

Allantospermum Forman (Irvingiaceae), a plant genus newly recorded from the Philippines

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Abstract. We newly report the genus *Allantospermum* Forman from the Philippines, with the collection of *Allantospermum borneense* subsp. *borneense* Forman in the remnant ultramafic forests of Bucas Grande Island, Surigao del Norte Province. The subspecies was previously known only from the island of Borneo. Our new locality record expands the documented range of the subspecies to northeastern Mindanao, Philippines. Here, we provide additional information about the taxonomy and distribution of the subspecies, and photographs from field collections.

Key words. Borneo, Malpighiales, northeastern Mindanao, range extension, ultramafic flora

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Introduction

Despite centuries of botanical exploration, the Philippine archipelago's complex topography and biogeographic isolation continue to yield scientific breakthroughs, revealing taxa new to science (Bucay et al. 2025a, 2025b; Docot et al. 2025; Lagunday et al. 2025; Mazo and Rubite 2025; Naive et al. 2025; Ordas et al. 2025; Ruales et al. 2025) or new distribution records to the country (Tandang et al. 2017; Pelsner et al. 2019; Fernando et al. 2020; De Los Angeles et al. 2021; Domingo et al. 2021; Altamirano et al. 2022; Espeja et al. 2024). This underscores the country's relatively underexplored biodiversity and the critical need for continued field-based research, even in the face of persistent natural and anthropogenic threats to its remnant natural ecosystems.

During a botanical survey conducted from 2017 to 2021 by Mark Gregory Q. Rule at the Siargao Islands Protected Landscape and Seascape (SIPLAS), a population of small trees with dehiscent fruits was found scattered in the remnant ultramafic forests in the eastern portion of the Bucas Grande Islands. An investigation of the family Irvingiaceae and its relative, Ixonanthaceae, on Co's Digital Flora of the Philippines (Pelsner et al. 2011; accessed at <http://www.philippineplants.org>) did not match any Philippine records. Correspondence with Dr. Fabian Brambach from the University of Göttingen, who has extensive experience with Bornean flora, led to the identification of the collected specimens as belonging to the genus *Allantospermum* Forman, which had not been previously recorded in the Philippines. Further review of vouchered specimens and protologue revealed that the collected specimens resemble *Allantospermum borneense* subsp. *borneense* Forman, a taxon known only from the island of Borneo.

Methods

Voucher specimens were collected under the Wildlife Gratuitous Permit Nos. R13-2020-08, and Wildlife Transport Permit No. R13-001-2020 issued by the Department of Environment and Natural Resources Region XIII (CARAGA) in coordination with the SIPLAS Protected Area Management Board. Specimens were fixed in denatured ethanol, air-dried, and mounted on herbarium sheets following standard



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curation protocols (Bridson and Forman 1998). Vouchers are deposited at the Philippine National Herbarium (PNH) and the Far Eastern University Herbarium (FEUH).

Morphological measurements were recorded *in situ* with digital calipers and a tape measure. Photographs were taken with a Canon G9x point-and-shoot camera. Locality data were compiled to produce a distribution map in QGIS v. 3.44. Field measurements were compared with the *Allantospermum* (Forman 1965) protologue accessible through JSTOR (<https://www.jstor.org/stable/4108215>), whereas digital vouchers were obtained from the Global Biodiversity Information Facility (GBIF Secretariat 2023) and A, K, L, P, MO, and US herbaria (acronym following Thiers 2025). The subspecies description presented herein is based exclusively on Philippine materials.

Results

***Allantospermum borneense* subsp. *borneense* Forman**, Kew Bull. 19, 517.

Figure 1, Table 1

New record (Figure 2). PHILIPPINES — PROVINCE OF SURIGAO DEL NORTE • Bucas Grande Islands, Municipality of Socorro, Barangay Honrado; 09°41'10"N, 125°55'18"E; 10–33 m a.s.l.; 22 June 2020; M.G.Q. Rule leg.; small trees in adjacent streams of Kanlanuk waterfalls; PNH 258660. FEUH 003648.

