

ADIANTUM LATIFOLIUM LAM. (PTERIDACEAE); A NEWLY NATURALIZED FERN IN JAVA, INDONESIA

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Muhamad Muhaimin. 2017. *Adiantum latifolium* Lam. (Pteridaceae); Catatan Naturalisasi Jenis Paku Eksotik di Jawa, Indonesia. *Floribunda* 5(6): 220–225.— Marga *Adiantum* di Jawa terdiri dari 19 jenis. Setelah itu, terdapat satu jenis yang keberadaannya masih diragukan di Jawa, yaitu jenis eksotik *Adiantum latifolium* Lam. Berdasarkan pengamatan lapangan yang dilakukan selama tiga tahun di Bogor, Depok, dan Jakarta, jenis tersebut akhirnya dapat dipastikan tumbuh secara meliar di Jawa. Bahkan, jenis tersebut dapat dikategorikan ke dalam jenis yang sudah ternaturalisasi di Jawa. Hasil dari pengamatan tersebut akan dipresentasikan dan didiskusikan dalam tulisan ini.

Kata kunci: *Adiantum latifolium* Lam., Jawa, naturalisasi.

Muhamad Muhaimin. 2017. *Adiantum latifolium* Lam. (Pteridaceae); A Newly Naturalized Fern in Java, Indonesia. *Floribunda* 5(6): 220–225. — The genus *Adiantum* in Java consists of 19 species. Following this publication, the existence of one species in Java is considered to be doubtful, which is *Adiantum latifolium* Lam. Based on field observations conducted for over three years in Bogor, Depok and Jakarta, the species can eventually be confirmed to grow escaping cultivated population in Java. Therefore, these species can be categorized into naturalized species in Java. The results of these observations will be presented and discussed in this paper.

Keywords: *Adiantum latifolium* Lam., Java, naturalized.

Adiantum is a fern genus belonging to the family *Pteridaceae*. This genus characterized by terrestrial or epipetric, stem suberect to long-creeping, lamina simple or pinnate, sori orbicular to linear with highly modified margin (false indusia), sporangia borne on or between veins of the strongly recurved, and the capsules facing the abaxial side of the lamina (Tryon et al. 1990, Mickel & Smith 2004). In the world, *Adiantum* consists of 226 species and five hybrids (Hassler & Schmitt 2016). The number of species of *Adiantum* for Java recorded by Backer & Posthumus (1939) is 19 species that many of them are exotic (12 species) and seven others are native.

After the publication from Backer & Posthumus (1939), Ferial et al. (1999) claimed had found *Adiantum latifolium* Lam. in Mt. Patuha, West Java. In their native habitat, *A. latifolium* is known to live between 50 to 600 m asl (Mickel & Smith 2004) showing its preference for lowland areas, whereas the record from Ferial et al. (1999) was reported above 2000 m asl. In addition, to this incongruence which could be a better knowledge for this species, there are not specimens or photos available to prove the correct identification. Despite this important contribution from this publica-

tion, the absence of a proper identification we are dubious of its validity, moreover no other publication mentioned the occurrence of this species in Java (Holttum 1974; Setyawan & Sugiyarto 2001; Perwati & Santoso 2002; Sunarmi & Sarwono 2004; Suryana 2009; Andayaningsih et al. 2013; Praptosuwiryo 2013; Ulfa et al. 2013).

In this paper, we report and discuss the observations and the first record of this species in Java. The existence of this species in Java eventually confirmed as a result of three years (2013–2015) of field observation in different sites in Bogor, Depok and Jakarta.

MATERIALS AND METHODS

Field observation conducted during three years (2013–2015) in the area of Indonesia University (which includes Depok and Jakarta), Cibinong Science Center and Bogor Agricultural University (Bogor). Specimens were collected in the exploration that used free exploration method follow Ruyayah et al. (2004). Data recorded includes collector name, collection number, location, GPS position, and habitat. We also located the exact coordinates of the observed population of the species on

the map. Specimens were processed and identified in the Herbarium of Department of Biology, Faculty of Mathematics and Natural Sciences, Indonesia University; UI-OLYMPUS Bioi-maging Center, Indonesia University; and Herbarium of Department of Biology, Bogor Agricultural University. Observation the specimens also have been conducted in Herbarium Bogoriense (BO), Herbarium Bandungense (FIPIA), and Herbarium of Department Biology-Indonesia University, to view the record of *Adiantum* specimen from Java. Specimens were identified using literature such as Tryon (1964), Stolze (1981) and Mickel & Smith (2004). Terminology used in description follow Beentje (2016).

