



Primulina hochiensis var. *rosulata* (Gesneriaceae)—a new variety at an entrance of a limestone cave from Guangxi, China

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Abstract

Primulina hochiensis var. *rosulata*, a new endemic variety from Guangxi, China, is described and illustrated. It is similar to *P. hochiensis sensu stricto*, but differs in lacking stolons, the different indumentum of peduncle, corolla, filament and anthers, leaf blades elliptical to slightly ovate, calyx purple, corolla white or pink, filaments geniculate close to the base, staminodes 3, and stigmas translucent to white, obtrapeziform, 2-lobed.

Introduction

The circumscription of *Primulina* Hance (1883: 169) has recently been revised (Wang *et al.* 2011, Weber *et al.* 2011). This genus has now at least 139 species and 11 varieties (Wang *et al.* 1990, Wang *et al.* 1998, Li & Wang 2004, Xu *et al.* 2009, Liu *et al.* 2010, Pan *et al.* 2010, Wei *et al.* 2010, Huang *et al.* 2011, Liu *et al.* 2011, Shen *et al.* 2011, Tang & Wen 2011, Wu *et al.* 2011, Wu *et al.* 2011, Xu *et al.* 2011, Xu *et al.* 2011ab, Hong *et al.* 2012, Huang *et al.* 2012, Li *et al.* 2012, Wen *et al.* 2012, Wen *et al.* 2012, Wu *et al.* 2012, Xu *et al.* 2012). Two of the authors, Bo Gao and Guo-Le Qin, found a population of *Primulina* plants at the entrance of a limestone cave near Tong'an town, Pingle County, Guilin City, Guangxi, China in 2008. Although this unknown taxon looks like *Primulina hochiensis* (Huang & Chen 1992: 14) Mich.Möller & A.Weber in Weber *et al.* (2011: 785), we concluded that it is a new variety after carefully consulting the relevant literature (e.g. Li & Wang 2004, Wei *et al.* 2010), Flora of China (Wang *et al.* 1990, Wang *et al.* 1998) and herbarium specimens. The characters are listed, described and illustrated below.

Taxonomic Treatment

Primulina hochiensis (C.C.Huang & X.X.Chen) Mich.Möller & A.Weber var. *rosulata* F.Wen & Y.G.Wei, var. nov. (Fig. 1 & Fig. 2A–H).

The new variety differs from the typical variety, *Primulina hochiensis* var. *hochiensis*, by lacking stolons, leaf blades elliptical to slightly ovate, peduncles erect (eglandular) puberulent, pedicels ≤ 7 mm long, flowers with purple calyx, corolla white or pale pink, outside puberulent with both glandular and eglandular hairs, filaments glabrous, geniculate close to the base, staminodes 3, pistil 9.2–9.7 mm long, and stigmas translucent to white, obtrapeziform, 2-lobed.

Type:—CHINA. Guangxi Zhuang Autonomous Region, Pingling county, Tong'an town, growing in the entrance of a limestone cave, 24°34'47"N, 110°55'34"E, elevation ca. 149 m, 17 August 2008 (fl.), B. Gao 08171 (holotype IBK!; isotype BJFC!).

