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Article in *Taiwania* · November 2018

DOI: 10.6165/tai.2018.63.305

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Primulina yandongensis (Gesneriaceae), a new species from southwestern Guangxi, China

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(Manuscript received 20 July 2018; accepted 4 September 2018; online published 3 October 2018)

ABSTRACT: *Primulina yandongensis*, a new species from the limestone area of southwestern Guangxi, China is described and illustrated. It is similar to *P. pungentisepala* (W. T. Wang) Mich. Möller & A. Weber in morphology, but it is easily distinguished from the latter by some of the distinct characters in cyme, corolla, filament, staminode and phenology. The detailed information, including morphological descriptions, illustrations and diagnostic comparisons etc. are provided.

KEY WORDS: China, Gesneriaceae, Limestone flora, New species, *Primulina yandongensis*.

INTRODUCTION

The genus *Primulina* Hance (1883) of Gesneriaceae has been considered a monospecific genus which contains only *P. tabacum* Hance for long time. However, in recent years, according to the results of molecular phylogenetic studies, all species of *Chirita* section *Gibbosaccus* C. B. Clarke (1883), *Chiritopsis* W.T. Wang (1981), and two species of *Wentsaiboea* D. Fang & D.H. Qin (2004), were incorporated into *Primulina* Hance (Möller *et al.*, 2009, 2011; Liu *et al.*, 2010; Wang *et al.*, 2011; Weber *et al.*, 2011). At present, the newly defined *Primulina* is one of the largest genera of Gesneriaceae in China (Weber *et al.*, 2011; Xu *et al.*, 2012; Weber *et al.*, 2013; Möller and Clark, 2013; Ning *et al.*, 2016; Feng *et al.*, 2016) and it contracts more than 180 species (Yang *et al.*, 2017). The genus is mainly distributed in S and SW China, as well as N Vietnam (Yang and Pan, 2017) and there are 180 species are reported from China (Xu *et al.*, 2017).

A *Primulina sp.* with a few yellow flowers was collected from Yandong town, Debao County, Baise City, southwestern Guangxi, China, when we were carrying out the fourth national survey of traditional Chinese medical resources in late November 2016. We took photographs and collected specimens of the species in full bloom in the wild, in September of the following year. After consulting the relevant literatures (Weitzman *et al.*, 1997; Pan *et al.*, 2010; Weber *et al.*, 2011; Wu *et al.*, 2011; Wen *et al.*, 2012; Jiang and Li, 2013; Guo *et al.*, 2015; Lai and Wen, 2015; Wen *et al.*, 2015; Ning *et al.*, 2016; Xu *et al.*, 2017; Yang and Pan, 2017; Xin *et al.*, 2018.) and herbarium specimens, we confirmed that the *Primulina sp.* is a new and undescribed one. Hence it is described here as a new species with detailed information, including morphological descriptions, illustrations and diagnostic comparisons etc. are provided below.

TAXONOMIC TREATMENTS

Primulina yandongensis Ying Qin & Yan Liu, *sp. nov.*

燕峒報春苣苔 Figs. 1 & 2

Type: CHINA. Guangxi, Baise City, Debao County, Yandong Town, elev. 559 m, 23°13' N, 106°42' E, 26 September 2017, *Debao expedition team of Chinese traditional medicine*, 451024170926007LY (holotype: IBK!, isotypes: IBK!).

The new species similar to *P. pungentisepala* (W. T. Wang) Mich. Möller & A. Weber in morphology, but it differs from the latter by its inflorescence 11–28-flowered, yellow corolla, thinner tube, filaments sparsely glandular-puberulent, 3 staminodes pubescent and sparsely glandular-puberulent.

Perennial herb. Rhizome 1.5–10 cm long, 1 cm in diameter. Leaves basal, 14–33; petiole 1.7–4.5 × 0.4–0.5 cm, densely pubescent, upper surface fluted; leaf slightly fleshy, narrowly ovate, long elliptic to broadly ovate, 5–10.5 × 2.2–4.6 cm, margin entire or slightly crenate, both surfaces densely pubescent, base cuneate and slightly oblique, apex obtuse or slightly acute; veins slightly prominent on lower surface, lateral veins 3–4 on each side of the midrib. Cymes axillary, 2–4-branched, 3–7 inflorescences per individual, 11–28-flowered for each inflorescence; peduncle 6.5–21 cm high, pubescent and glandular-puberulent; bracts opposite, 0.8–1.2 × 0.4–0.6 cm, virescent, narrowly ovate or lanceolate, pubescent, often slightly folded, apex acuminate, margin entire. Pedicel 0.7–1.4 cm long, pubescent and glandular-puberulent. Calyx 5-parted to near the base, lobes narrow-triangular or linear-lanceolate, 3–4 × ca. 1 mm, appressed pubescent and glandular-puberulent outside, glabrous inside, light yellow-green and white or slightly pale purple. Corolla yellow, 2.5–3.5 cm long, sparsely glandular-puberulent outside; tube 1.4–1.8 cm long, 5–8 mm in diameter at the mouth, 3–5 mm in diameter at the