Figure 1. *Allantospermum borneense* subsp. *borneense* Forman. **A.** Habit. **B.** Bark. **C.** Leaf variations with close-up of leaf petiole and apex (*inset*). **D.** Fruits with close-up of acumen (*inset*). **E.** Cross-section of fruit valves with seed (*inset*). **F.** Remnant of columella and twisted valves after dehiscence. **G.** Columella with remnant arilloid processes

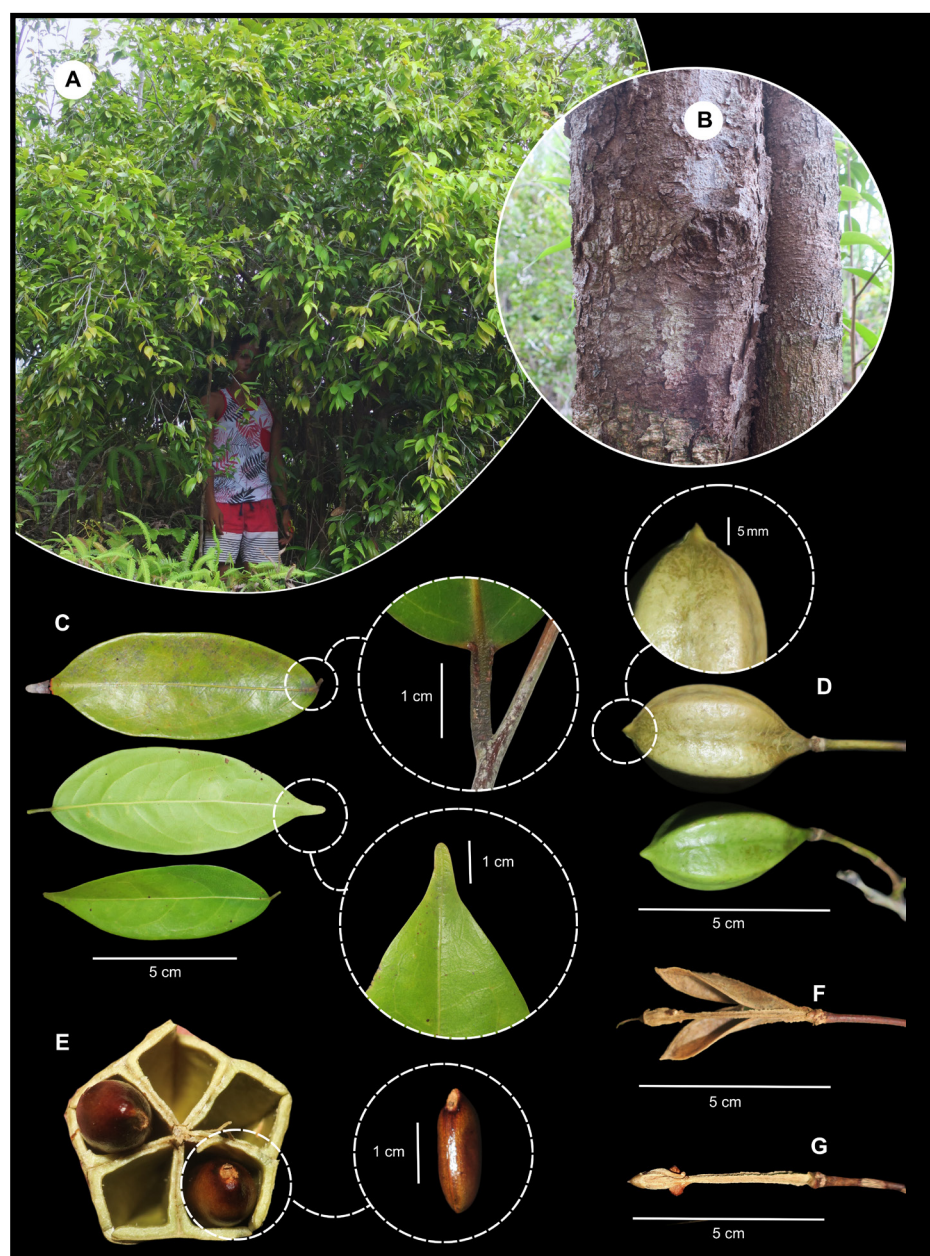


Table 1. Comparison of known Bornean *Allantospermum* species with the new Philippine record.

