Taiwania 70(4): 639–645, **2025**
DOI: 10.6165/tai.2025.70.639

Primulina longanica sp. nov. (Gesneriaceae) from a limestone area of Guangxi, China

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(Manuscript received 18 March 2025; Accepted 9 August 2025; Online published 8 September 2025)

ABSTRACT: *Primulina longanica* F.Wen & W.C.Chou, a new species of Gesneriaceae endemic to Guangxi, China, is described and illustrated. The new species is morphologically similar to *P. yangshuoensis* F.Wen & Y.G.Wei, but differs in several key characteristics, including the presence of stolons, indumentum of petiole, peduncle, filament, ovary, and style, bract shape, and corolla length. The species is currently known only from its type locality, in Long'an County, Guangxi, where it grows on limestone cliffs in a subtropical monsoon climate area. Due to its limited distribution and over-collection for ornamental purposes, *P. longanica* is provisionally assessed as Critically Endangered (CR) according to the IUCN Red List Categories and Criteria.

KEY WORDS: Flora of Guangxi, New taxon, *Primulina yangshuoensis*, Taxonomy.

INTRODUCTION

The genus, *Primulina* Hance (1883), is one of the most species-rich genera within Gesneriaceae in China. As of the end of 2024, approximately 240 species have been documented (GRC, 2025; IPNI, 2025; POWO, 2025, continuously updated). This genus is currently known to occur only in China and Vietnam, ranging from southern, southwestern, and eastern China to north-central Vietnam (Hong *et al*., 2020). It is particularly concentrated in limestone areas and Danxia landforms, with many species restricted to single to few caves or isolated limestone hill systems (Xu *et al*., 2021). This has led Chinese botanists to describe the distribution pattern of this genus with phrases such as "one hill, one species," "one valley, one species," and "one cave, one species" (Monro *et al*., 2018; Wei, 2018, 2023; Fu *et al*., 2022; Lai *et al*., 2025). Among the 45 genera currently known to be distributed in China, *Primulina* can be distinguished from other genera in the family by the following combination of morphological characteristics: plants typically possess rhizomes that may be long or short, conspicuous or inconspicuous; leaves are usually arranged in a basal rosette or clustered at the apex of the rhizome, mostly opposite but occasionally in whorls of three; the calyx is almost always split to the base with lobes usually nearly equal in length; the corolla is primarily funnel-shaped or tubular (only the type species is salverform, at present); there are two fertile stamens, with anthers often cohering face to face; and the stigma is tongue-shaped and of the chiritoid type (Weber *et al*., 2011, 2020).

In 2021, Mr. Chou, Wei-Chuen, one of the authors, discovered an unknown *Primulina* species in Long'an County, Guangxi, during a joint field survey with Mr. Lan Yu-Hua, a Gesneriaceae enthusiast. This unknown plant conformed to all the characteristics of the aforementioned *Primulina* plants, yet different. Mr. Chou and Mr. Lan introduced the species back to private nurseries in Liuzhou City and Long'an County, Guangxi for cultivation, and promptly sent some live plants to the Nursery of the National Gesneriaceae Germplasm Resources Bank of GXIB (NGGRB) and the Gesneriad Conservation Center of China (GCCC) for cultivation. From 2022 to 2024, this plant bloomed for three consecutive years. The authors found that leaves of the unknown species closely resembles *P. yangshuoensis* Y.G.Wei & F.Wen, but the latter is only found in Yangshuo County, Guangxi, China (Wen *et al*., 2012). Through further examination of specimens and consultation of relevant literature (Wang *et al*., 1998; Wei *et al*., 2010), especially the verification and comparison with the new *Primulina* taxa published in the past 20 years (e.g. Cai *et al*., 2024; Chen *et al*., 2024a,b; Deng *et al*., 2024a; Ding *et al*., 2024; Ge *et al*., 2024; Ma *et al*., 2024; Mai *et al*., 2024a,b; Tang *et al*., 2024; Zhang *et al*., 2024; Gu *et al*., 2025, Liu *et al*., 2025,), the results showed that it did not match any reported *Primulina* species. Therefore, we describe it here as a new species, named as *P. longanica*.

