

***Wentsaiboea tiandengensis* sp. nov. and *W. luochengensis* sp. nov. (Gesneriaceae) from Karst caves in Guangxi, southern China**

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Two new species of Gesneriaceae, *Wentsaiboea tiandengensis* Yan Liu & B. Pan and *Wentsaiboea luochengensis* Yan Liu & W. B. Xu from Karst caves in Guangxi, China are described and illustrated. *Wentsaiboea tiandengensis* resembles *W. renifolia*, but differs in the leaf blade being cordate or broadly ovate, the margin crenate or repand, with conspicuous pinnate veins 3–5 on each side, corolla throat constricted, corolla lobes ovate with apex acute, staminodes 3, and ovary broadly ovoid. *Wentsaiboea luochengensis* is similar to *W. renifolia*, but can be distinguished from the latter by the coriaceous leaf blade with 2–3 inconspicuous pinnate veins on each side, elliptic or broadly ovate to sub-rotund in shape, with sub-entire margin and attenuate to cuneate or sub-rotund base, broadly ovate or sub-rotund corolla lobes, rotund or obtuse apex, and 3 staminodes.

Wentsaiboea D. Fang & D. H. Qin (Gesneriaceae) was previously known as a monotypic genus with the single species, *W. renifolia* D. Fang & D. H. Qin (Fang et al. 2004) (Fig. 1) being endemic to the Karst landscape in Guangxi, China (Li et al. 2004). The genus is characterized by its obliquely campanulate and abaxially swollen corolla, stamens and staminodes nearly adnate to the base of the corolla tube, exserted pistil (erroneously described as pistil being included in the protologue), and hippocrepiform stigma (Fang et al. 2004). A comprehensive survey around Du'an County where the type of *W. renifolia* was collected revealed that this unique species is extremely rare, known only from two adjacent Karst caves in the region. The population size of *W. renifolia* in both caves is unfortunately very small and its habitat has become severely disturbed by tourists and local villagers. Thus, according to the IUCN categories and criteria (IUCN 2001), *W. renifolia* should be ranked as 'Critically Endangered' (CR).

However, in the course of a floristic survey of the Karst caves in 2005–2009, we collected two other interesting plants of Gesneriaceae from limestone areas in Guangxi. After consulting national floras and relevant literature (Wang et al. 1998, Fang et al. 2004, Li et al. 2004) as well as herbarium specimens, two new species of *Wentsaiboea* were identified, which are described and illustrated here.

***Wentsaiboea tiandengensis* Yan Liu & B. Pan sp. nov. (Fig. 2, 3E–G)**

Haec species W. renifoliae affinis, a qua foliis cordatis vel late ovatis, margine crenatis vel repandis, nervis pinnatis 3–5

utrinsecus conspicuis, corolla ore contracta, lobis ejus ovatis, apice acutis, staminodiis 3, ovario late ovoideo distinguitur.

Type: China. Guangxi Zhuangzu Autonomous Region, Tiandeng County, on moist limestone rock face in a Karst cave, 7 May 2009, Yan Liu and Wei-Bin Xu 09413 (holotype: IBK; isotypes: PE, HAST).

Perennial herb. Rhizome subterete, 3–5 mm long, ca 6 mm thick. Leaves basal, long petiolate. Petiole 5–10 cm long, ca 2–3 mm thick, pubescent. Leaf blade herbaceous, cordate or broadly ovate, 3.0–5.5 × 3.0–4.5 cm, apex obtuse or rounded, margin crenate or repand, base cordate or deeply cordate, pubescent on both surfaces, lateral veins impressed adaxially, conspicuous abaxially, 3–5 on each side. Cymes 4–12, 1–3-branched, 3–12-flowered; peduncle 4–7 cm long, pubescent; bracts 2, opposite, linear or narrowly lanceolate, 4–6 × 1.0–1.5 mm, margin entire, apex acute, pubescent abaxially, glabrous adaxially. Pedicel 5–15 mm long, glandular pubescent. Calyx 5-lobed nearly to the base, lobes linear-triangular, 4.0–6.5 × 1.0–1.5 mm, margin entire, glandular pubescent abaxially, sparsely glandular pubescent adaxially. Corolla obliquely campanulate, 10–13 mm long, sparsely glandular pubescent outside, glabrous inside; tube white, 5–9 mm long, 5.5–6.5 mm in diameter at the middle, with purple longitudinal striae inside; throat constricted, 4–5 mm in diameter at the mouth; limb pale purple; adaxial lip distinctly 2-lobed nearly to base, lobes ovate, 2.5–3.0 × ca 2 mm, acute at apex; abaxial lip 3-lobed nearly to base, lobes ovate, acute at apex, 3–4 × ca 3 mm. Stamens 2, adnate to near the corolla tube base; filaments



