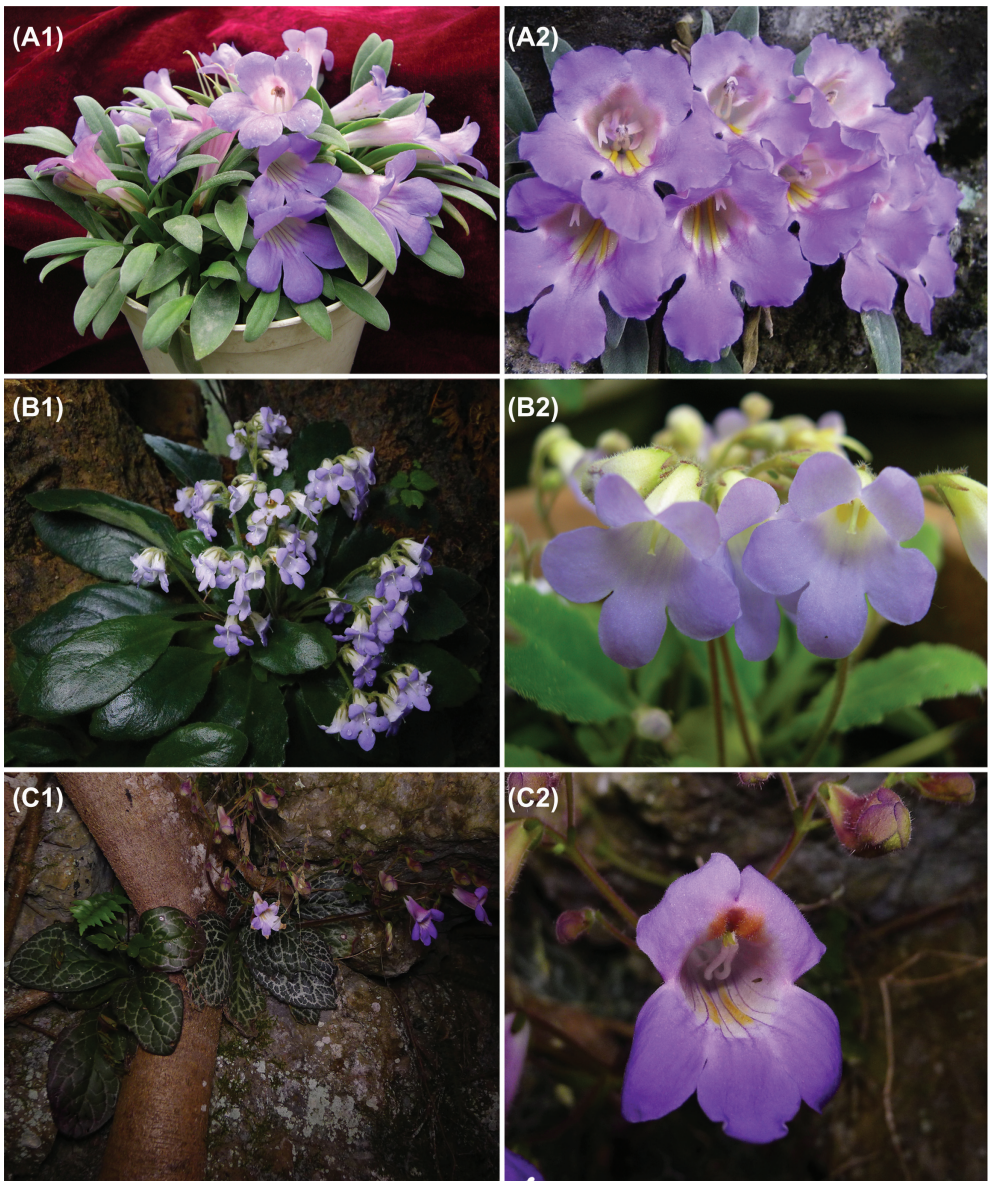


Figure 3. (A) *Primulina shouchengensis*, (B) *P. ronganensis*, (C) *P. sclerophylla*. (1) habit, (2) flower. Photo (A)–(B) by F. Wen and (C) by X. Hong.



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