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Petrocodon confertiflorus (Gesneriaceae), a new species from Guangdong, China

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A new species, *Petrocodon confertiflorus* H.Q. Li & Y.Q. Wang (Gesneriaceae) from Guangdong Province in south China, is described and illustrated. It is most similar to *P. dealbatus*, but is distinct from its congeners by its bigger ovate-oblong leaf blade with 6–12 pairs of lateral nerves, by the number of cymes (3–10) with 2–3 branches bearing densely placed flowers, by the swollen, urceolate corolla with a constricted orifice, by the stamens adnate to the corolla and with the anthers free, as well as by the leaf epidermal characters.

Introduction

The genus *Petrocodon* was established in 1883 and comprised of one species, *P. dealbatus*, endemic to southern China (Wang 1990, Wang *et al.* 1998, Li & Wang 2004). Subsequently, the variety *P. dealbatus* var. *denticulatus* (Wang 1990), three new species endemic to southern China i.e. *P. ferrugineus* (Wei 2007), *P. multiflorus* (Jiang *et al.* 2011) and *P. lancifolius* (Wen *et al.* 2012), as well as three new species endemic to southwest China i.e. *P. ainsliifolius*, *P. lithophilus* and *P. viridescens* (Chen *et al.* 2014), were described. Based on molecular studies, Weber *et al.* (2011) transferred four Chinese unispecific genera (*Calcareaoboea*, *Paralagarosolen*, *Tengia*, *Dolicholoma*), a small genus endemic to China (*Lagarosolen*), and a few species of *Didymocarpus* to the genus *Petrocodon*. This has raised the size of *Petrocodon* to more

than 20 species (Möller *et al.* 2011, Wang *et al.* 2011, Weber *et al.* 2011, Wen *et al.* 2012).

During our fieldwork on the floral biology of *Petrocodon* in July 2010, we found an unknown species of *Petrocodon* in Yangshan County, Guangdong Province, South China. It resembled especially *P. dealbatus*. In the flowering seasons 2010, 2011 and 2012, comparative studies on the flowering phenology, morphology and floral ecology between the two species were carried out in two localities. The unrecognized species grows on limestone rocks at the foot of a hill near to Lianjiang River, Yangshan County, Guangdong Province, South China (24°26.959'N, 112°47.333'E, alt. 80.6–97.1 m a.s.l.), and the studied population of *P. dealbatus* grows on limestone rocks at the foot of a mountain near by the Lishui River, Sangzhi County, Hunan Province in China (29°28.020'N, 110°00.649'E, alt. 310 m a.s.l.). Mature leaves of the two species were obtained