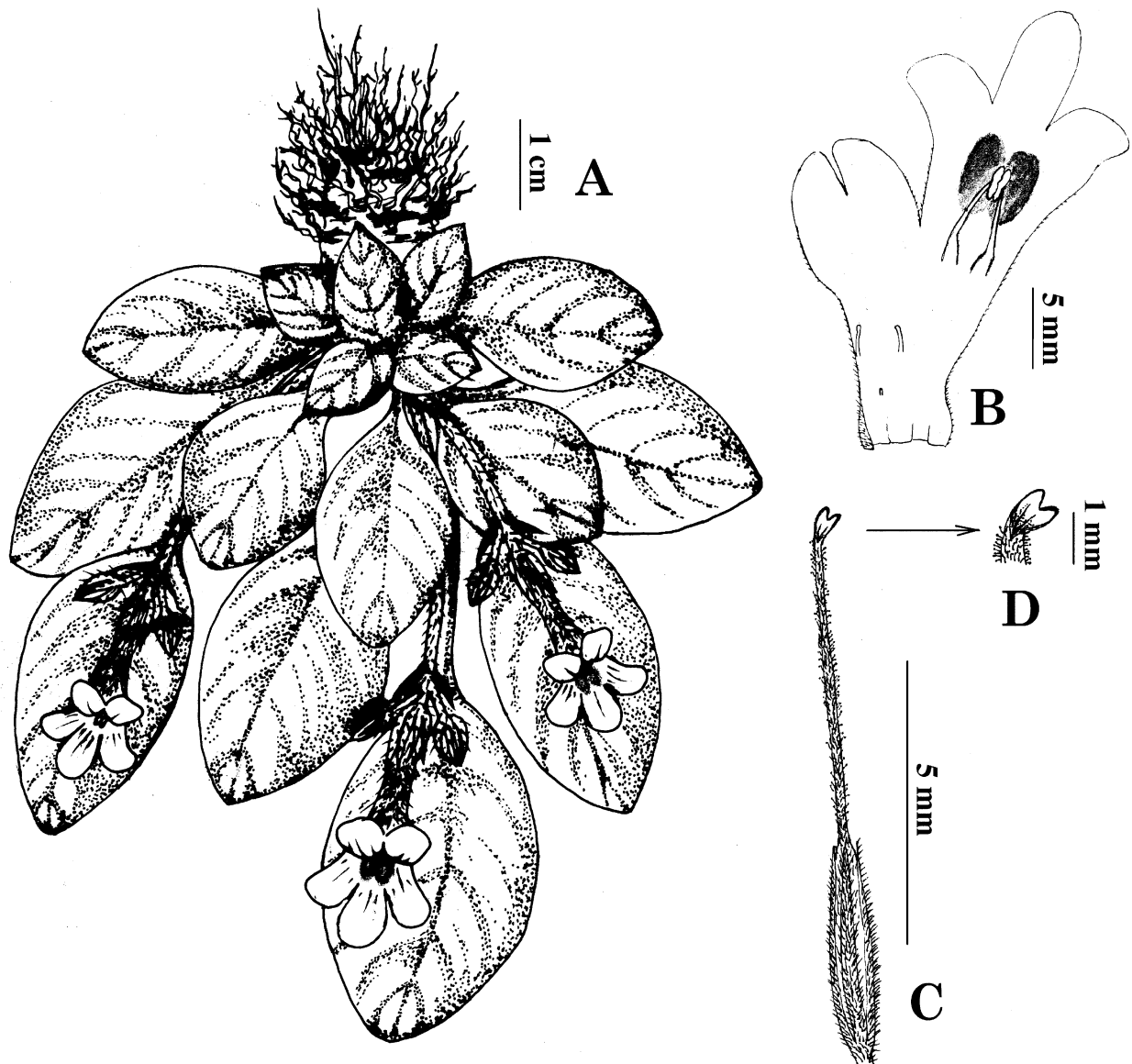


FIGURE 1. *Primulina hochiensis* var. *rosulata* F.Wen & Y.G.Wei (A) habit; (B) corolla opened with stamens and staminodes; (C) calyx and pistil; (D) stigma (based on B.Gao 08171).

Perennials, acaulescent. Rhizome cylindrical, ca. 1.6 cm long or longer, ca. 1.3 cm in diameter, glabrous; stolons lacking. Leaves basal, 12–16 or more; petiole cylindrical, extremely short pubescent, $3.0\text{--}5.5 \times 0.2\text{--}0.4$ cm; leaf blade elliptical to slightly ovate, $3.5\text{--}6.0 \times 2.5\text{--}4.0$ cm, chartaceous, densely appressed puberulent, base cuneate, margin entire, apex acute; lateral veins 4–5 on each side of midrib, inconspicuous. Cymes axillary, 2–4 or more, once branched or unbranched, 2–4-flowered; peduncle 3.0–9.5 cm long, 0.15–0.2 cm in diameter, densely erect puberulent; bracts 2, opposite, linear or withered before full-blooming period, when fresh $4\text{--}5 \times 1$ mm, puberulent, margin entire, apex acute. Pedicel ≤ 7 mm long, ca. 1 mm in diameter, puberulent. Calyx purple, 5-parted from base; segments equal, lanceolate-linear, $7\text{--}7.5 \times 1.5\text{--}2.3$ mm, outside densely pubescent, margin entire, apex acute. Corolla white or pale pink, throat with two distinctly elliptic yellow spots, 2.6–3.6 cm long, orifice 0.6–0.8 cm in diameter, outside puberulent with both glandular and eglandular hairs, inside glabrous; tube narrowly infundibuliform, ca. 1.0 cm long; limb

