

***Paraboea khaoyaica* (Gesneriaceae), a new species from Thailand**

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ABSTRACT. *Paraboea khaoyaica* Kaitongsuk, Triboun & Sungkaew, a new species from Southeastern Thailand, is described and illustrated and its conservation status is assessed. The species is currently only known from the type locality.

Keywords. Asia, endangered, Khao Yai National Park

Introduction

The genus *Paraboea* (C.B. Clarke) Ridl., distributed in tropical Asia with about 130 species (Triboun & Middleton, 2015), is one of the largest genera in the Gesneriaceae (Weber, 2004; Puglisi & Phutthai, 2017). The genus was revised by Xu et al. (2008), since when the two genera *Trisepalum* C.B. Clarke and *Phylloboea* Benth. have been synonymised into *Paraboea* based on evidence from a molecular phylogenetic study by Puglisi et al. (2011). Ongoing work to revise the genus for the *Flora of Thailand* has already led to the description of more than twenty new species from Thailand (Triboun & Middleton, 2012, 2015; Triboun, 2013; Puglisi & Phutthai, 2017). During a botanical expedition to Khao Yai National Park led by the first author in September 2019, an unknown *Paraboea* species was collected and examined. It does not match any of the previously known species of the genus. Therefore, it is here described and illustrated for the first time. Other useful information is also provided.

New species

Paraboea khaoyaica Kaitongsuk, Triboun & Sungkaew, **sp. nov.**

Paraboea khaoyaica is similar to *Paraboea pubicorolla* Z.R.Xu & B.L.Burt in having 1–3 subterminal inflorescences, leaves that are elliptic or ovate and with narrow wings at the base of the petiole joining across the nodes, and, unusually for species in the genus, occurs in a similar sandstone habitat. It differs in having a glabrous and flat-faced campanulate corolla with tube 4–5 mm long (vs a glandular hairy and deeply campanulate corolla with tube c. 7 mm long in *Paraboea pubicorolla*), filaments 1.5–2 mm long and glabrous (vs c. 4 mm long and pubescent in *P. pubicorolla*), and capsules 1–1.5 cm long (vs 2.5–3 cm long in *P. pubicorolla*). *Paraboea khaoyaica* is also similar to *P. chumphonensis* Triboun in the similar size of leaves and its flat-faced campanulate corolla with tube c. 4 mm long. It differs, however, in having a glabrous ovary (vs pubescent ovary in *Paraboea chumphonensis*), slightly shorter and glabrous capsules 1–1.5 cm long (vs slightly longer capsules c. 1.8 cm long which are covered with glandular hairs in *P. chumphonensis*), and occurrence in a sandstone habitat (vs limestone habitat in *P. chumphonensis*). – TYPE: Thailand, Prachin Buri, Prachantakham, Khao Yai National Park, 14°11'11.1"N 101°29'51.5"E, 3 September 2019, Kaitongsuk, Triboun, Uearee, Nitmee, Sreesaeng & Kaewsri S.K. 336/1 (holotype BKF; isotype BK). (Fig. 1 & 2).

