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Lepidagathis formosensis C.B.Clarke ex Hayata (Acanthaceae): an additional species to the Flora of Java

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ABSTRACT

Septian & Arifin Surya Dwipa Irsyam 2026. *Lepidagathis formosensis* C.B.Clarke ex Hayata (Acanthaceae): suatu jenis tambahan untuk Flora Jawa. Floribunda 9(2) 52 — 59 — *Lepidagathis formosensis* tersebar secara alami di Cina (Guangdong), Jepang (Nansei-shoto), dan Taiwan. Namun, survei botani kami di Jawa Barat menunjukkan bahwa jenis ini telah membentuk populasi spontan di kawasan Kampus ITB Jatinangor, Kabupaten Sumedang, sehingga menambah total jenis *Lepidagathis* yang tercatat di Jawa menjadi tujuh jenis. Melalui makalah ini, *L. formosensis* dilaporkan dan dideskripsikan secara resmi sebagai catatan baru untuk pulau tersebut.

Kata kunci: Barlerieae, Lamiales, *Lepidagathis*, Malesia, rekaman baru

Septian & Arifin Surya Dwipa Irsyam 2026. *Lepidagathis formosensis* C.B.Clarke ex Hayata (Acanthaceae): an additional species to the Flora of Java. Floribunda 9(2) 52 — 59 — *Lepidagathis formosensis* is naturally distributed across China (Guangdong), Japan (Nansei-shoto), and Taiwan. However, our recent botanical survey in West Java reveals that this species has established spontaneous populations within the ITB Jatinangor campus in Sumedang Regency, bringing the total number of *Lepidagathis* species recorded in Java to seven. Herein, *L. formosensis* is formally reported and described as a new record for the island.

Keywords: Barlerieae, Lamiales, *Lepidagathis*, Malesia, new record

INTRODUCTION

The genus *Lepidagathis* Willd. consists of 139 species distributed troughout tropic and subtropic regions (Kadam *et al*., 2024; POWO, 2026). Morphologically, the genus is distinguished by a five-lobed, heteromorphic calyx; a bilabiate corolla; and a thyrse composed of dichasial branches, including spikes with decussate flowers and secundiflorous spikes bearing both fertile and sterile bracts. The corolla has quincuncial aestivation, while the ovary contains two ovules per locule. The androecium consists of four didynamous stamens (or with one pair reduced or absent) that are usually included within the corolla tube. The anthers may be entirely bithecous or dimorphic, with the longer pair being bithecous and the shorter pair monothecous. The capsules are oblong, and the seeds are covered with hygroscopic trichomes (Backer & Bakhuizen van den Brinik, 1965; Hirao *et al*., 2019; Manzitto-Tripp *et al*., 2022; Kantachot & Chantaranothai, 2026).

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Six species are recognized in Java: *Lepidagathis backeri* Bremek., *L. billardiereana* Nees, *L. eucephala* Miq., *L. incurva* Buch.-Ham. ex D.Don, *L. javanica* Blume, and *L. parviflora* Blume (Backer & Bakhuizen van den Brink, 1965; Mustaqim *et al*., 2021-onwards; POWO, 2026). Among these, five species are considered endemic to Java, namely *L. backeri*, *L. billardiereana*, *L. eucephala*, *L. javanica*, and *L. parviflora*, whereas the remaining taxa have relatively wide geographic distributions (Backer & Bakhuizen van den Brink, 1965; Girmansyah, 2014; POWO, 2026). Nevertheless, the possibility of additional Lepidagathis species occurring in Java but remaining unreported cannot be excluded. Similar to recent documentations of newly naturalized Acanthaceae in Java, such as *Ruellia simplex* C.Wright (Irsyam *et al*., 2022) and *Strobilanthes schomburgkii* (Craib) J.R.I.Wood (Irsyam *et al*., 2025), the presence of additional or overlooked species highlights a broader trend of overlooked or emerging records in the region. Consequently, this study aims primarily to document this new floristic record while explicitly evaluating its current naturalization status.

During our botanical survey in West Java, we encountered another species of *Lepidagathis*, namely *L. formosensis* C.B.Clarke ex Hayata, a species naturally distributed from China to Taiwan. The species was found to be locally abundant around the ITB campus in Jatinangor. Based on our field observations and examination of relevant specimens, we formally report *L. formosensis* as a new record for Java.

