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RESEARCH ARTICLE

Begonia natunaensis (sect. *Reichenheimia*), a new species from Natuna Island, Indonesia

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ABSTRACT: *Begonia natunaensis*, a new species of sect. *Reichenheimia* from Natuna Island, Indonesia, is here described and illustrated. *Begonia natunaensis* resembles *B. goegoensis* N.E. Brown in having suborbicular, peltate leaves with an abruptly tapering tip, differing in the number of tepals in staminate flowers (2 vs. 4) and in pistillate flower (2 vs. 3) and the petiole (terete vs. 4-angular). The new species is also similar to another peltate-leaved *Begonia*, *B. sudjanae* Jans., but is distinguishable by being glabrous (vs. hispid throughout), the staminate tepals 2 [vs. (2–)4], and pistillate tepals 2 [vs. (2–)3]. Geographically, *B. natunaensis* is endemic to Natuna Island in the South China Sea, whereas *B. goegoensis* and *B. sudjanae* are distributed in western Sumatra, *ca.* 1,000 km away from Natuna.

KEY WORDS: *Begonia goegoensis*, *Begonia natunaensis*, *Begonia puspitae*, *Begonia sudjanae*, Indonesia, Natuna Island, New species, Sect. *Reichenheimia*.

INTRODUCTION

Natuna is the largest island in Riau Islands Province, Indonesia. Geographically, it is near the edge of the Sunda Shelf, 225 km northwest of borneo and 475 km east of the Malay Peninsula. Mount Ranai is the highest peak in Natuna Island, which reaches 1035 m in altitude (Girmansyah, 2013). Forests that were logged cover 70% of the island (Lammertink et al. 2003). The region was rarely explored botanically and only one species of *Begonia*, *B. ranaiensis* Girm. (sect. *Petermannia*), was recently documented from the archipelago (Girmansyah, 2012). In this paper we report the discovery of an unusual second species from Mt. Ranai. Based on its entire placentae, symmetric stamen masses and non-projecting anther connectives, staminate flowers basal and pistillate flowers distal, protandrous, it is assignable to sect. *Reichenheimia*.Tebbitt (2005) indicated that there are about 50 species in that section in Asia. Over a dozen species were published thereafter (Ardi *et al.*, 2013; Ardi and Hughes, 2010; Averyanov and Nguyen, 2012; Girmansyah, 2009; Hughes *et al.*, 2009; Kiew, 2005; Kiew and Julia, 2007, 2009; Lin et *al.*, 2014a,b). A careful study of plants collected from the field and in cultivation, as well as detailed comparison with herbarium collections (BO, BM, E, K, KEP, SAN, SNP, SING), relevant literature (*e.g.* Hughes, 2008) and Southeast Asian *Begonia* Database (Hughes and Pullan, 2007) confirm our collection as a new species, which we describe below.

TAXONOMIC TREATMENT

Begonia natunaensis C. W. Lin and C.-I Peng, ***sp. nov.*** Sect. ***Reichenheimia***

TYPE: Indonesia. Natuna Island, Mt. Ranai, *ca.* 100 m alt., collected by Chia-Wei Wang and presented to C. W. Lin on 11 March 2014, *C. W. Lin 563*. Type collections were made from plants brought from the field into cultivation (holotype, BO; isotypes, HAST, TAIF)

納圖那秋海棠 Figs. 1, 2, 3; Tab. 1

Plant monoecious, epipetric, perennial, rhizomatous, acaulescent. **Rhizomes** light green or reddish, 8–20 (–50) cm, 0.8–1.6 cm thick, internodes 0.5–2.3 cm long, glabrous. **Stipules** persistent, narrowly triangular, 1.5–2.9 cm long, 5.5–1.1 cm wide, reddish, soon dry and turning brown, herbaceous, glabrous, abaxially slightly keeled, with a few hairs near base, margin entire, apex acuminate and aristate, arista 3–6 mm long. **Petiole** terete, 13–35 cm long, 0.5–0.9 cm thick, pale green to pinkish, glabrous. **Leaves** 2–6, alternate, simple, suborbicular, peltate, petiole attachment displaced to one side, 11–19 cm long, 9.5–17.5 cm wide, adaxially light green, sometimes olive or reddish between veins, texture thickly chartaceous, very shallowly bullate, glabrous, margin sparingly hirtellous and with translucent, flat, narrowly triangular hairs recurved at venation apex; abaxially pale or pinkish between venation, glabrous or sparingly hirtellous on veins; apex