Figure 1. *Wentsaiboea renifolia* (A) habitat, (B) habit, (C) flowers, (D) fruit.

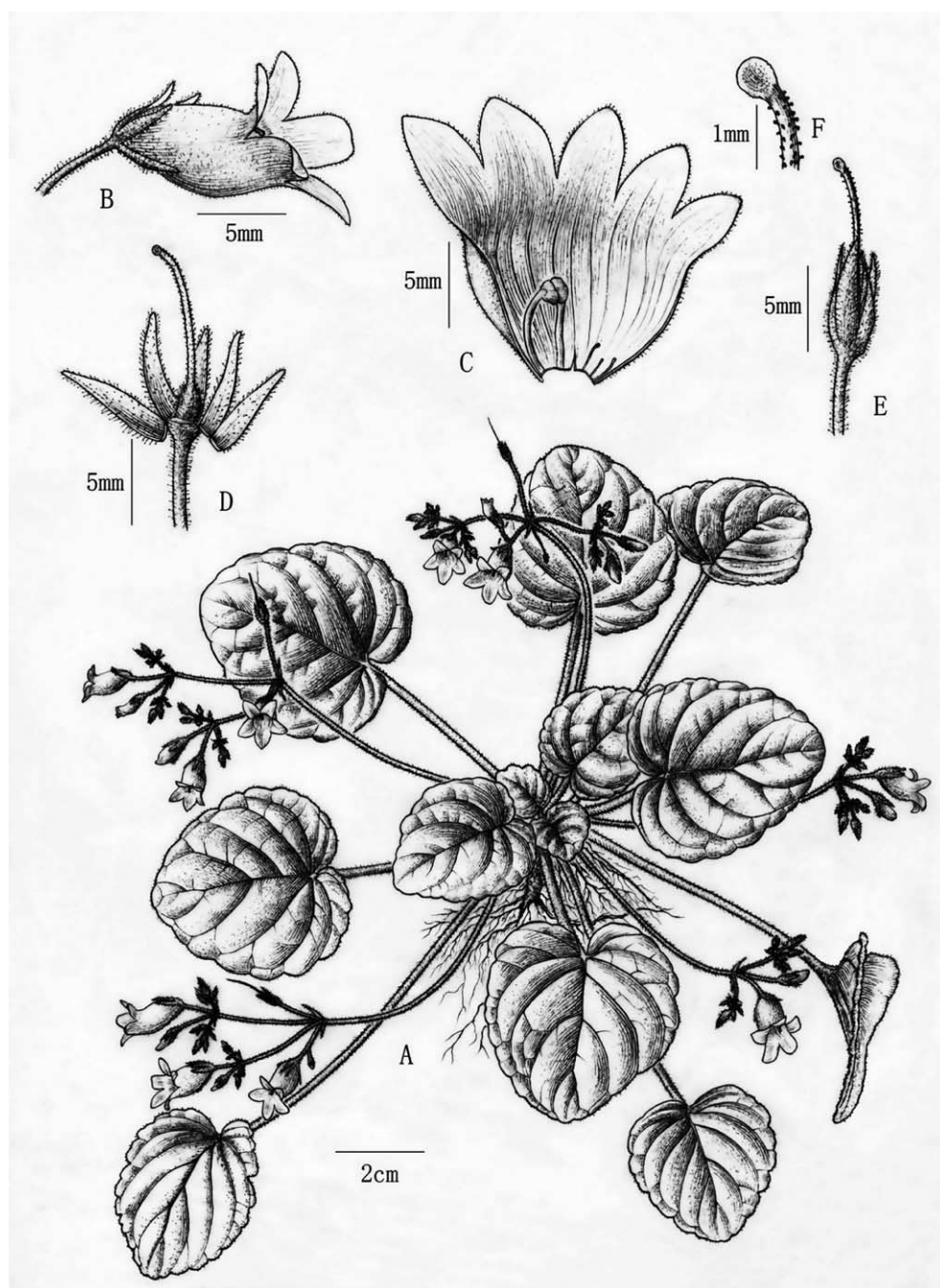


Figure 2. *Wentsaiboea tiandengensis* Yan Liu & B. Pan sp. nov. (A) habit, (B) flower side view, (C) opened corolla showing stamens and staminodes, (D) opened calyx showing disc and pistil, (E) pistil and calyx, (F) stigma. Drawn by Y.-X. Zhu from Yan Liu and W. B. Xu 09413.

linear, ca 3 mm long, arcuate, glabrous; anthers broadly elliptic, ca 1.2 mm long, glabrous. Staminodes 3, glabrous, slightly enlarged at apex, adnate to near the corolla tube base, lateral ones ca 1.5 mm long, middle one ca 1 mm long. Disc annular, ca 0.4 mm in height, glabrous, margin repand. Pistil 6–12 mm, ovary broadly ovoid, ca 1.5×1.0 mm, glandular puberulent; style 6–8 mm long, glandular puberulent; stigma subhippocrepiform, ca 0.5 mm. Mature capsule not seen. Flowering occurs in May–Jun.

Distribution, ecology and conservation status

Known only from one population on the moist rock face in a Karst cave, Tiandeng County, southwestern Guangxi, China; altitude ca 400 m a.s.l. (Fig. 4). Current information shows that the population size of this new species is fewer than 250 mature individuals, all at one site. We therefore assess *Wentsaiboea tiandengensis* as 'Critically Endangered' (CR) using the IUCN categories and criteria (IUCN 2001).

