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Floribunda merupakan organ resmi Penggalang Taksonomi Tumbuhan Indonesia, diterbitkan dua kali setahun dan menerbitkan makalah dalam bahasa Indonesia dan Inggris mengenai pelbagai gatra sistematika keanekaragaman flora Malesia pada umumnya dan Indonesia pada khususnya yang berasal dari hasil penelitian, pengamatan lapangan, pengalaman pribadi, telaahan bergagasan, dan tinjauan kritis.

Sidang Penyunting

Ketua Penyunting

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Penyunting

Bayu Adjie (KREKB)

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Deden Girmansyah (BO)

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Dewi Susan (BO)

Penyunting Pelaksana

Wita Wardani (BO)

Tata Letak

Andi Hapid (BO)

Petunjuk kepada pengarang

Jenis tulisan

Makalah lengkap memuat hasil penelitian floristik, revisi, atau monografi unsur-unsur flora Malesia. Komunikasi pendek mencakup laporan kemajuan kegiatan penelitian, pengembangan dan rekayasa keanekaragaman flora Malesia yang perlu segera dikomunikasikan.

Tulisan lain meliputi obituari tokoh keanekaragaman flora, tinjauan kritis bergagasan, telaahan serta pembahasan persoalan aktual seputar kegiatan penelitian, pengembangan dan rekayasa tetumbuhan Indonesia, serta timbangan buku akan dimuat berdasarkan undangan.

Rujukan pembakuan

Pemakaian Bahasa Indonesia sepenuhnya mengikuti *Pedoman Umum Ejaan yang Disempurnakan*, *Pedoman Umum Pembentukan Istilah*, *Kamus Besar Bahasa Indonesia*, serta kamus-kamus istilah yang dikeluarkan Pusat Bahasa. Bahasa Inggris yang dipakai adalah the Queen English dengan berpedoman pada *Oxford Dictionary of*

the English Language. Ketentuan-ketentuan yang dimuat dalam *Pegangan Gaya Penulisan, Penyuntingan, dan Penerbitan Karya Ilmiah Indonesia*, serta *Scientific Style and Format: CBE Manuals for Author, Editor, and Publishers*, dan buku-buku pegangan pembakuan lain akan sangat diperhatikan. Kepatuhan penuh pada *International Code of Botanical Nomenclature* bersifat mutlak.

Gaya penulisan

Penulisan naskah yang akan diajukan supaya disesuaikan dengan gaya penulisan yang terdapat dalam nomor terakhir terbitan *Floribunda*.

Abstrak informatif supaya diberikan dalam bahasa Indonesia dan Inggris yang masing-masing tidak melebihi 200 kata. Sediakan sekitar 7 kata kunci untuk keperluan pengindeksan dan pemindaian.

Bilamana diperlukan ucapan terima kasih dan bentuk persantunan lain dapat dicantumkan sesudah tubuh teks tetapi sebelum daftar pustaka.

Pengacuan pada pustaka hendaklah dilakukan dengan sistem nama-tahun. Daftar pustaka supaya disusun berdasarkan alfabet nama pengarang dengan memakai sistem Harvard.

Gambar dan tabel merupakan pendukung teks sehingga perlu disusun secara logis dalam bentuk teks atau tabel atau sebagai gambar, tetapi tidak dalam bentuk ketiganya sekaligus. Siapkan gambar yang lebarnya dua kolom cetak.

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Kantor penyunting

Sidang penyunting *Floribunda*

Herbarium Bogoriense, Cibinong Science Center

Jalan Raya Bogor KM 46 Cibinong 16911

Telepon : (021) 8765066-67

Fax : (021) 8765059

E-mail : floribundaptti@gmail.com;

floribunda@ptti.or.id



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**PHYLLANTHUS MYRTIFOLIUS (MOON EX WIGHT) MULL.ARG. AND
PHYLLANTHUS TENELLUS ROXB. (PHYLLANTHACEAE) IN JAVA**

**Muhammad Rifqi Hariri^{1*}, Arifin Surya Dwipa Irsyam², Afri Irawan³, Zakaria Al-Anshori⁴,
Arieh Mountara³ & Rina Ratnasih Irwanto⁵**

