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Paraboea crassifila, a new species of *Paraboea* (Gesneriaceae) from Danxia landform in Guangxi, China

Jing Guo[1,2], Zhao-Cen Lu[1,2], Jing Liu[1] and Wei-Bin Xu[1*]

1. Guangxi Key Laboratory of Plant Conservation and Restoration Ecology in Karst Terrain, Guangxi Institute of Botany, Guangxi Zhuang Autonomous Region and Chinese Academy of Sciences, Guilin 541006, China.
2. College of Life Sciences, Guangxi Normal University, Guilin 541004, Guangxi, China.
[*]Corresponding author. Email: gxibwbxu@163.com

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ABSTRACT: *Paraboea crassifila*, a new species of Gesneriaceae from Danxia landform in Guangxi, China is described and illustrated, based on morphological and anatomical features. *Paraboea crassifila* sp. nov. is reported firstly from Danxia landform in China, with the special feature of enlarged filaments differing from the others of *Paraboea* distributed in China. *Paraboea crassifila* is similar to *Paraboea guilinensis* L. Xu & Y.G. Wei in the habit, but it can be distinguished by the obovate to narrowly obovate leaf blade, the peduncle and calyx covered with ferrugineous matted indumentums, the corolla arachnoid outside, the enlarged filaments, and 3 staminodes.

KEY WORDS: Danxia landform, Gesneriaceae, new species, taxonomy

INTRODUCTION

The genus *Paraboea* (C.B. Clarke) Ridl. was first published as *Didymocarpus* sect. *Paraboea* C.B. Clarke in 1883, and then raised to generic level in 1905 (Xu *et al*., 2008). According to the recent and comprehensive revision of the genus, 89 species and five varieties were identified (Xu *et al*., 2008). Subsequently, *Paraboea* was further expanded to include *Trisepalum* C.B. Clarke and *Phylloboea* Benth, resulting in a total of around 120 species based on the molecular phylogenetic study (Puglisi *et al*., 2011). As currently circumscribed, *Paraboea* is a genus of rosulate or caulescent herbs found mainly on limestone substrates, however, in the course of floristic surveys in southeastern Guangxi in 2015, we collected a flowering plant of *Paraboea* from the Danxia landform which is featured by the red colouration in the rocks and highlighted by massive mountain blocks and majestic cliffs. After consulting relevant literature (Wang *et al*., 1990, 1998; Li & Wang 2004; Chen *et al*., 2008; Xu *et al*., 2008; Kiew, 2010; Chen *et al*., 2012; Triboun & Middleton, 2012; Xu *et al*., 2012; Wen *et al*. 2013), as well as herbarium specimens (E, GXMI, HITBC, IBK, IBSC, KUN, PE), a new species of *Paraboea* is identified based on detailed examination of salient morphological and anatomical features.

TAXONOMIC TREATMENT

Paraboea crassifila W.B. Xu & J. Guo, ***sp. nov.***
粗絲蛛毛苣苔 Figs. 1 & 2

Type: **CHINA**: Guangxi: Yulin City, Rongxian County, Shizhai Town. Duqiaoshan scenery spot, Alt. 270 m, 24 March 2015, *Wei-Bin Xu 12129* (holotype IBK, isotypes PE, IBK).

Paraboea crassifila is similar to *Paraboea guilinensis* L. Xu & Y.G. Wei in the habit, but it can be distinguished by the leaf blade obovate, narrowly obovate, rare oblong (vs. obovate-elliptic or elliptic), peduncles 7–12.5 cm long, covered with ferrugineous matted indumentums (vs. 3.5–6.5 cm long, glabrous), calyx with ferrugineous matted indumentum outside (vs. glabrous), corolla arachnoid outside (vs. glabrous), filaments 6–8 mm long, enlarged (vs. 4.5–5 mm long, geniculate near middle), staminodes 3 (vs. 2).