Table 1. Main morphological comparison of ***Primulina longanica*** and ***P. yangshuoensis***

Characters	P. longanica	P. yangshuoensis*
Stolon	conspicuous	lacking
Petiole indumentum	densely white villous	papillose-hispid
Leaf blade		
shape	elliptic to broadly ovate	broadly ovate-round, subround or round
size	1.2–3.4 × 0.8–2.5 cm	3.5–6.5 × 2–4.5 cm
indumentum	densely villous on both surfaces	densely erect semitransparent or white multicellular papillose-hispid on both surfaces
Lateral veins number	4–5	2–3
Peduncle indumentum	sparsely pubescent	pilose
Bracts shape	oblong	lanceolate or subulate
Corolla length	ca. 1.4 cm long	2–3 cm long
Filament indumentum	parsely glandular pubescent	sparsely puberulous
Ovary indumentum	puberulent and glandular puberulent	pubescent
Style indumentum	glandular pubescent	puberulent

*Morphological characteristics followed the protologue (Wen *et al*., 2012), type specimens and own observation from living collection.

MATERIALS AND METHODS

About ten living plants were collected during a fieldwork in Dingdang Town, Long'an County, Guangxi Zhuang Autonomous Region, China, in April 2021, and then cultivated in the nurseries of NGGRB and GCCC, Guilin City. Over the past two years of observation during the flowering period, the flowering time of this species has been further confirmed. As two dried specimens may shrink due to dehydration, the description is based on living plants observed in their natural flowering state in the wild. The dimensions of each organ and part are derived from the average of 15 randomly selected individuals flowering in the wild. Due to the large size of the plants, measurements were taken using a ruler and vernier caliper. Terminology follows Beentje (2016), Harris and Harris (2006), Hickey and King (2000). Abbreviations for herbarium names follow 'Index Herbariorum' (Thiers, continuously updated).

TAXONOMIC TREATMENTS

Primulina longanica F.Wen & W.C.Chou, ***sp. nov.***

隆安報春苣苔 **Figs 1 & 2**

***Type*:** CHINA. Guangxi Zhuang Autonomous Region: Nanning City, Long'an County, Dingdang Town, on rocks of limestone hills, 23°11'N, 107°55'E, elev. ca. 187 m, 9 November 2024 (fl.), *Wei-Chuen Chou 241109-01* (Holotype: IBK!; Isotype: IBK!).

***Diagnosis*:** *Primulina longanica* is similar to *P. yangshuoensis*, especially in its densely numerous, rosulate, and prominently white-hairy leaves on the adaxial surface, but it can be distinguished from the latter by the presence of its stolons (existing in *P. longanica vs.* lacking in *P. yangshuoensis*, the following in the same order); petiole, peduncle, filament, ovary and style indumentum (densely white villous *vs*. papillose-hispid; sparsely pubescent *vs*. pilose; sparsely glandular pubescent *vs*. sparsely puberulous; puberulent and glandular puberulent *vs*. pubescent; glandular pubescent *vs*. puberulent); bracts shape (oblong *vs*. lanceolate or subulate); corolla length (ca. 1.4 cm long *vs*. 2–3 cm long).

***Description*:** Perennial herb. **Rhizome** inconspicuous, if existing, usually conical, ca. 5 mm long, ca. 2 mm in diam., usually numerous fibrous at nodes and bottom, often producing short stolons (ca. 3 cm long) in the leaf axils and forming seedlings at the tips for clonal growth. **Leaves** rosette, 15–21 leaves or more, all basal, obviously petiolate when mature and inconspicuous when young. **Petiole** 0.9–1.7 cm long when mature, ca. 2.5 mm in diam., light green, densely white villous. **Leaf blade** pale green, elliptic to broadly ovate, 1.2–3.4 × 0.8–2.5 cm, more or less fleshy and thickly herbaceous when dried, margin entire, apex acute to obtuse, densely villous on both surfaces; lateral veins 4–5 on either side of midrib, very inconspicuous adaxially, conspicuously prominent abaxially. **Cymes** 2–6, rarely 1, axillary, usually solitary (namely 1-flowered) and occasionally 2-flowered per cyme; **Peduncle** 4.5–7.5 cm long, sparely pubescent. **Bracts** 2, opposite, inconspicuous, pale green, oblong, ca. 1.5 mm long, ca. 0.4 mm wide., sparsely villous abaxially, glabrous adaxially. **Pedicel** ca. 5 mm long, ca. 0.5 mm in diam., densely pubescent and glandular-puberulent. **Calyx** 5-lobed nearly to base, lobes ca. 2 mm long, ca. 0.8 mm wide at base, lanceolate, all nearly equal, abaxially densely pubescent, adaxially glabrous, margin entire. **Corolla** campaniform, zygomorphic, bilabiate, ca. 1.4 cm long, pale blue, with 2 yellow stripes inside the throat, outside pubescent and glandular-pubescent, inside glabrous; corolla tube ca. 8 mm long, corolla throat not constricted, ca. 6 mm in diam., white; adaxial lip 2-parted to the middle, lobes broadly ovate, apex obtuse, ca. 5 × 7 mm, abaxial lip 3-parted nearly to base, lobes ovate to elliptic, apex obtuse, lateral ones ca. 5 × 5 mm, middle one ca. 4 × 4 mm. **Stamens** 2, ca. 10 mm long, adnate to 2 mm above the corolla tube base; **filaments** ca. 9 mm

