



Begonia fulgurata (sect. *Diplocinium*, *Begoniaceae*), a new species from northern Thailand

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Key words

Chiang Mai
endemic
new species
taxonomy

Abstract *Begonia fulgurata*, a new species from northern Thailand, is here described and illustrated. *Begonia fulgurata* resembles *B. integrifolia*, a widespread species in Southeast Asia, in having tubers, erect stem with hairy leaves and a periodically dormant habit. However, the new species is sharply distinct in its lamina densely hirsute (vs sparsely puberulous) and with maroon patches and silvery white veins (vs uniformly green or with white spots); inflorescence densely clothed with glandular hairs (vs glabrous or puberulous); staminate flowers with 2, rarely 3 (vs 4) tepals; staminate and pistillate tepals glandular hairy (vs glabrous). As a deciduous species with basal tubers, together with an erect stem, ovate to broadly ovate leaves, 3-locular ovary, it may be mistaken as a dwarf plant of *B. grandis*, one of the most widely distributed species in China and the type species of sect. *Diplocinium*. However, *B. fulgurata* differs in its leaf upper side with fine silvery (vs green) veins; inflorescence densely glandular hairy (vs glabrous), staminate tepals 2 or rarely 3 (vs 4) and pistillate tepals 5 (vs 3), and ovary glandular hairy (vs glabrous).

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INTRODUCTION

Currently 54 species of *Begonia* are recognized in Thailand (Phutthai & Hughes 2016). Many are tuberous and periodically dormant during the dry season, such as some members in sect. *Diplocinium*, *Parvibegonia*, *Reichenheimia*, *Heeringia* and *Monophyllon*. All of these species have axile placentae and many were discovered recently, e.g., Doorenbos et al. (1998), Phutthai & Sridith (2010), Phutthai et al. (2014), Phutthai & Hughes (2016). Here we report the discovery of a handsome new species, *B. fulgurata*, from northern Thailand with partial parietal placentation, which resemble some *Begonia* sect. *Coelocentrum*, a relatively large group now of over 70 species (Chung et al. 2014, Peng et al. 2014, 2015a, b) occurring on karst limestone in southern China and northern Vietnam. Members of sect. *Coelocentrum* are evergreen, stemless rhizomatous, and produce axillary inflorescences and unequally winged fruits. The new species, however, does not fit in sect. *Coelocentrum* because of its tuberous habit, periodically dormant and erect stems and apical inflorescence and subequal wings. Its overall appearance appears to be allied to sect. *Diplocinium*. We provide a detailed morphological description, a line drawing and a colour plate to aid in identification of this new species.

TAXONOMIC TREATMENT

Begonia fulgurata C.-I Peng, C.W. Lin & Phutthai, *sp. nov.*
— Fig. 1, 2; Map 1

Type. THAILAND, Chiang Mai Province, Doi Lohn (Lahn), west side, Mae Lai Village, south slope above Mae Lai Stream, Huay Gayo Subdistrict, Mae Awn District. Sterile specimen collected on 23 Oct. 2005, *Peng 20548*, with

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Chien-I Huang, Tsung-Han Tsai, J.F. Maxwell and Pranee Palee. Type specimens pressed from plants brought back for cultivation in the experimental greenhouse of Academia Sinica, 26 Aug. 2008 (holo HAST; iso BKF).

Etymology. The specific epithet *fulgurata* is derived from the fine, silvery-white venation on the leaf upper surface, which resembles lightning.

