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Floribunda

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.

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ALSTONIA MACROPHYLLA (APOCYNACEAE): A NEW RECORD OF NATURALIZED SPECIES IN JAVA, INDONESIA

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Surianto Effendi & Wendy A. Mustaqim. 2021. *Alstonia macrophylla* (*Apocynaceae*): Satu Rekaman Baru Spesies Ternaturalisasi di Jawa, Indonesia. *Floribunda* 6(6): 207–212. — *Alstonia macropyhlla* (*Apocynaceae*), salah satu jenis pohon yang memiliki penyebaran yang luas di kawasan Malesia, di dalam tulisan ini untuk pertama kalinya secara resmi dilaporkan ditemukan secara alami di Jawa. Catatan ini didasarkan pada jenis yang tumbuh di Bukit Kapur Ciampea, Kecamatan Ciampea, Bogor Barat, Jawa Barat. Deskripsi, ekologi, ilustrasi dan pembahasan singkat mengenai keberadaan jenis ini sebagai tumbuhan ternaturalisasi di Jawa disajikan di dalam tulisan ini, termasuk kunci jenis-jenis *Alstonia* di Jawa.
Kata kunci: Pulai, taksonomi, jenis pohon, Jawa Barat.

Surianto Effendi & Wendy A. Mustaqim. 2021. *Alstonia macrophylla* (*Apocynaceae*): A New Record of Naturalized Species in Java, Indonesia. *Floribunda* 6(6): 207–212. — *Alstonia macrophylla* (*Apocynaceae*), a Malesian widespread species tree, here for the first time is formally reported to be naturally found in Java. The report is based on plants growing in the Ciampea limestone hills, Ciampea sub-district, west of Bogor, West Java. Description, ecology, illustration and a brief discussion regarding the occurrence state of this species as naturalized species in Java are presented. A key to *Alstonia* species in Java is also given.
Keywords: Pulai, taxonomy, tree species, West Java.

In recent years, the number of taxonomic studies in Java has been increased. Although plant diversity in this island has been thoroughly studied mainly by the publication of three volumes of Flora of Java by Backer & Bakhuizen van den Brink (1963; 1965; 1968), further occurrence records of native or even new species have been published by many authors (*e.g*. Hommels 1987; Hay 1998; Djarwaningsih 2010; Puspitaningrum *et al.* 2017; Mahyuni *et al.* 2018; Metusala & Supriatna 2017; Rahayu & Rodda 2019). On the other hand, many non-natives of which have become naturalized also have been reported (*e.g.* Sheil & Padmanaba 2011; Hariri & Irsyam 2018) as well as a recent addition of a *Plumeria* species in Java (Hariri *et al.* 2019).

In this paper, we formally report the occurrence of *Alstonia macrophylla*, a tree species belongs to the dogbane family (*Apocynaceae*), for Java. *Alstonia* is a pantropical genus that so far contains 43 species of which 16 has been reported in Malesia. In Flora Malesiana, the genus in Java is represented by four species which all of them are non-endemics (Sidiyasa 2007). Our discovery becomes the fifth species of *Alstonia* found in Java.

The plant was discovered in Ciampea limestone hills, west of Bogor. Ciampea is an interesting and popular for botanists, particularly due to the presence of single hill endemic orchid *Zeuxine tjiampeana* (Comber 1990). Together with the presence of mining activities, some floristic and/or ecological studies have been carried out (Sartika 2007; Satyanti & Kusuma 2010; Widiyanti & Kusmana 2014). The location thus can be considered as a well-studied site. However, none of these studies mentioned the occurrence of *A. macrophylla*,

which is rather common in some parts of the Ciampea limestone hills.

MATERIALS AND METHODS

The plant material was collected using standard guidelines following Bridson & Forman (1992). The plant with flowers and/or fruits has been processed into dried herbarium specimens. The description is based on fresh material. To confirm the identity of the plant we use Backer & Bakhuizen van den Brink (1965), Mustaqim *et al.* (2019), Nisyawati & Mustaqim (2017), and Middleton (2007) and observation on specimens in the Herbarium Bogoriense (BO) and Herbarium of Department of Biology, Universitas Indonesia, Depok, as well as digital herbarium (K, L, and P) (herbarium acronyms follow Thiers 2020–continuously updated).

RESULT AND DISCUSSION

The Occurrence State of *Alstonia macrophylla* in Java

The occurrence state of *A. macrophylla* in Java is intricate. Limestone hill is one of the habitats for the species in its wild state in its native range (Sidiyasa 2007). This gives us the impression that the species is possibly wild and native. However, during an exploration in an urban ecosystem of East Jakarta, around 100 km NE of Ciampea, the first author collected photographs of *A. macrophylla* (Fig. 1). Unfortunately no specimen could be collected due to permission. Besides that, this species is not included in the latest Jakarta's spermatophyte checklists (Mustaqim *et al.* 2019). It was seen growing in a camping ground where most of the tree species were planted. Some general explorations carried out by the first author since 2014 in some areas located between the two localities have shown that no individual of this tree species has been found.

