

Primulina lepingensis (Gesneriaceae), a new species from Jiangxi, China

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Primulina lepingensis, a new species of Gesneriaceae from Jiangxi, China, is described and illustrated. It is similar to the phylogenetically related *P. xiuningensis* in the shape of the flowers, but differs in having thin, leathery leaf blades, oblanceolate bracts, a longer corolla, a corolla tube puberulent inside below stamens, sparsely glandular pubescent stamens, 3 staminodes (2 with capitate apex, 1 without enlarged apex) and a 3-lobed stigma.

Chiritopsis was established by Wang (1981) in Gesneriaceae. It differed from *Chirita* by a smaller corolla, an ovoid ovary shorter than the style, and a smaller ellipsoid capsule equaling to or shorter than the calyx (Wang 1981, Li & Wang 2004). Recent molecular phylogenetic analyses have altered the concept of genetic delimitations among the Old World members of Gesneriaceae and demonstrated that the large genus *Chirita* was paraphyletic (Möller *et al.* 2009, 2011, Wang *et al.* 2011). Based on the phylogenetic analysis of ITS and *trnL-F* sequences, *Chiritopsis*, two *Wentsaiboea* species and all species of *Chirita* section *Gibbosaccus*, were incorporated into the thitherto monotypic *Primulina* (Weber *et al.* 2011).

In recent years, we collected living plants of Gesneriaceae from limestone areas of Guangdong, Hunan and Jiangxi, China. In September 2012, during investigations of a limestone area in northeast Jiangxi, we found a plant not in flower belonging to Gesneriaceae. Based on key

characters, such as the small plant body, small corolla, an ovoid ovary shorter than the style, and a small capsule shorter than the calyx (Wang 1981, Li & Wang 2004), it should be placed in the former genus *Chiritopsis*, now *Primulina*. First, it was identified as *P. xiuningensis* based on the morphological characteristics of leaf and plant body. In April 2013, the plants flowered in the South China Botanical Garden. We found the stigma to be 3-lobed, and that morphology was found in every individual and every flower. To further elucidate the phylogenetic affinities of this new taxon, in a recent study of genome size evolution of the genus, Kang *et al.* (2014) reconstructed a most comprehensive species-level phylogeny of this genus published to date, including 104 species based on one nuclear (ITS) and three plastid markers (*trnL-F*, *rpl32-trnL*, and *atpB-rbcL*), where *P. lepingensis* (“sp. nova 12”; Kang *et al.* 2014) was most closely related to *P. xiuningensis* and *P. juliae*. However, the morphological characteristics of *P. juliae* are