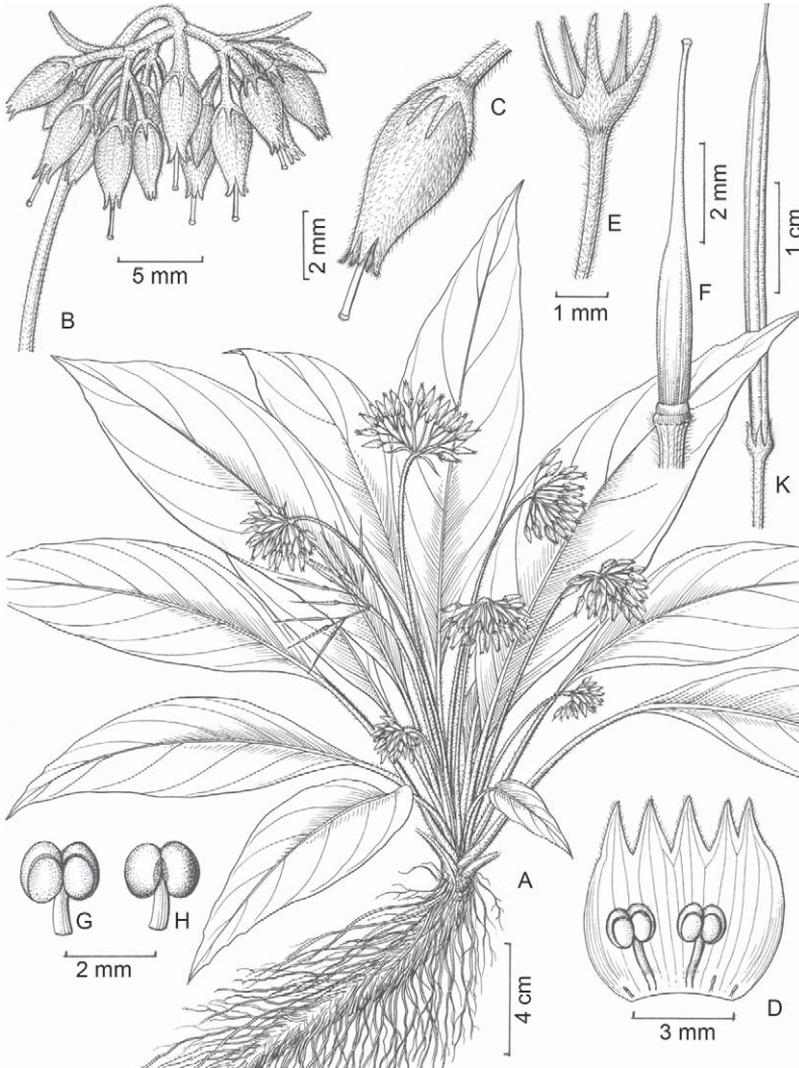


Fig. 1. *Petrocodon confertiflorus* (from the holotype). — **A:** Habit. — **B:** Inflorescence. — **C:** Flower. — **D:** Opened corolla, showing stamens and staminodes. — **E:** Calyx. — **F:** Ovary and style. — **G:** Anthers (anterior). — **H:** Anthers (dorsal). — **K:** Fruit.

from the field and their epidermal characters were investigated by light microscope (LM) and scanning electron microscope (SEM). The material for the LM study was shaved off mesophyll cells and epidermal tissue was obtained from the leaves by using a transparent gummed tape (Chen *et al.* 2004). The material for SEM observations was directly mounted on stubs without any treatment, and sputter coated with gold-palladium. After a careful examination and comparison with herbarium specimens of this genus and consulting the relevant literature, we found that the unknown species was evidently different from its congeners by its inflorescence and flower morphology, espe-

cially the floral characters. Therefore, we here describe a new species of *Petrocodon*.

***Petrocodon confertiflorus* H.Q. Li & Y.Q. Wang, *sp. nova* (Figs. 1–3)**

TYPE: China. Guangdong province, Yangshan County, Qinglian Town, growing on limestone rocks at the foot of a hill near to Lianjiang River, 112°47.333'E, 24°26.959'N, alt. 80.6–97.1 m a.s.l., 23 June 2012 *Wang Y. Q. 12001* (holotype SN; isotypes SN). — **PARATYPES:** China. Guangdong Province, Yangshan County, Qinglian Town, 11 July 2010 *Li H. Q. 6* (SN), 23 July 2012 *Li H. Q. 9* (SN).

ETYMOLOGY: The species is named after its densely crowded flowers.

