

## **PRIMULINA HSIWENII (GESNERIACEAE), A NEW SPECIES FROM SOUTHEASTERN YUNNAN, CHINA**

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A new species of Gesneriaceae, *Primulina hsiwenii* Lei Cai, Ting Zhang & J.D.Ya, from the karst regions in southeastern Yunnan, China, is described and illustrated. Its morphological relationship with a similar species is discussed, and a detailed description, colour photographs, distribution and habitat information and an IUCN conservation assessment are provided.

**Keywords.** Flora of China, karst regions, new species, *Primulina*.

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### **Introduction**

Based on molecular and morphological evidence, the genus *Primulina* Hance was enlarged to include all species of the genus *Chiritopsis* W.T.Wang, almost all species of the genus *Chirita* Buch.-Ham. ex D.Don sect. *Gibbosaccus*, and two species of the genus *Wentsaiboea* D.Fang & D.H.Qin (Wang *et al.*, 2011; Weber *et al.*, 2011). Subsequently, several adjustments were made to the generic circumscription (Xu *et al.*, 2014; Möller *et al.*, 2016a, 2016b; Xu *et al.*, 2019) and some newly described taxa were added (Li *et al.*, 2014; Wen *et al.*, 2015; Ning *et al.*, 2016; Pan *et al.*, 2017; Yang *et al.*, 2018; Hong *et al.*, 2019; Xin *et al.*, 2020; Vu *et al.*, 2021; Su *et al.*, 2022; Zhou *et al.*, 2023). At present, the genus *Primulina* s.l. consists of 229 species and 16 varieties (GRC, 2024) and its members are mainly distributed in limestone areas of southern China, with a few species found in northern Vietnam. It is currently the second largest genus in subfamily Didymocarpoideae (Wang *et al.*, 1998; Li & Wang, 2005; Wei, 2018; Kong *et al.*, 2022; Wei *et al.*, 2022; Wen *et al.*, 2024).

In May 2021, during field investigations of the limestone areas in southeastern Yunnan, China, an unknown species in the family Gesneriaceae (without flowers) was discovered in Funing County. It was later confirmed to belong to *Primulina* s.l. based on morphological characteristics such as leaves in a basal rosette with indistinct internodes, opposite leaves, two fertile stamens and a chiritoid stigma (floral characters from plants flowering in cultivation). After further study of flowering plants in the wild in August 2021, examination of herbarium specimens at KUN and IBK and of digital images from *JSTOR Global Plants*

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(<https://plants.jstor.org/>) and the Chinese Virtual Herbarium (<https://www.cvh.ac.cn/>), and review of the related literature (Wang *et al.*, 1998; Li & Wang, 2005; Liu *et al.*, 2010; Weber *et al.*, 2011), it was concluded that the newly collected *Primulina* differed from previously described taxa and represents a species new to science. It is here described and illustrated, and a morphological comparison with closely related species is made.

### Taxonomic treatment

*Primulina hsiwenii* Lei Cai, Ting Zhang & J.D.Ya, *sp. nov.*

A species closely allied to *Primulina luochengensis* (Yan Liu & W.B.Xu) Mich.Möller & A.Weber in habit, flattened petiole, shape of leaf blade, and shape and structure of flower but mainly differing from the latter in leaf blade covered with appressed puberulent hairs adaxially, puberulent abaxially (vs pubescent on both surfaces), bracts ovate triangular, c.1 mm long (vs narrowly linear, 4–6 mm long), corolla narrow campanulate, 12–16 mm long (vs obliquely campanulate, 8–9 mm long), stamens adnate to 2–2.5 mm above base of corolla tube, filament glabrous (vs adnate to 0.5 mm above the corolla tube base, filament sparsely puberulent at base), staminodes 2, adnate to c.1 mm above base of the corolla tube, inconspicuous, less than 0.5 mm in length (vs 3, adnate to 0.5 mm above the corolla tube base, conspicuous, 0.7–1 mm long), ovary ovoid, densely puberulent, style densely glandular puberulent (vs narrowly ovoid, sparsely puberulent as style). – Type: China, Yunnan Province, Funing County, Xinhua town, Naping village, Qinghuadong, on the surfaces of rocks at entrance of limestone cave, 23°36'59.67"N, 105°34'23.82"E, altitude 728 m, in flower, 12 viii 2021, *J.D. Ya & Lei Cai* 21CS20620 (holotype KUN!, isotypes KUN!). [Figure](#).

