



## A new species of *Primulina* (Gesneriaceae) from Guangdong, China

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### Abstract

A new species of Gesneriaceae, *Primulina yangchunensis*, is described and illustrated from China. The species is related to *P. orthandra*, but it can be easily distinguished by its leaf blade base cuneate, margin entire and rugose, both surfaces hispid, longer bracts broadly lanceolate, 1–2 cm long, and the length of the abaxial lip obviously longer than that of the adaxial one. The conservation status of this new species was assessed as “Critically Endangered” (CR) according to IUCN Red List Category and Criteria.

**Key words:** China, *Chirita*, *Chiritopsis*, IUCN, limestone, *Primulina yangchunensis*

### Introduction

In the traditional sense, the genus *Chirita* Buch.-Ham. ex Don (1822: 89) used to be a large genus in the subfamily Cyrtandroideae Burnett (1835: 963) of Gesneriaceae Richard & Jussieu in Candolle (1816: 182) (Wang *et al.* 1990, Li 1996). It was recognized as one of the most diverse genera of the family with about 160 species distributed in subtropical and tropical Asia ranging from Sri Lanka, India eastward to eastern China and southward to southern Indonesia (Wood 1974, Wang 1985a, 1985b, Wang *et al.* 1990, 1998, Li 1996, Nguyen & Kiew 2000, Burt 2002, Li & Wang 2004, Webber 2004). The genus has wide distribution, but most species are narrow endemics with small population size at each locality (Wen & Zhong 1998, Li & Wang 2004, 2007, Wei *et al.* 2004). It has high diverse in the limestone regions of northern Vietnam and southern China.

Clarke (1883) was the first to establish the classification system in *Chirita* in which the genus was divided into five sections: sect. *Euchirita* Clarke (1883: 111), sect. *Liebigia* (Endlicher 1841: 1407) Clarke (1883: 122), sect. *Bilabium* (Miquel 1858: 730) Clarke (1883: 126), sect. *Microchirita* Clarke (1883: 127) and sect. *Gibbosaccus* Clarke (1883: 130). The most comprehensive revision of the genus *Chirita* was done by Wood (1974). He divided the genus into three sections (sect. *Chirita*, sect. *Gibbosaccus* and sect. *Microchirita*) while merging sect. *Liebigia* and sect. *Bilabium* with sect. *Chirita*. Wood's system was adopted by latter authors (Wang 1985a, 1985b, Wang *et al.* 1990, Li & Wang 2004, Wei *et al.* 2010). Wang (1985a, 1985b) further divided sect. *Gibbosaccus* and sect. *Chirita* into three and two subsections, respectively. This classification was supported by palynological studies by Yan & Li (2003). Hilliard (2004) reinstated sect. *Liebigia* from sect. *Chirita* to accommodate *asperifolia* (Blume 1826: 767) Burt (1962: 41) and its allies.

Weber (2004) indicated that a great morphological heterogeneity of *Chirita* implies the problems in delimitation of the genus and the subdivisions within it. The polyphyly of *Chirita* was demonstrated by recent molecular phylogenetic analysis (Li & Wang 2007, Möller *et al.* 2009, 2011, Wang *et al.* 2011, Weber *et al.* 2011). Based on the molecular phylogenetic analysis, the new classifications for *Chirita* and its allied genera were proposed by Wang *et al.* (2011) and Möller *et al.* (2011). Five genera are currently recognized by them: (1) *Henckelia* Sprengel (1817: 402), including *Chirita* sect. *Chirita* (excluding the species placed in *Damrongia*), (2) *Damrongia* Kerr ex Craib (1918: 364), including presently six species previously placed in *Chirita* sect. *Chirita*, (3) *Microchirita* (C.B. Clarke) Y. Z. Wang in Wang *et al.* (2011: 59), including the species of *Chirita* sect. *Microchirita*, (4) *Liebigia* Endlicher (1841: 1407), including the species of *Chirita* sect. *Liebigia*, (5) *Primulina* Hance (1883: 169), including the species of *Chirita* sect. *Gibbosaccus*, *Chiritopsis* Wang (1981: 21), *Primulina*, *Deltocheilos* Wang (1981: 39) and *Wentsaiboea* Fang & Qin (2004: 534).

