



Taxonomic studies on *Begonia* (Begoniaceae) in Yunnan I: Two new species from southeastern Yunnan, China

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(Manuscript received 7 February 2025; Accepted 30 June 2025; Online published 9 July 2025)

ABSTRACT: The *Begonia* flora of Yunnan is highly diverse with over 125 taxa currently recognized. From 2019 to the present, the authors have conducted special field surveys and taxonomic studies on *Begonia* in Yunnan. *Begonia bazhaiensis* and *B. tianbaoensis*, two new species from southeast Yunnan, China, are here described. *Begonia bazhaiensis* belongs to sect. *Diploclinium* and *B. tianbaoensis* belongs to sect. *Platycentrum*. The conservation statuses of the two new species are provisionally assessed as Critically Endangered, respectively, according to Guidelines for Using IUCN Red List Categories and Criteria.

KEY WORDS: *Begonia bazhaiensis*, *Begonia tianbaoensis*, Begoniaceae, *Diploclinium*, limestone flora, new species, *Platycentrum*.

INTRODUCTION

The genus *Begonia* L. (Begoniaceae), distributed in tropical and subtropical areas of Asia, Africa, and America, comprises 2191 species and the number of known species has been increasing rapidly (Hughes *et al.*, 2015–). In China, up to now, 294 species (including infraspecies and natural hybrid species) have been recognized (Gu *et al.*, 2007; Borah *et al.*, 2023, 2024a,b; Das *et al.*, 2024; Tian *et al.*, 2024a,b,c; Wang *et al.*, 2024; Zhou *et al.*, 2024; Xi *et al.*, 2025). Yunnan Province is thus one of the centers of *Begonia* species diversity in Asia and worldwide (Chen *et al.*, 2019). Six sections and 101 taxa (including 89 species, 3 subspecies and 9 varieties) were recognized from Yunnan Province in 2006 (Huang and Shui, 2006). Recently, 15 new species (Ma and Li, 2006; Peng *et al.*, 2006; Wei *et al.*, 2007; Wang and Chen *et al.*, 2015; Wang *et al.*, 2019, 2020a,b; Ding *et al.*, 2020, 2022, 2023; Xi *et al.*, 2020; Chen *et al.*, 2021; Dong *et al.*, 2021; Feng *et al.*, 2021; Cai *et al.*, 2022), 7 new records (Peng *et al.*, 2006; Yang *et al.*, 2015; Wang *et al.*, 2019, 2022; Tian *et al.*, 2021; Yue *et al.*, 2023) were newly reported from Yunnan, as well 9 taxa were taxonomic treatment (*Begonia difformis* (Irmsh.) W.C. Leong, C.I Peng & K.F Chung (Leong *et al.*, 2015), *B. longiciliata* C.Y.Wu (Tian *et al.*, 2020), *B. menglianensis* Y.Y.Qian (Yang *et al.*, 2015) and *B. reflexisquamosa* C.Y.Wu (Gu *et al.*, 2007) segregated from *B. palmata* D.Don, *B. rex* Putz., *B. augustinei* Hemsl. and *B. miranda* Irmsh.; *Begonia* × *lancangensis* S.H.Huang and *B. × malipoensis* S.H.Huang & Y.M.Shui have been confirmed to be natural hybrids (Tian *et al.*, 2020); *B. arborea* Y.M.Shui, *B. muliensis* T.T.Yu and *B. yunnanensis* H. Léveillé are synonyms for *B. garrettii* Craib, *B. taliensis* Gagnep. and *B. modestiflora* Kurz (Gu *et al.*, 2007; Chen *et al.*, 2018; Tian *et al.*, 2020)) and 2

species (*B. fimbristipula* Hance and *B. pedatifida* H. Lévl.) have been confirmed not to be distributed in Yunnan (Gu *et al.*, 2007). Now in Yunnan, 125 taxa including 113 species, 3 subspecies and 9 varieties are recognized.

