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Goniothalamus obovatus (Annonaceae), a new species from southern Thailand

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ABSTRACT: *Goniothalamus obovatus* Chaowasku & Damth., a new species of Annonaceae from southern Thailand is described and illustrated. It is morphologically most similar to *G. banii* endemic to Vietnam, but can be distinguished from it by possessing terete (vs ± angular) branches, a subcordate to cordate (vs rounded) leaf base, shorter inner petals, an inner petal apex that is ± acute (vs long-acuminate), a lower ratio of inner petal to outer petal length, fewer stamens per flower, a staminal connective apex that is ± apiculate (vs rounded), fewer carpels per flower and densely hairy (vs glabrous) ovaries. The conservation status of the new species is provisionally assessed as Data Deficient.

KEY WORDS: Annoninae, *Goniothalamus*, *Goniothalamus banii*, new species, Satun, taxonomy, Thailand.

INTRODUCTION

Goniothalamus Hook.f. & Thomson is the fifth largest genus of Annonaceae (Annonoideae, Annoneae, Annoninae; Nge *et al*., 2024) consisting of over 130 species of treelets to medium-sized trees distributed in tropical Asia and Oceania (e.g., Munzinger *et al*., 2023). The genus is best characterized by the combination of (1) inner petals that are smaller than the outer petals (sometimes only slightly so) and remain connivent at maturity, (2) septate anthers and (3) tetrad pollen (Saunders, 2002, 2003). In Thailand, 27 species of *Goniothalamus* have been reported (Saunders and Chalermglin, 2022), two of which were recently described from the southern region (Leeratiwong *et al*., 2021). In this study, we describe a new species of *Goniothalamus* originating from Satun Province, southern Thailand, based on material collected from a cultivated plant; the sapling was obtained from its natural habitat several years ago and has since been maintained in cultivation in Chiang Rai Province, northern Thailand. Morphological distinctions from its most similar congener are discussed. Additional morphological differences from other similar congeners are also noted. The indumentum terminology of Hewson (1988) was used. Square brackets in the description indicate measurements derived from spirit-preserved material. The abbreviation ca. (circa) was used when only a single observation or measurement was available.

TAXONOMIC TREATMENT

Goniothalamus obovatus Chaowasku & Damth., ***sp. nov.*** **Figs. 1–2**

***Type*:** THAILAND, cultivated in Chiang Rai Province [originally from Thung Wa District, Satun Province (near the border of Satun-Trang Provinces)], 29 March 2024, *Chanthamrong & Ruangritthidech 91* (holotype CMUB; isotype QBG), fl.

***Diagnosis*:** The new species morphologically most similar to *G. banii* B.H.Quang, R.K.Choudhary & V.T.Chinh endemic to Vietnam (Quang *et al*., 2016) mainly in leaf, sepal and outer petal shape, as well as number of ovules per ovary, but distinguishable from it by having terete (vs ± angular) branches, a subcordate to cordate (vs rounded) leaf base, shorter inner petals, an inner petal apex that is ± acute (vs long-acuminate), a lower ratio of inner petal to outer petal length, fewer stamens per flower, a staminal connective apex that is ± apiculate (vs rounded), fewer carpels per flower and densely hairy (vs glabrous) ovaries (Table 1).

***Description*:** Treelets; young twigs short-puberulous with mostly appressed hairs. Petiole 12–15 mm long, almost glabrous to ± puberulous with appressed and erect hairs, grooved above. Leaf blade subcoriaceous, (24–)27.7–29 × (5.8–)8.2–9.2 cm, obovate, sometimes narrowly obovate, short-puberulous with appressed hairs on both surfaces, base subcordate to cordate, apex caudate-acuminate (acumen 11–15 mm long); midrib sunken above, short-puberulous with appressed hairs, raised below, ± puberulous with mostly appressed hairs; secondary veins 22–25 per side, prominent below, angle with midrib 55°–60° (at middle part of leaf blade). Flowers axillary (mostly in axils of fallen leaves), solitary or paired; pedicel 3–4 mm long, short-puberulous with appressed hairs, bearing 4–5 bracts toward base. Sepals