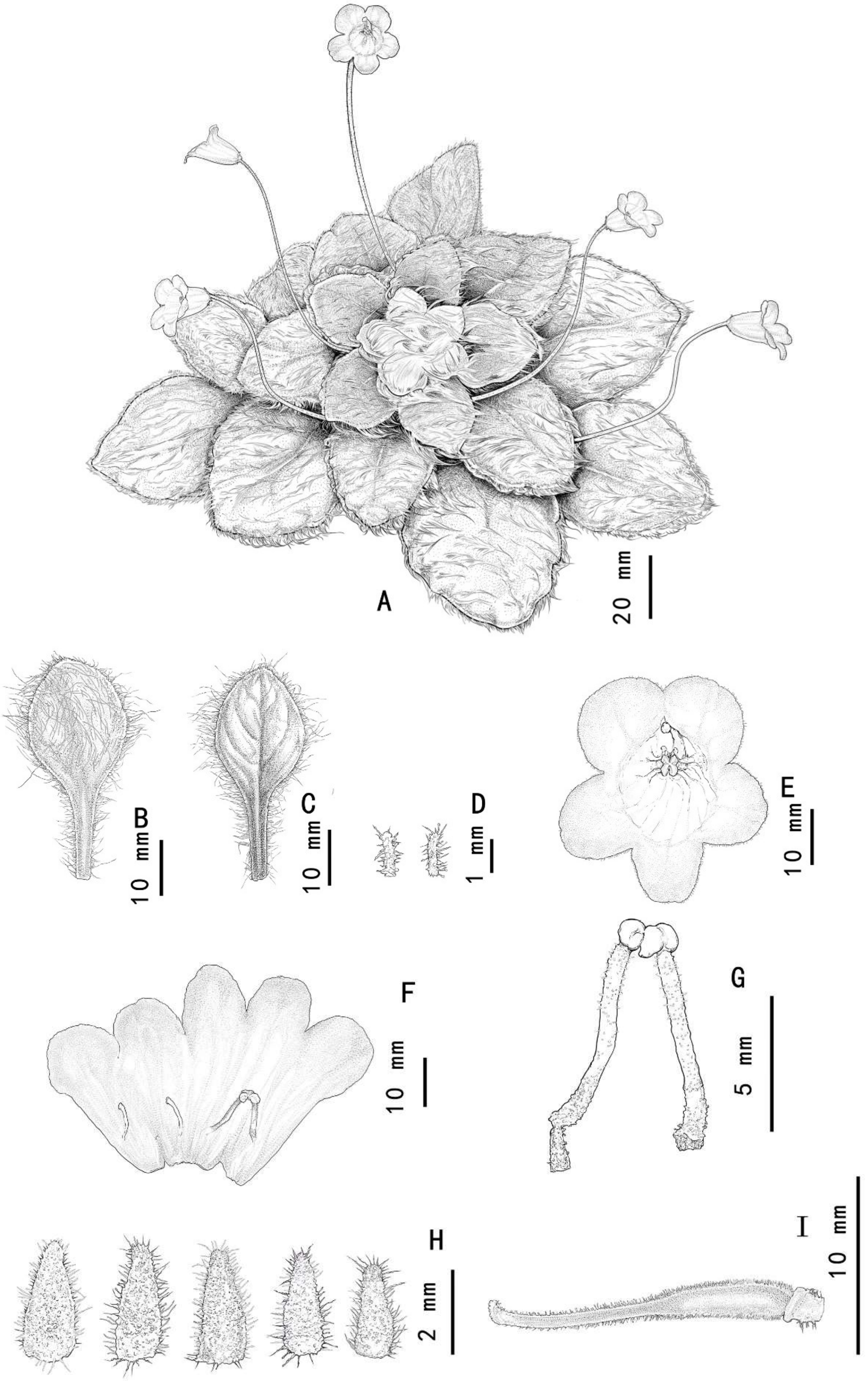

Fig 1. ***Primulina longanica*** F.Wen & W.C.Chou sp. nov. **A.** Habit. **B.** The abaxial surface of leaf. **C.** The adaxial surface of leaf. **D.** The abaxial surfaces of bracts. **E.** The frontal view of corolla. **F.** Opened corolla for showing stamens and staminodes. **G.** Stamens (Anthers and filaments). **H.** The abaxial surfaces of calyx lobes. **I.** Pistil and disc (Drawing by Di Hu).