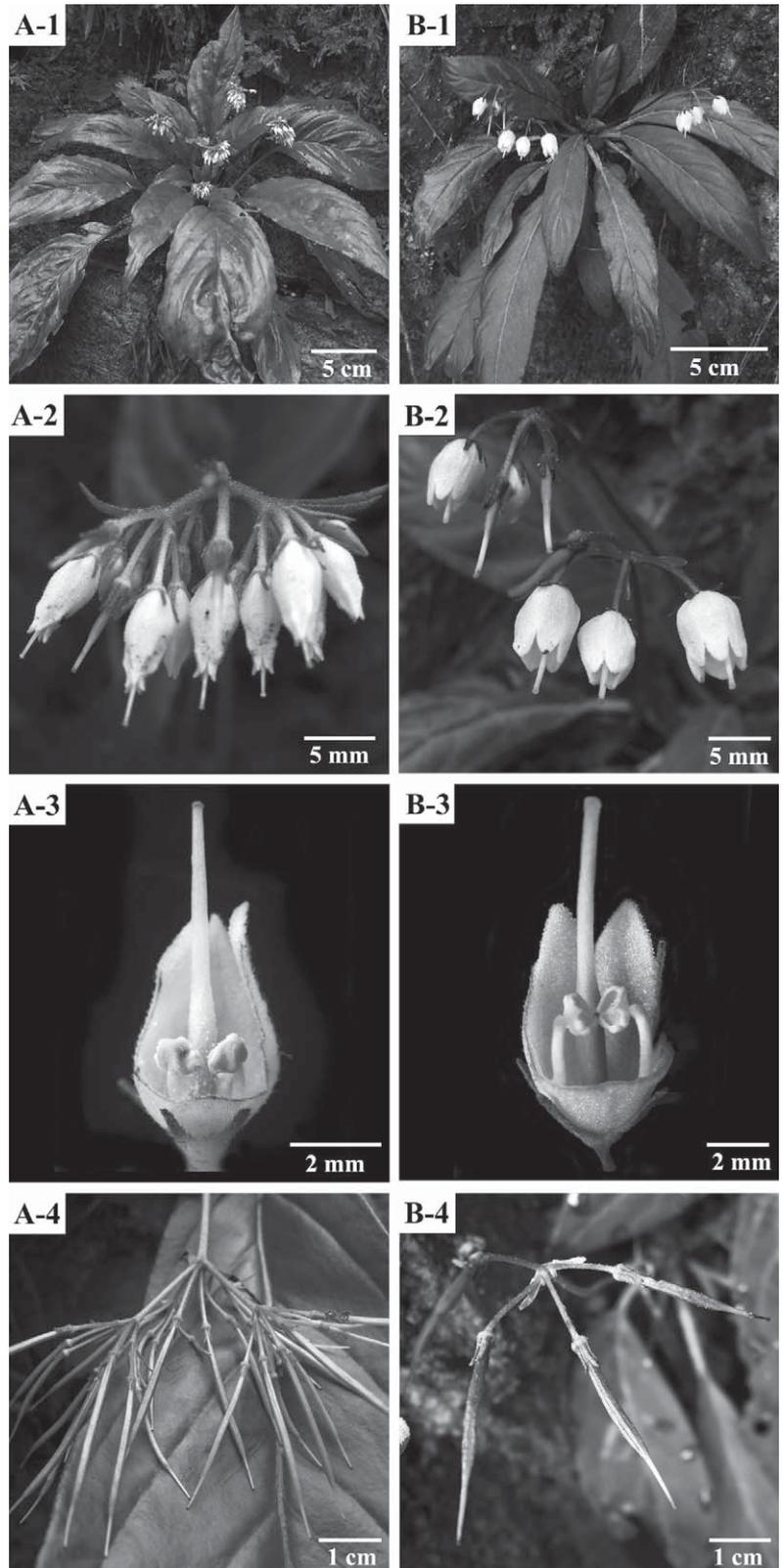


Fig. 2. Morphological comparison of (A) *Petrocodon confertiflorus* and (B) *P. dealbatus*. — 1: Plant and habit. — 2: Flowers and cymes. — 3: Opened flowers. — 4: Infructescence with capsules.