Perennial herb, internode inconspicuous. *Rhizome* subterete, 2–5 × 0.4–0.6 cm. *Leaves* 8–15, in basal rosette; petiole pubescent, slightly concave on adaxial surface, flattened at apex, 2.5–7.5 long, c.1.8 mm wide; leaf blade elliptic or broadly ovate to subrotund, 2–4.5 × 1.2–2.5 cm, adaxially dark green, covered with appressed puberulent hairs, abaxially pale green, puberulent, base cuneate or rounded, margin entire, apex obtuse to rounded; lateral veins 2–4 pairs, inconspicuous. *Inflorescence* an axillary cyme, 2–6, 1- to 4-flowered; peduncle 5–8 cm long, densely pubescent; bracts 2, opposite, ovate triangular, c.1 mm long, outer surface pubescent; pedicel 4–12 mm long, pubescent. *Calyx* 5-merous, divided to base; lobes equal, narrowly triangular to linear-triangular, 3–3.5 × 0.5–0.9 mm, margin entire, outer surface puberulent, inner surface glabrous. *Corolla* bluish violet, narrow campanulate, 12–16 mm long, outer surface puberulent, inner surface with purple longitudinal stripes on abaxial part (three on the middle lobe, and two on the lateral lobes), glabrous; tube 8–10 mm long, base c.2 mm in diameter, mouth c.6 mm in diameter; limb distinctly 2-lipped, adaxial lip 2-lobed to near base, lobes broadly ovate to subrotund, 3–4 mm long, c.3 mm wide at base, abaxial lip 3-lobed to base, lobes ovate-oblong, 4–6 mm long, c.4 mm wide