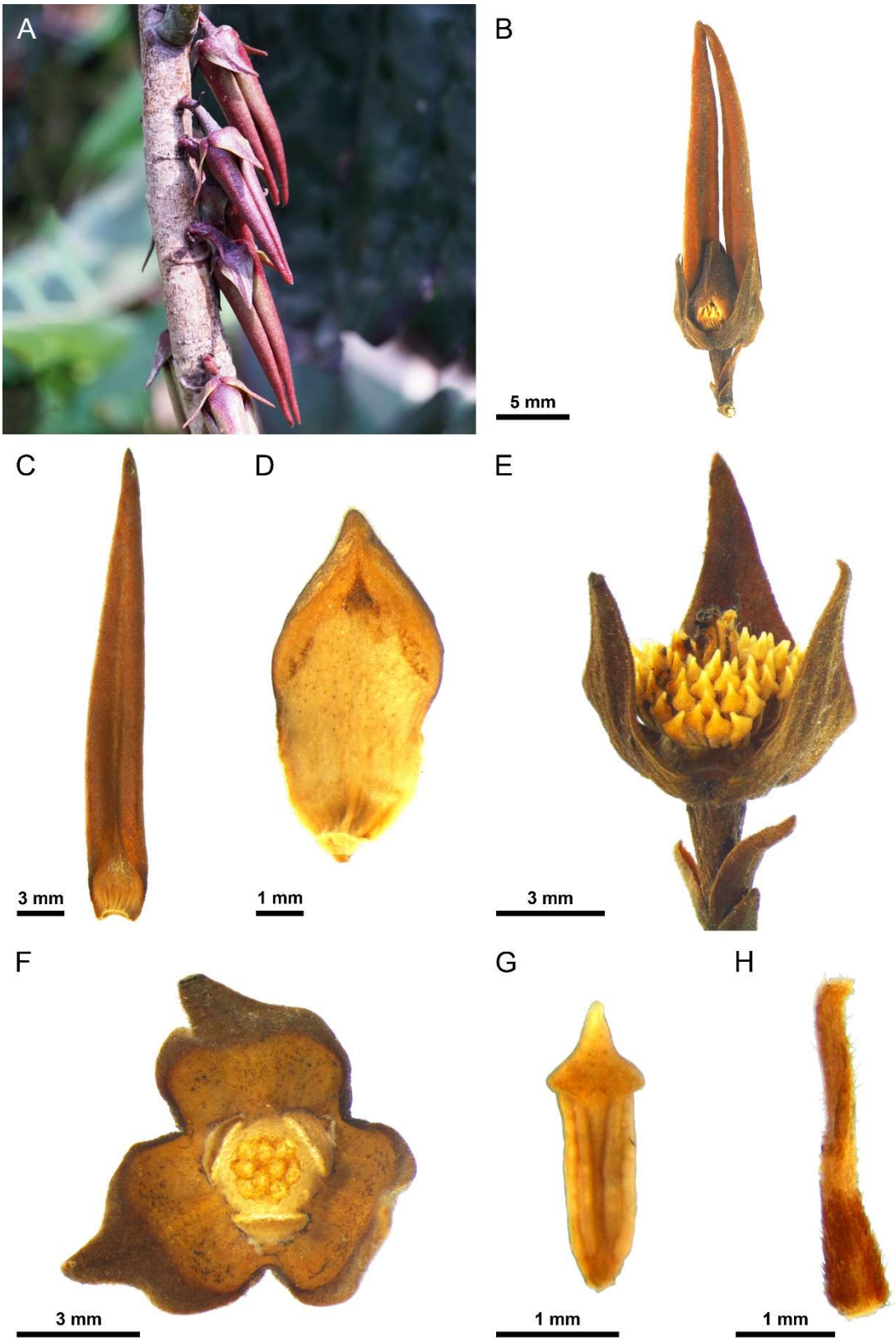

Fig. 1. Flowers and floral organs of ***Goniothalamus obovatus*** sp. nov. **A.** Flowers. **B.** Flower with one outer petal removed. **C.** Adaxial side of outer petal. **D.** Adaxial side of inner petal. **E.** Flower with petals removed. **F.** Flower with petals, stamens and carpels removed. **G.** Abaxial side of stamen. **H.** Carpel. All from the holotype (B–H from material in spirit).