Plant perennial, monoecious, epipetric or terrestrial. *Tuber* globose or subglobose with fibrous roots. *Stem* erect or ascending, to 40 cm long, 3–7 mm across, fleshy, unbranched, densely white-velutinous and sparsely glandular hairy, internodes 3.2–11 cm long. *Tuber* subglobose, to c. 10 mm across. *Bulbils* sometimes present at lower stem, white, globose, c. 2 mm across. *Stipules* ovate-triangular, 4–10 mm long, 3–6 mm wide, hyaline, pale green, strongly keeled, abaxially densely velutinous, margin entire, apex mucronate or apiculate. *Leaves* 3–6, oblique, held pendent, distant; petiole terete, 1.3–9.5 cm long (longer in lowermost leaves, progressively shortened above), 3–5 mm across, pale green to pinkish, densely white-velutinous; slightly grooved adaxially; lamina ovate-lanceolate to widely ovate, basifixed, asymmetric, base cordate, margin undulate or denticulate, hirsute, apex acuminate, attenuate to caudate, 7–13(–18) cm long (basal lobes included), 3–7(–10) cm wide, basal lobes unequal, 0.7–3.5(–7) cm long; leaf chartaceous, succulent, adaxially dark green, embellished with maroon to dark brown irregular patches, veins silvery to snow white, veins passing through maroon patches becoming rosy pink to silvery magenta; abaxially pale green, magenta between veins; venation palmate-pinnate, midrib distinguishable, 5–9(–13) cm long, with c. 3 major lateral veins on either side of midrib, other primary veins branching dichotomously or nearly so, tertiary veins reticulate; all venation prominently raised on the underside. *Bracts* pale green, hyaline, persistent, those at basal nodes of inflorescence ovate, c. 1 cm long, 6 mm wide, outside densely erect velutinous and glandular hairy, apex obtuse, margin with glandular hairs or velutinous; bracts on upper part of inflorescence similar but progressively smaller. *Inflorescence* a terminal, bisexual, cymosely branching panicle 4–7 cm long, pale green, densely glandular hairy, peduncle to 4.5 cm long; protandrous. *Staminate flower*: pedicel 8–14 mm