¹Research Center for Plant Conservation and Botanic Gardens, Indonesian Institute of Sciences,
Jl. Ir. H. Juanda No. 13, Bogor

²Herbarium Bandungense (FIPIA), School of Life Sciences and Technology (SITH),
Institut Teknologi Bandung, Labtek VC, Jl. Let. Jen. Purn. Dr (HC) Mashudi No. 1, Sumedang

³Department of Biology, Faculty of Mathematics and Natural Sciences, IPB University, Dramaga Bogor

⁴Department of Silviculture, Faculty of Forestry, IPB University,
Jl. Lingkar Akademik Kampus IPB Dramaga Bogor

⁵School of Life Sciences and Technology (SITH), Institut Teknologi Bandung,
Labtek XI, Jl. Ganeca No. 10, Bandung

Corresponding e-mail: ^{1*}muhammad.rifi.hariri@lipi.go.id

Muhammad Rifqi Hariri, Arifin Surya Dwipa Irsyam, Afri Irawan, Zakaria Al-Anshori, Arieh Mountara & Rina Ratnasih Irwanto. 2020. *Phyllanthus myrtifolius* (Moon ex Wight) Müll.Arg. dan *Phyllanthus tenellus* Roxb. (*Phyllanthaceae*) di Jawa. *Floribunda* 6(5): 188–194. — *Phyllanthus* L. merupakan marga terbesar dalam suku *Phyllanthaceae*, terdiri dari 1302 jenis yang tersebar luas di kawasan tropik dan subtropik. Sebanyak 20 jenis *Phyllanthus* telah tercatat dalam *Flora of Java*. Namun, jenis lainnya masih mungkin ditemukan dari Pulau Jawa. Oleh sebab itu, penelitian ini bertujuan untuk melaporkan adanya informasi tambahan mengenai *Phyllanthus* di Jawa. Eksplorasi lapangan telah dilakukan di Bandung, Bogor, Jakarta, Sumedang, dan Situbondo. Pengamatan lapangan menunjukkan adanya 2 jenis *Phyllanthus* tambahan untuk *Flora of Java*, yaitu *P. myrtifolius* (Moon ex Wight) Müll.Arg. dan *P. tenellus* Roxb. *P. myrtifolius* telah dibudidayakan secara luas sebagai tanaman hias eksotik, sementara *P. tenellus* merupakan tumbuhan asing yang baru terekam di Jawa. Keberadaan kedua jenis tersebut menambah jumlah jenis *Phyllanthus* di Jawa. Kata kunci: Jawa, jenis asing, *Phyllanthus myrtifolius*, *Phyllanthus tenellus*.

Muhammad Rifqi Hariri, Arifin Surya Dwipa Irsyam, Afri Irawan, Zakaria Al-Anshori, Arieh Mountara & Rina Ratnasih Irwanto. 2020. *Phyllanthus myrtifolius* (Moon ex Wight) Müll.Arg. and *Phyllanthus tenellus* Roxb. (*Phyllanthaceae*) in Java. *Floribunda* 6(5): 188–194. — *Phyllanthus* L. is the largest genus in the *Phyllanthaceae* and consists of 1302 species that are widely distributed in tropical and subtropical regions. There were 20 discovered species of *Phyllanthus* recorded in the *Flora of Java*. However, additional species of *Phyllanthus* in Java can still be discovered in the future. Therefore, this research was aimed to report any additional information on *Phyllanthus* of Java. Field exploration was conducted in Bandung, Bogor, Jakarta, Sumedang, and Situbondo. Field observation resulted in the findings of two *Phyllanthus* additional species within the *Flora of Java*, namely *P. myrtifolius* (Moon ex Wight) Müll.Arg. and *P. tenellus* Roxb. *P. myrtifolius* was widely cultivated as an exotic ornamental plant, while *P. tenellus* is a newly recorded alien species to Java. The discovery of these species would increase the number of *Phyllanthus* species in Java.

Keywords: Alien species, Java, *Phyllanthus myrtifolius*, *Phyllanthus tenellus*.