RESULT AND DISCUSSION

Adiantum latifolium Lam. is naturally distributed in Central and South America (Mickel & Smith 2004). The species became exotic in several

areas in tropical Asia. Distribution of this species outside its native range have been reported in Sri Lanka (Sledge 1973), India (Dixit et al. 1995), Thailand (Boonkerd et al. 2004), and also stated as naturalized species in Malaysia (Piggott 1988) and Singapore (Chong et al. 2009). In Indonesian Archipelago, it was recorded from a rubber plantation in Jambi, Sumatra (Beukema 2013). In Java, we confirmed the existence of the species after field observations in Depok, Jakarta, and Bogor (Fig. 1). Besides that, we found specimens of this species that was collected from Java in the past, were misidentified. Among the commonly used wrongnames were *A. trapeziforme* and *A. flabellulatum*. Both species is differed from *A. latifolium* in their scales, division of leaves and size of characters of petiolules, with additional differences on rhizome and shape of ultimate segments for the later. The comparison character of three species can be found in table 1.

Table 1. Comparison character of *A. latifolium* with *A. flabellulatum* and *A. trapeziforme*

Character	<i>A. flabellulatum</i>	<i>A. latifolium</i>	<i>A. trapeziforme</i>
Rhizome	erect, short	long creeping	short to long creeping
Scales on stipe and rachis	Absent	presence, dense	Absent
Division of leaves	2–3 pinnate, pedate	2–pinnate	2–3 pinnate
Shape of ultimate segments	flabellate to dimidiate	dimidiate	dimidiate
Size of petiolule on pinules or ultimate segments	1–2 mm long	very short (not over 1 mm long) or absent	1–5 mm long

Pysek et al (2004) stated that an exotic species can be considered to be a naturalized species whenever it can independently reproduce in the wild for at least ten years without direct human intervention. We found a specimen that was collected in 2003 (Ahmad s.n.). Therefore we conclude that *A. latifolium* at this point could be categorized as a naturalized species. However, the exact mode of the species escaping cultivation is remain unknown. Backer & Posthumus (1939) noted that the Javanese people had introduced various species of *Adiantum* for ornamental purpose. Following those periods, the introduced were recorded to grow independently in the wild, as in *A. capillus-veneris* (native of Southern Europe, Africa, and Asia Continental), *A. trapeziforme* (native of Tropical America), and *A. tenerum* (native of West Indies).

The same mode might also be the case for *A. latifolium* although with different timeframe.

Taxonomy

Adiantum latifolium Lam., Encycl. 1: 43. 1783; Tryon, Contrib. from Gray Herb. of Harv. Univ. 194: 151–152. 1964. fig. 107; Stolze, Fieldiana, Bot. 39: 24. 1981; Mickel & Smith, The pteridophytes of Mexico. 2004 – Neotype: Guadeloupe, Basse Terre, Le Faubourg, *Proctor 20110* (A! (electronic image with barcode A00020372); isoneotype BM! (electronic image with barcode US00142162) (Fig. 2 & 3).

Adiantum glaziovii Bak., J. Bot. 309. 1882
Adiantum lucidum Sw. var. *bipinnatum* Mett. ex. E.Fourn., Mexic. Pl. 1: 129. 1872

For further synonymy, see Lellinger (1989).

Rhizome long creeping; scales dark brown, 1.4–2.3 mm long, linear or lanceolate, clathrate, margin entire or slightly toothed; fronds distinctly spaced. Stipe dark brown or black, pectinate scales dense along stipe and rachis surfaces. Lamina bipinnate, 25–47.5 cm long, deltate or ovate shape, 1 or 2 pairs of lateral pinna with apical ones, herbaceous; pinna 7.5–16 × 4–7 cm; pinnules 1.5–6 × 0.7–3.5 cm, dimidiate, trapeziform, sometimes falcate, acroscopic base truncate, basicopic base cuneate, apex rounded or acute, basicopic margin entire, acroscopic margin serrate or lobed in fertile

pinnules, not hairy, petiolules very short (not over 1 mm long) or absent; veins free, simple or forked, ending in marginal serration or lobed. Sori marginal, 2–3 mm long, along acroscopic margin and not fully in basicopic margin, each sorus covered by indusium. Indusium oblong to linear, glabrous, green or brownish when spores mature. Each sporangium consists of 64 homospores. Spores about 25.1–27 μm (proximal view), light yellow-translucent, trilete shape with triradiate laesura, glabrous, no perispore.