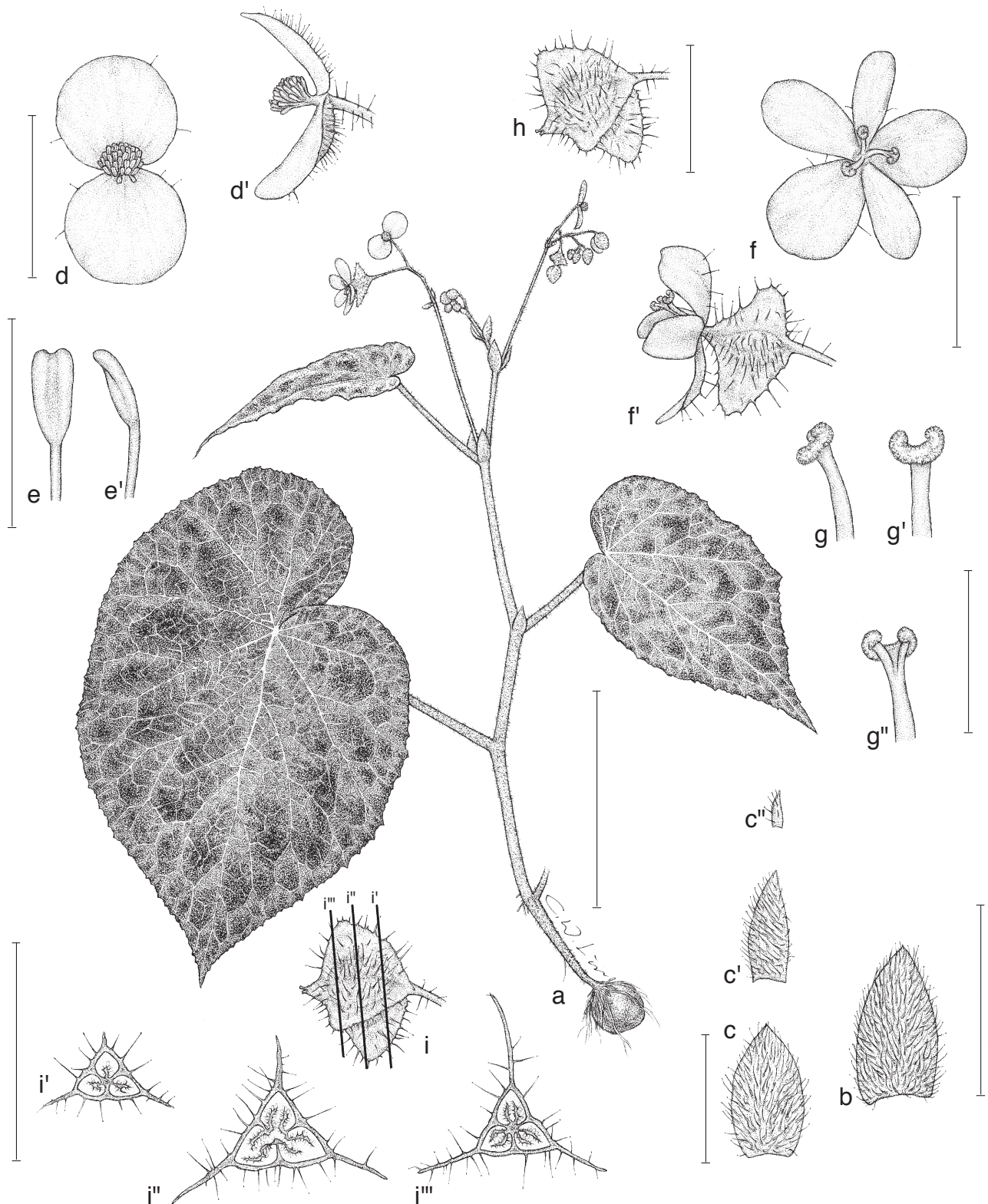


Fig. 1 *Begonia fulgurata* C.-I Peng, C.W.Lin & Phutthai. a. Habit; b. stipule; c, c', c''. bracts at lowermost and uppermost parts of inflorescence; d, d'. staminate flower, face and side views; e, e'. stamen, dorsal and side views; f, f'. pistillate flower, face and side views; g, g', g''. style, dorsal, side and ventral views; h. capsule; i, i', i''. cross section of an ovary. — Scale bars: a = 5 cm; b, c, c', c'', d, d', f, f', h, i, i'', i''' = 1 cm; e, e' = 2 mm; g, g', g'' = 3 mm. — Drawn by: Che-Wei Lin.