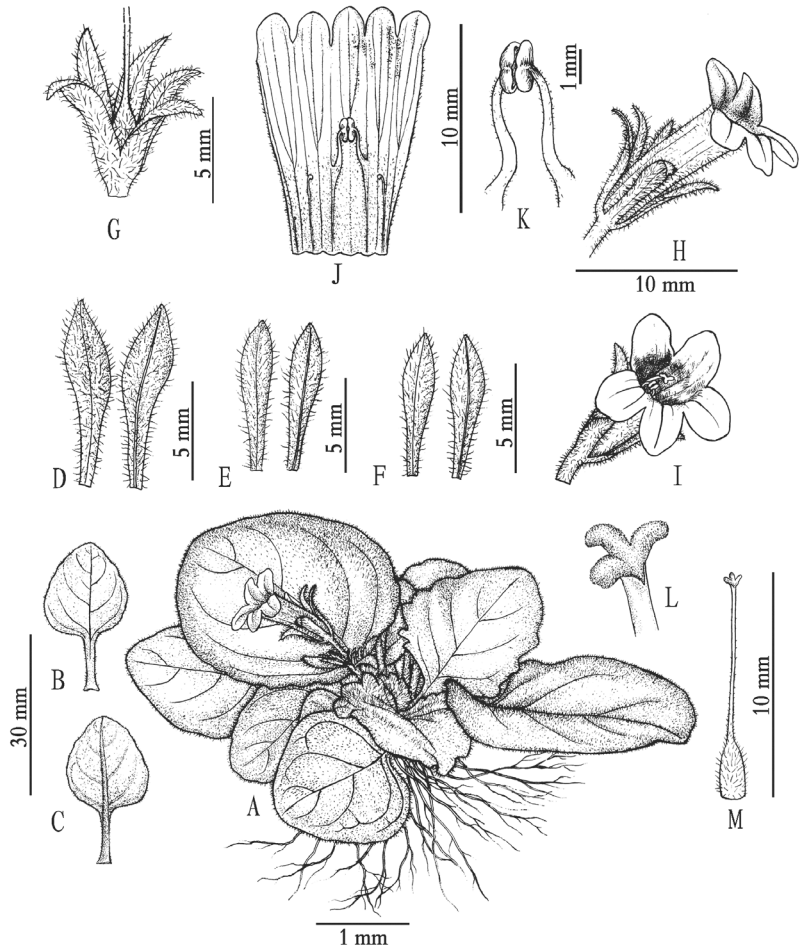


Fig. 1. *Primulina lepingensis* (drawn by Yu-Xiao Liu from the holotype). — **A:** Habit. — **B and C:** Leaf blade. — **D–F:** Bracts, adaxial and abaxial views. — **G:** Calyx and pistil. — **H and I:** Flower. — **J:** Corolla opened showing stamens and staminodes. — **K:** Stamens. — **L:** Stigma. — **M:** Pistil.

different from those of *P. xiuningensis* and *P. lepingensis*. After consulting the relevant literature (Wang 1981, Liu & Guo 1989, Wang 1990, Wang *et al.* 1998, Fang *et al.* 2004, Li & Wang 2004, Shen *et al.* 2010, Wei *et al.* 2010, Liu *et al.* 2010, Wen *et al.* 2012, Ning *et al.* 2013), as well as herbarium specimens in IBSC and IBK, we concluded that the specimens represented a new species of *Primulina*.

***Primulina lepingensis* Z.L. Ning & M. Kang, sp. nova** (Figs. 1 and 2)

TYPE: China, Jiangxi: Leping City, Hongyan Town, 29.03°N, 117.47°E, 419 m, on limestone rock face in a stony forest, 12 Sep. 2012 M. Kang *et al.* JXLP01-1 (holotype IBSC!).

ETYMOLOGY: The specific epithet is derived from the name of the type locality, Leping City, Jiangxi Province, China.

Perennial herbs. Stems short, internodes indistinct. Leaves opposite, 6–12, all basal. Petiole flat, 0.5–1.5 cm long, densely puberulent. Leaf blade thinly leathery, ovate to broadly ovate, 2–3.8 × 1.5–3.2 cm, apex obtuse to rounded, base broadly cuneate, margin repand-denticulate to nearly entire, both surfaces densely white-puberulent; lateral veins 3–4 on each side, inconspicuous. Cymes 3–5, 1–2-branched, 3–5-flowered; peduncle 1–2 cm long, densely puberulent; bracts 3, verticillate, oblanceolate, 5–8 × ca. 3 mm, margin entire, apex acute or short acuminate, densely puberulent. Pedicel 2–5 mm long, spreading puberulent. Calyx 5-lobed nearly to base, lobes oblong-lanceolate, 5–8 × 1.5–2 mm, margin entire or slightly denticulate, puberulent. Corolla yellowish, ca. 1.5 cm long, sparsely puberulent outside and below stamens inside; tube nearly cylindri-