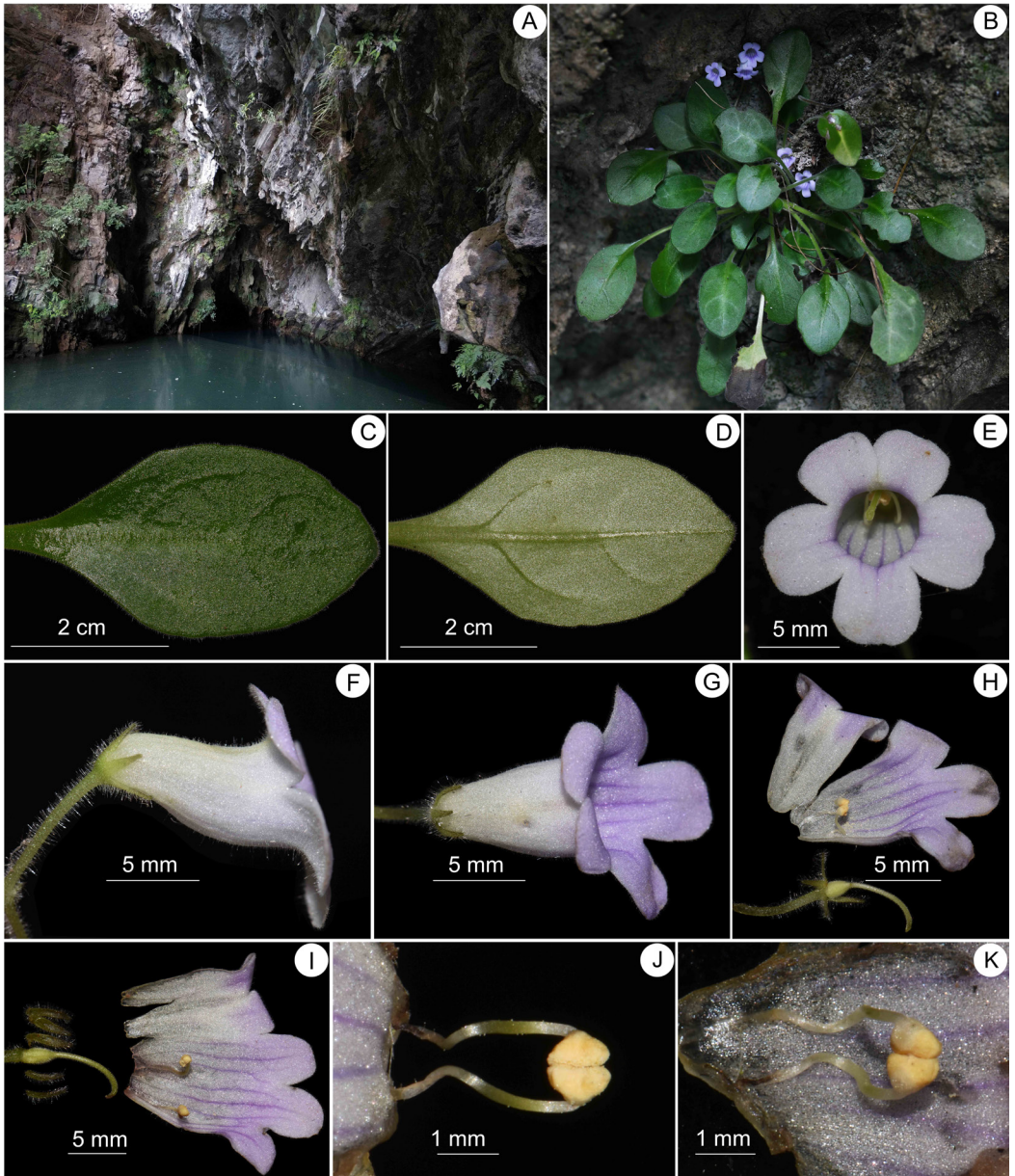


Figure. *Primulina hsiwenii* Lei Cai, Ting Zhang & J.D.Ya, sp. nov. A, Habitat; B, flowering plant; C, adaxial leaf surface; D, abaxial leaf surface; E, flower, front view; F, flower, side view; G, flower, top view; H and I, opened corolla, exposing stamens and staminodes, and pistil with calyx; J, abaxial view of adnate anthers cohering face to face; K, adaxial view of cohering anthers. Photographs: Lei Cai.

at base. *Stamens* 2, filaments linear, 2.5–3.5 mm long, adnate to 2–2.5 mm above base of corolla tube, geniculate, glabrous; anthers reniform, yellow, cohering face to face, c.1 mm long, 0.8 mm wide, glabrous; staminodes 2, adnate to c.1 mm above base of corolla tube, inconspicuous, less than 0.5 mm in length. *Disc* annular, c.0.3 mm in height, glabrous, inconspicuous. *Pistil* 7–8 mm long, ovary ovoid, 2–2.5 mm long, c.1.5 mm in diameter, densely puberulent, style 4.8–5.5 cm long, c.0.4 mm in diameter, densely glandular puberulent; stigma subhippocrepiform, c.0.5 mm long. *Capsule* unknown.

*Distribution.* Currently known only from the type locality in Funing County, Yunnan Province, China.

*Habitat and ecology.* Growing on rock surfaces at the entrance of a limestone cave at an altitude of 728 m. Flowering from June to August, fruiting unknown.

*Etymology.* The specific epithet is in memory of Prof. Li Hsi-Wen of Kunming Institute of Botany, Chinese Academy of Sciences, for his contribution to the taxonomy of the Gesneriaceae family in the *Flora of China* (Wang *et al.*, 1998).

*Vernacular name.* The Chinese name is *Xī Wén Bào Chūn Jù Tái* (锡文报春菝葜).

*Proposed IUCN conservation category.* The type locality is the only known population of this species and includes c.100 individuals. There is no information on possible threats, and the IUCN conservation category is thus considered Data Deficient (DD), following the IUCN categories and criteria (IUCN Standards and Petitions Committee, 2024). Further investigation into a possible second population in Funing County and an assessment of possible threats are needed before a formal evaluation of the species is conducted.