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shortly acuminate; venation palmate with 5–7 primary veins, veins pinnate along midrib, with 2–3 secondary veins on each side, other primary veins branching dichotomously or nearly so, tertiary veins weakly percurrent or reticulate. **Bracts** reddish, herbaceous, ovate to broadly ovate, at first node of inflorescence 5–7 mm long, 3–4 mm wide, margin ciliate, apex acute and aristate; bracteoles elliptic to lanceolate, 1–2 mm long, margin sparsely ciliate. **Inflorescence** a bisexual, cymose panicle, 1–3 arising directly from rhizome, peduncles 6–33 cm long, 2.5–5.5 mm thick, greenish or reddish, glabrous; erect and short at early staminate-flower anthesis, prolongating and ascending or pendent with the appearance of pistillate flowers; with up to 5 orders of branching, subequal to leaves in

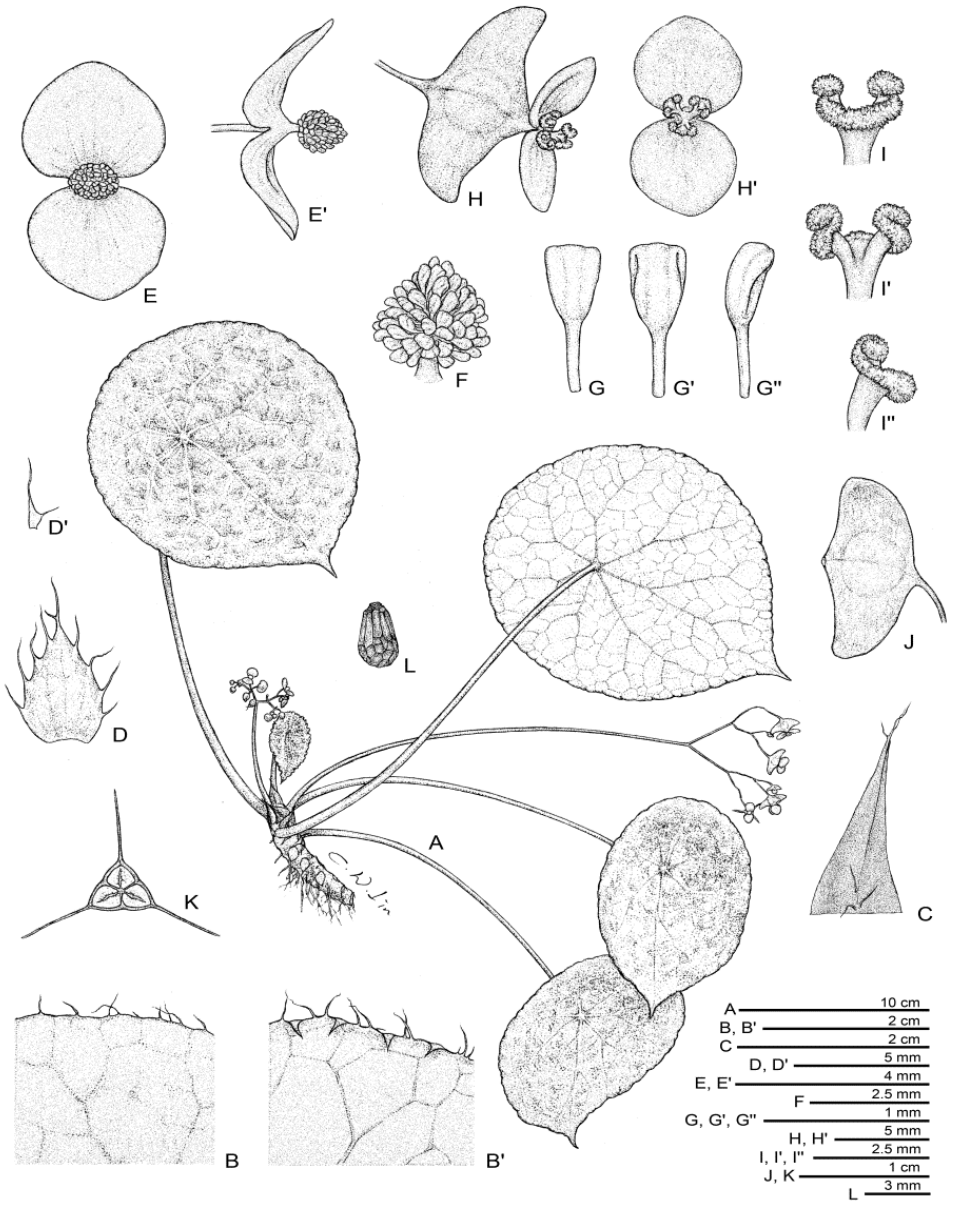


Fig 1. *Begonia natunaensis* A. Habit; B. Portion of leaf adaxial surface, B'. Same, on leaf abaxial surface; C. Stipule; D. Bract, D'. Bracteole; E. Staminate flower, face view; E'. side view; F. Androecium; G. Stamen, dorsal view; G'. Stamen, ventral view, G''. Stamen, side view; H. Pistillate flower, side view, H'. Same, face view; I. Style, ventral view, I'. Style, dorsal view, I''. Style, side view; J Fruit; K. Middle cross section of an ovary; L. seed. All from *C.W. Lin 563* (TAIF).

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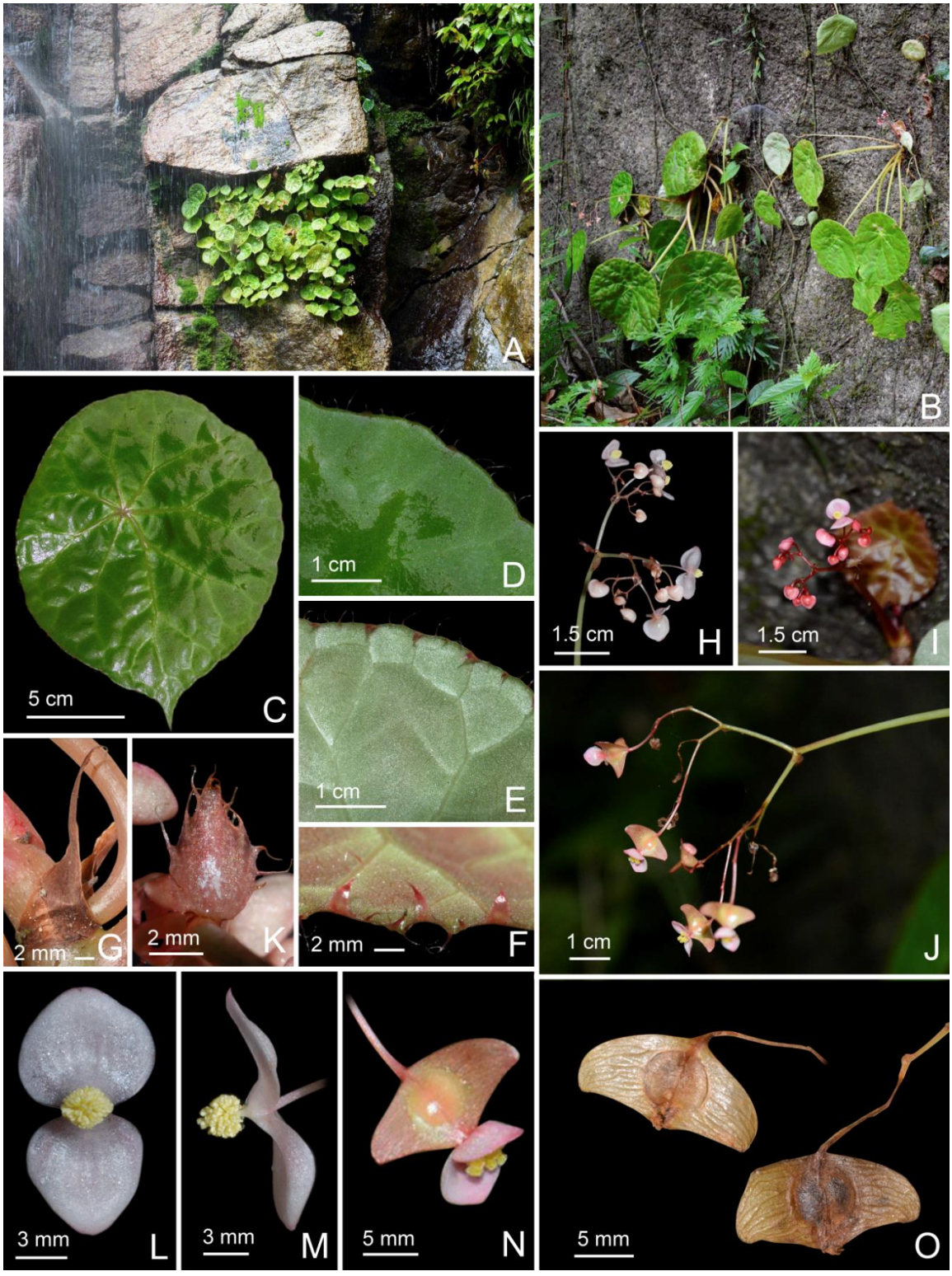