Perennial herbs, Rhizomes subterete, 4–22 cm long, 3–8 mm in diameter, branched sometimes. Leaves 6–8, congested at the apex of the rhizome, petiole 1.1–3.2 cm long, 2–3 mm in diameter, covered with ferrugineous matted indumentum, leaf blade 5–13.5 × 2.1–5.2 cm, 2–3 times as long as wide, obovate, narrowly obovate, rare oblong, leather, bases cuneate, margins denticulate to shallowly repand, apices obtuse to subround, upper leaf surfaces with arachnoid covering when young, but glabrescent in age, lower leaf surfaces with ferrugineous matted indumentum, lateral veins 6–8 on each side of midrib, smooth adaxially and prominent abaxially, tertiary venation conspicuously reticulate on the lower leaf surface. Inflorescences cymose, axillary, 1–2(very rare 3)-branched, 3–12-flowered; peduncles 7–12.5 cm long, 1.5–2.5 mm in diameter, covered with ferrugineous matted indumentum; bracts 2 (or 3), 4–7 × 2–3 mm, lanceolate, margins entire, apices acute, with ferrugineous matted indumentum outside and glabrous inside; pedicels 1.2–3.0 cm long, ca. 1.0 mm in diameter, covered with ferrugineous matted indumentum. Calyx 3.0–4.0 mm