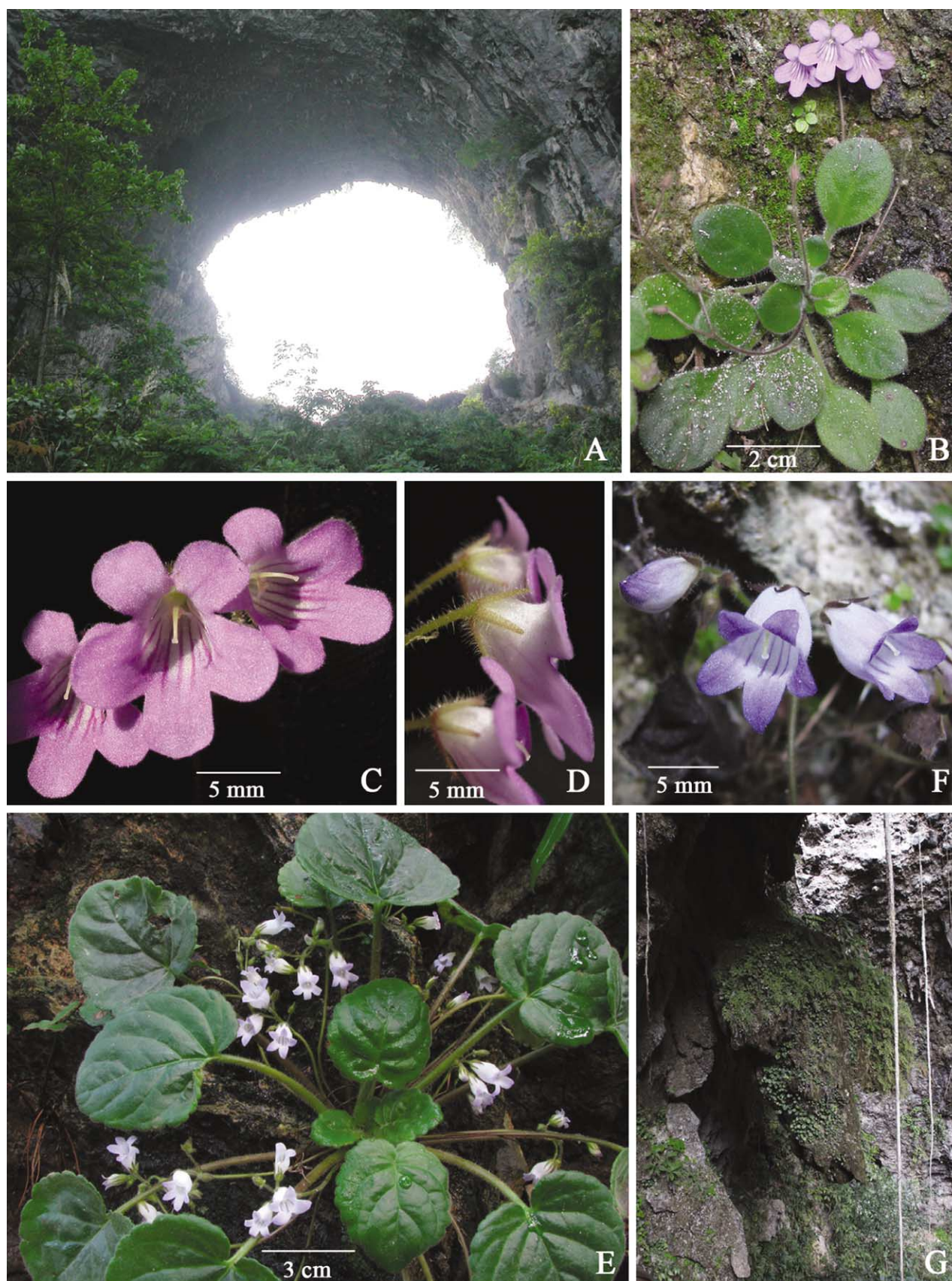


Figure 3. *Wentsaiboea luochengensis* sp. nov. (A) habitat, (B) habit, (C) flower face view, (D) flower side view. *Wentsaiboea tiandengensis* sp. nov. (E) habit, (F) flower, (G) habitat.



Figure 4. Distribution of *Wentsaiboea renifolia* (★), *W. tiandengensis* sp. nov. (●) and *W. luochengensis* sp. nov. (■) in Guangxi Zhuangzu Autonomous Region, China.

Etymology

The specific epithet is derived from the type locality, Tiandeng County.

Similar species

Wentsaiboea tiandengensis is grossly similar to *W. renifolia*, but differs by having a cordate or broadly ovate leaf blade with margin crenate or repand and 3–5 conspicuous pinnate veins on each side, a constricted corolla throat, ovate corolla lobes with acute apex, 3 staminodes, and a broadly ovoid ovary. Table 1 lists the differences between the two species.

Additional specimens examined (paratypes)

China. Guangxi, Tiandeng County, 26 May 2009, Yan Liu, Wei-Bin Xu and Bo Pan 09655 (IBK).

Wentsaiboea luochengensis Yan Liu & W. B. Xu sp. nov. (Fig. 5, 3A–D)

Species nova *W. renifoliae* similis, a qua foliis coriaceis ellipticis vel late ovatis-subrotundis, margine sub-

integris, basi attenuatis-cuneatis vel subrotundis, nervis pinnatis 2–3 utrinsecus inconspicuis, lobis corollae late ovatis vel rotundis, apice rotundis vel obtusis, staminodiis 3 differt.

Type: China. Guangxi Zhuangzu Autonomous Region: Luocheng County, on moist limestone rock face, 20 Apr 2009, Yan Liu and Wei-Bin Xu 09390 (holotype: IBK, isotype: PE).