MATERIALS AND METHODS

Botanical inventory was carried out from June to August 2026 in several place in West Java (Bandung, Bogor, Cirebon, Sumedang). Plant specimens were collected following the guideline of the Royal Botanic Garden Edinburgh (2017). The collected specimens were deposited in the Herbarium Bandungense (FIPIA), School of Life Sciences and Technology, ITB. The preservation of plant specimens followed the procedures described by Bridson and Forman (1998), and botanical terminology followed Beentje (2012). The distribution map was prepared using ArcMap 10.4.1.

RESULT AND DISCUSSION

Lepidagathis formosensis **C.B.Clarke ex Hayata**, J. Coll. Sci. Imp. Univ. Tokyo 30(1): 213 (1911). (Figures 1–4)

Herbs, prostrate, up to 40 cm in height, woody at base, rooting at nodes. *Stem* quadrangular, purplish green, glabrous; nodes swollen, purple, glabrous; internodes 2.4–4.2 cm long. *Leaves* opposite; petiole 1.5–17 mm long; blade ovate to narrowly elliptic to broadly elliptic, 13–80 × 5–48 mm, base attenuate, margin entire to shallowly dentate, ciliate, apex acute, adaxial surface green to dark green, puberulent, abaxial surface pale green, puberulent at the midrib and veins, midrib greenish white on young leaves, green on adult leaves; veins raised abaxially, 3–6 pairs per side. *Spikes* axillary and terminal, oblong-ovoid, 8–17 mm long, clustered; peduncle short, 1–3 mm long, green, pubescent; bracts imbricate, oblong, ca. 5.5 × 1.5 mm, apex cuspidate, 1-veined, green, pubescent abaxially and marginally, bearing both non-glandular and gland-tipped trichomes; bracteoles 2 per flower, oblong, ca. 5.5 × 1 mm, apex cuspidate, margin transparent, green at the apex and vein, pubescent, non-glandular and gland-tipped trichomes present; calyx 5-parted, heteromorphic, connate at base, sepal lobes free, green, pubescent with non-glandular and gland-tipped trichomes, margin ciliate; posterior sepal broadest, oblong, ca. 5 × 1 mm; lateral sepals 2, lanceolate, ca. 4 × 0.5 mm; anterior sepals 2, lanceolate, ca. 5 × 0.5 mm; corolla bilabiate, with quincuncial aestivation, white; tube cylindrical, ca. 4 mm long, glabrous; posterior lip 2-lobed, ca. 2.5 × 2.5 mm; anterior lip 3-lobed, lobes obovate-oblong, ca. 3 × 1.5 mm, apex rounded; stamens 4, didynamous, inserted near the apex of the corolla tube, glabrous; filament very short, curved, white; anthers oblong, 0.5–1 mm long, curved, bithecous, yellowish green to yellow; pollen white; disc yellow, glabrous; ovary ellipsoid, 0.7–1 mm long, gradually narrowing

towards the apex, 2-locular with ovules 2 per locul, green, pubescent at the apex; styles slightly curved to strongly curved, white, 2–2.5 mm long, white, glabrous; stigma capitate, 0.1–0.2 mm in diam., entire, white. *Fruits* capsule, brown, ellipsoid, ca. 5.5 mm long, pubescent. Seeds 2 per capsule, subcircular, compressed, ca. 1.8 × 1.6 mm, brown, with hygroscopic trichomes, retinacula present.

Distribution. The species is native to China Southeast, Japan (Nansei-shoto), and Taiwan (POWO, 2026). In this paper, *L. formosensis* is formally reported in the Sumedang Regency (Figure 1).

Habitat. Within the ITB Jatinangor campus, specimens were recorded in dry, open habitats such as the edges of footpaths (Figure 2A), jogging tracks (Figure 2B), drainage ditches (Figure 2C), as well as rocky or gravelly substrates (Figure 2D) and the arboretum floor (Figure 2E–F) at elevation 727–731 m asl.

Specimens examined. INDONESIA. JAVA — **West Java**: Sumedang Regency, Jatinangor, ITB Campus area, roadside arount the Lecturer Dormitory Building, 30.VIII.2026, *ASD Irsyam 1350* (FIPIA); ITB Campus area, in front of the Labtek VC Building, 30.VIII.2026, *ASD Irsyam 1351* (FIPIA).