The genus *Primulina* was originally described by Hance (1883: 169) and recognized as a monospecific genus with single species *P. tabacum* Hance (1883: 169) for a long time (Wang *et al.* 1990, 1998, Ying *et al.* 1993, Li & Wang 2004, Zheng & Xia 2005, Wei *et al.* 2010). It was thought to be distinguished from *Chirita* by its ovary ovoid or narrowly ovoid, capsule narrowly ovoid to ellipsoid, equalling to shorter than calyx (Wang *et al.* 1990, 1998, Li & Wang 2004). Currently *Primulina* become one of the largest genera in Gesneriaceae comprising about 150 species and distributed in southern and southwestern China and Vietnam (Wang *et al.* 2011, Möller *et al.* 2011). Available information suggested that *Primulina* is one of several species-rich, essentially calciphilous genera with typical habitats being karst limestone towers in south China with high endemism, and Guangxi is particularly rich in species with about half species founded there (Wei *et al.* 2004, Möller *et al.* 2011, Xu *et al.* 2012a, 2012b, Chung *et al.* 2014). Most recently synopsis of the genus was done by Möller *et al.* (2011), but some new species were still found from South China (Liu *et al.* 2011, Tang & Wen 2011, Wu *et al.* 2011a, 2011b, 2011c, 2012, Xu *et al.* 2011a, 2011b, 2012a, 2012b, 2013, Li *et al.* 2012, 2014, Hong *et al.* 2012, Wen *et al.* 2012a, 2012b, 2012c, 2013, Huang *et al.* 2012, Chung *et al.* 2013, Jiang & Li 2013, Liang *et al.* 2013, Lu *et al.* 2013, Ning *et al.* 2013a, 2013b, Pan *et al.* 2013, Zhao *et al.* 2013a, 2013b, Cai *et al.* 2014).

In 2000, a botanical expedition between South China Botanical Garden and Missouri Botanical Garden was carried out in Yangchun city, Guangdong, China and a new species belonging to *Primulina* was found. This species was included in a recent publication of Wei *et al.* (2010) under the name *Chirita yangchunensis* Y.L. Zheng in Wei *et al.* (2010: 462). However, the name *C. yangchunensis* is not validly published because no Latin diagnosis or type was provided as the requirement by ICN (McNeil *et al.* 2006, 2012). Herein, we described it below as *P. yangchunensis* Y.L. Zheng & Y.F. Deng.

***Primulina yangchunensis* Y. L. Zheng & Y. F. Deng, sp. nov. (Fig. 1)**

*A P. orthandrae* (W. T. Wang) Mich. Moller & A. Weber *foliorum basi cuneatis, marginibus integris, utrinque hispidis, bracteis late lanceolatis 1–2 cm longis, corollae lilicinis, labio posico antico longioribus differt.*

Type:—China. Guangdong: Yangchun Shi, Chunwan Zhen, Longgongdong, in crevice on vertical rock face, 12 December 2000, MO-IBSC Expedition to Hainan 635 (holotype IBSC!, isotypes BM!, MO!).

*Chirita yangchunensis* Y.L. Zheng in Wei (2010: 462), nom. invalid.