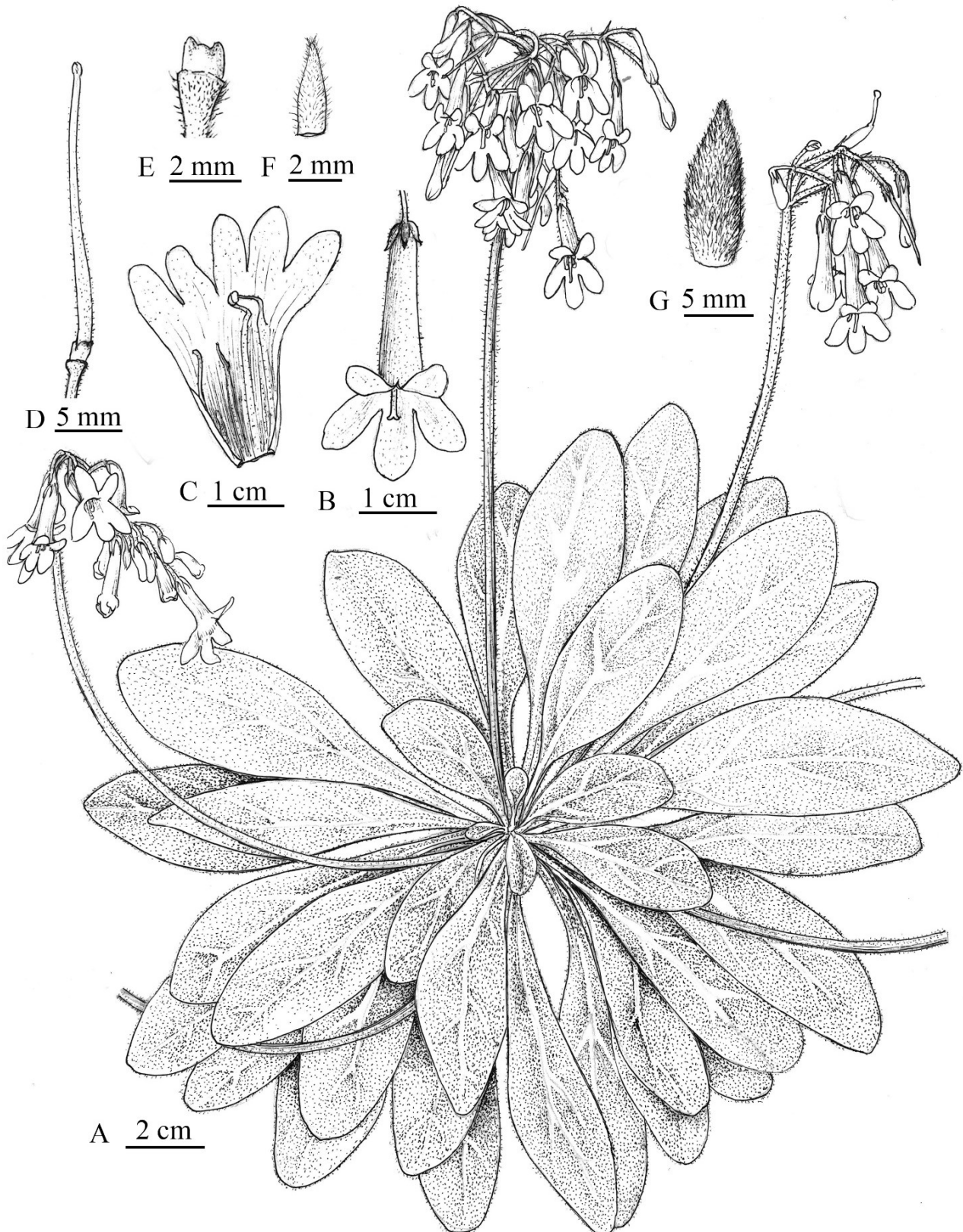


Fig. 1. *Primulina yandongensis* A: Habit. B: Flower in top view. C: Opened corolla. D: Pistil. E: Disc. F: Outside surface of calyx. G: Outside surface of bract.