Phyllanthus L. is the largest genus in the *Phyllanthaceae* comprises around 1302 species that are widely distributed around the world, except for Europe and Antarctica (Kathriarachchi

et al. 2006; Ralimanana & Hoffmann 2011; Christenhusz *et al.* 2017). *Phyllanthus* is one of the most diverse groups in the Angiosperms, due to its various life forms. It ranges from annual and

perennial herbaceous, arborescent, climbing, floating aquatic, to pachycaulous and phylloclade (Kathirarachchi *et al.* 2006; Ralimanana & Hoffmann 2011; Bouman *et al.* 2018). Morphologically, the genus is characterized by simple leaves with distichous or opposite arranged, flowers in cyme, fascicle or solitary, tepals 4–6, and its fruit is either a form of schizocarp, baccate or drupaceous (Backer & Bakhuizen van den Brink Jr. 1963; Ralimanana & Hoffmann 2011).

The genus *Phyllanthus* was included into the *Euphorbiaceae* family by Backer & Bakhuizen van den Brink Jr., due to the family ordered based on the Hutchinson's system (Backer & Bakhuizen van den Brink Jr. 1963). In the classical system, *Phyllanthus* was considered as a primitive *Euphorbiaceae* because of its pistillate flower having a 3-locular ovary and its fruit is a 3-celled capsule (Webster 1994). Recently, *Phyllanthus* have been excluded from *Euphorbiaceae* and regarded as *Phyllanthaceae*, a separate family, based on the Angiosperm Phylogeny Group (APG 2016). This new classification system is based on molecular studies using DNA sequence data of nuclear PHYC and plastid atpB, matK, ndhF, and rbcL (Hoffmann *et al.* 2006). Other genera separated from *Euphorbiaceae* were *Antidesma* L., *Aporosa* Blume, *Baccaurea* Lour., *Bischofia* Blume, *Breynia* L., *Glochidion* J.R.Forst. & G.Forst., *Sauropus* Blume, *Securinega* Comm. ex A.Juss., and *Uapaca* Baill. (Wurdack *et al.* 2004; Hoffmann *et al.* 2006).

The taxonomical information of *Phyllanthus* of Java was recorded by Backer & Bakhuizen van den Brink, Jr. (1963) in the *Flora of Java* first volume. As many as 20 species of *Phyllanthus* discovered in Java, i.e., *P. accrescens* J.J.Sm., *P. acidus* (L.) Skeels, *P. acutissimus* Miq., *P. buxifolius* (Blume) Müll.Arg., *P. ceramanthus* Bakh. f., *P. emblica* L., *P. gracilipes* (Miq.) Müll.Arg., *P. hasskarlianus* Müll.Arg., *P. indicus* (Dalzell) Müll.Arg., *P. javanicus* Poir. ex Spreng., *P. maderaspatensis* L., *P. microcarpus* (Benth.) Müll.Arg., *P. muriculatus* J.J.Sm., *P. niruri* L., *P. pulcher* Wall. ex Müll.Arg., *P. reticulatus* Poir., *P. trichosporus* Adelb., *P. urinaria* L., *P. virgatus* G.Forst., and *P. zollingeri* Müll.Arg.

In 1987, an additional species of *Phyllanthus*, namely *P. debilis* Klein ex Willd., was reportedly grown like a weed on the rice plantations in Java (Soerjani *et al.* 1987). Therefore, it is suspected that other additional species may still be found within the island. Thus, the study aims to find out the newly recorded species to be written in the

alien flora of Java.

MATERIALS AND METHODS

The field exploration was conducted on April to June 2019 in Bandung (Cidadap, Ciwaruga, Lembang, Pasir Impun), Bogor (Bogor Botanic Gardens, Dramaga), Jakarta, Sumedang (Jatinangor), and Situbondo. The plant materials collected in this study include vegetative and generative organs. Data recorded from the fields includes collector name, collection number, location, vernacular name, uses, and habitat. The materials were preserved and identified in Herbarium Bandungense (FIPIA), School of Life Sciences and Technology (SITH), Institut Teknologi Bandung (ITB).