Perennial herb. Rhizome subterete, 5–10 mm long, 3–6 mm thick. Leaves basal; petiole flattened, 1.5–4.0 (7.0) cm long, pubescent; blade coriaceous, elliptic or broadly ovate to subrotund, 1.5–4.0 × 1.0–2.5 cm, obtuse or rounded at apex, margins subentire, attenuate to cuneate or subrotund at base, pubescent on both surfaces, lateral veins 2 or 3 on each side, inconspicuous. Cymes 4–12, 1–2-branched, 3–10-flowered; peduncle 4–8 cm long, patently pubescent; bracts 2, opposite, narrowly linear, 4–6 × 1.0–1.5 mm, margins entire, obtuse at apex, patently pubescent abaxially, sparsely pubescent adaxially. Pedicel 3–7 mm long, patently pubescent. Calyx 5-lobed nearly to the base, lobes linear-triangular, 3–4 × 0.7–1.0 mm, margins entire,

Table 1. Morphological comparison of *Wentsaiboea renifolia*, *W. tiandengensis* sp. nov. and *W. luochengensis* sp. nov.

	<i>W. renifolia</i>	<i>W. tiandengensis</i>	<i>W. luochengensis</i>
Leaf blade	chartaceous	herbaceous	coriaceous
shape	reniform or sub-cordate	cordate or broadly ovate	elliptic or broadly ovate to sub-rotund
margin	sub-entire or repand	crenate or repand	sub-entire
base	cordate or deeply cordate	cordate or deeply cordate	attenuate to cuneate or sub-rotund
nerves	inconspicuous, palmately 3–5-nerved	conspicuous, pinnate veins, 3–5 on each side	inconspicuous, pinnate veins, 2–3 on each side
Corolla	throat not constricted, lobes rounded, apex rounded	throat constricted, lobes ovate, apex acute	throat not constricted, lobes broadly ovate or sub-rotund, apex rotund or obtuse
Staminodes	2	3	3
Ovary	narrowly ovoid	broadly ovoid	narrowly ovoid