The southeastern part of Yunnan is mainly composed of limestone mountains, valleys, waterfalls, caves and many different small habitats, suitable climate and sufficient water, which make the region very rich in biodiversity (Xi *et al.*, 2020). Since 2019, the first author has conducted a comprehensive survey of *Begonia* in Yunnan, along with literatures and specimens research. Here, we report two new *Begonia* species from this region, namely *Begonia bazhaiensis* W.G.Wang & R.K.Li (*B. sect. Diploclinium*) and *B. tianbaoensis* W.G.Wang & R.K.Li (*B. sect. Platycentrum*).

TAXONOMIC TREATMENT

Begonia bazhaiensis* W.G.Wang & R.K.Li, *sp. nov.

Sect. *Diploclinium*

八寨秋海棠 Fig. 1

Type: CHINA. Yunnan Province, Wenshan Zhuang and Miao Autonomous Prefecture, Maguan County, Bazhai Town, Yangwendi Village, in shaded environment of limestone forests, elev. 1300–1400 m, 11 March 2023, W.G. Wang & R.K. Li 499 (holotype: HITBC0130254; isotypes: HITBC, BAZI).

Diagnosis: *Begonia bazhaiensis* morphologically resembles *B. saxifragoides* T.N.Bon & C.W.Lin (Bon *et al.*, 2023) in rhizome and leaves, but differs in leaves shape (orbicular to broadly ovate vs orbicular to reniform), androecium (actinomorphic vs zygomorphic), pistillate flower tepals (5 vs 3), flowering time (March vs September).

Monococious rhizomatous herb, 20 cm tall. **Rhizome** stout, reddish-brown, ca. 10 cm long, 5–8mm thick, internodes congested, 5–10mm long, densely reddish