Characteristics	<i>A. borneense</i> ssp. <i>borneense</i> (Philippines)	<i>A. borneense</i> ssp. <i>borneense</i> (Bornean)	<i>A. borneense</i> ssp. <i>rostratum</i> (Bornean)	<i>A. multicaule</i>
Habit				
Growth	Tree	Tree	—	Tree
Height and DBH	To 5 m tall and to 18 cm DBH	To 30 m tall with 50 cm DBH	—	To 15m tall
Buttress and bark	Short, with postulated, flaky bark	Short and steep, with warts	—	
Stipule	Not observed but stipular scars observed in young leaves	Narrowly elliptical-oblong, pointed, present only in leaf buds	—	Narrowly lanceolate, ca. 2.0–2.5 mm long, very acute, very caducous, leaving lateral scars after falling
Leaf				
Dimensions	Entire, 6.2–13.5 cm × 2.8–7.6 cm	Entire, 7.0–16.0 cm × 3.0–8.0 cm	—	Entire, 3.5–10.0 mm × 1.5–3.5 cm
Texture and surface	Glabrous, coriaceous, with dark green above; pale to glaucous beneath	Glabrous, glossy above; dull beneath	—	Entirely glabrous, membranous margin
Shape	Narrowly elliptical (young leaves) to broadly elliptical (older leaves)	Elliptical	—	Ovate-elliptical
Apex and base	Apex bluntly acuminate to acute; base acute to rounded	Apex bluntly acuminate; base cuneate to broadly rounded	—	Apex acute, almost always acuminate; base broadly obtuse or subrounded
Leaf veins	Midrib prominent with camptodromous, 5–7 pairs of secondary veins, these sometimes not pronounced	Midrib prominent, with traverse, netted secondary veins in 5–10 pairs, arching upward and meeting in a not very conspicuous intramarginal vein	—	Midrib prominent on both sides; secondary veins 3–5 pairs, prominent on both sides, curved at the apex and anastomosing; dense reticulation
Petiole	Blackish, channeled above, 0.8 cm–1.3 cm × 0.2–0.3 mm	Dark-colored, grooved above, 1.0 cm	—	Canaliculate/grooved above, 3.0–8.0 mm long,
Flowers				
Inflorescence length	Panicles to 5 cm	Panicles lax, to 7 cm	Shorter and more condensed, predominantly branched towards base, to 2 cm long	Shorter than leaves, slightly branched
Bracts	Caducous, with visible leaf scars	Early caducous, with an obvious scar	—	0.3–0.7 mm long, broadly triangular, apiculate
Pedicels	To 12.7 mm	7.0–9.0 mm	—	Slender, 5.0–10.0 mm long, articulate at base, accreting after anthesis
Sepals	—	Boat-shaped, reflexed at anthesis, 3.0–4.0 × 2.0–3.0 mm, caducous when fruit matures	—	Ovate-triangular, 0.7–1.0 × 0.7–0.8 mm, obtuse at apex
Petals	—	Elliptical to obovate, 4.0–5 × 2.5–3.0 mm, membranous, veined, reflexed at anthesis, caducous	—	White, ovate-elliptical, ca. 4.0 × 2.5 mm, rounded at apex, then reflexed throughout anthesis
Stamens	—	To 6.0 mm long, with versatile, 1.0 mm long latrorse-introrse anthers Disc ca. 1.5 mm in diameter × 0.5 mm thick	—	To 4.0–4.5 mm long, with white filaments dilated at base; anthers ovate, ca. 0.9 × 0.6 mm, deeply excised at base Disc ca. 2.5 mm in diameter × 1.0 mm thick
Ovary	—	5-lobed, ca. 1.5–2.0 mm	—	Subglobose, ca. 1.5 mm in diameter
Style	—	Filiform, ca. 3(–4) mm	—	Style barely 2 mm long
Stigma	—	Capitellate	—	
Fruit				
Shape and size	Capsule broadly ellipsoidal, 5-lobed, 3.0–4.5 cm × 1.55–2.4 cm	Capsule broadly ellipsoidal, 5-lobed, 2.5–5.0 cm × 2.0–3.0 cm	—	Broadly elliptical or subglobose or slightly obovate, 1.7–2.0 cm in diameter × 1.9–2.2 cm high, frosty gray
Acumen	1.8–3.5 mm long	2.0–4.0 mm long	6.0–8.0 mm long	
Seeds	Oval, attached to apical placenta, 1.4–1.5 cm × 0.3–0.4 cm	Cylindrical, attached to apical placenta, often slightly curved, 2.0–2.5 cm × 0.4–0.6 cm	—	Oblong-cylindrical, attached to apical placenta, straight or slightly curved at apex, ca. 10.0–14.0 mm × 3.5–4.0 mm