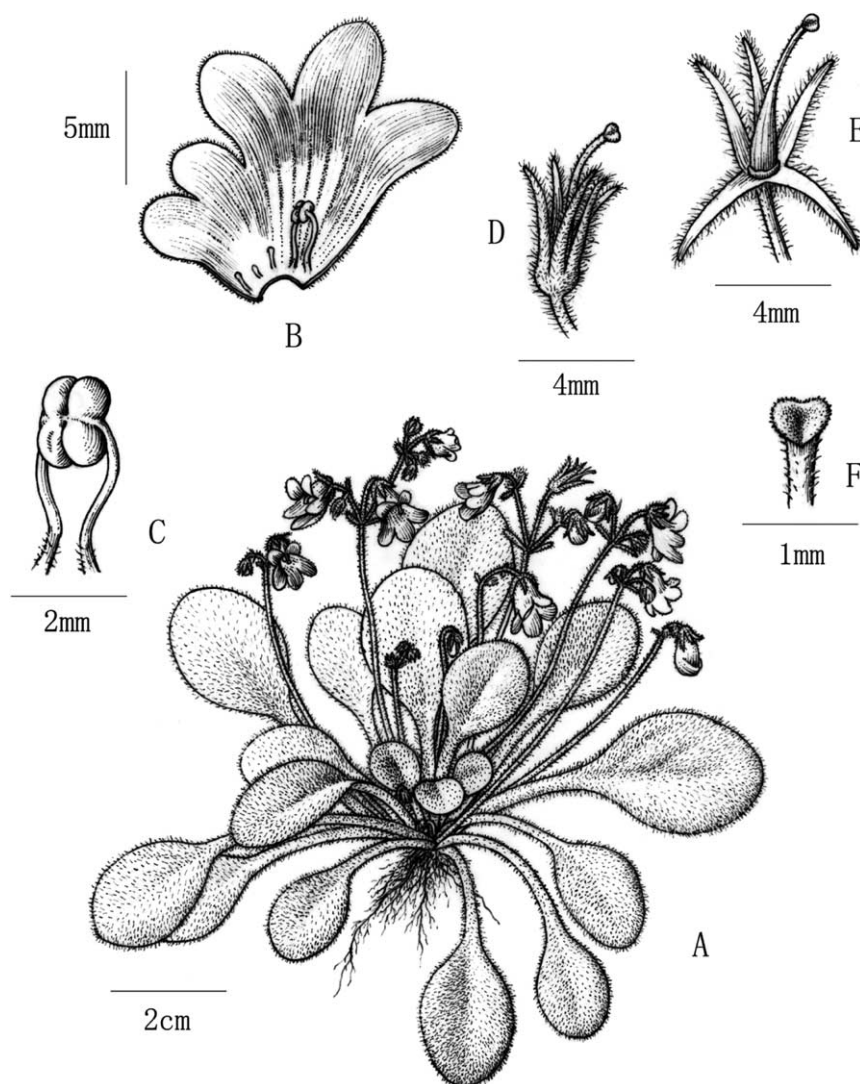


Figure 5. *Wentsaiboea luochengensis* Yan Liu & W. B. Xu sp. nov. (A) habit, (B) opened corolla showing stamens and staminodes, (C) stamens, (D) pistil and calyx, (E) opened calyx showing disc and pistil. Drawn by S.-Q. He from Yan Liu and W. B. Xu 09390.

patently pubescent abaxially, glabrous to sparsely pubescent adaxially. Corolla obliquely campanulate, 8–9 mm long, sparsely pubescent outside, glabrous inside; tube white, 5–6 mm long, ca 4.5 mm in diameter at the middle, with purple longitudinal striae inside, 5 mm in diameter at the mouth; limb pale purple; adaxial lip distinctly 2-lobed to near base, lobes subrotund, ca 2.5×2.0 mm, with rotund apex; abaxial lip 3-lobed to near middle, lobes broadly ovate, rotund or obtuse at apex, ca 3×2 mm. Stamens 2, adnate to 0.5 mm above the corolla tube base; filaments linear, ca 3 mm long, arcuate, sparsely puberulent at base; anthers reniform, ca 1.5 mm long, glabrous. Staminodes 3, glabrous, slightly widened at apex, adnate to 0.5 mm above the corolla tube base, lateral ones ca 1 mm long, middle one ca 0.7 mm long. Disc annular, ca 0.3 mm in height, glabrous, margin repand. Pistil 5–7 mm long; ovary narrowly ovoid, ca 1.5×1.0 mm, sparsely puberulent; style 3–5 mm long, sparsely puberulent; stigma subhippocrepiform, ca 0.5 mm. Mature capsule not seen. Flowering occurs in Mar–May.

Distribution, ecology and conservation status

Known only from one population on the moist limestone rock face in a Karst cave, Luocheng County, northern Guangxi, China; altitude ca 300 m a.s.l. (Fig. 3). Current information shows that the population size is less than 250 mature individuals, all at one site. We thus assess *W. luochengensis* as ‘Critically Endangered’ (CR) using the IUCN categories and criteria (IUCN 2001).

Etymology

The specific epithet is derived from the type locality, Luocheng County.

Similar species

Wentsaiboea luochengensis differs from *W. renifolia* by its coriaceous leaf blade, elliptic or broadly ovate to sub-rotund leaf shape, sub-entire margin, attenuate to cuneate or sub-rotund leaf base, 2–3 inconspicuous pinnate veins on

each side, broadly ovate or sub-rotund corolla lobes with rotund or obtuse apex, and 3 staminodes. Further differences between *W. luochengensis* and *W. renifolia* are provided in Table 1.

Additional specimens examined (paratypes)

China. Guangxi, Luocheng County, 18 Apr 2007, Yan Liu and Wei-Bin Xu 07243 (IBK).

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