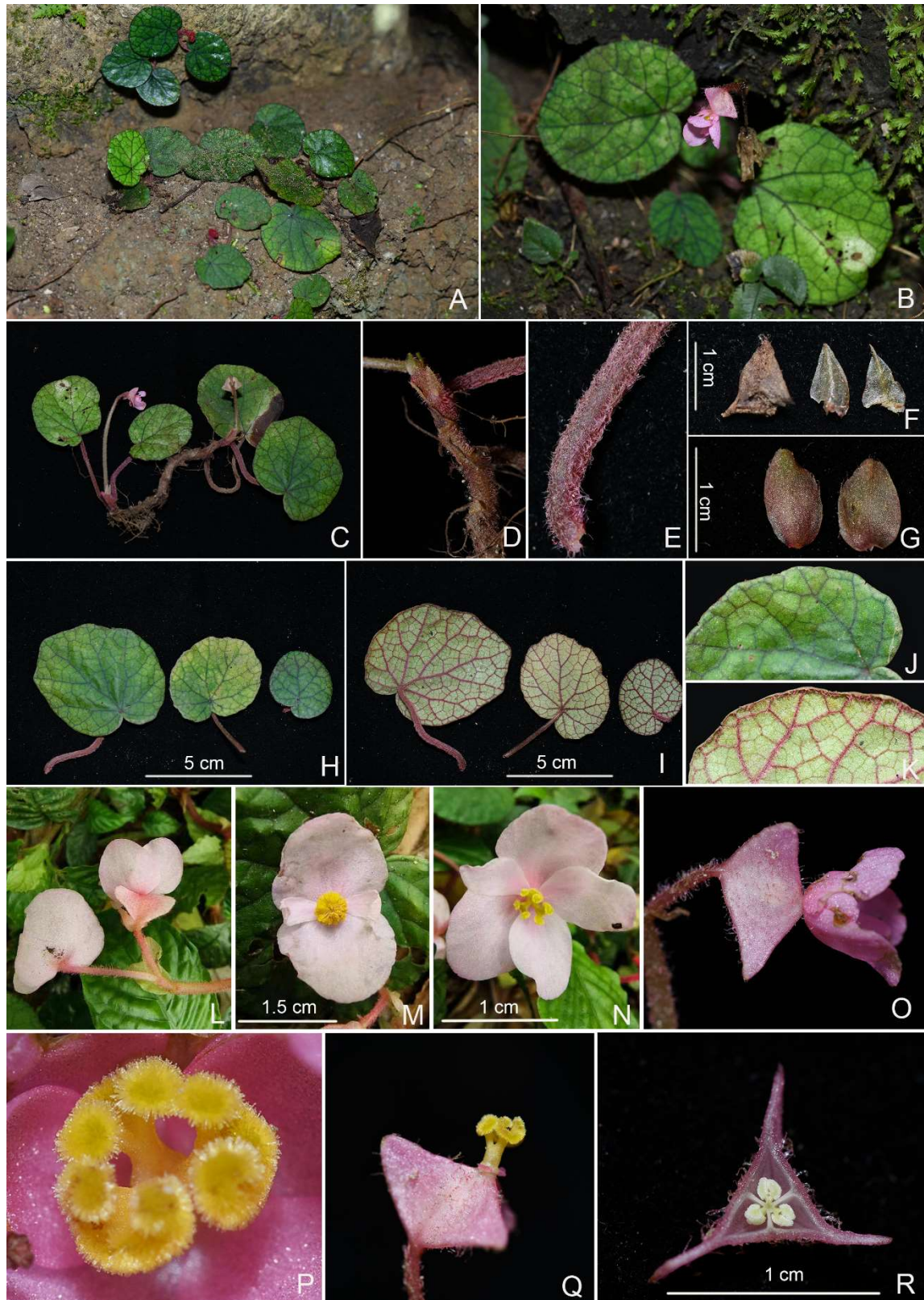


Fig. 1. *Begonia bazhaiensis* W.G.Wang & R.K.Li **A, B.** Habitat and habit; **C.** Flowering plant; **D.** Rhizome; **E.** Petiole; **F.** Stipules; **G.** Bracts; **H, I.** Leaves showing two sides; **J, K.** Leaf showing abaxial and adaxial indumentums; **L.** Inflorescence; **M.** Staminate flower; **N.** Front view of pistillate flower; **O.** Side view of pistillate flower; **P.** Stigmas; **Q.** Side view of young fruit; **R.** Dissected ovary showing axile placentation. (Photos : A–K, O–R by Wen-Guang Wang; L–N by Hui-Kui Wang)



pilose, with numerous fibrous roots. **Stipules** persistent, pale green to brown, triangular, $5-7 \times 3-5$ mm, herbaceous, strongly keeled, midrib scattered with hirsute, margin entire, apex aristate, arista 1–2 mm long. **Petioles**, reddish-brown, cylindrical, 3–5 cm long, 2–4 mm thick, densely reddish-brown villous. **Leaves** 3–5, asymmetric, orbicular to broadly ovate, $3.5-7 \times 3.2-5.8$ cm, basal lobes cordate, 9–15 mm long, apex rounded, margin denticulate to crenulate, recurved and undulated, adaxially glabrous or subglabrous, greyish-green to olive green, venation blackish-green and slightly impressed; abaxially pale green; venation palmate, veins distinct, 7–8, primary veins branching dichotomously or nearly so, tertiary veins reticulate; all veins densely pink pilose or puberulous on abaxial surface. **Inflorescence**: axillary, bisexual, dichasial cyme, arising from rhizome, branched twice; 3.2–6.5 cm long; peduncle pale green to brown, 3–6 cm long, 2–3 mm thick, sparsely pinkish-white pilose. **Bracts** caducous, yellowish-green, ovate, $6-8 \times$ ca. 5 mm, abaxially sparsely pilose, margin fimbriate. **Staminate flower**: pedicel pinkish-brown, 10–15 mm long, densely pilose; tepals 4, pinkish-white to pink, outer two suborbicular to widely obovate, $15-18 \times 18-20$ mm, abaxially pilose, margin entire, apex rounded, inner two narrowly obovate to oblong, $8-10 \times 4-5.5$ mm, glabrous, apex obtuse or rounded; androecium actinomorphic, ca. 6 mm across; stamens yellow, ca. 50; filaments ca. 1.5 mm long, fused at base; anthers oblong to obovate, ca. 1 mm long, 2-locular, apex rounded. **Pistillate flower**: pedicel pinkish-brown, 5–12 mm long, 2 mm thick, densely pink pilose; tepals 5, whitish-pink; outer 2 suborbicular to broadly ovate, inner 3 narrowly ovate, $4-9 \times 3-8$ mm, abaxially pilose, margin entire, apex rounded; styles 3, yellow, connate base 2 mm long, free part 2 cm, stigma slightly spirally twisted. Ovary pink, sparsely very short pubescent, 3-locular, placentation axile, placenta bilamellate. Fruits brown, sparsely white to pink pubescent, subequally 3-winged, abaxial wing triangular, ca. 6×7 mm, lateral wings triangular, ca. 5×7 mm.