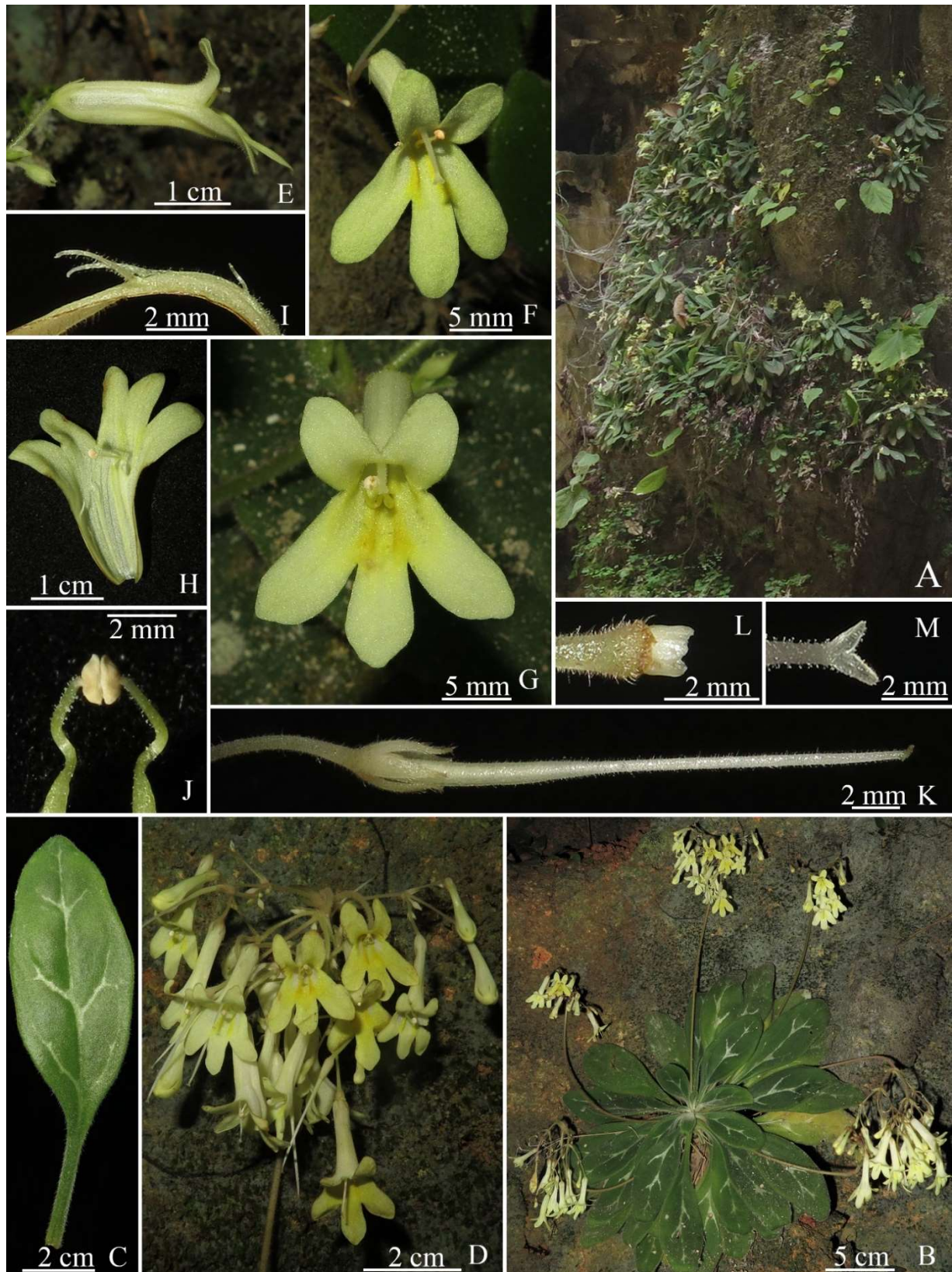


Fig. 2. *Primulina yandongensis* **A:** Habitat. **B:** Flowering habit. **C:** Upper surface leaf. **D:** Cyme. **E:** Flower in side view. **F:** Flower in oblique view. **G:** Flower in face view. **H:** Opened corolla. **I:** Staminodes. **J:** Stamens. **K:** Pistil and calyx. **L:** Disc. **M:** Stigma.