distinctly 2-lipped, adaxial lip 2-parted to the base, lobes slightly oblique linguiform or ovate, ca. 5×2.5 mm; abaxial lip 3-parted to the middle, lateral lobes obliquely ovate, ca. 5×4 mm, the central one 5×3 mm. Stamens 2, adnate to ca. 1.0 cm above the corolla base; anthers dark purple or purple, reniform, ca. 2.5×1.2 mm, slightly constricted at the middle, glabrous; filaments geniculate close to the base, ca. 6 mm long, glabrous; staminodes 3, lateral ones short linear, glabrous, 1.2–1.5 mm long, adnate to 4–5 mm above the corolla base, the central one linear, 0.4–0.5 mm long, adnate to 2.5–3 mm above the corolla base; disc annular, margin entire or sometimes slightly erose, 0.4–0.5 mm high. Pistil 9.2–9.7 mm long; ovary linear, 3.8–4.2 mm long, ca. 1.5 mm in diameter, densely puberulent with both glandular and eglandular hairs; style 5.4–5.5 mm long, ca. 0.5 mm in diameter, the middle-lower part glandular-puberulent, the part close to stigma glabrous. Stigmas translucent to white, obtapeziform, apex 2-lobed up to the middle, 0.7–0.9 mm long. Capsule linear, 1.8–2.2 cm long, ca. 2 mm in diameter, puberulent with both glandular and eglandular hairs.