Phenology: The plants bloom in March, the fruits ripen from May to July.

Etymology: The species is named after the type location Bazhai Town (Maguan County), where this new species was collected. The Chinese name is given as “八寨秋海棠”.

Distribution and Ecology: Endemic to Yangwendi Village, Bazhai Town, Maguan County, southeast of Yunnan Province. Grows on rocky surface under the forest of karst mountain at 1300–1400 m altitude.

Conservation status: *Begonia bazhaiensis* is considered as Critically Endangered (CR B1ab(v)+2ab(v)) according to the Guidelines using the IUCN Red List Category and Criteria (IUCN 2025). The area of occupancy (AOO) of the species is estimated to be less than 5 km² and the type location is very close to the *Laixiangia tsaoko* (Crevost & Lemarié) M.F.Newman &

Škorničk. and *Wurfbainia villosa* (Lour.) Škorničk. & A.D.Poulsen field. Its occupancy area and the total number of mature plants are predicted to decline in the future due to climate change and human activity.

***Begonia tianbaoensis* W.G.Wang & R.K.Li, sp. nov.**

Sect. *Platycentrum*

天保秋海棠 Fig.2

Type: China. Yunnan Province, Wenshan Zhuang and Miao Autonomous Prefecture, Malipo County, Tianbao town, elev. 419 m, 16 May 2020, W.G. Wang & R.K. Li GX2434 (holotype: BAZI001048; isotype: HITBC).

Diagnosis: *Begonia tianbaoensis* is morphologically allied to *B. tamdaoensis* C.-I Peng (Peng *et al.*, 2015) in having rhizomes, short erect stems in flowering and hairy plants, differs in having different indumentum of leaves, flowers (villose vs hispid), pedicels (villose vs glandular pilose) and ovary (papillose-hispid vs glandular-hispid); androecium (actinomorphic vs zygomorphic), stamens number (163 vs 12–35); abaxial wing (2 mm vs 11–19 mm long).

