



## ***Petrocodon lancifolius* (Gesneriaceae), a new species endemic to a central subtropical zone of Guizhou Province, China**

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### **Abstract**

A new species of Gesneriaceae from southern China, *Petrocodon lancifolius*, is described and illustrated. It is similar to another stenochoric species, *P. scopulorum*, but is differentiated from its congeners by several characters, such as the shape of the leaf blades, the indumentum of peduncle, pedicels, the outside of bracts and corolla, the corolla shape, limb and lobes, the ovary, pistil, style, and phenology. A description of *P. lancifolius*, together with illustrations, a distribution map, habitat description, conservation assessment and a diagnostic comparison with *P. scopulorum* are presented.

**Key words:** Conservation Status, Limestone flora, Taxonomy

### **Introduction**

Based on latest molecular data and taxonomic studies, some Chinese monotypic genera, *Calcareoboea* C.Y.Wu ex Li (1982: 241), *Paralagarosolen* Wei (2004: 528), *Dolicholoma* Fang & Wang (1983: 18) and *Tengia* Chun (1946: 279), one small genus endemic to China, *Lagarosolen* Wang (1984: 11) and a few species of *Didymocarpus* Wallich (1819: 378), have recently been merged into another small Chinese genus of Gesneriaceae, *Petrocodon* Hance (1883: 167) (formerly three species and one variety) (Wang 1990, Wang *et al.* 1998, Li & Wang 2004, Wei 2007, Wei *et al.* 2010, Jiang *et al.* 2011). This genus has been recently enlarged to more than 20 species (Möller *et al.* 2011, Wang *et al.* 2011, Weber *et al.* 2011).

During a botanical investigation in 2009 for endemic plants of Guizhou province, some specimens of an unknown species in Gesneriaceae were collected in Huishui County from the central of Guizhou Province, China. The reproductive organs of this species, especially its stamens, look like those of *P. scopulorum* (Chun 1946: 281) Wang (1990: 136), however the morphology of their vegetative organs is very different. After consulting local and national floras and relevant literatures (Wang 1990, He & Cong 1992, Wang *et al.* 1998, Li & Wang 2004, Wei *et al.* 2010) as well as herbarium species from BJFC, HGCM, IBK, IBSC, KUN, and PE, we concluded it is a new species of *Petrocodon*. Based on a detailed comparison with the other species in this genus (Wang 1990, Wang *et al.* 1998, Li & Wang 2004, Wei 2007, Jiang *et al.* 2011, Wang *et al.* 2011), we describe and illustrate the new species, *P. lancifolius*, which is endemic to Guizhou Province, China. It is closely similar to *P. scopulorum*.