Plant naturalization in Bogor and its surrounding regions is quite common (Mustaqim & Nisyawati 2016; Mustaqim *et al.* 2017; Nisyawati & Mustaqim 2017; Hariri & Irsyam 2018; Irsyam & Mountara 2018; Irsyam *et al.* 2019a, 2019b; Mustaqim 2019; Irsyam *et al.* 2020). There is a good example of undetected but already widespread species of alien tree of *Cecropia peltata*. This species was just reported in 2010 but already has a wide distribution in Bogor and the surrounding areas (Sheil & Padmanaba 2011). It has become quite common in some places (Nisyawati & Mustaqim 2017) including the Ciampea limestone hills where we found the population of *A. macrophylla*. *A. macrophylla* has a high capacity of becoming invasive (PIER 2008) and was just reported as possibly naturalized in Singapore (Middleton & Rodda 2019).

We considered that the population of this species in Ciampea is a result of naturalization. The source possibly from plants cultivated in the Bogor Botanical Gardens and possibly the seeds were dispersed by wind. Moreover, this species is quite prominent in appearance and is highly likely to be overlooked in the previous exploration, especially during the Dutch era where many plant specimens have been collected from Ciampea limestone hills which strongly shown that the area has been quite routinely explored. This has been shown by notes in the taxonomic account of certain species such as *Aeschynanthus pulcher* (Backer & Bakhuizen van den Brink 1965) and *Zeuxine tjiampeana* (Comber 1990). These all indicate that the presence of this species in Ciampea limestone hill is relatively new and become another reason why this species should be categorized as a result of naturalization.

Key to Javanese Species of *Alstonia* (adopted from Sidiyasa 2007).

1a. Corolla lobe dextrorse; leaves 3–4 per whorls 2
1b. Corolla lobe sinistrorse; leaves (3-)4–9 per whorls 3
2a. Sepals pubescent outside; corolla lobes length up to 2.1 times as long as wide ..... *A. spectabilis*
2b. Sepals glabrous or laxly puberulous outside; corolla lobes 2.2–5 times as long as wide; 2.8 mm long at least ..... *A. macrophylla*
3a. Adaxial lateral nerves prominent ..... *A. scholaris*
3b. Adaxial lateral nerves obscure 4
4a. Leaf blades elliptic or oblong, apex usually acuminate, acute or obtuse ..... *A. angustiloba*
4b. Leaf blades spathulate, apex rounded or retuse ..... *A. spatulata*

Taxonomic Treatment

Alstonia macrophylla Wall. ex G.Don, Gen. Syst. 4: 87 (1837). -- Type: *Wallich 1648* (lecto K-W, designated by Huber (1973) *op. cit.;* iso P), India, Hort. Bot. Calcutta. Fig. 1.

Tree to 15 m tall, to 30 cm diam., buttresses absent. Bark smooth, very shallowly fissured, greyish to brown; inner bark cream, yellowish, with orange streaks, white latex abundant in the younger part of twigs. Branchlets patently pu-berulous. Leaves in whorls of 3–4; petiole 9–25 mm long, colleters light brown, up to 1 mm long, densely packed colleters mats up to 4.5 mm from the base of petiole; lamina papery to thinly coriaceous, obovate-oblong to obovate-lanceolate.