Description: Herb, monoecious, perennial, rhizomatous, 10–25 cm tall. **Rhizome** creeping, 5–9 cm long, ca. 9 mm thick, internodes 10–25 mm long, reddish villous; erect stems seen only at anthesis, 1 internode, internode ca. 2.5 cm long, 7 mm thick, densely red villous. **Stipules** persistent, pink, triangular, 7–15 cm long, 5–7 mm wide, herbaceous, strongly keeled, abaxially densely hirsute at midrib, 1–2.2 mm long, margin entire, apex aristate, arista ca. 2 mm long. **Petioles** terete, reddish-brown, 7–15 cm long, 3–7 mm thick, densely reddish-brown villous. **Leaves** 3–6 asymmetric, oblique, broadly ovate, 8–15 cm long, 6–13 cm wide, broad side 3–5 cm wide, basal lobes cordate, 6–14 mm long, margin denticulate, apex acuminate; leaf thickly chartaceous, succulent, adaxially dark green, subglabrous, veins impressed; abaxially pale green to reddish-brown, densely reddish-brown villous along veins; venation palmate, veins distinct abaxially, 7–8, midrib distinct, 3–4 secondary veins on each side, tertiary veins reticulate; smaller leaves of erect stem similar to terrestrial ones in shape and texture. **Inflorescence**: terminal, monoecious, cymose panicle arising on a short stem, dichasial cymes branched 2–3 times; 4–16 flowers; peduncle green to brown, 9–13 cm long, 3–6 mm thick, densely red villous; bracts persistent, reddish, elliptic to oblanceolate, 8–13 mm long, 6–9 mm wide, abaxially hirsute at midrib, margin entire or sparsely denticulate and villous; bracts of upper inflorescence similar but smaller, 6–10 mm long, 3–5 mm wide. **Staminate flower**: pedicel 20–23 mm long, 1.5 mm thick, densely red villous; tepals 4, white to pink, outer 2 ovate, 19–22 mm long, 12–15 mm wide, abaxially red hirsute, inner 2 elliptic to oblanceolate, 17–23 mm long, 9–11 mm wide; androecium actinomorphic, ca. 6 mm across; stamens 163, golden yellow; filaments 1–3 mm long, fused at base; anthers obovate, ca. 1 mm long, 2-locular, apex obtuse. **Pistillate flower**: pedicel