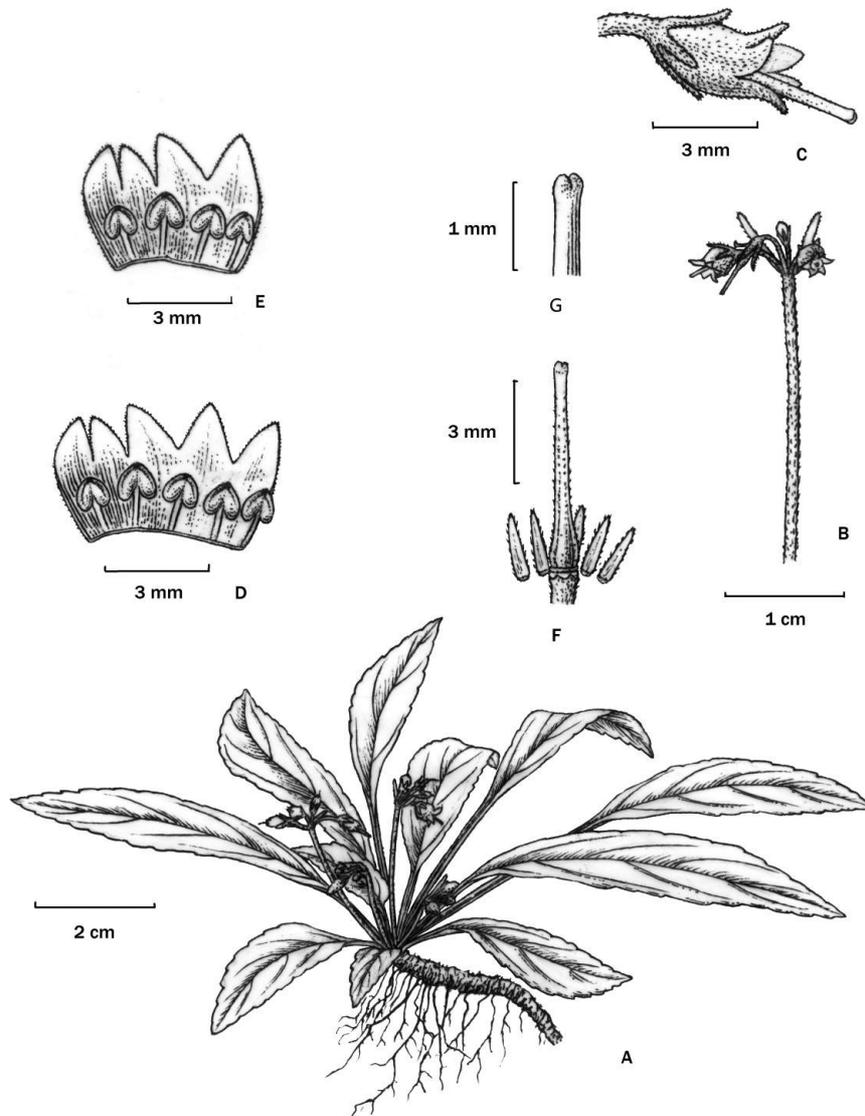
### **Taxonomic Treatment**

#### ***Petrocodon lancifolius* Fang Wen & Y.G.Wei, *sp. nov.* (Figure 1)**

The new species differs from its relative, *P. scopulorum* (Chun) Y.Z.Wang, by its narrower leaves, leaf blades

symmetrical or rarely asymmetrical lanceolate, peduncles, pedicels, the outside of bracts and corolla purplish brown strigulose, corolla campanulate, 4.1–4.5 mm long, limb 4- or 5-lobed, lobes obliquely deltoid or deltoid, stamens 4 or 5, ovary glabrous, pistil 5.4–6.2 mm long, style 3.8–4.2 mm long and sparsely fleshy strigose.

**Type:**—CHINA. Guizhou province: Huishui County, Duanshan Town, growing on the damp limestone stones at the bottom of hill near to a large sized cave, where stream runs out from the opening, 25°49'N, 106°43'E, elevation 1108–1110 m, 12 July 2009 (fl.), *Fang Wen FW-Ges2009071201* (holotype IBK!; isotype BJFC!).