*Notes.* *Primulina hsiwenii* is most similar to *P. luochengensis*, which was placed in the genus *Wentsaiboea* when first published in 2010 (Liu *et al.*, 2010). It was then transferred, with another species, to *Primulina* in 2011 (Weber *et al.*, 2011). *Wentsaiboea* was previously circumscribed based on its obliquely campanulate and abaxially swollen corolla, stamens and staminodes nearly adnate to the base of the corolla tube, exerted pistil, and hippocrepiform stigma (Fang *et al.*, 2004). It is clear that this new species shares these characteristics, and thus we chose to compare it with *Primulina luochengensis* and place it in the genus *Primulina s.l.*

At present, only eight species of *Primulina s.l.* occur in Yunnan Province: *P. carnosifolia* (C.Y.Wu ex H.W.Li) Yin Z.Wang, *P. grandibracteata* (J.M.Li & Mich.Möller) Mich.Möller & A.Weber, *P. longistyla* (W.T.Wang) F.Wen, XinHong & Y.G.Wei, *P. lungzhouensis* (W.T.Wang) Mich.Möller & A.Weber, *P. maguanensis* (Z.Y.Li, H.Jiang & H.Xu) Mich.Möller & A.Weber, *P. malingheensis* X.X.Bai *et al.*, *P. malipoensis* L.H.Yang & M.Kang and *P. speluncae* (Hand.-Mazz.) Mich.Möller & A.Weber (Wang *et al.*, 1998; Xu *et al.*, 2008; Li & Möller, 2009; Yang *et al.*, 2018, Zhou *et al.*, 2023). All of them are distributed east of the Red River (Hóng

Hé River). Therefore, we speculate that the Red River may be the westernmost boundary of the distribution of the genus. Based on the diversity and clear distribution boundaries of *Primulina*, it would be worth studying the genus on a more geographical context in the future. A key to the species of *Primulina* occurring in Yunnan, China, is provided below.

### Key to the *Primulina* species of Yunnan, China




- 1a. Corolla obliquely narrow campanulate \_\_\_\_\_ *P. hsiwenii*  
 1b. Corolla tube cylindrical, funnellform to nearly tubular \_\_\_\_\_ 2
- 2a. Flowers yellow \_\_\_\_\_ *P. malipoensis*  
 2b. Flowers pink or purple \_\_\_\_\_ 3
- 3a. Leaf blade small, < 2.5 cm long, corolla tube cylindrical \_\_\_\_\_ *P. speluncae*  
 3b. Leaf blade big, > 2.5 cm long, corolla tube thin funnellform to nearly tubular \_\_\_\_\_ 4
- 4a. Bracts linear-lanceolate to narrow linear, 5–9 mm long \_\_\_\_\_ 5  
 4b. Bracts ovate to suborbicular, > 12 mm long \_\_\_\_\_ 6
- 5a. Leaf blade papery, narrowly elliptic to oblong, densely appressed puberulent  
*P. carnosifolia*
- 5b. Leaf blade herbaceous ovate to elliptic or obovate, adaxially appressed puberulent and sparsely villous \_\_\_\_\_ *P. longistyla* (= *Chirita longistyla*)
- 6a. Bracts < 2.5 cm long, cymes 1- to 3-flowered \_\_\_\_\_ *P. malingheensis*  
 6b. Bracts ≥ 2.5 cm long, cymes 3- to 10-flowered \_\_\_\_\_ 7
- 7a. Corolla 2.6–2.8 cm long, purple \_\_\_\_\_ *P. maguanensis*  
 7b. Corolla 4.5–5.3 cm long, white with dark red or light purple \_\_\_\_\_ 8
- 8a. Leaf blade margin dentate or denticulate to serrate, calyx segments lanceolate, 7–8.5 mm long \_\_\_\_\_ *P. lungzhouensis*  
 8b. Leaf blade margin irregularly serrate, calyx segments narrowly triangular, c.6 mm long  
*P. grandibracteata*

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