The literature used in the identification was a monographic study of the West Indian species of *Phyllanthus* (Webster 1956), A revision of *Phyllanthus* (*Euphorbiaceae*) in the continental United States (Webster 1970), *Flora of Java* vol 1 (Backer & Bakhuizen van den Brink Jr. 1963), Synopsis of *Croton* and *Phyllanthus* (*Euphorbiaceae*) in Western tropical Mexico (Webster 2001) and Two new species of *Phyllanthus* and notes on *Phyllanthus* and *Sauropus* (*Euphorbiaceae: Phyllanthaceae*) in New South Wales (Hunter & Bruhl 1997).

RESULT

Two additional species of *Phyllanthus* from the observation sites were identified as *P. myrtifolius* (Moon ex Wight) Müll.Arg. and *P. tenellus* Roxb. They have not been included to the *Flora of Java* by Backer & Bakhuizen van den Brink Jr. Their morphological characters are shown on Figure 1 and Figure 2.

Phyllanthus myrtifolius (Moon ex Wight) Müll.Arg., Prodr. 15(2): 396. 1866; Hook.f., Fl. Brit. Ind. 5: 295. 1887; Webster in Dassanayake & Clayton, Rev. Handb. Fl. Ceyl. 11: 211. 1997; Chantaranothai, Thai For Bull (Bot) 33: 19. 2005 Verwijs, Bouman & van Welzen, Blumea 64(3): 242. 2019. — *Phyllanthus myrtifolius* Moon ex Hook. f., Fl. Brit. India 5(14): 296. 1887. — *Macraea myrtifolia* Moon ex Wight, Icon. Pl. Ind. Orient. 5(2): 27. 1852. — *Diasperus myrtifolius* (Moon ex Wight) Kuntze, Revis. Gen. Pl. 2: 600. 1891. Type: *Thwaites C.P. 650*, Sri Lanka, Mawelly ganga (lecto K; iso G, PDA).

Shrub, 30–50 cm, without milky latex, monoecious; branches not a phyllanthoid type, reddish-brown, scabridulous or hispidulous, persis-

tent. *Stipules* 0.5–1 mm long, ovate, apex acuminate, red. *Leaves* simple, alternate; petioles very short, 0.6–1 mm, red; lamina narrowly oblanceolate to falcate, 10–15 × 4–6 mm, base minutely hastulate, margin entire, apex acute, green above, glaucous beneath, subcoriaceous, veins 4–6 pairs. *Inflorescence* in an axillary fascicle, unisexual. *Staminate flowers*: pedicel 5–7 mm long; sepals 6, red, connate at base; disc glands 6, orbicular; stamens 3, free; filaments yellow; anthers basifixed,

yellow. *Pistillate flowers*: pedicels 5–7 mm long; sepals 6, connate at base, ovate, 1–1.5 mm long, red; ovary superior, globose, 3-carpellate, green, placenta axillary, ovules 2 per locule; styles 3, green; stigma bifid, reddish-green. *Fruits* not seen. *Distribution*: *P. myrtifolius* is native to India and Sri Lanka (Chantaranothai 2005; Verwijs et al. 2019).

Habitat: The plant grows in open areas.



Figure 1. Morphological characters of *P. myrtifolius*. A. habit; B. branches with leaves and inflorescence; C. adaxial surface of leaf; D. abaxial surface of leaf; E. stipule (arrow); F. inflorescence in axillary fascicle; G. pistillate flower (sp= sepal; sl= style; sg= stigma); H. staminate flower (sp= sepal; gl= gland; ath= anther).

Specimen examined: **Bogor:** Bogor Botanic Gardens, June 21 2019, *MR Hariri s.n.* (FIPIA); Taman Koin, IPB University, June 20 2019, *A Irawan 02* (FIPIA). **Jakarta:** Kebun percobaan Badan Tenaga Nuklir Nasional, Pasar Jumat, June 20 2019, *MR Hariri s.n.* (FIPIA); **Sumedang:** Main Gate of ITB Jatinangor, Sumedang, June 14 2019, *A Irawan 01* (FIPIA).
 Vernacular name: Ceylon Myrtle, Mousetail Plant (English), *tanaman cendrawasih* (Bahasa Indonesia).
 Etymology: The epithet *myrtifolius* means myrtle-leaved (Gledhill 2008).
 Uses: The species is widely cultivated as ornamental plants (Chantaranothai 2005; Yok & Sia 2008; Verwijs *et al.* 2019).