Perennial herbs, stemless. Rhizome subterret, 1–1.5 cm long, ca. 0.5 cm in diameter, internodes inconspicuous. Leaves basal, opposite; petioles 2–5 cm, hispid; blades elliptic, 3–7 × 1.5–3 cm, papery, apex obtuse, base cuneate, margin entire and rugose, both surfaces hispid, lateral veins 4 or 5 on each side of midrib. Cymes 5–15-flowered. Peduncles 4–10 cm, pubescent. Bracts 2, opposite, free, broadly lanceolate, 0.8–2 × 0.2–0.5 cm, margin entire, pubescent. Pedicels 1–3.5 cm, pubescent. Calyx 5-lobed almost to the base, segments equal, lanceolate, 3–6 mm, outside pubescent, inside glabrous, margin entire, apex acute. Corolla pink, 1.5–2 cm, outside puberulent, tube narrowly funnel-form, 1.5–2 cm, mouth ca. 5 mm diam., adaxial lip 2–3 mm, 2-lobed, lobes broadly ovate, abaxial lip 5–7 mm, 3-lobed to near middle, lobes orbicular-ovate. Stamens 2, filaments ca. 5 mm, adnate to 8–12 mm above abaxial side of corolla tube base, erect, apex sparsely puberulent, anthers ca. 1 mm, glabrous, elliptic. Staminodes 2, ca. 3 mm, adnate to 6–9 mm above the base of corolla tube. Disc ring-like, ca. 1 mm. Pistil 1–1.5 cm, pubescent, ovary linear, 5–8 mm; style 4–6 mm, puberulent; stigma oblong, 2-lobed. Capsule linear, 2–3 cm.

**Distribution and habitat:**—*Primulina yangchunensis* is only known from the type locality, Longgongyan, Yangchun Shi, Guangdong Province, China. It grows on the rocks of a limestone hill at the elevation of about 100 m.

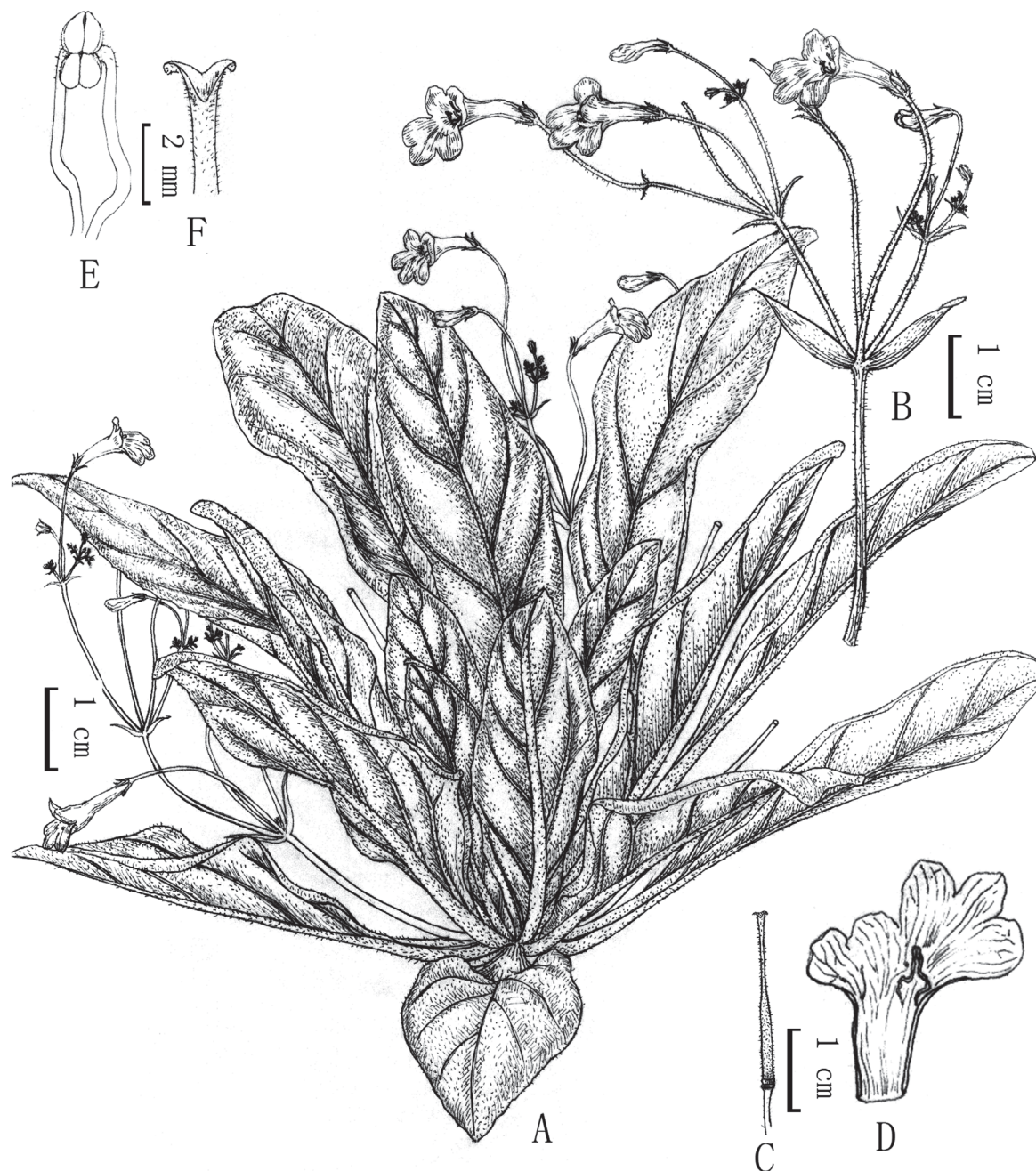
**Conservation Red List Category:**—Current information shows that the population size of this new species is less than 250 mature individuals from only one known site. We therefore assess it as “Critically Endangered” (CR) (B2a, C2a) using the IUCN Red List categories and criteria (IUCN 2001, 2011).