Identification. A small tree up to 5 m in height and 18 cm in diameter at breast height (DBH), some branching at 0.6 above ground, with short buttresses and flaky bark, brown both sides but darker in the inner side. Intrapetiolar stipules early caducous. Leaves: entire, glabrous, simple-alternate, ca. 7.5–13.5 cm long and 3.0 cm × 7.0 cm wide, coriaceous, dark adaxial and pale to glaucous abaxial surface, narrowly elliptical young leaves to broadly elliptical older leaves, with a bluntly acuminate to acute apex and rounded base. Leaf venation camptodromous with a prominent midrib and 5–7 pairs of secondary veins that are often not pronounced. Petioles: grooved above, rugose, up to ca. 1.3 cm long. Infructescence: terminal on branched racemes. Fruit: ellipsoidal ca. 2.5–4.0 cm long and 1.5–1.6 cm wide, apex abruptly acuminate with acumen ca. 5–7 mm long, 5-lobed capsule dehiscing septically and partially loculicidally, valves subsequently twisting and aborting after dehiscence, leaving a central columella ca. 2 cm long. Seeds: cylindrical ca. 1.3 cm long, attached to the apex of the columella, and leaving some materials when separating from the placental attachment in the columella. Flowers not observed.

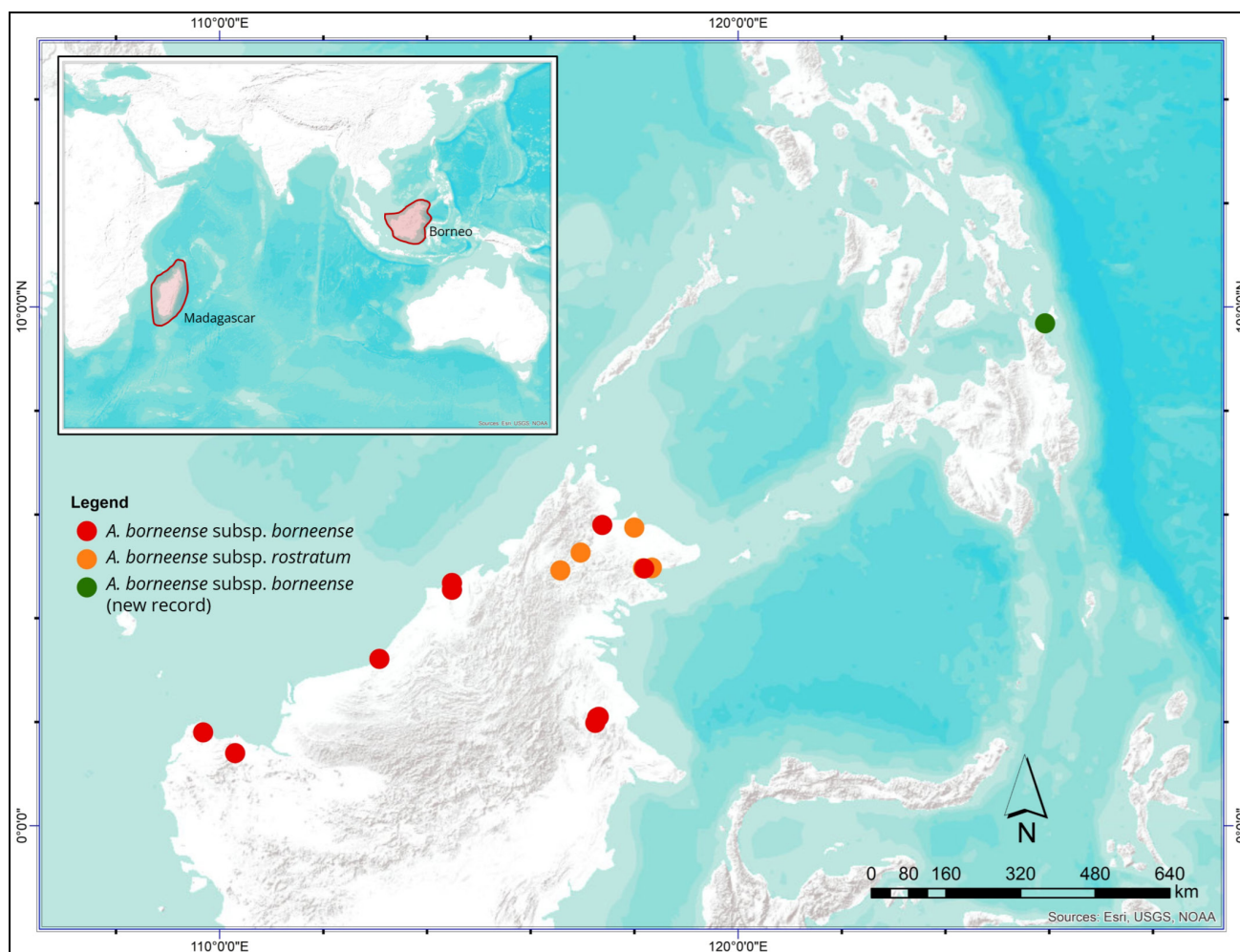


Figure 2. Distribution of *Allantosperrum borneense* Forman. Red and orange circles represent known records, and green circle represent new distribution. Inset is the known distribution of the genus.

Ecology. This subspecies has been observed fruiting from June to July at about 10–33 m a.s.l. Approximately 50 mature individuals with sparse regenerants mostly confined underneath mother trees were recorded within less than 1 ha during the 2017–2021 surveys. Botanical surveys in adjacent ultramafic habitats of mainland Surigao, Dinagat, Southern Leyte, and Taganaan Islands are recommended to delineate its full distribution, given its cryptic appearance outside reproductive periods.

Discussion