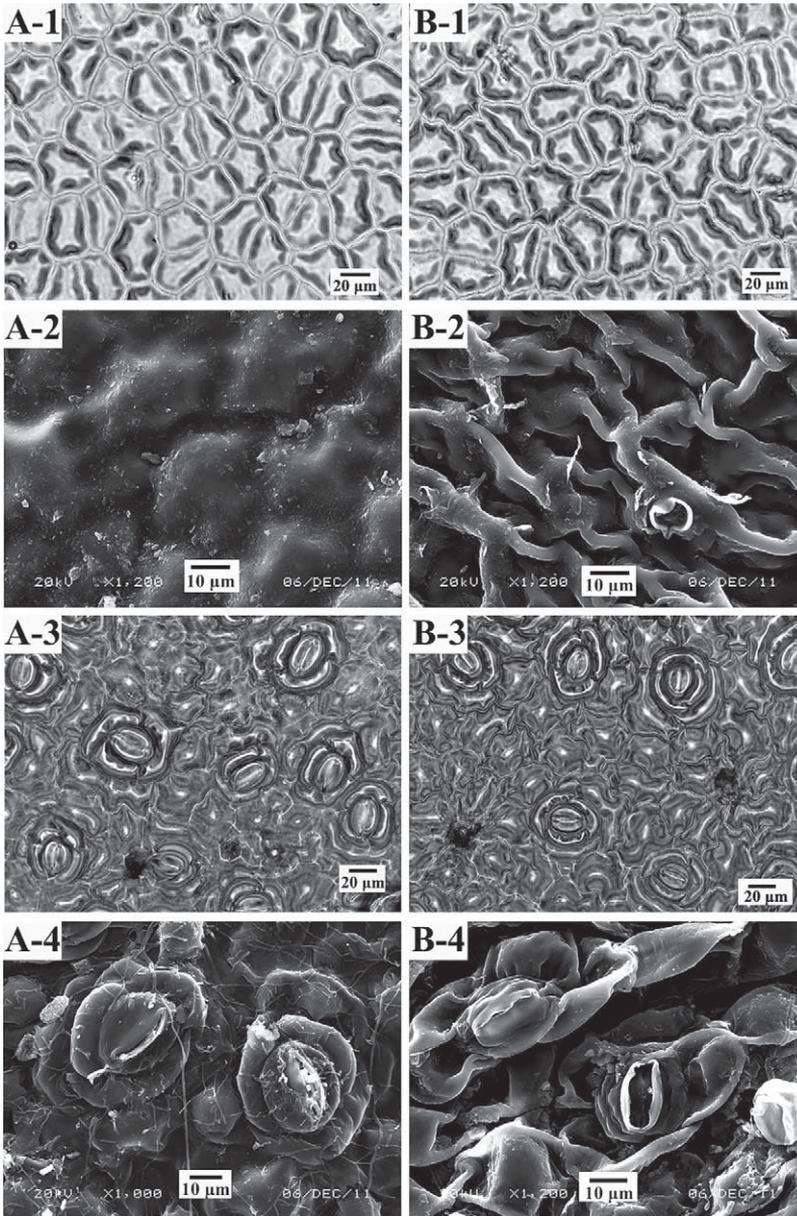


Fig. 3. Comparative morphology of leaf epidermal surface between (A) *Petrocodon confertiflorus* and (B) *P. dealbatus* (LM, SEM). — 1: Adaxial epidermal cells. — 2: Adaxial cuticular membrane (SEM) — 3: Abaxial epidermal cells (LM). — 4: Abaxial cuticular membrane and stomata (SEM).

Perennial herb, acaulescent. Rhizomes straight or curved, terete or subterete, 1.7–7.0(–13) cm long, 0.5–1.9 cm in diameter. Leaves 4–19, basal; leaf blade thinly coriaceous or papery, usually slightly asymmetrical, ovate-oblongate, rarely lanceolate, 10.5–30.0 × 2.6–10.7 cm, base cuneate, apex acuminate and sometimes caudate, rarely acute, margin slightly revolute, crenate generally up to middle, more rarely nearly entire or completely crenate, adaxi-

ally blackish green or bottle green and sparsely appressed strigose, abaxially pale green, white powdery and appressed strigose, rarely both surfaces upper portion of leaf amaranth, lateral nerves 6–12 pairs, densely appressed strigose; petioles 2.4–9.0 cm, appressed strigose and white powdery. Inflorescence cymose, each plant bearing (12–)22–181 flowers borne in (1–)3–10 cymes, each cyme with 2–3 branches, bearing 10–67 flowers on each cyme; peduncles 2.4–