Note. According to Hu & Daniel (2011) and Kantachot & Chantaranothai (2026), *L. formosensis* is differ from *L. incurva* by having 3–6 pairs of vein on each sides (vs. 7–9 pairs), shorter calyx (5–6 mm vs. to 8–10 mm), and white-colored corolla (vs. white with purple, pink or brownish markings).

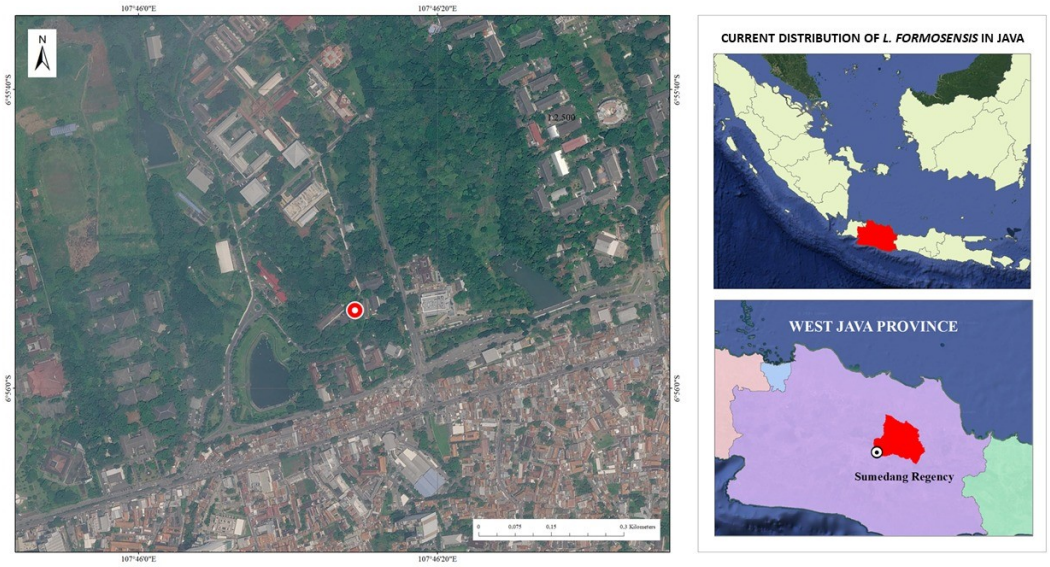


Figure 1. Current distribution area of *Lepidagathis formosensis* in Java

The historical introduction of *L. formosensis* to Java remains unclear, though it may have arrived accidentally as a contaminant. Morphologically, *L. formosensis* has very small seeds covered with hygroscopic hairs (Figure 4J), allowing them to easily adhere to the soles of shoes or sandals as well as vehicle tire surfaces, given that this species frequently grows along roadsides frequented by humans. The hygroscopic hairs on the seed surface become mucilaginous (sticky and jelly-like) when exposed to liquid moisture, effectively gluing the seed to various surfaces such as footwear, vehicle tires, and surrounding soil particles (Kreitschitz *et al*., 2021; Abe *et al*., 2022). On the other hand, the retinacula on the seeds function to support and hold the seeds so that they remain attached within the fruit capsule before the fruit matures. When the capsules dries and splits explosively, the curved and tensed retinaculum acts like a spring that ejects the seeds away from the parent plant to disperse them further (Cooper *et al*., 2018).