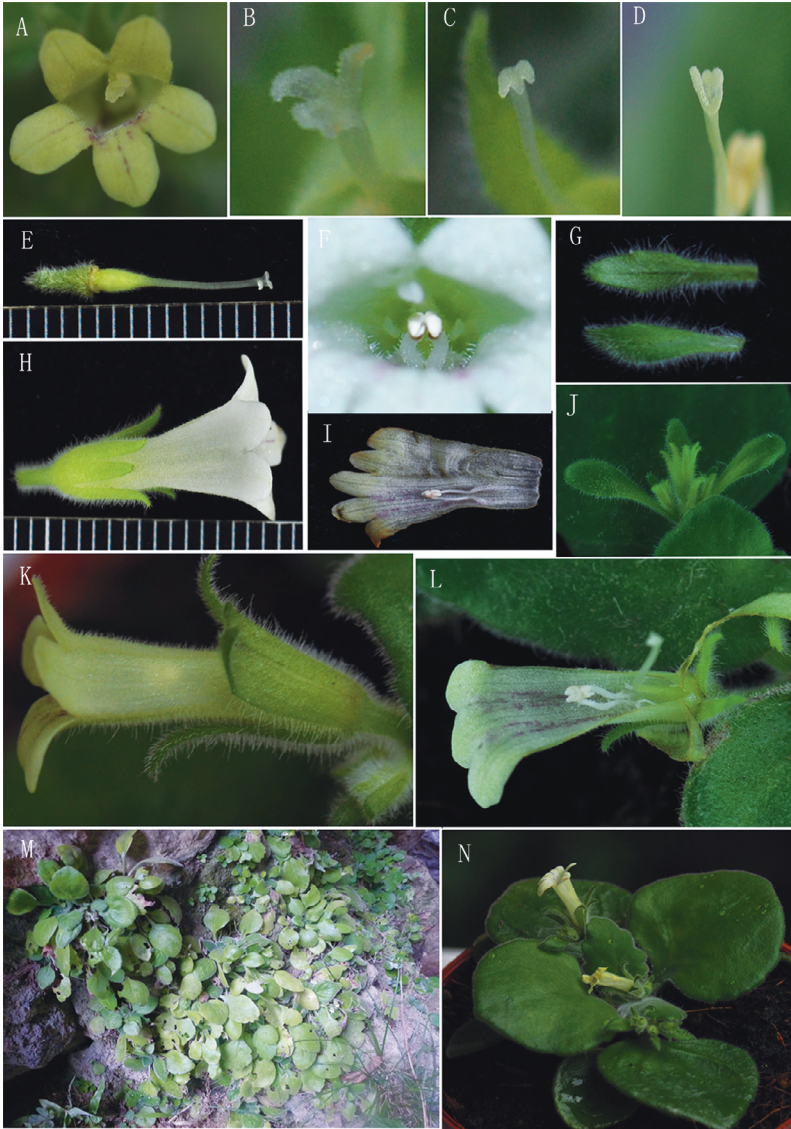


Fig. 2. *Primulina lepingensis*. — **A:** Flower, frontal view. — **B–D:** Stigma of different flowers from the same individual. — **E:** Pistil. — **F:** Corolla tube, inside view. — **G:** Bracts. — **H and K:** Flower, side view. — **I and L:** Corolla opened showing stamens and staminodes. — **J:** Inflorescence. — **M:** Habit. — **N:** Plant cultivated in SCBG.

cal, ca. 1.2 cm long, orifice ca. 5 mm in diameter, with reddish-rose spots inside; adaxial lip distinctly 2-lobed, lobes broadly ovate, 3–4 × ca. 3 mm, apex rounded; abaxial lip 3-lobed, lobes oblong, apex rounded, ca. 4 × 3 mm. Stamens 2, anterior, adnate to ca. 3 mm above base of corolla tube; filaments linear, slightly geniculate above base, ca. 4 mm long, sparsely glandular pubescent; anthers ellipsoid, ca. 1.5 mm, glabrous. Staminodes 3, glabrous; 2 posterior with a capitate apex, ca. 1 mm long, adnate to ca. 2 mm above base of corolla tube; 1 not enlarged at apex, ca. 0.2 mm long, adnate to ca. 1 mm above

base of corolla tube. Disc annular, ca. 0.5 mm in height, glabrous, margin repand. Pistil ca. 1 cm long, ovary ovoid, ca. 3 × ca. 1.5 mm, densely puberulent; style ca. 7 mm long, sparsely pubescent; stigma obtrapeziform, ca. 0.5 mm long, 3-lobed, 0.2–0.3 mm long. Capsule narrowly ovoid, ca. 5 mm long, ca. 1.5 mm in diameter, densely puberulent. Flowering in April–June, fruiting in May–July.

Primulina lepingensis is only known from the type locality near the city of Leping in north-east Jiangxi, China. It is uncommon, and grows mostly on wet rock faces in limestone areas. It

Table 1. Morphological comparison of *Primulina lepingensis* and *P. xiuningensis*.