Phyllanthus tenellus Roxb., Fl. Ind. 3: 668. 1832; Webster, Brittonia 22: 45, fig. 1 & 2, 46, fig. 5 & 6 and 47, fig. 18. 1970; James & Harden, Fl. New South Wales 1: 398. 1990; Hunter & Bruhl, Telopea 7(2): 160. 1997; Webster, Contr. Univ. Michigan Herb. 23: 385. 2001. — *Diasperus tenellus* (Roxb.) Kuntze, Revis. Gen. Pl. 2: 601. 1891. Type: India, West Bengal, Calcutta Botanical Gardens, *Wallich 7892 p.p.* (holo K).

Phyllanthus brisbanicus F.M. Bailey, Queensl. Fl. 5: 1418. 1902. Type: Australia, Queensland, Brisbane, *Bailey* (holo BRI; iso K).

Phyllanthus corcovadensis Müll. Arg., Fl. Bras. 11(2): 30. 1873. — *Diasperus corcovadensis* (Müll. Arg.) Kuntze, Revis. Gen. Pl. 2: 601. 1891. Type: Brazil, Monte Corcovado near Rio de Janeiro, *Glaziou 229* (holo ?)

Phyllanthus minor Fawc. & Rendle, J. Bot. 57: 65. 1919. Type: Jamaica, Hope Botanical Gardens, *Harris 1220* (lecto UCWI; isolecto: GH, JAM, MT, NY, US).

Herb to small shrub, up to 70 cm, without milky latex, monoecious; branching phyllanthoid, 4–13 cm long, reddish-brown, glabrous, deciduous. *Cataphylls* arranged spirally at the base of a plagiotropic branchlet, lanceolate, up to 1 mm long, red. *Leaves* simple, alternate; petioles very short, 0.5–1 mm, red; lamina obovate-elliptic, 0.5–2 × 0.2–1 cm, base cuneate, margin entire, apex acuminate, rounded to obtuse, membranous, green above, glaucous beneath, veins 5–6 pairs. *Stipules* 0.5–1 mm long, lanceolate, apex acuminate, red. *Inflorescence* axillary, solitary or in cyme and fascicle, unisexual. *Staminate flowers:* pedicels ± 1 mm long; sepals 5, white, valvate; stamens 5, free; filaments whitish; anthers basifixed, yellow. *Pistillate flowers:* pedicels 4–7 mm long; sepals 5,

connate at base, ovate-deltoid, ± 0.5 mm long, white, green in the middle, persistent; ovary superior, depressed globose, 3-carpellate, green, placenta axillary, ovules 2 per locule; styles short, 3, yellow; stigma bifid. *Fruits* schizocarp, globose, 1–2 mm wide, green, glabrous. *Seeds* trigonous, ± 1 mm, papillose, brown to yellowish.

Distribution: *P. tenellus* is native to Madagascar and Mascarene Islands. It has been introduced to other tropic and subtropic regions, such as Australia, India, and Iran (Webster 1970; Hunter & Bruhl 1997; Tandyekkal & Ramla 1997; Reddy & Raju 2002; Zare *et al.* 2015).

Habitat: The plant frequently grows around the vegetable plantation, flowerpots, gardens, roadside, and open areas.

Specimen examined: **Bandung:** Ledeng bus station, Cidadap, Bandung, 20 April 2019, *ASD Irsyam 265* (FIPIA); Setiabudhi Regency, Ciwaruga, Parongpong, Bandung Barat Regency, April 20 2019, *ASD Irsyam 264* (FIPIA); West gate of Padjajaran University, Jatinangor, Sumedang, April 29 2019, *ASD Irsyam 234* (FIPIA); Jl. Haji Umar, Pasir Impun, Madalajati, Bandung, June 13 2019, *ASD Irsyam 235* (FIPIA); Jl. Suka-resmi, Mekarwangi village, Lembang, Bandung Barat Regency, June 22 2019, *ASD Irsyam 236* (FIPIA). **Bogor:** around Treub laboratory, Bogor Botanic Gardens, April 27 2019, *MR Hariri 32* (FIPIA). **Situbondo:** Asembagus Park, June 7 2019, *MR Hariri 33-34* (FIPIA).