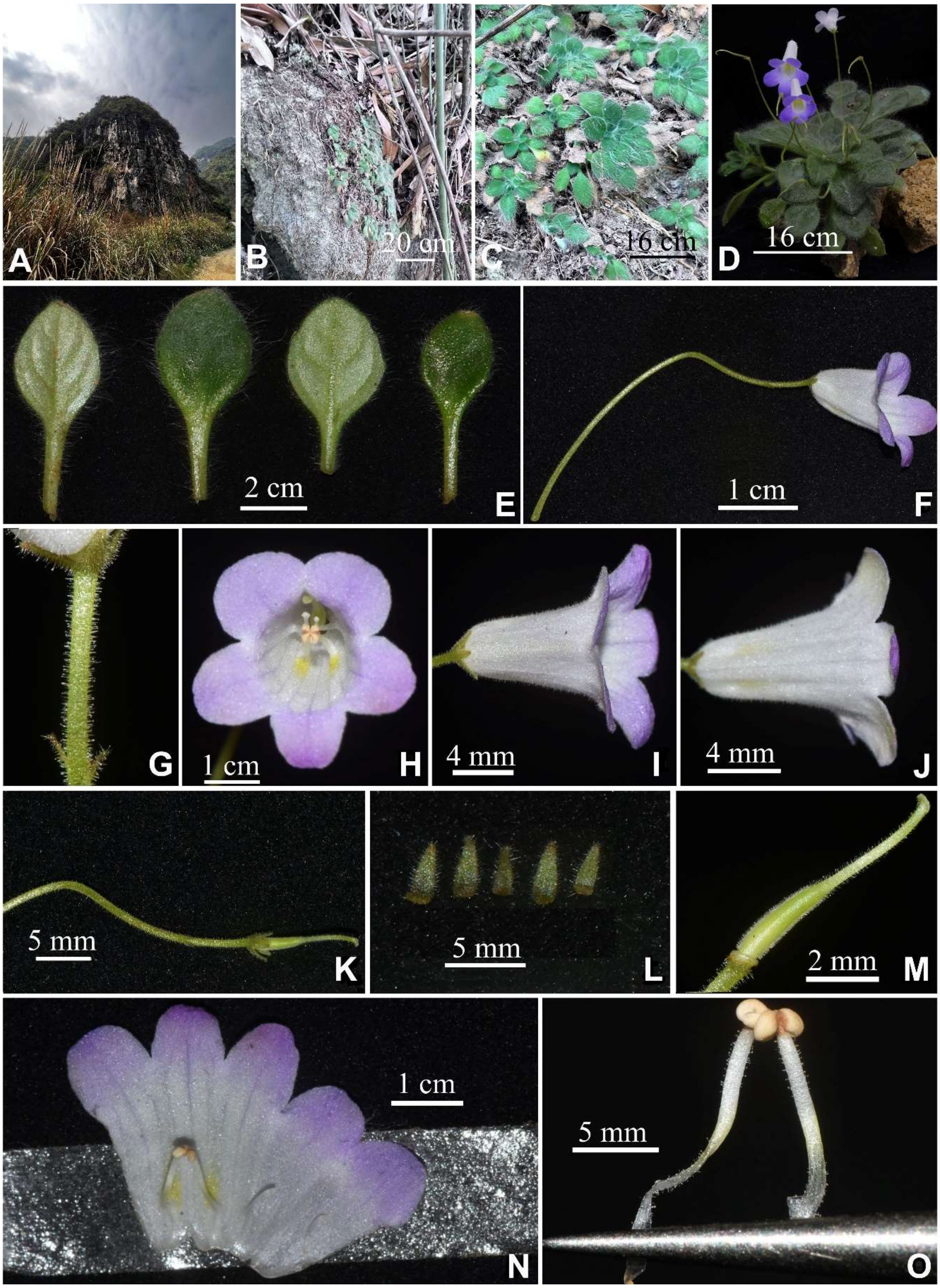

Fig 2. Photographs of ***Primulina longanica*** F.Wen & W.C.Chou sp. nov. **A.** Natural habitat. **B.** Habit (population, and plants grow on the limestone cliff). **C.** The close view of plants. **D.** The flowering plant with stolons (Photographed by Fang Wen and Wen-Qin Ma). **E.** The abaxial and adaxial surfaces of leaves. **F.** Cyme with single flower. **G.** Bracts and pedicel. **H.** The frontal view of corolla. **I.** The top view of corolla. **J.** The upward view of corolla. **K.** The peduncle, pedicle, calyx and pistil without corolla. **L.** The abaxial surfaces of calyx lobes. **M.** Pistil without corolla. **N.** Opened corolla. **O.** Stamens. (Photographed by De-Chang Meng and Fang Wen).

long, white, geniculate near the base, sparsely glandular pubescent; **anthers** ca. 1 mm long, pale yellow, reniform, constricted near the middle, glabrous. **Staminodes** 3, glabrous, adnate to ca. 0.5 mm above the corolla tube base, lateral ones ca. 5 mm long, linear, incurved, apex capitate, the central one inconspicuous, punctiform. **Disc** annular, ca. 0.8 mm in height. **Pistil** ca. 8 mm long; ovary ca. 4 mm long, ca. 1 mm in diameter, densely puberulent and glandular puberulent; **style** ca. 4 mm long, 0.5 mm in diam., glandular pubescent; **stigma** elliptical, inconspicuously 2-lobed, or stigma apex slightly sunken, ca. 0.6 mm long, ca. 0.4 mm wide, translucent. **Capsule** unseen.

***Phenology*:** The natural flowering period of this species is from August to September. Based on the fruiting patterns of *Primulina* species, their capsules typically mature 2 to 3 months after flowering, so we infer that this species' fruiting period should be from approximately October to November.

***Etymology*:** The specific epithet of this new species, "*longanica*", is derived from the type locality where this species is found. The type locality is situated in the limestone areas of Long'an County in Guangxi.