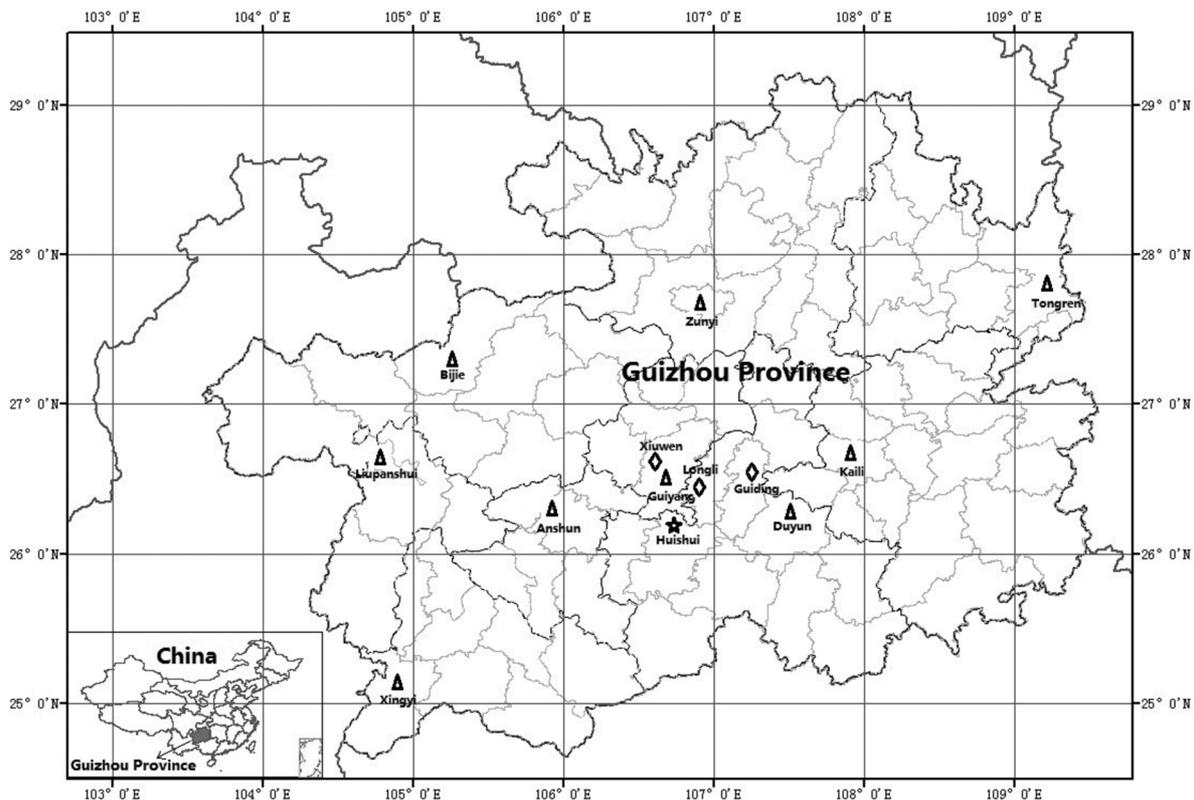


**FIGURE 1.** *Petrocodon lancifolius*. A. Habitat, B. Cyme, C. Corolla, D. Opened corolla, showing five corolla segments and five stamens, E. Opened corolla, showing four corolla segments and four stamens, F. Pistil, also showing opened five calyx segments, G. Stigma. Drawn by Y.X. Zhu from *Fang Wen FW-Ges2009071201* (IBK).

Perennial herb, acaulescent. Rhizomes terete or subterete, ascending, 2–6 cm long, 1–4 mm in diameter, rooting at the nodes. Leaves 11–20 or more, basal; leaf blade coriaceous, usually symmetrical, rarely asymmetrical, lanceolate, 2.5–7.0 × 0.8–1.1 cm, base narrowly cuneate, apex acuminate, acute or obtuse, margin crenate generally up to the middle, more rarely completely crenate or entire to a various degree, glabrous on both surfaces, lateral nerves 3–5 pairs, obviously depressed, midvein raised; petiole 0.9–4.2 cm long, glabrous. Cymes 4–6, 1-branched or not, 4–8-flowered; peduncle 1.5–3.2 cm long, green, purplish brown strigulose; bracts green, linear, 6–9 × 0.8–0.1 mm, apex obtuse or rounded, margin entire, outside densely scattered purplish brown strigulose, inside glabrous. Flowering pedicel 0.5–0.8 cm long, hairs same

as peduncles. Calyx 5-parted to the base, 1.8–1.9 mm long, lobes narrowly lanceolate or lanceolate-linear, outside sparsely purplish brown strigulose. Corolla campanulate, orifice slightly constricted, tube slightly swollen, white, lobes margin slightly green, 4.1–4.5 mm long, 2–2.1 mm in diameter at the middle, 1.6–1.9 mm at the mouth, outside sparsely purplish brown strigulose, inside glabrous; limb 4- or 5-lobed, both sometimes appearing in the same cyme, usually zygomorphic, the adaxial lobes obliquely deltoid, 1.16–1.33 mm long, 1.0–1.17 mm at the base, apex acute, abaxial lip 2- or 3-lobed to near one third of the lobes, lateral two lobes of 5-lobed flowers or two lobes of 4-lobed flowers obliquely deltoid, 1.2–1.4 mm long, 1.1–1.2 mm at the base, apex acute, the median lobe of 5-lobed flower deltoid, 1.65–1.75 mm long, 1.65–1.75 mm at the base, mauve spot inside. Stamens 4 in 4-lobed flowers, 5 in 5-lobed flowers, 1.8–2.1 mm long, adnate to the corolla tube base; filaments 1.3–1.5 mm long, straight, anthers cordate, 0.5–0.6 mm long, ca. 0.6 mm at the middle, free, apex acute. Disc ring-like, 0.1–0.2 mm high, entire. Pistil 5.4–6.2 mm long, ca. 0.75–0.8 mm in diameter; style white, 3.8–4.2 mm long, sparsely white fleshy strigose, ovary oblong-cordate, green, glabrous, 1.6–2.0 mm long, stigma 1, capitate, slightly parted to the middle. Capsule unknown.

**Distribution and ecology:**—*Petrocodon lancifolius* has been only found in the type locality (see Map 1) and grows on the moist and shaded rock faces at the bottom of a hill near to a large sized cave, where a stream emerges from the opening, elevation 1108–1110 m. The type locality experiences subtropical monsoon climate, the average annual rainfall was 1200 mm, and mean annual temperature was 15.7 °C. The vegetation type is central subtropical evergreen broad-leaved forest on limestone hills.