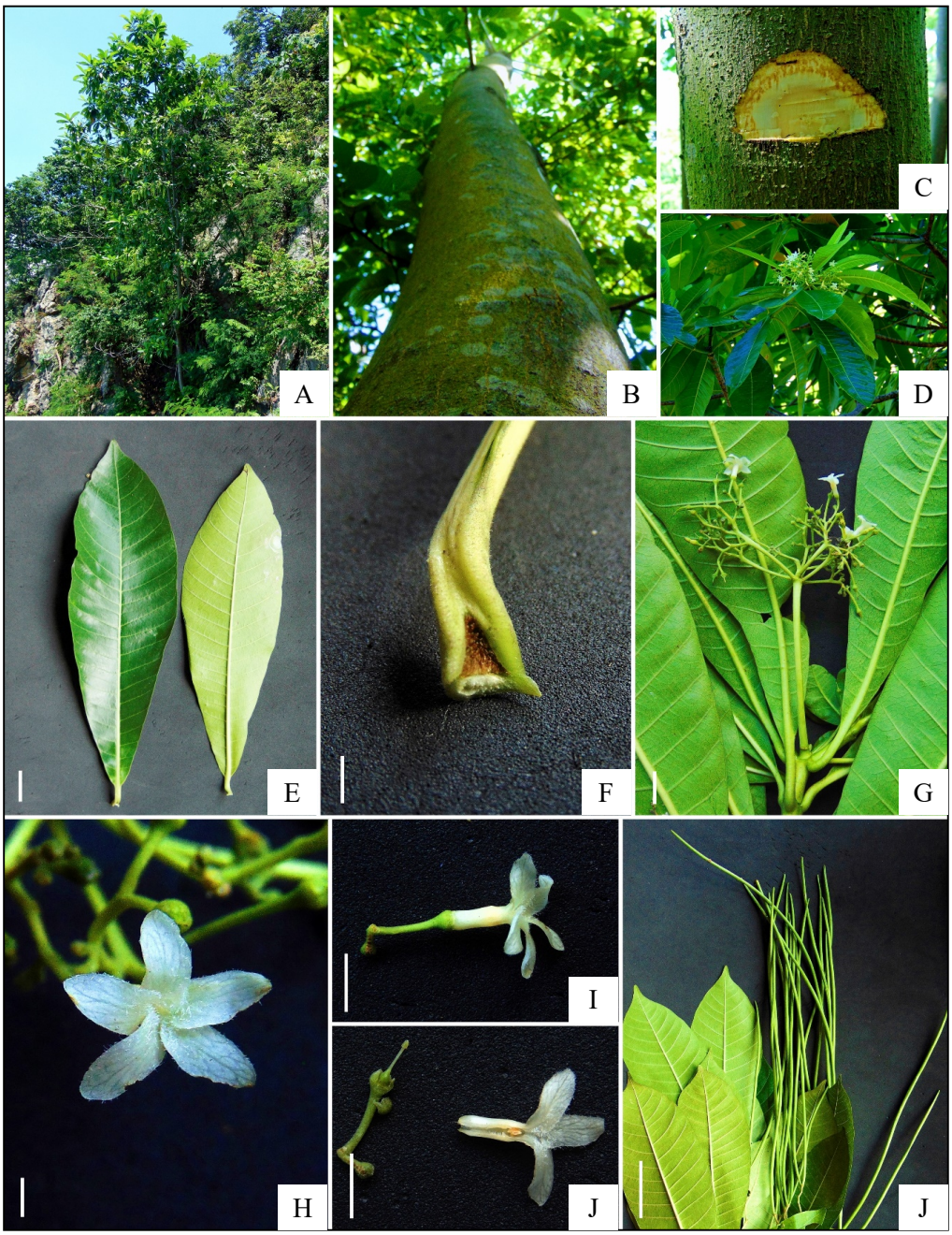

Fig. 1. Morphology of *A. macrophylla* collected from West Java: A. the plant. B. trunk. C. stem bark, showing inner bark and wood. D. flowering twig. E. leaves. F. base of petiole with colleters. G. inflorescence. H. ventral view of flower. I. flower. J. flower showing anther (an), ovary (ov), style (st) and stylehead (sh). K. immature follicles. Scale bar: A-D: not applicable; E = 2 cm; F = 3 mm; G = 1 cm; H = 2 mm; I--I = 5 mm; and K = 4 cm. Photographs: A-D by Surianto Effendi, E-K by Wendy A. Mustaqim.