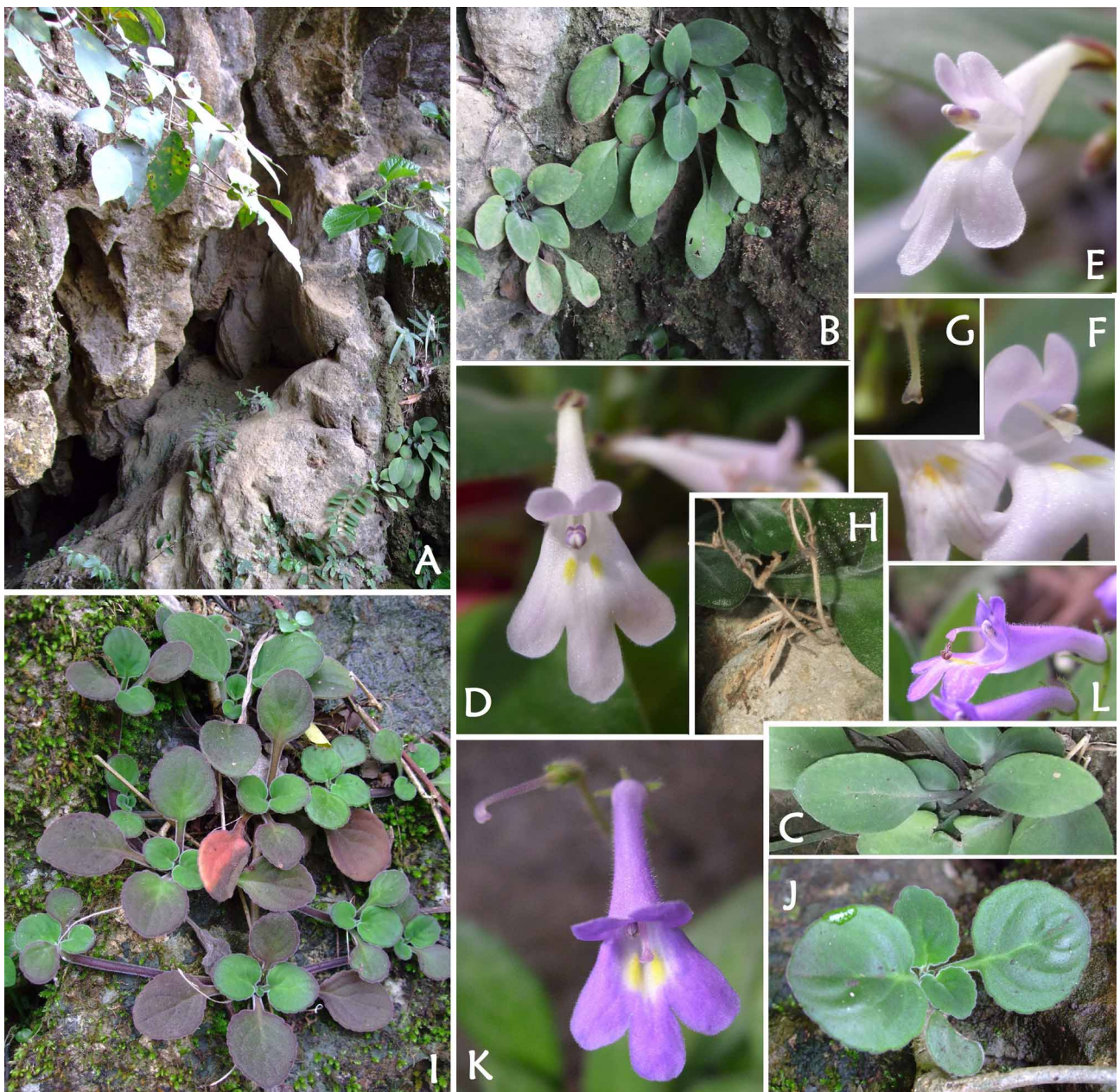
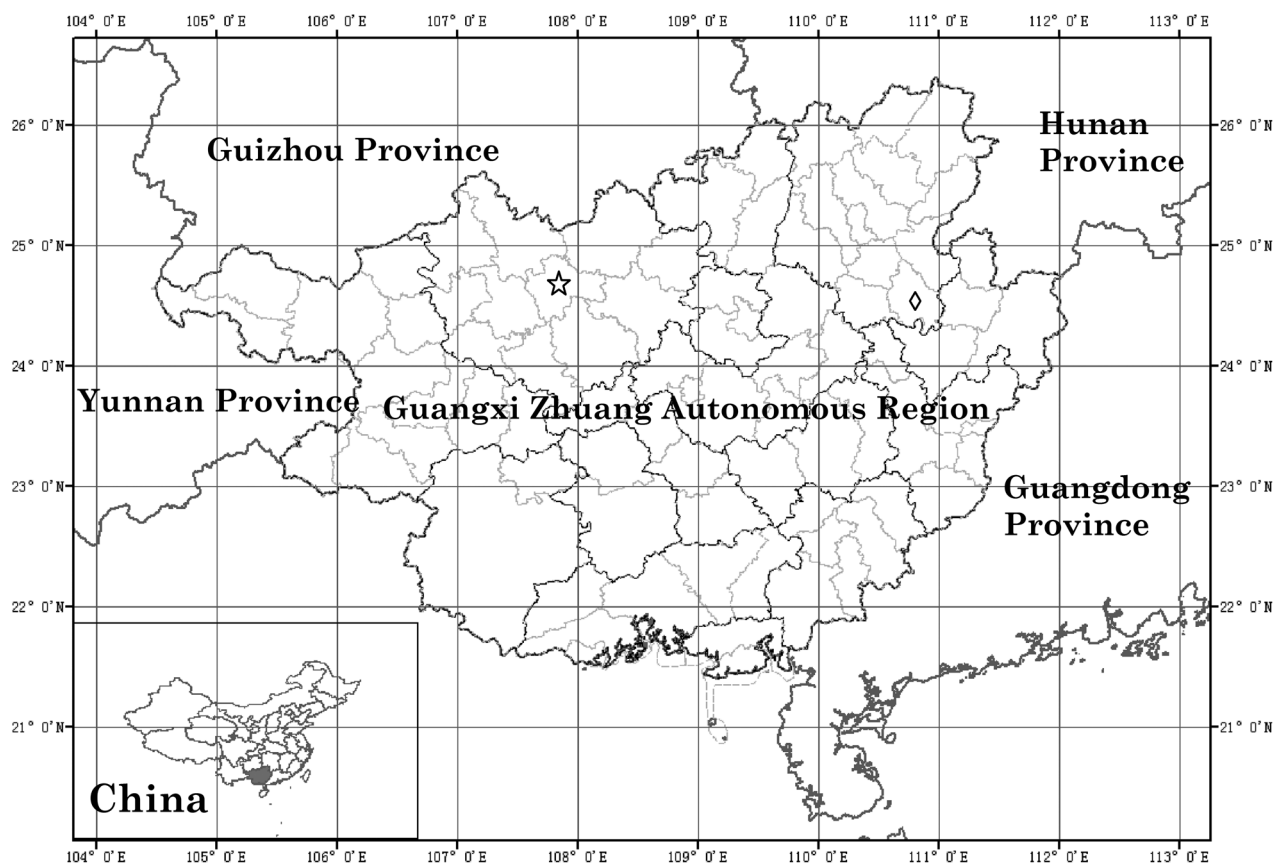