**Table 1.** Morphological comparison of *Primulina yandongensis* and *P. pungentisepala*.

Characters	<i>Primulina yandongensis</i>	<i>P. pungentisepala</i>
Leaves	5–10.5 × 2.2–4.6 cm, lateral veins 3–4 on each side of the midrib	3.5–8.5 × 1–2.5 cm, lateral veins 4–5 on each side of the midrib
Cymes	2–4-branched, 11–28-flowered	1–2-branched, 3–15-flowered
Bracts	narrowly ovate or lanceolate, 8–12 × 4–6 mm	triangular-linear, 5–13 × ca. 1.5 mm
Calyx	lobes narrow-triangular or linear-lanceolate, 3–4 × ca. 1 mm, appressed pubescent and glandular-puberulent outside, glabrous inside	lobes narrowly triangular-linear, 1.2 × 0.6 mm, pubescent outside, glabrous inside
Corolla	yellow, tube 1.4–1.8 cm long, 5–8 mm in diameter at the mouth	white to pale blue-purple, tube ca. 2.5 cm long, ca. 1 cm in diameter at the mouth
Stamens	2, filaments 5–6 mm long, yellow, sparsely glandular-puberulent	2, filaments ca. 13 mm long, white, glabrous
Staminodes	3, pubescent and glandular-puberulent, lateral ones ca. 2.9 mm long, middle one ca. 1.1 mm long	2, glabrous, 7–8 mm long
Florescence	September to November	March to May

base, slightly compressed on both sides; limb distinctly 2-lipped, sparsely glandular-puberulent, adaxial lip 2-lobed, the lobes 5.4–8 × 3.6–7 mm, oblong, the abaxial lip 3-lobed, the lobes 6.2–10 × 3.8–7 mm, oblong. Stamens 2, adnate to 1.2–1.6 cm above the corolla base, sparsely pubescent at the connecting line between the stamens and the corolla base; filaments 5–6 mm long, linear, yellow, sparsely glandular-puberulent, geniculate at 2–2.4 mm above the filament base; anthers 1.2–1.9 mm long, glabrous, reniform, close together. Staminodes 3, linear, pubescent and glandular-puberulent, lateral ones ca. 2.9 mm long, middle one ca. 1.1 mm long, sparsely pubescent at the connecting line between the staminodes and the corolla base. Disc ca. 1 mm high, cricoid, margin slightly repand, glabrous. Pistil ca. 2.2 cm long; ovary linear, densely pubescent and glandular-puberulent, 8 mm long, ca. 0.9 mm in diameter; style 1.4 cm long, linear, densely pubescent and glandular-puberulent; stigma 2-lobed, ca. 1 mm wide. Capsula not seen.

Distribution, habitat and ecology: *Primulina yandongensis* was known only from the limestone areas of Yandong Town, Debao County, Baise City, Southwestern Guangxi, China. This new species were found from the cliffs of karst tiankengs, or from the entrance of karst caves, and accompanied by *Hymenodictyon flaccidum* Wallich, *Milusa sinensis* Finet & Gagnepain, *Strophoblachia fimbriolax* Boerlage, *Trigonostemon thyrsoides* Stapf, *Excoecaria cochinchinensis* var. *viridis* (Pax & K. Hoffmann) Merrill, *Alchornea trewioides* (Benth.) Müller Argoviensis, *Rinorea bengalensis* (Wallich) Kuntze, *Cipadessa baccifera* (Roth) Miquel, *Maesa perlaris* (Loureiro) Merrill, *Tinomisium petiolare* Miers ex J. D. Hooker & Thomson, *Paphiopedilum hirsutissimum* (Lindley ex Hooker) Stein, *Begonia chingii* Irmscher, *Begonia edulis* H. Léveillé, *Pothos chinensis* (Rafinesque) Merrill, *Pollia japonica* Thunberg, *Pilea boniana* Gagnepain, *Pellionia radicans* (Siebold & Zuccarini) Weddell, *Adiantum gravesii* Hance,

Adiantum capillus-veneris Linnaeus, *Adiantum malesianum* Ghatak, *Ctenitopsis devexa* (Kunze) Ching et C. H. Wang, etc.

Phenology: Flowering from September to November.

Etymology: The epithet is derived from the type locality Yandong Town, Daobao County, Baise City, Southwestern Guangxi, China.

Distinguishing characters: *Primulina yandongensis* is morphologically close to *P. pungentisepala*. Shared characters mainly include leaf with similar shape and veins, peduncle with similar length and indumentum, bracts with similar shape and indumentum. However, *P. yandongensis* can be easily distinguished from the latter by its inflorescence 11–28-flowered, yellow corolla, tube 1.4–1.8 cm long, 5–8 mm in diameter at the mouth. More detailed comparisons between *Primulina yandongensis* and *P. pungentisepala*. are presented in Table 1.