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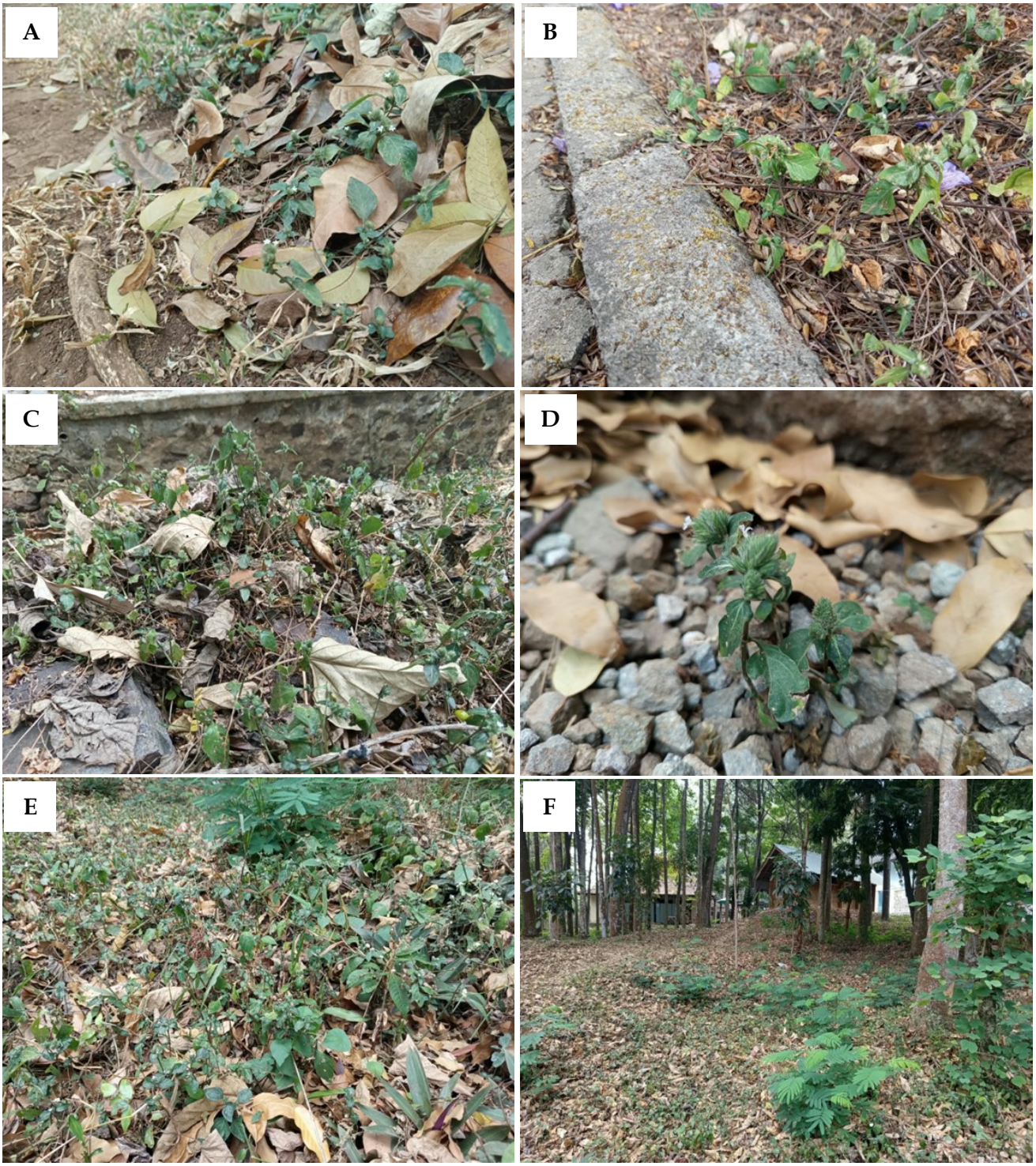


Figure 2. Various habitats of *L. formosensis* in the ITB Jatinangor Campus.