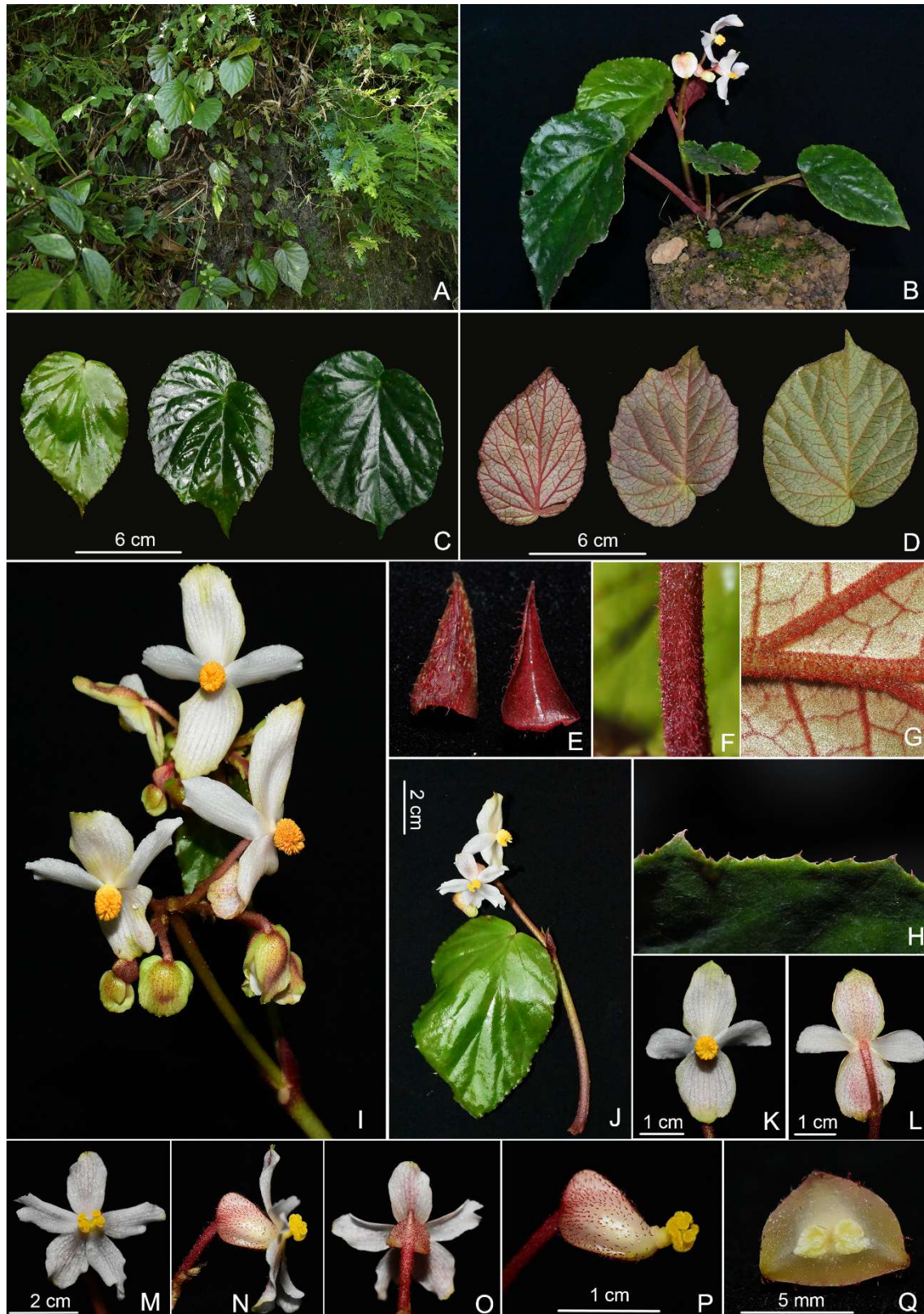


Fig. 2. *Begonia tianbaoensis* W.G.Wang & R.K.Li **A.** Habitat; **B.** Cultivated plant; **C, D.** Leaves showing two sides; **E.** Stipules; **F.** Petiole; **G.** Leaf showing abaxial indumentums; **H.** Margin denticulate; **I, J.** Inflorescences; **K, L.** Front and back views of staminate flower; **M–O.** Front, side and back views of pistillate flower; **P.** Side view of young fruit; **Q.** Dissected ovary showing axile placentation. (Photos : A by Wen-Guang Wang; B–Q by Ren-Kun Li)



10–14 mm long, 1.5 mm thick, red villous; tepals 5, white to pink, orbicular to obovate, 18–22 mm long, 7–14 mm wide, abaxially red villous, margin entire, apex rounded; styles 2, yellow, connate base 4 mm long, free part 2.5 mm, stigma slightly spirally twisted. Ovary pink to brown, densely red papillose-hispid, 2-locular, placentation axile placentae bilamellate. Capsule trigonous-ellipsoid, 10×8 mm; wings short, unequal, abaxial wing ca. 2×10 mm mm, lateral wings ca. 1×10 mm.

Phenology: The plants bloom in May, the fruits ripen unknown.

Etymology: The species is named after the type location Tianbao Town (Malipo County), where this new species collected. The Chinese name is given as “天保秋海棠”.

Distribution and Ecology: Endemic to Tianbao Town, Malipo County, southeast of Yunnan Province. Grows on rocky surface near the waterfall under the forest of karst mountain at 419 m altitude.

Conservation status: There is only one population with 30 mature individuals occupying ca. 400 m². All the individuals have not been protected in any nature reserve, and a rubber plantation exists nearby the population. Based on IUCN Red List Categories and Criteria (IUCN 2025), the new species is categorized as “Critically Endangered” (CR Blab(v)+2ab(v); D).

ACKNOWLEDGMENTS

This work was supported by the Conservation Research of Plant Species with Extremely Small Population Project of Yunnan (2022SJ07X-05); 14th Five-Year Plan of Xishuangbanna Tropical Botanical Garden, Chinese Academy of Sciences (E3ZKFF8B). Mr. Hui-Kui Wang is grateful for his help on field survey and photographs.

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