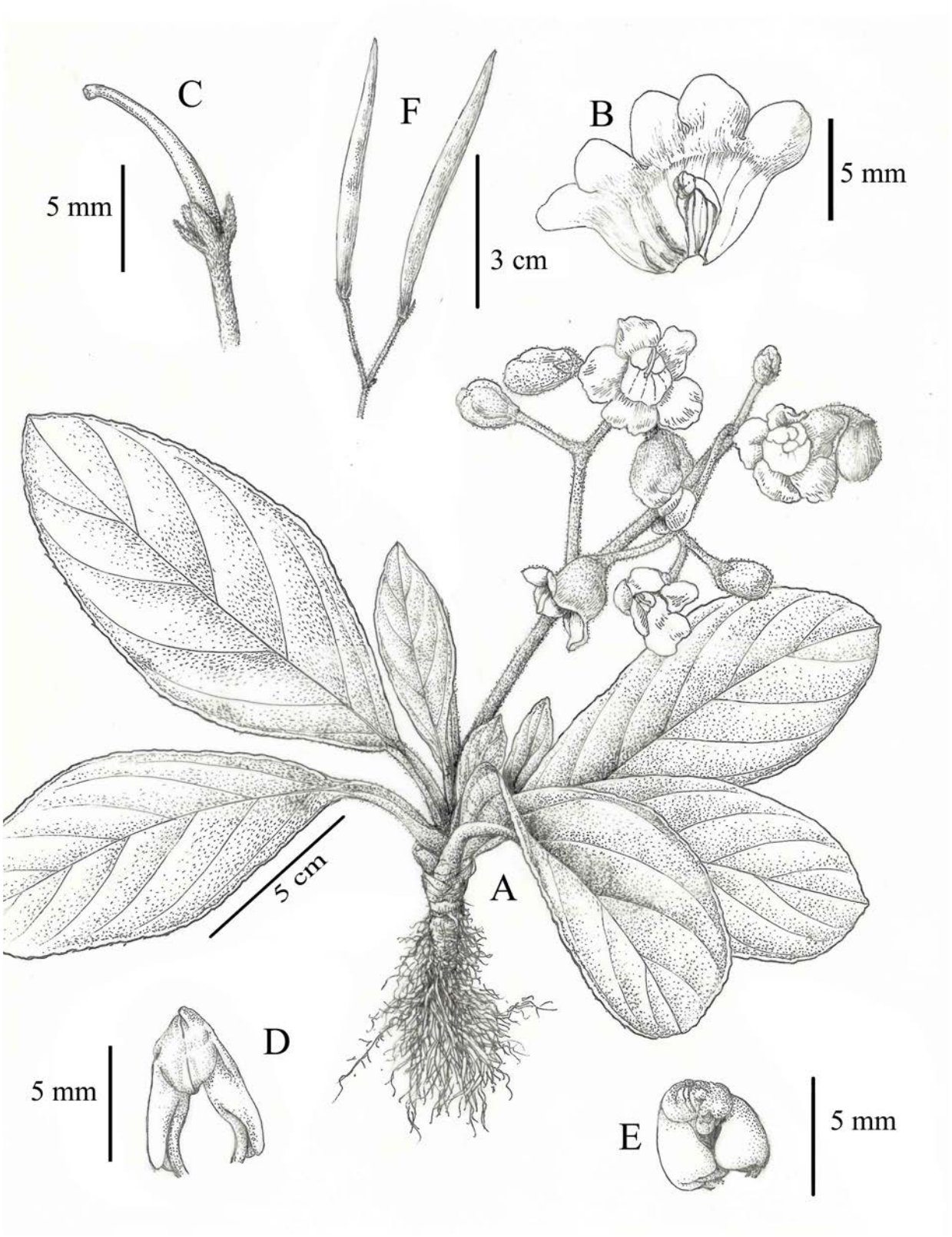

Fig 1. ***Paraboea crassifila***. **A:** Habit. **B:** Opened corolla showing stamens and staminodes. **C:** Pistil and calyx. **D:** Stamens dorsal view. **E:** Stamens face view. **F:** Capsule.