***Distribution and ecology*:** The type locality of this species, Long'an County, belongs to the subtropical monsoon climate, with an average annual temperature of about 21–23℃. The summers are hot, with the highest temperature reaching above 35℃, and the winters are mild, with the lowest temperature usually between 5–10℃. The annual precipitation is about 1200–1500 mm, with the rainy season concentrated from April to September, accounting for more than 70% of the annual precipitation. Drought periods of 3 months or more often occur in autumn and winter. The average annual relative humidity is between 75%–85%, and the air humidity is high. The vegetation is affected by the subtropical monsoon climate and topography, and has typical subtropical vegetation characteristics. The area where *Primulina longanica* grows belongs to the karst landform, and the vegetation is dominated by drought-resistant and barren-resistant plants. This species mainly grows on the calcified cliffs under the low shrubs and small trees forests mixed with species such as *Indocalamus latifolius* (Keng) McClure, *Zenia insignis* Chun, *Radermachera sinica* (Hance) Hemsl., *Clausena excavata* N.L.Burman, *Ficus nervosa* Heyne ex Roth, and *F. cyrtophylla* Wall. ex Miq.

***Preliminary conservation assessment*:** *Primulina longanica* is currently known to have only one population in its type locality. The population in its type locality has been over-collected, and currently only large, mature individuals remain on the tops of high cliffs that are difficult for humans to reach, while almost all individuals at lower elevations have been collected. There are currently about 40 mature individuals. Compared with the initial discovery, the population of this species has decreased sharply by more than 90%. The area of distribution (EOO) and area of occupancy (AOO) of this species are about 0.2 km^2 and 25 m^2, respectively. Due to its beautiful flowers, graceful leaves, and snow-white, soft hairs on the leaf surface, it has high ornamental value, and is therefore over-collected by local people and sold as an ornamental plant on online sales platforms. Therefore, according to the IUCN Red List Categories and Criteria (IUCN 2024), until new populations are found, this species is provisionally assessed as Critically Endangered [CR B1ab (iii, v) + B2ab (iii, v)]."