Conservation status: Following the IUCN Red List Categories and Criteria (IUCN, 2017), *P. yandongensis* is assessed as endangered [EN B2ab (ii, iii)]. At present, three distribution points of the species is known and its estimated area of occupancy is less than 10 km². The main threat now comes from environmental damage caused by grazing, and there is a risk of poaching in the future because its distribution is close to the villages.

Additional specimens examined (paratype): CHINA. Guangxi, Baise City, Debao County, Yandong Town, elev. 640 m, 23°11'N, 106°40'E, 27 November, 2016, *Debao expedition team of Chinese traditional medicine* 451024161127027LY (IBK!).

ACKNOWLEDGEMENTS

The authors are grateful to Wen-Hong Lin from IBK for the accurate drawing, Guang-Fu Mou from IBK for his help in the wild. This study was supported by Special Program the Traditional Chinese Medicine Public Health ([2011]76) and Traditional Chinese Medicine industry research special project (201207002); grants from the Natural Science Foundation of China-Guangdong Natural Science Foundation Joint Project (U1501211).

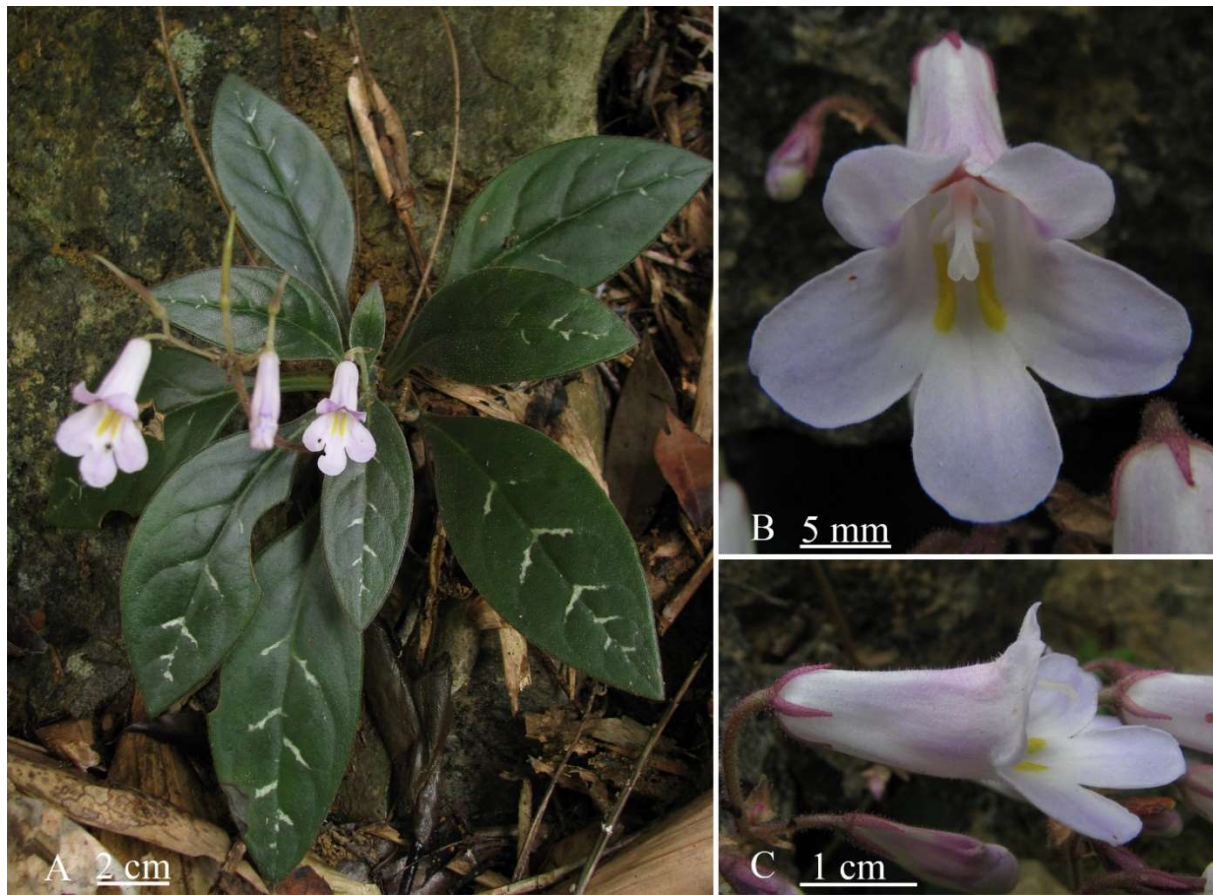


Fig. 3. *Primulina pungentisepala* A: Flowering habit. B: Flower in face view. C: Flower in side view.

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