Characters	<i>P. lepingensis</i>	<i>P. xiuningensis</i>
Leaf blade	thinly leathery, ovate to broadly ovate, base cuneate or broadly cuneate	herbaceous, ovate to broadly ovate or elliptic to nearly orbicular, base cuneate, shallowly cordate or suborbicular
Bracts	3, verticillate, oblanceolate, 5–8 × ca. 3 mm, apex acute or short acuminate	2, opposite, linear, 3–7 × 0.5–1 mm
Calyx	segments oblong-lanceolate, 6–10 × 1.5–2 mm, margin entire or slightly denticulate	segments linear to narrowly linear-lanceolate, 3–5 × 0.7–1 mm, margin entire
Corolla	ca. 1.5 cm long, sparsely puberulent below stamens inside; tube ca. 1.2 cm long, orifice ca. 5 mm in diameter; adaxial lip lobes broadly ovate, 3–4 × ca. 3 mm; abaxial lip lobes oblong, ca. 4 × ca. 3 mm	ca. 1.2 cm long, glabrous inside; tube ca. 0.9 cm long, orifice ca. 4 mm in diameter; adaxial lip lobes ovate, ca. 3 mm long; adaxial lip lobes ovate, ca. 2 mm long; abaxial lip lobes ovate, ca. 2 mm long
Stamens	filaments sparsely puberulent,	filaments glabrous
Staminodes	3, of which 2 ca. 1 mm long and with capitate apex, 1 ca. 0.2 mm long and without capitate apex	2, both ca. 0.5 mm long, apex not capitate
Stigma	3-lobed	2-lobed

is similar to *P. xiuningensis* in the shape, corolla color and size of the flowers. It can be distinguished from *P. xiuningensis* by the characters given in Table 1.

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References

- Li Z.Y. & Wang Y.Z. 2004: [*Plants of Gesneriaceae in China*]. — Henan Science and Technology Publishing House, Zhengzhou. [In Chinese].
- Liu X.L. & Guo X.H. 1989: A new species of *Chiritopsis* from Anhui. — *Bulletin of Botanical Research* 9: 51–54.
- Kang M., Tao J.J., Wang J., Ren C., Qi Q.W., Xiang Q.Y. & Huang H.W. 2014: Adaptive and nonadaptive genome size evolution in Karst endemic flora of China. — *New Phytologist* 202: 1371–1381.
- Möller M., Forrest A., Wei Y.G. & Weber A. 2011: A molecular phylogenetic assessment of the advanced Asiatic and Malaysian didymocaroid Gesneriaceae with focus on non-monophyletic and monotypic genera. — *Plant Systematics and Evolution* 292: 223–248.
- Ning Z.L., Li G.F., Wang J., Smith J.F., Rasolonjatovo H. & Kang M. 2013: *Primulina huaijiensis* (Gesneriaceae), a new species from Guangdong, China. — *Annales Botanici Fennici* 50: 119–122.
- Shen R.J., Lin S.S., Yu Y., Cui D.F. & Liao W.B. 2010: *Chiritopsis danxiaensis* sp. nov. (Gesneriaceae) from Mount Danxiashan, south China. — *Nordic Journal of Botany* 28: 728–732.
- Wang W.T. 1981: *Quinque genera nova Gesneriacearum e Sina*. — *Bulletin of Botanical Research* 1: 21–51.
- Wang W.T. 1990: [*Chiritopsis* W. T. Wang]. — In: Wang W.T., Pan K.Y. & Li Z.Y. (eds.), *Flora Reipublicae Popularis Sinicae*, vol. 69: 409–418. Science Press, Beijing. [In Chinese].
- Wang W.T., Pan K.Y., Li Z.Y., Weitman A.L. & Skog L.E. 1998: Gesneriaceae. — In: Wu Z.Y. & Raven P.H. (eds.), *Flora of China*, vol. 18: 345–348. Science Press, Beijing & Missouri Botanical Garden Press, Saint Louis.
- Wang Y.Z., Mao R.B., Liu Y., Li J.M., Dong Y., Li Z.Y. & Smith J.F. 2011: Phylogenetic reconstruction of *Chirita* and allies (Gesneriaceae) with taxonomic treatments. — *Journal of Systematics and Evolution* 49: 50–64.
- Weber A., Middleton D.J., Forrest A., Kiew R., Lim C.L., Rafidah A.R., Sontag S., Triboun P., Wei Y.G., Yao T.L. & Möller M. 2011: Molecular systematics and remodeling of *Chirita* and associated genera (Gesneriaceae). — *Taxon* 60: 767–790.
- Wei Y.G., Wen F., Möller M., Monro A., Zhang Q., Gao Q., Mou H.F., Zhong S.H. & Cui C. 2010: *Gesneriaceae of South China*: 492–527. Guangxi Sciences and Technology Publishing House, Nanning. [In Chinese and English].