Fig. 2. ***Begonia natunaensis.*** **A. Habitat on cliff face of a waterfall; B. Habitat, sandstone cliff; C. Leaf, adaxial surface; D. Portion of a leaf, adaxial surface; E. Portion of a leaf, abaxial surface; F. Portion of a young leaf margin, abaxial view; G. Stipule; H, I. Inflorescence, protandry; J. Inflorescence with pistillate flowers; K. Bract; L. Staminate flower, face view; M. Staminate flower, side view; N. Pistillate flower, side view; O. Fruit. All from *C.W. Lin* 563 (TAIF).**

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Table 1. Comparison of *Begonia natunaensis*, *B. goegoensis* and *B. sudjanae*.

	B. natunaensis (Figs. 1, 2)	*B. goegoensis*	*B. sudjanae*
Stipule abaxial surface	Glabrous, or with a few scattered hairs at both ends	Hairy on midrib and margin	Hispid throughout
Leaf			
abaxial color	Pale green or pinkish	Dull red	Pale green
adaxial pubescence	Glabrous	Subglabrous, with a few hairs along nerves	Densely hispid
abaxial pubescence	Glabrous, occasionally with a few obscure hairs	Sparsely hairy	Densely hispid
Petiole	Terete	4-angular	Terete
Peduncle pubescence	Glabrous	Glabrous	Densely crisp hispid
Bracts	Glabrous	Unknown	Hispid
♂ **flower tepal number**	2	4	(2)–4
♀ **flower tepal number**	2	3	(2)–3

length. **Staminate flower:** tepals 2, margin entire, glabrous, ovate to very widely ovate, base rounded, apex rounded to obtuse, 5.5–7 mm long, *ca.* 7 mm wide, abaxially pink or whitish, glabrous, adaxially pinkish; androecium actinomorphic, ovoid, stamens 55–85, *ca.* 0.5 cm long, shortly fused at base; anthers 2-locular, slightly compressed, creamy yellow, obovate-triangular, *ca*. 0.6 mm long, 0.4 mm wide, apex slightly retuse to truncate. **Pistillate flower**: tepals 2, margin entire, glabrous, ovate to very widely ovate, *ca*. 6 mm long, 6 mm wide, base rounded, apex rounded to obtuse, adaxially pink to whitish, abaxially pinkish; ovary 3-locular, placentation axile, placental branches 1 per locule; ovary body trigonous-orbicular, *ca*. 3 mm long, 3 mm thick (wings excluded), pinkish, 3-winged; wings subequal, reddish, deltate to broadly deltate, 5–7.5 mm long, 4.5–6 mm wide; styles 3, yellow, fused at base, *ca*. 2.5 mm long, apically split, stigma in a spiral band, papillose all around. **Fruit** a capsule, nodding, reddish-green when fresh, *ca.* 4.5–6 mm long, 5–6 mm across (wings excluded), wings shallowly triangular to deltate, rounded at tip, subequal, *ca*. 8 mm long, 6 mm wide. **Seeds** numerous, brown, widely ellipsoid or ellipsoid, *ca*. 0.35 mm long, 0.2 mm thick, chalazal end rounded, micropylar end obtuse, outer periclinal walls concave; collar cells elongated, straight or slightly undulate, nearly rectangular, 10–13 cells in a ring, anticlinal walls between collar cells raised, straight or slightly undulated; testa cells nearly isodiametric-polygonal.