Lithophytic perennial herb. **Stem** erect, 8–25 cm high, slender, 4–10 mm in diameter, semi-woody, cracked and longitudinally wrinkled, all parts covered with dense white hairs; rootstock cracked and corky with parallel grooves. **Leaves** 7–16, densely decussate, crowded towards the apex of stem; petiole up to 5 cm long, 2–3 mm in diameter, with narrow wings at base, joining across the nodes, densely covered with white hairs; blade chartaceous, elliptic or ovate, 6.5–15 × 2.5–5.5 cm, apex obtuse, base decurrent cuneate or attenuate, margin slightly crenate, densely covered with indumentum on both sides, secondary veins 4–8 on each side of midrib, sunken above and prominent below, tertiary veins reticulate. **Inflorescences** 1–3, subterminal, compound monochasia, with 1–3 orders of branching, congested; peduncle green to purplish red, 9–15.5 cm long, 0.5–1 mm in diameter with white hairs at base; bracts linear or lanceolate, 4–5 × 1.5–2 mm, the upper ones strongly reduced, 2.5–3 × 1–1.5 mm; flowers paired; pedicels 2–4 mm long. **Flower bud** light mauve, 3–4 mm in diameter. **Calyx** green to purplish red, fused at base, c. 1 mm long, divided into 5 lobes; lobes narrowly triangular, 3–3.5 × 0.5–1 mm, apex acute, glabrous. **Corolla** glabrous, white to very light mauve, rotate to shallowly campanulate, 5-lobed; tube 4–5 mm long; lobes orbicular or broadly ovate, 4–5 × 5–6 mm, apex rounded. **Stamens** 2, inserted near base of corolla tube; filaments orange, geniculate, 1.5–2 mm long, c. 0.5 mm wide, glabrous; anthers light yellow, c. 3 × 2 mm; staminodes 3, attached near base of corolla tube. **Ovary** cream-white, ovoid, c. 2 mm long, glabrous; style light mauve, 3–4 mm long; stigma capitate, white or light mauve. **Capsules** plagiocarpic, narrowly cylindrical, 1–1.5 × 0.1–0.2 cm, slightly twisted, glabrous; calyx persistent, pale green when young, brown when mature.