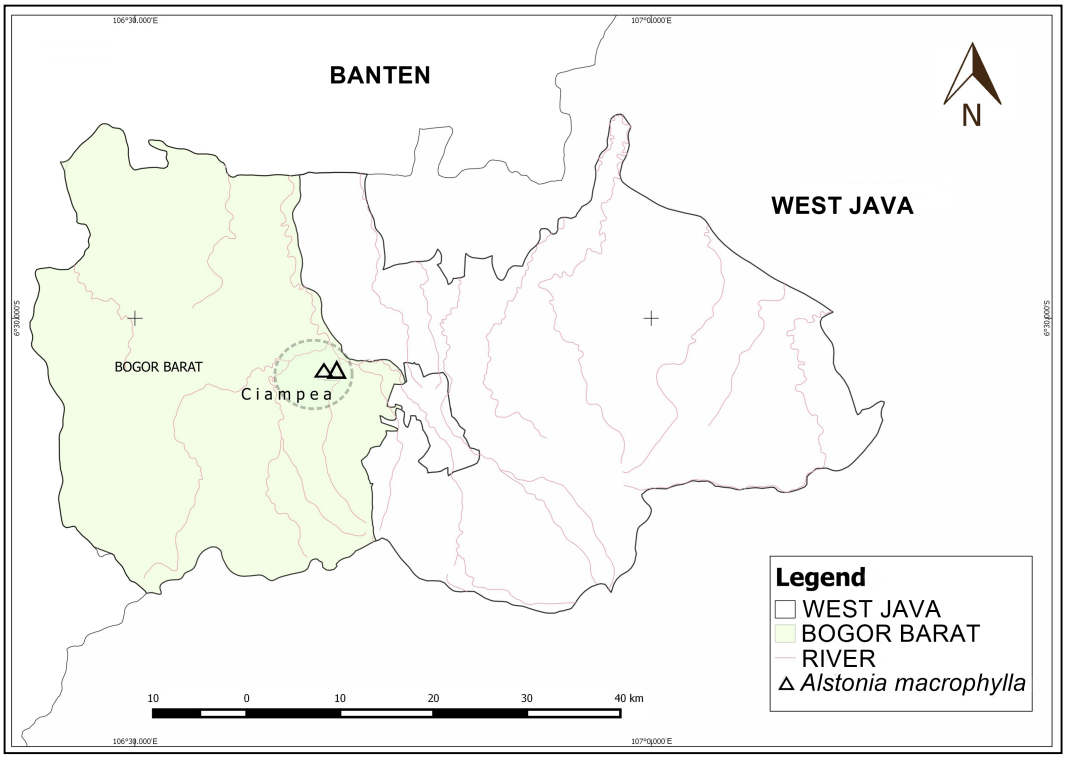

Fig. 2. Geographical distribution of *A. macrophylla* in Bukit Kapur of Ciampea limestone Hill, West Java.

sometimes subfalcate, (6.1–) 16.7–29 × (1.6–) 6.6–11.3 cm, 2.4–3.75 times as long as wide, apex acute to obtusely short acuminate, acumen to 18 mm long with a blunt tip, base acute to decurrent onto the petiole, sometimes abruptly so; glabrous above, densely pubescent beneath, secondary veins 11–24 pairs, 1.25–22 mm distance from each other, short intermediate veins sometimes present, intramarginal veins often well-defined; intercostal veins reticulate, rarely sub-scalariform, flat above, raised beneath. Inflores-cences many-flowered cyme, 3.5–12 cm long including 1.8–6.5 cm long peduncle; pedicels 2.5–7 mm long, puberulous; flowers fragrant. Calyx lobes ovate-triangulate, sometimes broadly so, 0.8–1.5 × 1–1.25 mm, apex obtuse, sometimes rounded, ciliolate, puberulous outside, glabrous inside, erect. Corolla with greenish-yellow tube and yellow lobes, turning white at anthesis, the upper half of the tube creamy, glabrous outside, the lower half of the tube glabrous inside, upward densely hairy, pilose surrounding the mouth, corolla lobes ciliate; tube 4.25–5 mm long, c. 1.75–2 mm wide around the stamens, lobes overlapping to the right, oblong or slightly ovate, sometimes slightly falcate or oblique, *c*. 5 × 2.5 mm, *c*. 2 times as long as wide, apex rounded. Stamens inserted at 3.5 mm from the base; anthers ovate, c. 0.8 mm long, acute. At the base with nectary-like thickening. Ovary green, 0.75 mm high, glabrous; style white *c*. 2.5 mm long, style head yellowish-green, 0.6 mm long. Fruit a pair of linear follicles, light green, 13–42.5 cm long, *c*. 2.5 mm in diam., glabrous. Seeds not seen.

Distribution. This species is widely distributed from Sri Lanka and India, east to Thailand, Cambodia, Vietnam and throughout Malesia except in Nusa Tenggara and Sulawesi. In Java only known from Ciampea, West Java (Fig. 2).

Ecology. In Ciampea, the plant was discovered from an elevation below 300 m asl. It is growing in the mixed forest on a limestone hill. We estimated that there are more than 30 mature trees of *A. macrophylla* growing in Ciampea Limestone Hill. Many seedlings and treelets also have been recorded during field exploration.

Notes. A. macrophylla is unique among other Malesian species by the combination of the following: leaves arranged in 3 or 4 whorls with thickly coriaceous blades, outer surfaces of sepals that are glabrous or laxly puberulous, the corolla tube at most 1.5 times as long as the lobes and the dextrorse corolla lobes. This species is similar to *A. breviloba*, a New Guinean endemic, which the latter differs by the chartaceous to coriaceous leaf

blades and corolla tube is only up to 2.1 times as long as the lobes. In Java, this species is similar to *A. spectabilis*, also a quite widespread species, by the dextrorse corolla lobes, but *A. macrophylla* possesses falcate corolla lobes (vs not falcate in *A. spectabilis*) (Sidiyasa 2007).

Specimen examined. Indonesia: Jawa: West Java, Bogor Regency, Ciampea subdistrict, Bukit Kapur Ciampea, *Mustaqim & Effendi* 045 (FIPIA!); West Java, Bogor Botanical Gardens, cultivated, *Koorders* 30903β (BO!); *ibid*. cultivated, *Kostermans 11141* (BO!).

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