**Phenology:**—The new species was observed on flowering from August to November and fruiting in January.

**Etymology:**—The new species is named after its type locality, Yangchun Shi, Guangdong Province, China.

**Relationship:**—This new species is similar to *Primulina orthandra* (Wang 1985b: 42) Mich.Moller & A. Weber in Weber *et al.* (2011: 784), from which it differs in leaf blade base cuneate, margin entire and rugose, both surfaces hispid, bracts broadly lanceolate, 1–2 cm long, and the length of the abaxial lip obviously longer than that

of the adaxial lip. *Primulina orthandra* has leaf blade base oblique cuneate, margin densely crenulate to dentate or serrulate, both surfaces densely puberulent, bracts ca. 5 mm, ovate, and the abaxial lip of corolla slightly longer than that of the adaxial lip. The morphological comparison is shown in table 1.



**FIGURE 1.** *Primulina yangchunensis*. A: Habit, B: Inflorescence, C: Ovary and style, D: Opened corolla, E: Stamens, F: Stigma. Drawn by Yunxiao Liu (IBSC) based on *MO-IBSC Exped. to Hainan 635*.

**Additional specimens examined (Paratypes):**—CHINA. Guangdong: Guangzhou, cultivated in South China Botanical Garden, introduced from Yangchun Shi, 20 August 2002, *Zheng Yongli 401* (IBSC); Yangchun Shi, Chunwan Zhen, Lingxiaoyan, 25 August 2011, *Zheng Yongli 201108001* (IBSC).

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**TABLE 1.** Morphological comparison of *Primula yangchunensis* and *P. orthandra*.

Characters	<i>Primulia yangchunensis</i>	<i>Primulina orthandra</i>
Leaf		
shape	narrowly ovate to narrowly elliptic	broadly elliptic
base	cuneate	oblique cuneate
margin	entire and rugose	densely crenulate to dentate or serrulate
trichome	hispid on both surfaces	densely puberulent on both surfaces
Cymes	2–8-flowered	5–15-flowered
Bracts	broadly lanceolate, 0.8–2 cm long	ovate, ca. 5 mm
Corolla		
trichome	outside puberulent	glabrous
adaxial lip	2–3 mm long	ca. 3.5 mm long
abaxial lip	5–7 mm long	ca. 5 mm long

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