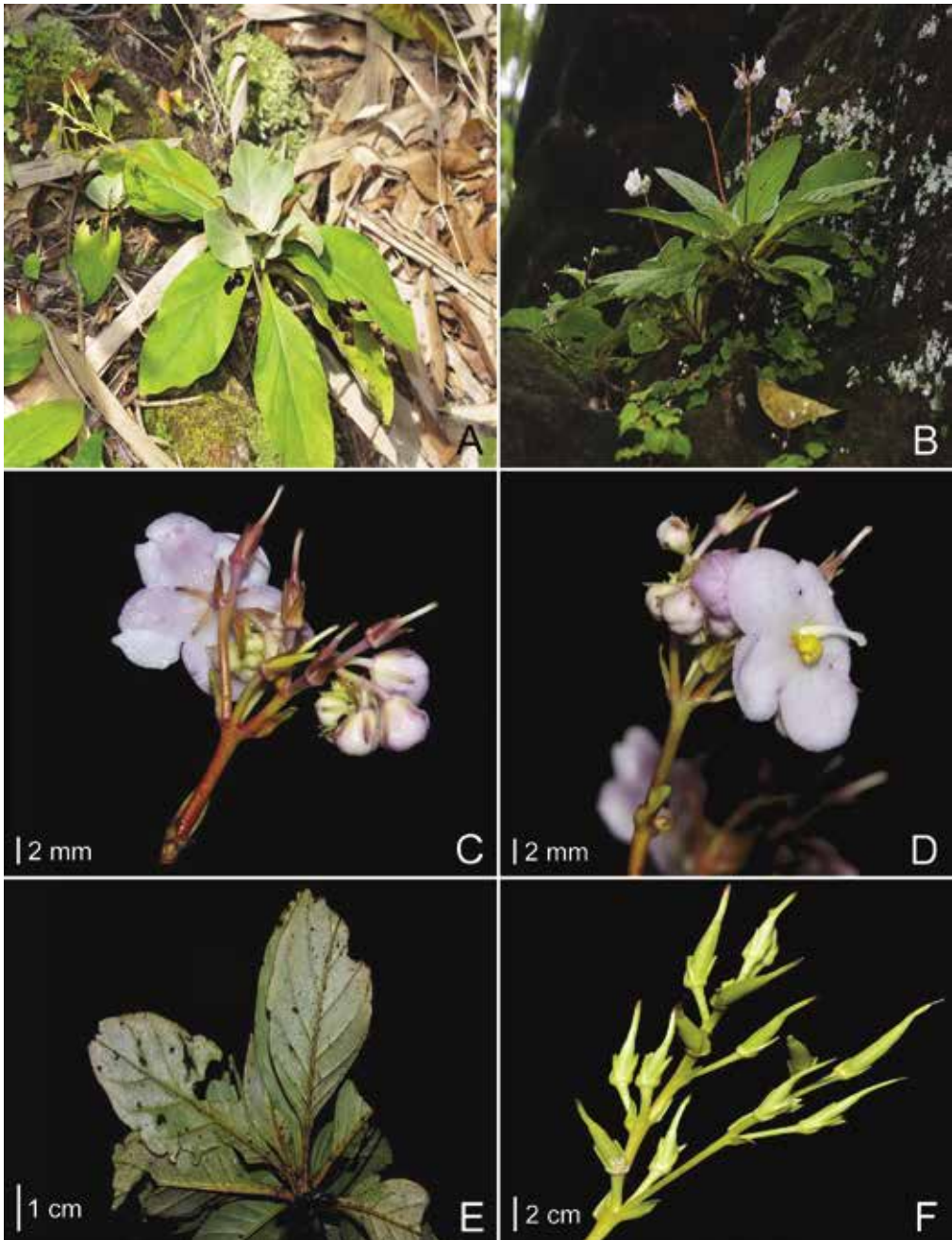


Fig. 1. *Paraboea khaoyaica* Kaitongsuk, Triboun & Sungkaew. **A–B.** Habit. **C.** Inflorescence with open flowers (back view), flower buds and young fruits. **D.** Inflorescence with open flower (front view), flower buds and young fruits. **E.** Undersurface of leaves. **F.** Infructescence with young fruits. (Photos: S. Kaitongsuk).



Fig. 2. *Paraboea khaoyaica*. **A.** Habit. **B.** Open flower and young fruits. Drawn by Orathai Kerdkaew.

Distribution. Endemic to Southeastern Thailand.

Ecology. Growing on sandstone rocks along a stream and on moist rocks in partial shade in bamboo and dry dipterocarp forest, alt. 100–150 m.

Phenology. Flowering and fruiting between August and November.

Etymology. The specific epithet refers to Khao Yai National Park (the type locality).

Vernacular name. Cha Rue Si Khao Yai (ชาฤๅมิเขาใหญ่).

Provisional IUCN conservation assessment. Following the IUCN Red List categories and criteria (IUCN Standards and Petitions Committee, 2019), *Paraboea khaoyaica* is assessed as Endangered (EN B1ab(iii) + B2ab(iii)). It is only known from three locations from sandstone vegetation in bamboo and dry dipterocarp forest in Khao Yai National Park with an Extent of Occurrence (EOO) of around 20 km², and an estimated known Area of Occupancy (AOO) of around 8 km². The principal threat is that the area is seasonally dry between March and April and prone to fire.

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References

- IUCN Standards and Petitions Committee (2019). *Guidelines for Using the IUCN Red List Categories and Criteria*. Version 14. Prepared by the Standards and Petitions Committee. Available from <http://www.iucnredlist.org/documents/RedListGuidelines.pdf>.
- Puglisi, C., Middleton, D.J., Triboun, P. & Möller, M. (2011). New insights into the relationships between *Paraboea*, *Trisepalum*, and *Phylloboea* (Gesneriaceae) and their taxonomic consequences. *Taxon* 60(6): 1693–1702.
- Puglisi, C. & Phutthai, T. (2017). A new species of *Paraboea* (Gesneriaceae) from Thailand. *Edinburgh J. Bot.* 75(1): 51–54.
- Triboun, P. (2013). *Paraboea middletonii* (Gesneriaceae), a new species from Thailand. *Thai Forest Bull., Bot.* 41: 45–47.
- Triboun, P. & Middleton, D.J. (2012). Twenty new species of *Paraboea* (Gesneriaceae) from Thailand. *Gard. Bull. Singapore* 64: 333–370.
- Triboun, P. & Middleton, D.J. (2015). Three new species of *Paraboea* (Gesneriaceae) from Thailand. *Thai Forest Bull., Bot.* 43: 18–23.
- Weber, A. (2004). Gesneriaceae. In: Kubitzki, K. & Kadereit, J.W. (eds) *The Families and Genera of Vascular Plants*, vol. 7. Berlin/Heidelberg: Springer.
- Xu, Z., Burtt, B.L., Skog, L.E. & Middleton, D.J. (2008). A revision of *Paraboea* (Gesneriaceae). *Edinburgh J. Bot.* 65: 161–347.