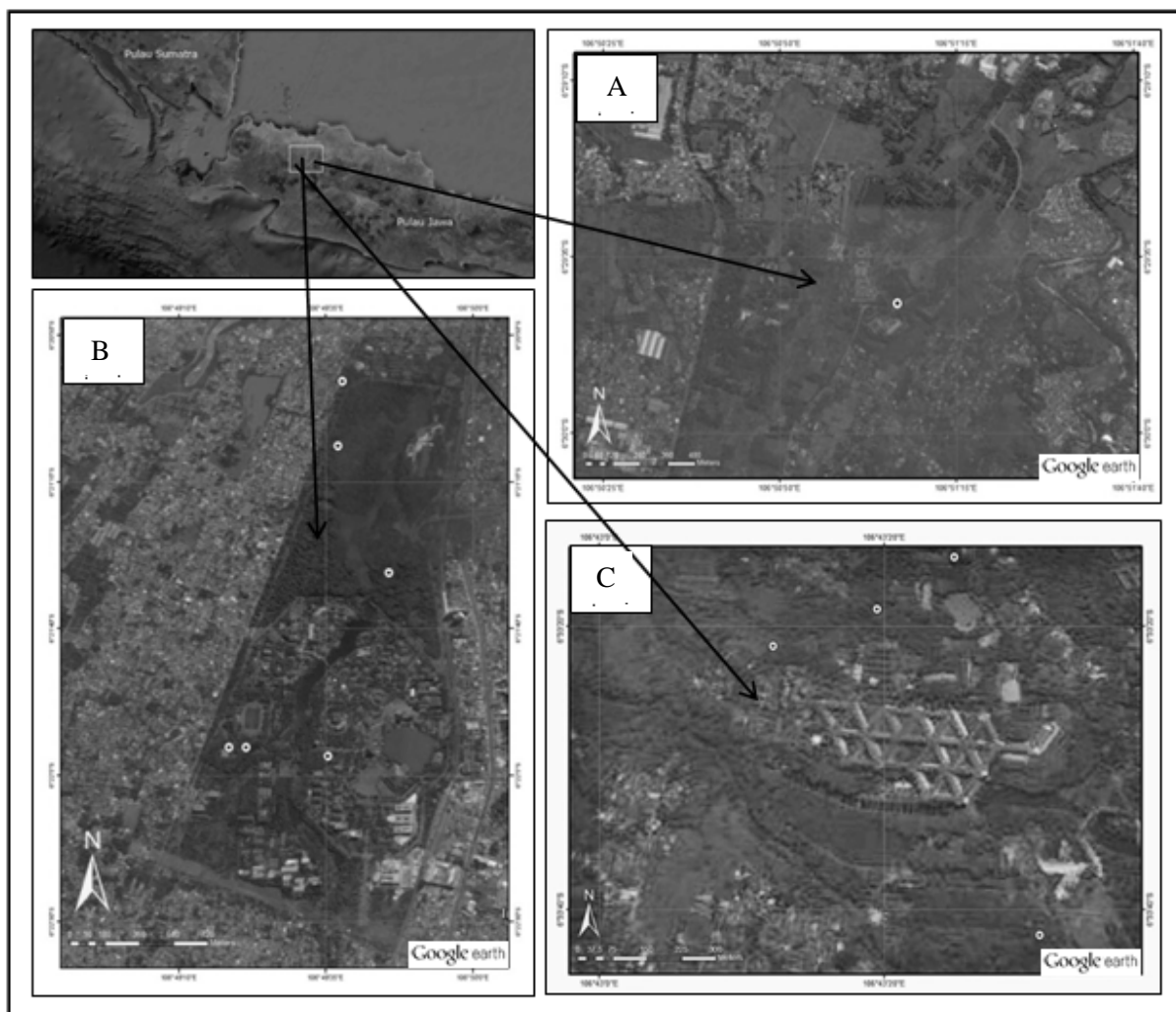


Figure 1. Distribution of *Adiantum latifolium* Lam. based on recent field observations (circle). A. Cibinong Science Center, Bogor; B. Distribution in Indonesia University, Depok & Jakarta; C. Distribution in Bogor Agricultural University, Bogor. Map created using ArcGIS 9.3, map source from *Google Earth*.