Vernacular name: *meniran* (Sundanese language).

Etymology: *P. tenellus* has been named for its delicate and fragile leaves. The epithet *tenellus* means delicate or tender (Gledhill 2008).

Uses: unknown.

DISCUSSION

P. tenellus is native to Madagascar and Mauritius and has been naturalized across the Indo-Pacific region (Crisafulli *et al.* 2011; Wagner & Lorence 2011; Zare *et al.* 2015). However, its existence in Java has not been recorded before and the species are first reported here. At the observation sites in Bandung and Jatinangor, *P. tenellus* multiplies in vegetable plantation, garden, and along the roadside. The species were also observed as a weed in several flowerpots of exotic ornamental plants in Bandung (Setiabudhi regency, Mekarwangi, Pasir Impun) and Bogor Botanic Gardens. In Bogor Botanic Gardens (BBG), the naturalized population can be found around the

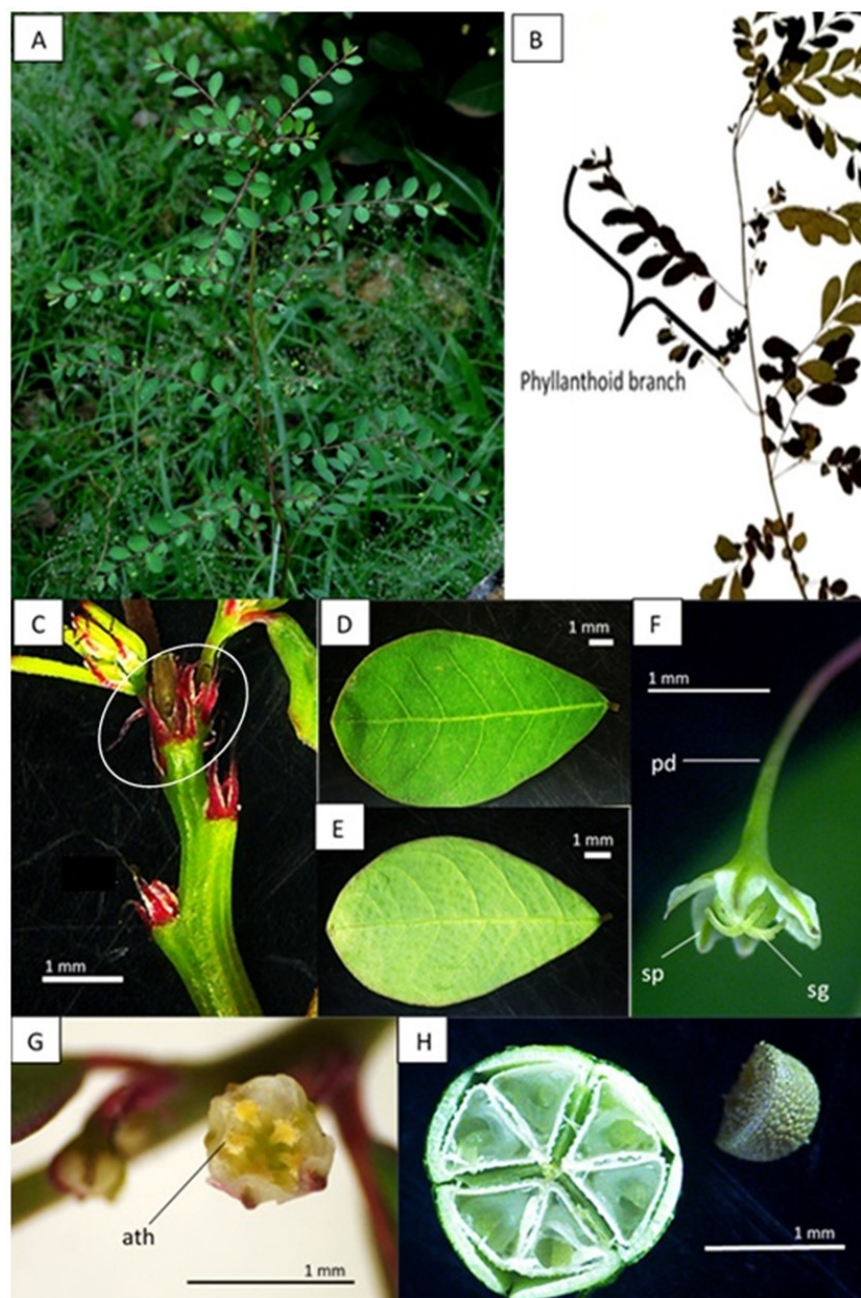


Figure 2. Morphological characters of *P. tenellus*. A. habit; B. Phyllanthoid branch; C. cataphylls; D. adaxial surface of leaf; E. abaxial surface of leaf; F. solitary pistillate flower (pd= pedicel; sp= sepal; sg= stigma); G. staminate flower (ath= anther); H. section of fruit and seed.

Treub Laboratory and the library building. *P. tenellus* is thought to have been accidentally introduced to Java as a soil or plant contaminant. In Sicily, Italy, *P. tenellus* was probably introduced by way of exotic plant commerce (Crisafulli *et al.* 2011). This view is supported by previous research, which showed that the weedy species of *Phyllanthus* possess very small seeds. This enabled them to be transported when other plants are moved (Webster 1970).

P. tenellus can become invasive due to its rapid

flowering and explosive dehiscent fruits. These factors cause *P. tenellus* to grow invasively within the new distribution area (Zare *et al.* 2015). Previous research of *P. tenellus* demonstrated that the species had been considered as an invasive alien species in Australia (Orchard 1994), Hawaii (Oppenheimer & Bartlett 2000), Japan (Mito & Uesugi 2004), and Polynesia (Florence *et al.* 2010). In Ethiopia, the species invasively grows on sugar cane plantations (Yirefu & Tana 2007). Therefore, the presence of *P. tenellus* in Java

Island needs to be noticed and further research on its potential as an invasive alien species is needed.