***Notes*:** Long'an County was placed under the jurisdiction of Nanning City, Guangxi, China. Before the discovery of this new species, the status of *Primulina* in the urban area of Nanning and its subordinate counties was as follows: There were a total of 9 species distributed in the suburbs of Nanning and its subordinate administrative districts, cities, and counties: *P. fimbrisepala* (Hand.-Mazz.) Yin Z.Wang, *P. linearifolia* (W.T.Wang) Yin Z.Wang (Li and Wang, 2005), *P. leiyyi* F.Wen, Z.B.Xin & W.C.Chou (Li *et al*., 2019), *P. leprosa* (Yan Liu & W.B.Xu) W.B.Xu & K.F.Chung (Xu *et al*., 2010, 2012), *P. longgangensis* (W.T.Wang) Yan Liu & YinZ.Wang, *P. macrorhiza* (D.Fang & D.H.Qin) Mich.Möller & A.Weber, *P. pinnatifida* (Hand.-Mazz.) Yin Z.Wang (Li and Wang, 2005), and *P. papillosa* Z.B.Xin, W.C.Chou & F.Wen (Xin *et al*., 2021) and *P. swinglei* (Merr.) Mich.Möller & A.Weber (Li and Wang, 2005). After the publication of this new species, the number of *Primulina* species in Nanning increased to 10, and Long'an County will be reported to have 3 species: *P. linearifolia*, *P. papillosa*, and *P. longanica* (Wei *et al*., 2010). The karst landform centered on Guangxi, including the Danxia landform, is the center of modern species diversity of *Primulina* in Gesneriaceae in the world (Xu *et al*., 2019). There are still a large number of unexplored limestone mountains around Nanning, and it can be predicted that with further investigation and understanding of biodiversity in karst landforms by botanical researchers, more new taxa of Gesneriaceae, especially *Primulina*, will be discovered and described.

The new species, along with the other nine *Primulina* species distributed within Nanning City's administrative area, can be quickly identified using the following identification key.

1a. Leaf blade margin irregularly pinnately lobed, pinnatilohate to deeply parted ……………….……………... ***Primulina pinnatifida***
1b. Leaf blade margin entire or serrate, crenate, dentate, repand, or shallowly lobed, but not pinnately lobed, pinnatilohate to deeply parted ……………………………………………………………..…… 2
2a. Corolla yellow; leaf blade adaxial surface conspicuously bullate …………………………………………………… ***P. leprosa***
2b. Corolla non-yellow; leaf blades adaxial surface smooth, non-bullate ……………………………………………………………..… 3
3a. Mature leaf blades narrower and longer, length-to-width ratio ≥ 5 ……………………………………………………..……..……… 4
3b. Mature leaf blades broader, length-to-width ratio < 5 …………… 7
4a. Leaf blades opposite, densely arranged on upper part of rhizome .. 5
4b. Leaf blades ternate …………………………………..………… 6

5a. Leaf blade surface densely and nearly vertically papillose-hispid ………………………………………………… ***P. papillosa***
5b. Leaf blade surface appressed pubescent, epapillose ... ***P. linearifolia***
6a. Bracts elliptic to cymbiform; corolla outside sparsely glandular-puberulent, inside glabrous …………………………….. ***P. leiyyi***
6b. Bracts linear to lanceolate or obovate; corolla outside glabrous to puberulent, inside puberulent or glabrous below stamens …………………………………………… ***P. longgangensis***
7a. Corolla inner surface scattered, irregular, dark purple spots and patches, but without purple longitudinal stripes …… ***P. fimbrisepala***
7b. Corolla inner surface without dark purple spots and patches, or only with yellow/purple stripes ……………………………………….. 8
8a. Leaf blade surface white villous; cymes usually solitary, occasionally 2-flowered ……………………………... ***P. longanica***
8b. Leaf blade surface appressed pubescent or strigose; cymes multiflowered, usually ≥8 ………………………………………… 9
9a. Corolla broadly funnelform, 4.5 – 6 cm long, stigma apex 2-lobed ……………………………………………… ***P. macrorhiza***
9b. Corolla shallowly campanulate to campanulate, 2.4 – 4.2 cm long, stigma undivided ……………………………………….. ***P. swinglei***

ACKNOWLEDGMENTS

The authors send thanks to Mr. Lan Yu-Hua for his active assistance during field investigations; the National Natural Science Foundation of China (Grant No. 32460422), the Guangxi Natural Science Foundation (2024GXNSFAA010462) and the Project for Fundamental Research of Guangxi Institute of Botany (GZY24006) for financial support.

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