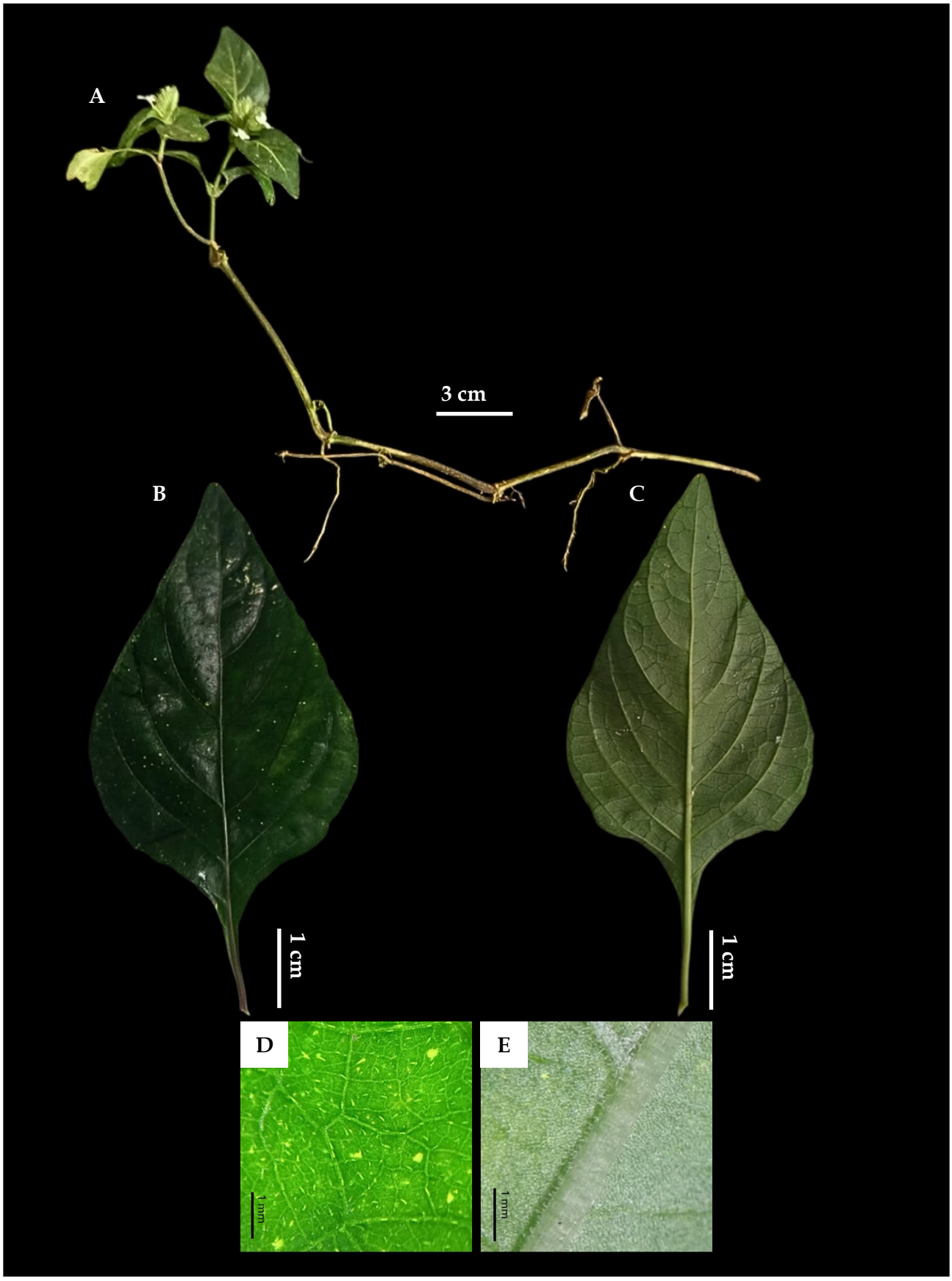


Figure 3. Vegetative parts of *L. formosensis*. A. Habit, B. Adaxial view of the leaf blade, C. Abaxial view of the leaf blade, D. Close-up of the adaxial leaf surface showing puberulent hairs, E. Close-up of the abaxial leaf surface showing puberulent veins and midrib.