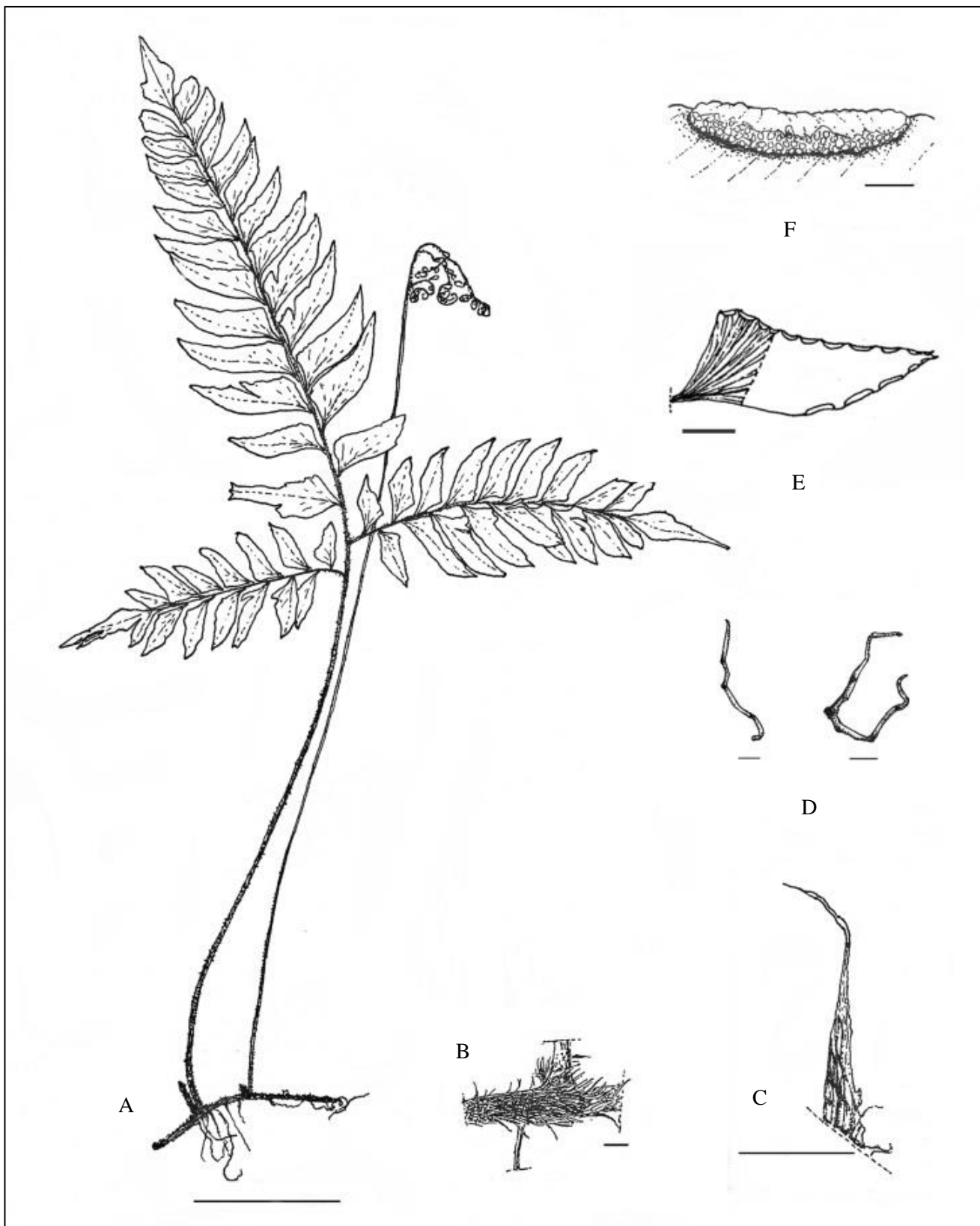


Figure 2. *Adiantum latifolium* Lam. A. Habitus; B. Rhizome with scales; C. Scales on rhizomes; D. Pectinate scales on rachis; E. Lateral pinnules with sori; F. Young sorus. Notes: Scale bar: 50 mm for A, 2 mm for B, 0.5 mm for C, 0.1 mm for D, 5 mm for E, 0.5 mm for F. A – D from *Muhaimin M156*, E – F from *Muhaimin M187*. Illustrated by W.A. Mustaqim.