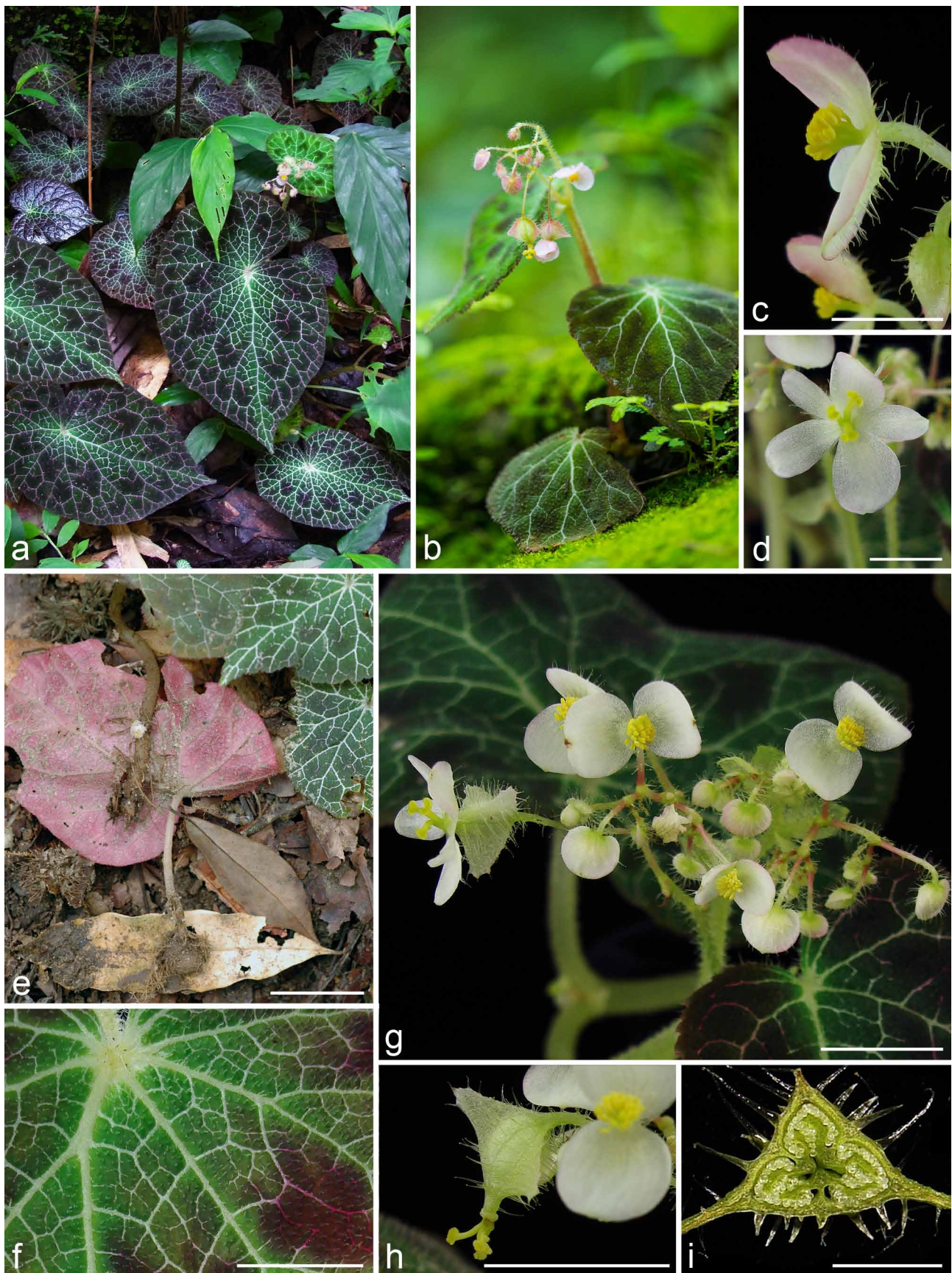


Fig. 2 *Begonia fulgurata* C.-I Peng, C.W.Lin & Phutthai. a–b. Habit; c. staminate flower; d. pistillate flower; e. sterile plants with tubers on petiole and at base; f. portion of leaf; g. inflorescence; h. staminate flower and an immature capsule; i. cross section of the middle part of an ovary. — Scale bars: c–d = 5 mm; e = 2 cm; f–h = 1 cm; i = 3 mm. — Photos: a. Wei-Min Lin; b. Advance Thailand Geographic; c–i. Ching-I Peng.

Table 1 Comparison of *Begonia fulgurata* C.-I Peng & C.W. Lin and *B. grandis* and *B. integrifolia*.

	<i>B. fulgurata</i> (Fig. 1, 2)	<i>B. grandis</i>	<i>B. integrifolia</i>
Section	<i>Diploclinium</i> , tentatively	<i>Diploclinium</i>	<i>Parvibegonia</i>
Leaf			
maculation	dark patches between venation; veins finely silvery to snow white	uniformly green	uniformly green or with minute, white spots
vestiture	densely hirsute	subglabrous	sparsely puberulous
Inflorescence			
vestiture	glandular hairy	glabrous	glabrous
Staminate flower			
no. of tepals	2 (rarely 3)	4	4
abaxial vestiture	glandular hairy	glabrous	glabrous
Pistillate flower			
no. of tepals	5	3	5
abaxial vestiture	glandular hairy	glabrous	glabrous
ovary vestiture	glandular hairy	glabrous	glabrous
Placentation	parietal in the middle part of ovary, axile on both ends	axile	axile

long, glandular hairy; tepals 2, white to pinkish, suborbicular, outside glandular hairy, margin entire, 5–8 mm across, sometimes with an additional, narrowly elliptic tepal c. 5 mm long, 2.5 mm wide; androecium zygomorphic, stamens c. 25, yellow, obovate, filaments shortly fused at base; anthers c. 1 mm long, subequal to filaments. *Pistillate flower*: pedicel c. 1 cm long, glandular hairy; ovary pale green or pinkish, shortly beaked at apex, body trigonous-ellipsoid, 3.5–5 mm long, c. 3 mm across, 3-winged; wings subequal, triangular, obtuse or nearly rounded at summit; c. 7 mm long, 2.5–4 mm wide; ovary 3-locular but the septa not completely fused midway up, placentas bilamellate; tepals 5, white to pinkish, tepals ovate to lanceolate,