FIGURE 2. A–H: *Primulina hochiensis* var. *rosulata* F.Wen & Y.G.Wei. (A) habitat; (B) plants; (C) leaves; (D) frontal view of flower; (E); lateral view of flower; (F) corolla and stigma; (G) stigma; (H) dehiscent capsule. I–L: *P. hochiensis* (C.C.Huang & X.X.Chen) Mich.Möller & A.Weber var. *hochiensis*. (I) plant with stolons; (J) leaves and stolon; (K) frontal view of flower; (L) lateral view of flower and stigma.

Distribution:—China (endemic to Pingle County, northeast Guangxi Autonomous Region; see Map 1).

Habitat & Ecology:—*Primulina hochiensis* var. *rosulata* is known only from the type locality near to Tong'an town, Pingle County, Guilin, Guangxi. All plants grow on a moist and dark cliff at the entrance of a limestone cave, at an elevation of 149 m a.s.l. Very probably the reproduction and survival of this species relies on this special habitat. The surrounding limestone hills are relatively dry except for the cave, and other suitable caves are lacking. At the same time, we did not find any other population of this new species around the type locality (about 5 km²). A single population of a few hundred individuals (ca. 350 adult plants) was observed in an area of 25 m². The average temperature of Pingle County is 19.9 °C; the average annual precipitation has been calculated with 1335.8–1865.4 mm. The forest where *P. hochiensis* var. *rosulata* occurs is subtropical evergreen broad-leaved forest. Flowering is in August.



MAP 1. Distribution of *Primulina hochiensis* var. *rosulata* (◇) and *P. hochiensis* var. *hochiensis* (☆).

Etymology:—This variety is comparatively similar to the typical species, *Primulina hochiensis*. However, the epithet 'rosulata' indicates that no stolon is formed in the adult plants of this new variety, so that the plants have a rosulate appearance.

Vernacular name:—Lianzuo Zhuang hechi baochunjutai.

Primulina hochiensis var. *rosulata* is closely related to *P. hochiensis* var. *hochiensis* in several characters (Fig. 2 A–L). An obvious difference is the absence of stolons. We observed that all adult plants of *P. hochiensis* from its type locality, Hechi city of Guangxi, always form stolons from axils of leaves, but no stolon is found in the new variety. In addition, the new variety differs from the typical species in having elliptical to slightly ovate leaf blade (instead of ovate, ovate-elliptic to nearly rounded), the cuneate base of leaf blade (instead of base nearly rounded or broadly cuneate), white or pink corolla (instead of purple),

glabrous filaments geniculate close to the base (instead of straight and with glandular pubescence), glabrous anthers (instead of abaxially white villous), three staminodes (instead of two), translucent to white stigma (instead of purple). A detailed comparison of the relevant characters of *P. hochiensis* var. *rosulata* and *P. hochiensis* var. *hochiensis* is shown in Table 1.

TABLE 1. Comparison of *Primulina hochiensis* var. *rosulata* and *P. hochiensis* var. *hochiensis*.

Characters	<i>Primulina hochiensis</i> var. <i>rosulata</i>	<i>P. hochiensis</i>
Stolon	lacking	forming many stolons in plants for many years
Leaf blade	elliptical to slightly ovate, base cuneate, apex acute, margin entire	ovate, ovate-elliptic or nearly rounded, base nearly rounded or broadly cuneate, apex nearly rounded to obtuse, margin 6–8 crenate on each side or rarely subentire
Peduncle	densely erect puberulent	densely glandular puberulent,
Pedicel	≤ 7 mm long,	7–23 mm long,
The colour of calyx	purple	white
Corolla	white or pale pink; outside puberulent with both glandular and eglandular hairs	purple, glandular-pubescent
Filaments	geniculate close to the base, glabrous	straight, glandular pilose
Anthers	glabrous	abaxially white villous
Staminodes	3	2
Pistil	0.92–0.97 cm long	1.5–2 cm long
Stigma	translucent to white, obtrapeziform, apex 2-lobed to the middle	purple, ligulate, emarginate at apex

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