Distribution and ecology: *Begonia natunaensis* is endemic to Mt. Ranai, eastern Natuna Island, Indonesia (Fig. 3). The new species was found on wet sandstone cliffs in a waterfall area, associated with mosses in rock crevices, *ca.* 100 m elevation.

Vernacular name: Natuna Island *Begonia*

Etymology: The specific epithet is derived from the type locality, Natuna Island of Indonesia.

Notes: The new species is second species of *Begonia* discovered in Natuna Island. *Begonia natunaensis* resembles *B. goegoensis* of sect. *Reichenheimia* in the suborbicular, peltate leaves with an abruptly tapering tip, differing in the staminate tepals 2 (vs. 4), pistillate tepals 2 (vs. 3) and the terete (vs. 4-angular) petiole. The new species is also similar to *B. sudjanae* Jans., another peltate-leaved species in sect. *Reichenheimia*, but is distinguishable by being glabrous (vs. hispid throughout), the staminate tepals 2 [vs. (2–)4], and pistillate tepals 2 [vs. (2–)3]. Despite that the label on the type specimen (made from cultivated plant) of *B. goegoensis* at Kew herbarium clearly indicated that the pistillate flowers are 3-tepalled, Tebbitt (2005: p. 134) described its pistillate flowers as having 5 tepals, which is probably a typographic error. We have *B. goegoensis* in cultivation in the experimental greenhouse for years and 5-tepalled-pistillate flowers were never observed.

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A detailed comparison of this new species with *B. goegoensis* and *B. sudjanae* is presented in Table 1. Another Indonesian species, *Begonia puspitae* Ardi (sect. *Reichenheimia*), also has 2-tepalled pistillate and staminate flowers. *Begonia natunaensis*, however, is sharply distinct in the leaf blades peltate (vs. basifixed), plant glabrous (vs. densely pubescent), and the primary peduncle subequal to the leaves in length (vs. elevated well above the foliage). Geographically, *B. natunaensis* is endemic to Natuna Island in the South China Sea, whereas *B. goegoensis*, *B. sudjanae* and *B. puspitae* are distributed in western Sumatra, *ca.* 1,000 km away from Natuna.

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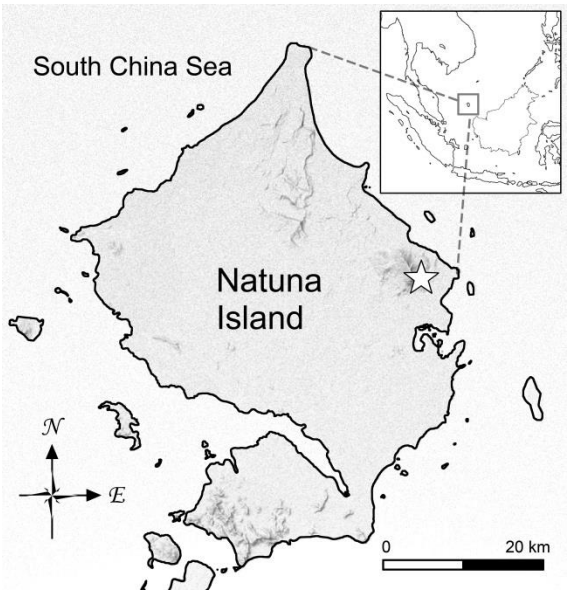


Fig. 3. Distribution of *Begonia natunaensis* (star) in Natuna Island, Indonesia.

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印尼秋海棠科一新種：納圖那秋海棠

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摘要：本文報導印尼納圖那島東部之拉奈山低海拔瀑布區岩壁著生，通體近於光滑無毛的秋海棠科一新種：納圖那秋海棠(*Begonia natunaensis* C.W. Lin and C.-I Peng)。本種略似兩種產於蘇門答臘且直線距離超過 1,000 公里，原產地不詳但現已廣泛栽培的秋海棠： 一為火焰秋海棠(*B. goegoensis* N.E. Brown)，然新種葉柄截面近圓形，托葉窄三角形，雌花及雄花之花被片皆為兩枚；另一近似種為毛盾葉秋海棠(*B. sudjanae* Jans.)，但後者全株密被糙硬毛，花被片數目不同，易於區分。

關鍵詞：火焰秋海棠、納圖那秋海棠、*Begonia puspitae*、毛盾葉秋海棠、印尼、納圖那島、新種、單座組。

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