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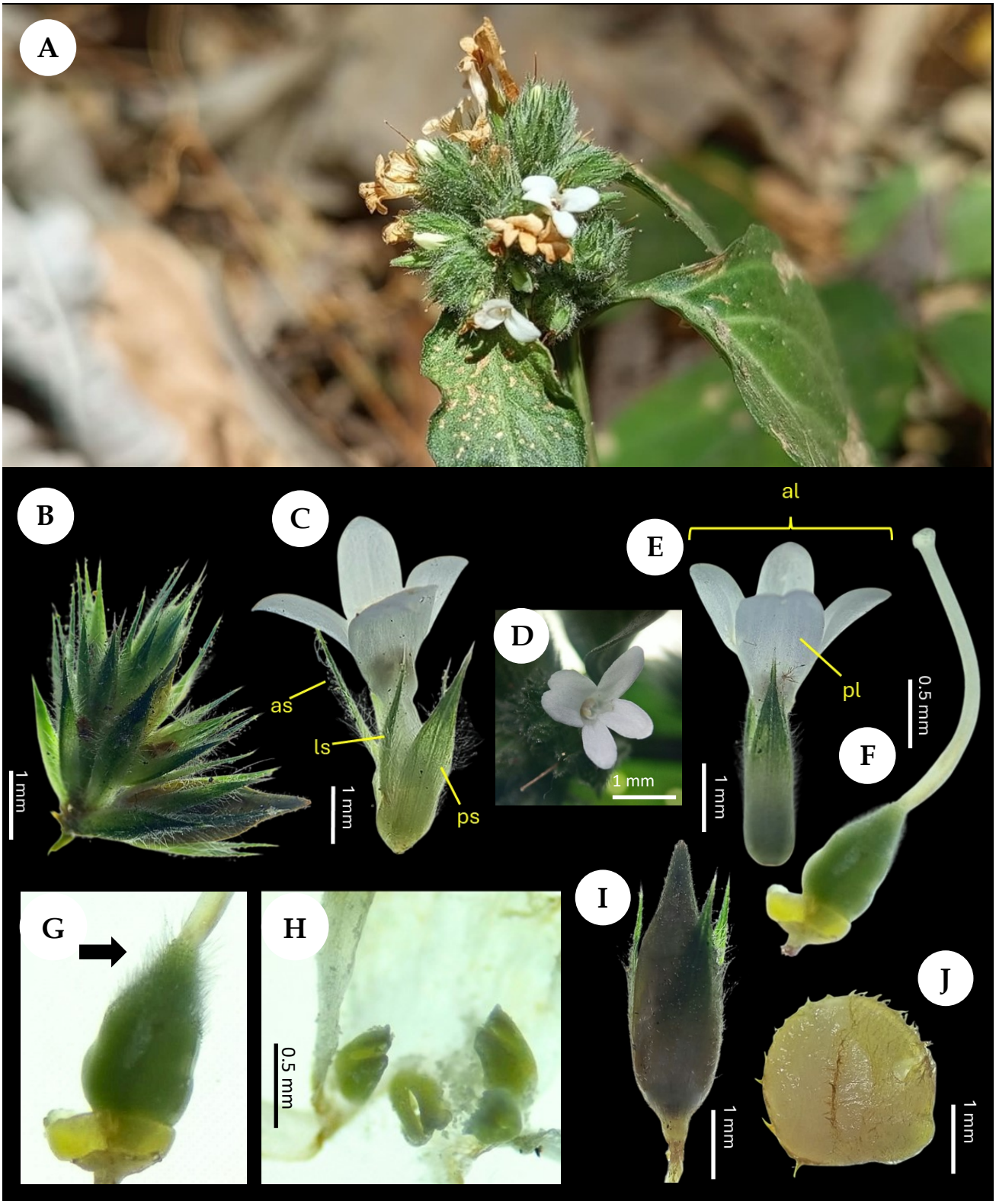


Figure 4. Generative parts of *L. formosensis*. A. Habit showing the inflorescence, B. Close-up view of the spike, C. Lateral view of the flower showing the calyx segments (as: anterior sepals, ls: lateral sepals, ps: posterior sepal), D. Front view of the flower, E. Lateral view of the flower showing the corolla lips (al: 3-lobed anterior lip, pl: 2-lobed posterior lip), F. Pistil, G. Ovary showing the trichomes (indicated by the arrow), H. Dissected flower showing the androecium, I. Mature capsule, J. Seed.

Lepidagathis formosensis exhibits potential for expanding its population through vegetative reproduction via stem fragmentation, given that populations at all recorded sites are regularly trimmed by the maintenance staff (K3L) of the ITB Jatinangor campus. This mode of stem fragmentation is morphologically supported by the fact that *L. formosensis* exhibits rooting at the nodes (Figure 3A). By analogy, this mechanism reflects previous findings showing that *R. simplex* and *S. schomburgkii* are capable of spreading widely, often mediated by stem cuttings discarded through gardening activities (Irsyam *et al*., 2022; Irsyam *et al*., 2025), thereby providing a plausible comparative framework for similar naturalization pathways.

Future monitoring and ecological research are necessary to track the population dynamics and distribution of this species at the study site. Continuous observation will help determine whether the populations are actively expanding and assess any potential ecological impacts on the local flora. Such efforts are crucial for understanding the naturalization process of this newly recorded taxon in Java.

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