The genus *Allantosperrum* is a flowering tree with two recognized species (*A. borneense* Forman and *A. multicaule* (Capuron) Noot.) and two subspecies (*A. borneense* subsp. *borneense* and *A. borneense* subsp. *rostratum* Noot.) (Appendix). Its placement in the family Irvingiaceae was uncertain until 2016, owing to the intermediate characters of the genus between the *Ixonanthes* and *Irvingia*. Lewis Leonard Forman first described the genus in 1965 with *A. borneense* as the type species and classified it in the family Ixonanthaceae due to its unique dehiscence and absence of secretory canals. Capuron (1965) described a monotypic Malagasy genus, *Cleistanthopsis*, under Irvingiaceae, with *C. multicaulis* as the type species.

Due to the shared leaf, flower, and fruit characteristics, Nooteboom (1967) reduced *Cleistanthopsis* to a synonym of *Allantosperrum* and proposed the new name combination *A. multicaule* (Capuron) Noot. Moreover, Nooteboom (1972) agreed with the classification of Capuron to place the genus in Irvingiaceae based on morphological, palynological, and chemo-taxonomical characters, albeit considered Irvingiaceae, along with Ixonanthaceae, as subfamilies of Simaroubaceae. He also described the subspecies, *A. borneense* subsp. *rostratum* to accommodate specimens with shorter, more condensed inflorescences that are only up to 2 cm long (vs. 7 cm), which are predominantly branched towards the base, and have longer acumen on the fruit, up to 6–8 mm long (vs. 3 mm).

On revising the genus *Ixonanthes*, Kool (1980) supported the exclusion of *Allantospermum* from Ixonanthaceae by concurring with the characteristics pointed out by Nootboom (1972). Van Welzen and Baas (1984), however, did not support the placement of *Allantospermum* in Irvingiaceae or Simaroubaceae and, using leaf anatomy, suggested it shares more leaf anatomical characters with Ixonanthaceae. Takhtajan (1997) placed *Allantospermum* within Irvingiaceae, positioning it near Simaroubaceae, and assigning Ixonanthaceae to Rutales. Byng et al. (2016) conducted a phylogenetic analysis to address the unresolved relationship of Irvingiaceae and Ixonanthaceae and revealed *Allantospermum* to be strongly supported as the sister of the former.