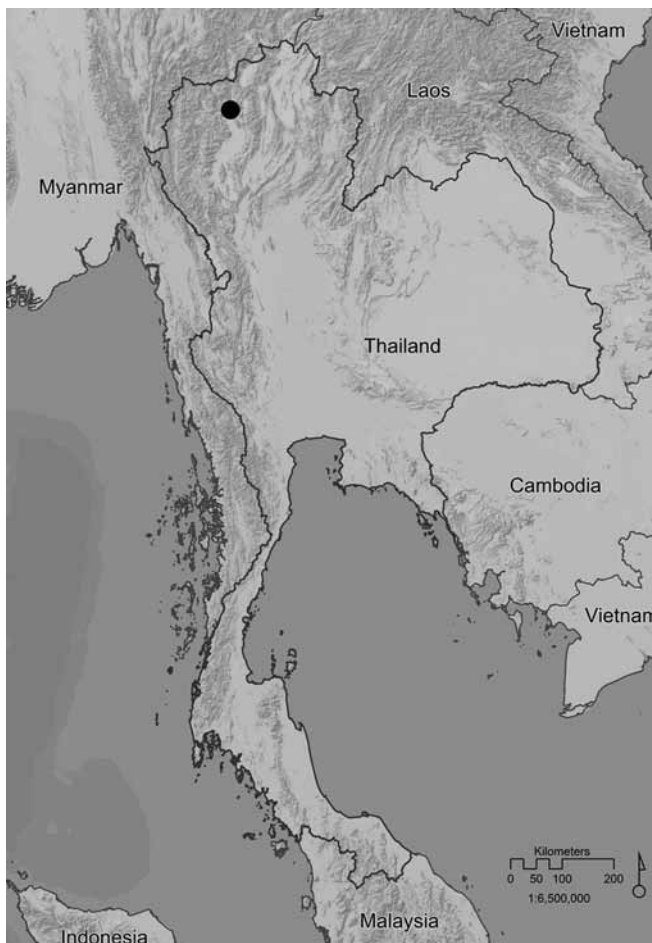
3–7 mm long, 1.5–4 mm wide, outer two glandular hairy on outside; styles 3, yellowish green, each bifid, c. 3 mm long, shortly fused at base; stigmas in a spiral band and papillose all around. *Capsule*: pedicel c. 1 cm long, capsule body globose, c. 6–8 mm across long, 5 mm wide, glandular hairy, placentae bilamellate; wings 3, subequal, c. 1 cm long, 2–5.5 mm wide.

Distribution & Ecology — *Begonia fulgurata* is endemic to Chiang Mai, northern Thailand (Map 1), at 1000–1200 m altitude, where it is known only from the type locality.

Additional specimens examined. THAILAND, Chiang Mai Province, Doi Lohn (Lahn), west side, above Mae Lai Village, along Mae Lai Stream, Huay Gayo Subdistrict, Mae Awn District. On shady soil slope. Sterile plant with bulbil on petiole, N18°52'57" E99°21'59", c. 1150 m elevation, 25 Oct. 2005, Peng 20623 (HAST), with Chien-I Huang, Tsung-Han Tsai, J.F. Maxwell and Pranee Palee, loc. cit., fertile specimens pressed from plants brought back for cultivation in the experimental greenhouse of Academia Sinica, 11 Sept. 2007, Peng 20623a (HAST).

Conservation assessment — *Begonia fulgurata* is a small-endemic species known only from the type locality in northern Thailand. It is very attractive, and has been collected and entered into cultivation in and outside of Thailand. Locations of populations of the species are classified as recreation areas (IUCN protected area category VI – [Category Ib: Wilderness Area]) that receive many tourist visitors during the high season. The handsome new species may be collected or tramped upon by hiking tourists. We consider a category of vulnerable (VUD2) to be appropriate, as the populations are prone to the effects of human activities or stochastic events within a very short period of time (IUCN 2012).

Note — *Begonia fulgurata* is somewhat similar to the widespread (in SE Asia) *B. integrifolia* Dalzell (1851: 230) of sect. *Parvibegonia* in having a tuberous base, erect stem with hairy leaves and the periodically dormant habit. However, the new species is easily distinguishable by its lamina maculated with maroon patches and silvery-white veins (vs uniformly green or with white spots) and densely hirsute (sparsely puberulous); inflorescence densely glandular hairy (vs glabrous); staminate flowers with 2 or rarely 3 (vs 4) tepals, and staminate and pistillate tepals with glandular hairy (vs glabrous). The new species also bears some resemblance to *B. grandis* Dryand. (1791: 163) of sect. *Diploclinium* in its deciduous habit, erect stem and ovate to broadly ovate leaves, mainly 3-locular ovary. However, *B. fulgurata* markedly differs from *B. grandis* in the leaf upper side with fine silvery (vs green) veins; inflorescence densely glandular hairy (vs glabrous), staminate tepals 2 or rarely 3 (vs 4) and pistillate tepals 5 (vs 3), ovary glandular hairy (vs glabrous). A detailed comparison of *B. fulgurata* with *B. integrifolia* and *B. grandis* is presented in Table 1.

**Map 1** Distribution of *Begonia fulgurata* C.-I Peng, C.W. Lin & Phutthai (●).

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