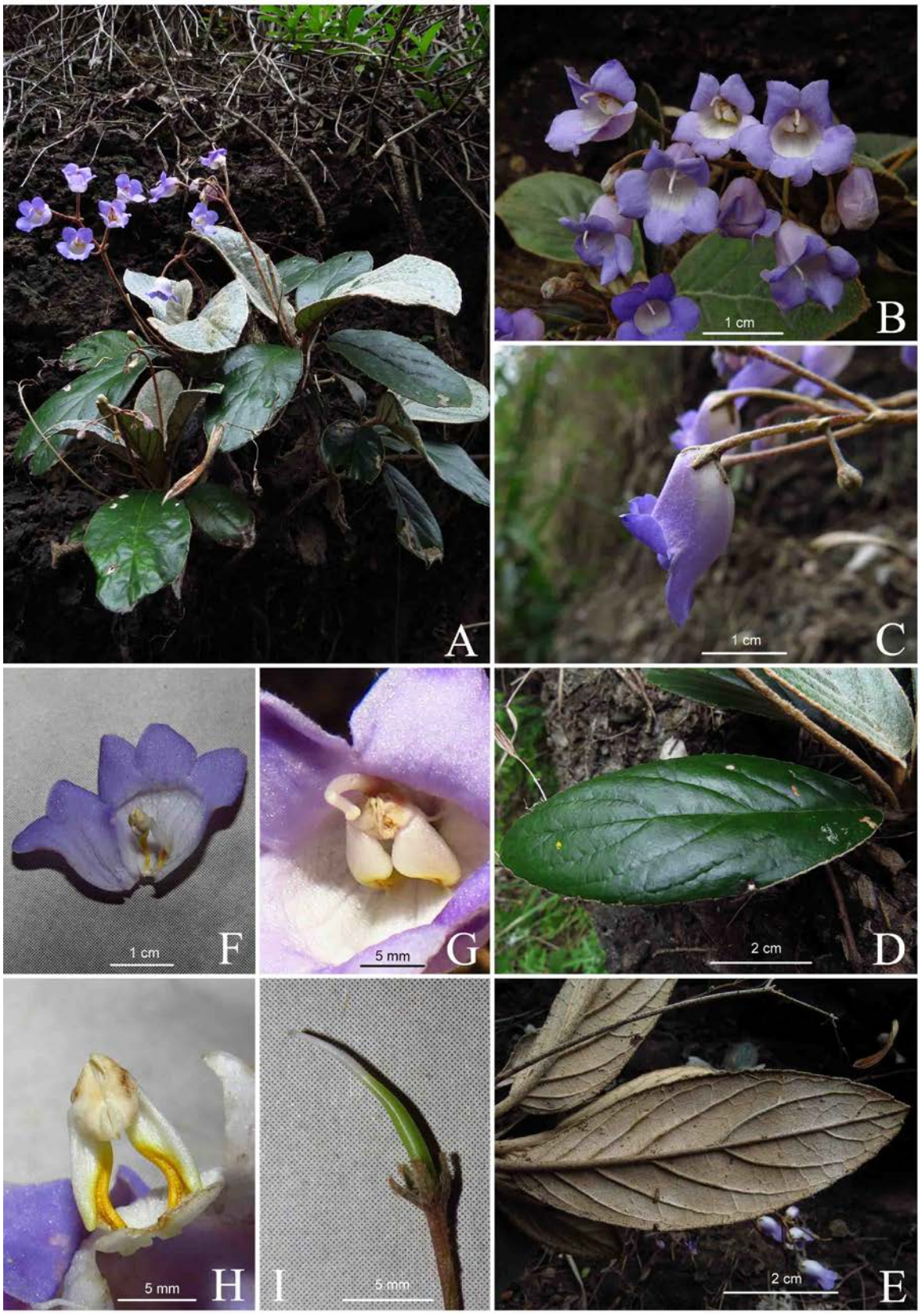

Fig 2. ***Paraboea crassifila***. **A:** Habit. **B:** Flowers face view. **C:** Flowers side view. **D**: Adaxial leaf surface. **E:** Abaxial leaf surface. **F:** Opened corolla showing stamens and staminodes. **G:** Stamens face view. **H:** Stamens dorsal view. **I:** Pistil and calyx.

Table 1. Morphological comparison of ***Paraboea crassifila*** and ***P. guilinensis***

	Paraboea crassifila	***P. guilinensis***
Blade	obovate, narrowly obovate, rare oblong, 5–13.5 × 2.1–5.2	obovate-elliptic or elliptic, 2.8–5.8 × 1.5–2.2
Lateral veins	6–8	5–6
Peduncles	7–12.5 cm long, covered with ferrugineous matted indumentum	3.5–6.5 cm long, glabrous
Calyx	3.0–4.0 mm long, with ferrugineous matted indumentum outside	1.8–2.1 mm long, glabrous outside
Corolla	arachnoid outside	glabrous outside
Filaments	filaments 6–8 mm long, enlarged	filaments linear, 4.5–5 mm long, geniculate near middle
Staminodes	3	2
Pistil	ovary 7–8 mm long, style 5–8 mm long	ovary 2.8–3 mm long, style 3.2–3.5 mm long
Capsule	3.2–4.8 cm long	2–2.8 cm long

long, 5-parted nearly to the base, lobes linear-lanceolate, 0.8–1.2 mm wide, with ferrugineous matted indumentum outside and glabrous inside, margins entire. Corolla 1.2–1.8 cm long, purplish, arachnoid outside and glabrous inside; tube 7–9 mm long, ca. 8 mm in diameter at the mouth; the limb distinctly 2-lipped, adaxial lip 2-lobed to near base, lobes broadly ovate, 4–5 × ca. 5 mm, abaxial lip 3-lobed to over middle, lobes oblong, 6–7 × 5–6 mm. Stamens 2, adnate to the corolla base; filaments 6–8 mm long, enlarged, glabrous, the apex of filaments strongly enlarged, triangular; anthers elliptic, 3.0–4.0 mm long; staminodes 3, glabrous, lateral ones 4–5 mm long, adnate to the corolla tube base; middle one 2–3 mm long, adnate to the corolla tube base. Pistil glabrous; ovary 7–8 mm long, ca. 1.5 mm in diameter, style 5–8 mm long, stigma capitate. Capsule linear, straight, 3.2–4.8 cm long, ca. 2.0 mm in diameter, glabrous.

Distribution and habitat: *Paraboea crassifila* is only found from type locality (Fig 3), and only four populations have so far been identified by us during field investigations in 2015. *Paraboea crassifila* grows on rock faces of Danxia landform, at an elevation between 130 and 280 m.

Phenology: Flowering from March to April, and fruiting May to June.

Etymology: The specific epithet *'crassifila'* is derived from the enlarged filaments.

Notes: The special feature of *Paraboea crassifila* is the enlarged filaments (Fig. 2 D and E; Fig. 3 G and H), which is reported firstly from the genus of *Paraboea* in China. *Paraboea crassifila* is similar to *Paraboea guilinensis* L. Xu & Y.G. Wei in the habit, but it is easily distinguished from the latter by some characters. A detailed morphological comparison of the two species is shown in Table 1.

Additional specimens examined: (paratype) **CHINA**: Guangxi: Yulin City, Rongxian County, Shizhai Town. 270 m, 24 March 2015, *Wei-Bin Xu 12127* and *12128* (IBK). The same locality, 3 June 2012, *Shui-Song Mo & Yu-Song Huang Liuyan1016* (IBK) and *Yu-Song Huang & Shui-Song Mo Y1506* (IBK).

Fig 3. Distribution of ***Paraboea crassifila*** (★) and ***Paraboea guilinensis*** (▲) in Guangxi Zhuang Autonomous Region, China.

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