TABLE 1. Morphological differences between ***Goniothalamus obovatus*** sp. nov. and ***G. banii*** (data from Quang *et al*., 2016; the number of carpels per flower was derived from figure 2M of the same study).

Feature	*Goniothalamus obovatus*	*Goniothalamus banii*
Branch appearance	terete	± angular
Leaf base	subcordate to cordate	rounded
Inner petal length (mm)	8–8.5	10–20(–30)
Inner petal apex	± acute	long-acuminate
Ratio of inner petal to outer petal length	ca. 1/4	ca. 3/5
Number of stamens per flower	ca. 55	80–85
Staminal connective apex	± apiculate	rounded
Number of carpels per flower	ca. 9	ca. 15
Ovary indumentum	dense	absent

Fig. 2. Holotype of ***Goniothalamus obovatus*** sp. nov. at CMUB.

basally connate, [9–10] × [4.5–5] mm, ratio of length to width 1.8–2, ovate-triangular, short-puberulous with appressed hairs on both sides, margin short-puberulous with erect hairs. Outer petals [28.5–31] × [4–4.5] mm, ratio of length to width 6.6–7.8, narrowly ovate, outside short-puberulous (or sparser) with appressed hairs, margin short-puberulous with appressed hairs, inside almost glabrous but short-tomentose with erect hairs at middle part of base, apex of outer petals acuminate; inner petals [8–8.5] × [4–4.2] mm, ratio of length to width 2–2.1, elliptic-obovate, outside puberulous-pilose with appressed hairs, margin ± puberulous with appressed and erect hairs, inside short-tomentose (sparser on middle part) with erect hairs, intermixed with curly-pilose on ± apical half, openings between adjacent inner petals ca. [3.1] × [2.3] mm, apex of inner petals ± acute. Torus ± depressed hemispherical. Stamens ca. 55 per flower, [2.5–3] mm long, connective apex ± apiculate, covering thecae. Carpels ca. 9 per flowers, [3.5–4] mm long; stigmas ± terete; ovaries tomentose with mostly appressed hairs; ovule 1 per ovary, subbasal. Fruits unknown.

***Etymology*:** The specific epithet refers to the obovate leaves of this species.

***Distribution and ecology (at original locality)*:** Thung Wa District, Satun Province, southern Thailand; occurring in evergreen forests at the base of a limestone hill.

***Phenology*:** Flowering material was collected in March (in cultivation).

***Field notes*:** Flowers (probably submature) brownish purple tinged with yellowish green.

***Preliminary conservation assessment*:** Since field data on the occurrence of this species at the original locality are limited, the category Data Deficient (DD) based on IUCN Standards and Petitions Committee (2024) is herein applied.

***Notes*:** The new species is also morphologically similar to *G. acehensis* R.M.K.Saunders endemic to Sumatra (Saunders, 2002), but differs from it in many characters, including leaf base, number of secondary veins per leaf side, flowering pedicel and inner petal length, ratio of inner petal to outer petal length and number of stamens per flower. In a key to the species of *Goniothalamus* in Thailand (flowering specimens; Saunders and Chalermglin, 2022), *G. obovatus* keys out to couplet six. The new species can be easily distinguished from *G. tapis* Miq. and *G. uvarioides* King

in the couplet six by the narrower outer petals (4–4.5 mm wide vs 10–25 mm wide in *G. tapis* and 9–18 mm wide in *G. uvarioides*), the shorter inner petals (8–8.5 mm long vs 10–19 mm long in *G. tapis* and 12.5–16.5 mm long in *G. uvarioides*) and the fewer stamens (ca. 55 vs 115–185 in *G. tapis* and 165–200 in *G. uvarioides*) and carpels (ca. 9 vs 15–40 in *G. tapis* and 16–21 in *G. uvarioides*) per flower.

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