P. myrtifolius is native to India and Sri Lanka, and was then introduced to many countries as bonsai and ground cover plants (Chantaranothai 2005; Yok & Sia 2008). Although it has been cultivated for ornamental plants, its presence in Java has never been previously recorded. *P. myrtifolius* was collected from IPB Dramaga, ITB Jatiningor, an experimental garden of Badan Tenaga Nuklir Nasional (BATAN), and Bogor Botanic Gardens (BBG). In BBG, *P. myrtifolius* planted as a non-collection species. Thus it was not included in the *Phyllanthus* of BBG written by Husaini and Hidayat (Husaini & Hidayat 2018). The species had been widely cultivated in Thailand and considered a new record to the Flora of Thailand (Chantaranothai 2005).

Taxonomically, the two *Phyllanthus* belongs to the different subgenera. *P. myrtifolius* placed in the subgenus *Macraea* (Wight) Jean F. Brunel, whereas *P. tenellus* is a member of subgenus *Tenellanthus* Jean F. Brunel. Therefore both of them display different morphological characteristics. Subgenus *Macraea* has persistent branches without phyllanthoid branching, clypeate pollen, and verrucate seeds (Bouman *et al.* 2018). Meanwhile, subgenus *Tenellanthus* has phyllanthoid branches, globose pollen, and papillose to verrucose seeds (Ralimanana & Hoffmann 2011). Lateral axes characterized phyllanthoid branch, resembling a legume compound leaf (Fig. 2-B). Its leaves on lateral axes usually develop, while leaves on the primary axes are reduced to cataphylls (Webster 1956; Challen *et al.* 2011).

P. myrtifolius and *P. tenellus* accounts as an additional species to the *Flora of Java*. Backer & Bakhuizen van den Brink Jr. (1963) did not list both species previously. There is a potential that the species introduced to Java after *Flora of Java* vol 1 was published. Thus, the presence of *P. myrtifolius* and *P. tenellus* at the observation sites increase the number of *Phyllanthus* species in Java. This finding also illustrates that a review on *Phyllanthus* of Java is still needed because other additional *Phyllanthus* species may still be found in Java.

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d.a. “Herbarium Bogoriense” Bidang Botani, Puslit Biologi, CSC-LIPI
Jl. Raya Jakarta Bogor, Km. 46. Cibinong, Bogor. 16911. Indonesia