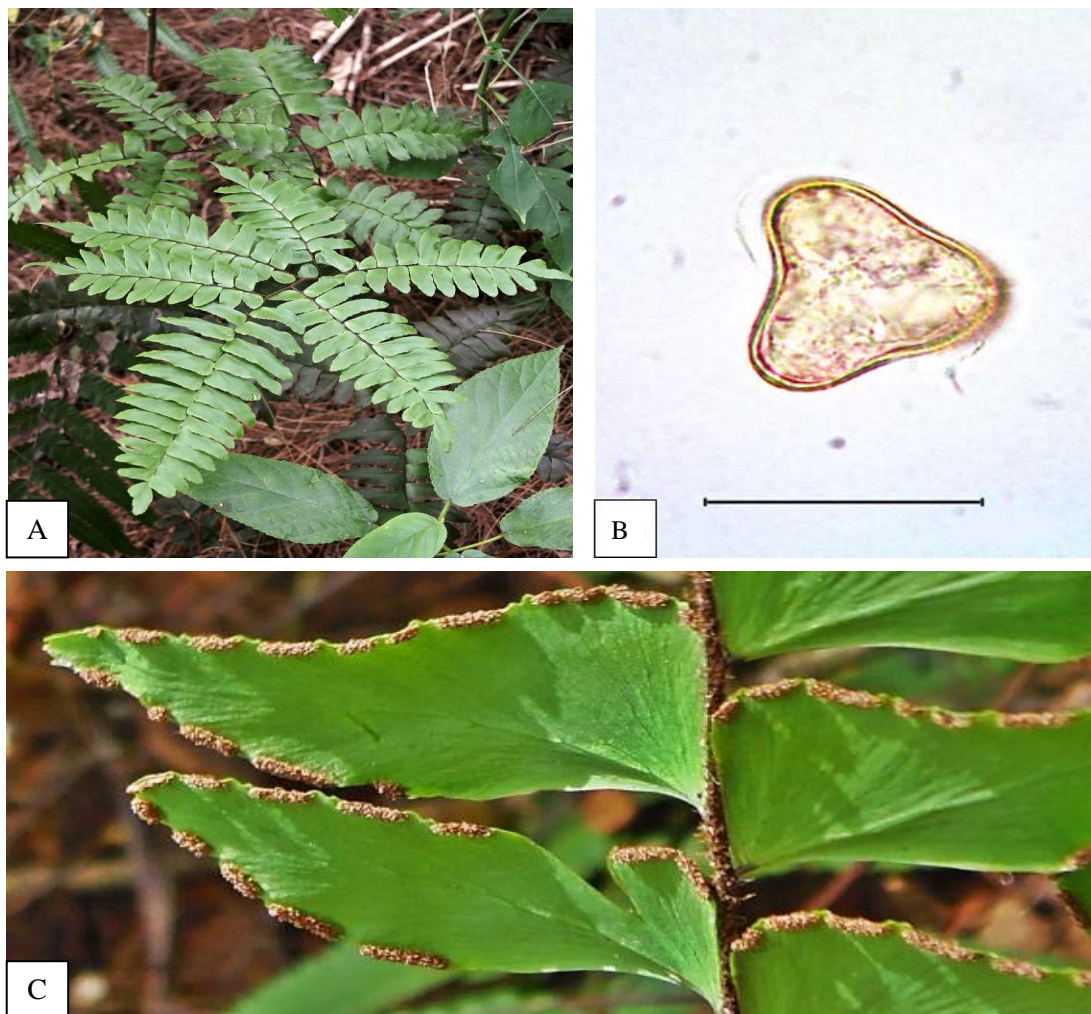


Figure 3. *Adiantum latifolium* Lam. A. Habitus; B. Spore; C. Fertile pinnules. Notes: Scale bar: 30 mm for B.

Distribution: Central and South America. Exotic in Sri Lanka, India, Thailand, Peninsular Malaysia, Singapore, and Indonesia.

Location in Java: This species found in Urban Forest of University Indonesia-Jakarta, Pancasila University-Jakarta, University Indonesia-Depok, Cibinong Science Center-Bogor, and Bogor Agricultural University-Bogor.

Habitat and ecology: In Java, *A. latifolium* can be found in urban areas such as urban forest, the rest of rubber plantation, and around of building ground, low light. In other region, these species also found in lowland rain forests, lower montane rain forests, or deciduous tropical forest at 50–600 m (Mickel & Smith 2004).

Specimens examined: Depok, Indonesia University (*Ahmad* s.n.!; *M. Muhaimin* M155!, M156!, M157!); Jakarta, Pancasila University (*R.I. Nurpratiwi* 33, BO!); Jakarta, Urban Forest of Indonesia University (*M. Muhaimin* M153!, M187!); Bogor, Dramaga, Bogor Agricultural University

(*Irene Rosalin* IR004!); Bogor, Cibinong Science Center-LIPI (*Rian* 48, BO!).

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