Although phylogenetic analysis was not conducted and flowers were not observed, the combination of fruit traits observed for the Philippine material species—including a 5-lobed capsule that dehisces septicidally and partially loculicidally, twisting valves, and a persistent central columella where seeds attached apically—unequivocally identifies the specimens as belonging to the genus *Allantospermum* (Forman 1965; Nootboom 1967; Byng et al. 2016).

The suite of diagnostic characters exhibited by the Bucas Grande specimens also aligns with *A. borneense* subsp. *borneense*, particularly the combination of leaf morphology, inflorescence length, fruit acumen length, and fruit width (Table 1). While the bark texture and short buttress likewise mirror protologue data, the tree height and diameter at breast height (DBH) deviate, with the Philippine specimens having a smaller stature that likely reflects local edaphic constraints rather than taxonomic divergence.

The Philippine record of *A. borneense* represents a unique disjunction within Irvingiaceae, suggesting the link between the Philippines and African–Malagasy flora as observed in *Petersianthus* (Lecythidaceae) (Prance and Jongkind, 2015), and an unnamed *Geosiris* (Pelser et al., 2011). It further supports Bornean–Philippine floristic affinities (Fernando et al. 2020; De Los Angeles et al. 2021; Domingo et al. 2021; Mazo et al. 2022a, 2022b; Docot et al. 2025). Its potential absence in western Mindanao likely reflects historical isolation or undersampling. Additional research will help resolve the cause of the current distribution pattern.

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Additional information

Conflict of interest

The authors declare that no competing interests exist.

Ethical statement

No ethical statement is reported.

Artificial intelligence (AI) use

No use of AI was reported.

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Author contributions

Conceptualization: MGQR. Data curation: MGQR, NMM, RLRG. Formal analysis: MGQR, NMM. Investigation: MGQR, NMM, RLRG, RVAD. Methodology: MGQR. Supervision: MGQR, RVAD. Visualization: MGQR, NMM, RLRG. Writing – original draft: MGQR. Writing – review and editing: MGQR, NMM, RLRG, RVAD.

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All data that support the findings of this study are available in the main text.

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Appendix

Additional specimens examined.

***Allantospermum borneense* subsp. *borneense*.** MALAYSIA — BORNEO (Sarawak) • Arboretum, Semengoh F.R., Kuching District at 300 feet; Galau S15262; K000442180 (image), K000442181 (image) both holotype; Galau S15261; L 0563478 (image) • same locality; Rosli S15167; K004198365 (image), L 0563494 (image); Rosli S15164; K004198365 (image), A 00255072 (image); Rosli S15016; K004198362 (image), L 0563506 (image) • 12th Mile, Penrissen Road, Kuching District; J.A. Kudi and B.A. Bubong S25221; L 0563499 (image), K004198380 (image) • Semengoh Arboretum, 20 Km Penrissen Road, Kuching District on mixed dipterocarp forest; I. Paie S40576; K004198372 (image) • Lambir Hills National Park, Miri District from primary forests on sandstone and shale; Perumal and LaFrankie 352; A 01166129 (image).

***Allantospermum borneense* subsp. *rostratum*.** MALAYSIA • BORNEO (SANDAKAN) • Silam Block 10, Lahab Datu on hill sides of primary forests with clayey soils at 400 feet; A. Abdullah SAN 36068; L 0017732 (image), holotype; SAN 36015; L 0563471 (image) • In a mining camp of the East hill of Mt. Silam, primary forest on ultrabasic, red-brown soils at 800 feet; W. Meijer SAN 37931; L 0017731 (image), syntype, K004198394 (image); W. Meijer and M. Anak SAN 37479; L 0563475 (image), K004198400 (image) — BORNEO (SEMPORNA) • Mt. Pock, F.R. on primary forest with brown soils at 300 feet; N. Gansau SAN 54493; K004198397 (image).

***Allantospermum multicaule*.** MADAGASCAR • remains of eastern forest between Farafangana and Manombo, on basalt laterites; R. Capuron 23640–SF; P00048006 (image), holotype, P00048007 (image) isotype, P00048008 (image) isotype, MO 05006676 (image) isotype; K000435054 (isotype); P00048009 (image), K004198410 (image); R. Capuron 23944–SF; P05480412 (image), US 3628743 (image); R. Capuron 23629–SF; P04781434 (image).