**MAP 1.** Distribution of *Petrocodon lancifolius* (☆) and *P. scopulorum* (◇) in Guizhou Province, China. (Δ): main cities in Guizhou Province.

**Etymology:**—The specific epithet refers to the narrow and lanceolate leaves of this new taxon. The morphology of the leaf blade is obviously different to *P. scopulorum*.

**Conservation status:**—According to the detailed information from our careful field investigation in this area, the population size of this new species is fewer than 500 individuals, all at one site. They grow on the bottom of a limestone cliff in a karst gorge. According to IUCN red list categories (IUCN 2001, Pullin 2004), we therefore assess *Petrocodon lancifolius* as Critically Endangered, CR C2a(ii).

**Additional specimen examined (paratype):**—CHINA. Guizhou Province: Huishui County, Duanshan Town, same locality as type, 07 July 2010, *Fang Wen FW-Ges2010070702* (IBK!).

**Specimens of *P. scopulorum* examined:**—CHINA. Guizhou Province: Xiuwen County, Maochong, in limestone scopulus, 1200 m, 22 July 1991, *Shun-Zhi He 91050* (PE!), *91051* (PE!), *91052* (HGCM!).

**Discussion:**—*Petrocodon lancifolius* is similar to *P. scopulorum* based on, e.g., the stamen shape, but it can be distinguished by its narrower, usually symmetrical, rarely asymmetrical, lanceolate leaf blade (*vs.* asymmetrical, elliptic to ovate, rarely obovate), peduncle, pedicels, the outside of bracts and corolla purplish brown strigulose (*vs.* brown puberulent), corolla campanulate (*vs.* urceolate, often with long neck), limb 4- or 5-lobed (*vs.* only 5-lobed), stamens 4 or 5, 1.8–2.1 mm long (*vs.* only 5, 2.5–3.5 mm long); ovary glabrous (*vs.* sparsely puberulent), shorter pistil, 5.4–6.2 mm long (*vs.* 5.5–12 mm long), style sparsely white short fleshy strigose (*vs.* puberulent). A detailed comparison of the two species is given in Table 1.

**TABLE 1.** Comparison of *Petrocodon lancifolius* and *P. scopulorum*.

Character	<i>P. lancifolius</i>	<i>P. scopulorum</i>
Shape of leaf blade	usually symmetrical, rarely asymmetrical, lanceolate, base narrowly cuneate, apex acuminate, acute or obtuse	asymmetrical, elliptic to ovate, rarely obovate, base cuneate to nearly rounded, margin crenate, apex acute
Size of leaf blade	2.5–7.0 × 0.8–1.1 cm	(1.5–)3–6 × (1–)1.5–2.5 cm
Hairs on the leaves	glabrous on both surfaces	adaxially appressed puberulent, glabrescent, abaxially densely appressed puberulent
Peduncle	1.5–3.2 cm long, green, densely scattered purplish brown strigulose	4–6.5 cm long, green, brown puberulent
Bracts	green, linear, 6–9 × 0.8–1.0 mm, apex obtuse or rounded, outside purplish brown strigulose	purple, narrowly lanceolate, 2–5 × 0.5–0.8 mm, apex acute, outside glabrous to sparsely pubescent
Pedicel	5–8 mm long	4–12 mm long
Corolla	campanulate, orifice slightly constricted, tube slightly swollen, white, lobes margin slightly green, 4.1–4.5 mm long, 2–2.1 mm in diameter at the middle, 1.6–1.9 mm at the mouth, outside purplish brown strigulose	urceolate or urceolate with long neck, orifice distinctly constricted, tube distinctly swollen, white or lilac, 5–11.3 mm long, 3.3–3.8 mm in diameter at the middle, 0.8–1.4 mm at the mouth, outside sparsely puberulent, glabrescent above middle
Limb of corolla	4- or 5-lobed, both in the same cyme, commonly inconspicuously zygomorphic, rarely actinomorphic, if zygomorphic adaxial lobes obliquely deltoid, 1.16–1.33 × 1.0–1.17 mm	5-lobed, lobes equal, triangular, 1.2–3 × 0.5–1 mm
Stamens	4 or 5, 1.8–2.1 mm long	5, 2.5–3.5 mm long
Pistil	5.4–6.2 mm long	5.5–12 mm long
Ovary	glabrous	sparsely puberulent
Style	3.8–4.2 mm long, sparsely white short fleshy strigose	4–9 mm long, white puberulent

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