14.0 cm long, 1.2–3.4 mm in diameter, green, densely purplish long strigose; bracts 2, opposite, green, linear or lanceolate-linear, 7.9–26.3 × 0.8–6.8 mm, densely strigose; bracteoles 2, narrowly linear, 3.6–13.5 × 0.5–2.0 mm, densely strigose. Pedicel 3.8–9.2 mm long, densely strigose. Calyx 5-parted, basally connate, calyx lobes narrowly lanceolate-linear, 1.5–3.4 × 0.3–0.5 mm, outside sparsely strigose. Corolla white, urceolate, swollen, outside white strigose, inside glabrous, 4.1–6.2 mm long, 2.7–4.6 mm in diameter at middle, orifice constricted, 0.4–1.0 mm in diameter; limb 5-lobed, zygomorphic, adaxial lip 2-lobed to near or over a half of lobes, deltoid, 1.4–3.0 mm long, 0.7–1.5 mm at base, apex acute, abaxial lip 3-lobed to base of lobes, deltoid, lateral lobes 1.3–2.6 mm long, 1.0–1.5 mm at base, apex acute, median lobe 1.8–3.2 mm long, 1.3–1.9 mm at base, apex acute. Stamens 2(–3), glabrous, 2.8–4.6 mm long; filaments linear, glabrous, free, slightly curved in middle, 1.2–2.8 mm long, inserted at 0.3–1.8 mm from base of corolla tube; anthers free, cordate to ellipsoidal, 0.9–1.5 × 1.5–2.4 mm, apex obtuse; staminodes (2–)3, linear, inserted 0.3–1.4 mm from base of corolla tube, 0.7–1.3 mm long, glabrous. Disc ring-like, 0.2–1.4 mm high, 0.9–1.7 mm in diameter. Pistil 8.6–9.9 mm long, glabrous; style linear, white, 4.0–6.9 mm long, exerted 3.3–4.5 mm from corolla; ovary linear, green, glabrous, 2.9–6.5 mm long, 0.5–1.0 mm in diameter; stigma 1, small, capitate. Fruit linear, 16–26(–40) × 0.9–1.3 mm, straight, glabrous. Flowering in late May to late August, fruits ripe during late June–September.

Petrocodon confertiflorus is known only from the type locality in Qinglian Town, Yangshan country, Guangdong Province, South China. *Paraboea dictyoneura* and *Chirita juliae* are growing alongside.

Petrocodon confertiflorus is most similar to *P. dealbatus*, having a similar shape of the pistil and fruits, but is distinct by its bigger ovate-oblong leaf blade with 6–12 pairs of lateral nerves, 10.5–30.0 × 2.6–10.7 cm (*vs.* oblanceolate to elliptic leaf blade with 4–6 pairs of lateral nerves, 5–17.8 × 1.5–6.8 cm); by the number of cymes borne by an individual plant and the number of flowers in each cyme, 3–10 cymes with 2–3 branches bearing 10–67 flowers in each

cyme [*vs.* 1–4(–6) cymes with 1(–2) branches bearing (2–)4–15(–17) flowers in each cyme]; by the urceolate corolla, 4.1–6.2 × 2.7–4.6 mm, orifice distinctly constricted, 0.4–1.0 mm in diameter [*vs.* suburceolate-tubular corolla, not swollen, 4.7–7.2 × 3.7–6.7 mm, mouth orifice not constricted, (2.4–)3.5–6.1 mm in diameter]; by the stamens with the filaments slightly curved in the middle and the anthers free (*vs.* the filaments curved ca. 90° on the top and the anthers coherent apically); by the leaf epidermis cells with straight anticlinal walls, the cuticular membrane being smooth (*vs.* repand anticlinal walls, cuticular membrane striate, wrinkled and grooved); and by its larger stomata with smooth outer stomatal rim, 32.3 ± 2.2 × 23.7 ± 1.6 μm (mean ± SE, *n* = 50), (*vs.* 26.1 ± 3.3 × 21.4 ± 2.1 μm, outer stomatal rim sinuate).

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