

Additional distribution of *Calamus reinwardtii* (Arecaceae) in Java, Indonesia

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Abstract: *Calamus* is one of the largest genera in the Arecaceae family, with 416 species classified under the subtribe *Calaminae* and the tribe *Calameae*. This genus is widely distributed across tropical and subtropical regions, including in Africa, Asia, and the southwest Pacific. Despite its extensive distribution, some species are known to be regionally endemic, with *Calamus reinwardtii* Mart., in particular, being found only in Java. The primary aim of this study was to confirm the presence of *C. reinwardtii* Mart. in Banyumas, Central Java, and to examine potential morphological variations between populations from those grown naturally in Western and Eastern Java. Through an analysis of specimens from Herbarium Bogoriense (BO), this study provides new insights into the distribution and morphological characteristics of *C. reinwardtii* Mart. Our findings contribute to a better understanding of the species distribution within Java and adding to the knowledge of the genus *Calamus* in the region.

Keywords: *Calamus*, herbarium, distribution, Java Island.

Introduction

Calamus is one of the largest genera in Arecaceae, with 416 species (Rustiami & Sulistyarningsih, 2019; Henderson, 2020; POWO, 2025) which mostly consists of climbing rattans with a flagellum or a cirrus, characterized by the presence of fruit scales, almost 150 metres in height, and sometimes, erect or stemless species are also known (Atria *et al.*, 2017). This genus is distributed in the tropical Africa, tropical and subtropical Asia, to the southwest Pacific (POWO, 2025). Geographical distribution of *Calamus* is divided into six regions,

including Afro-India, Indo-Burma, Philippines, Sundaland, Wallacea, and Sahul (Henderson, 2020). In this regard, Java Island belongs to the Sundaland and the West Malesia floristic region. West Malesia's high species richness is supported by complex geological and climatic history, resulting in a narrow pattern of distribution and endemism of palm taxa (Rustiami, 2009).

Calamus reinwardtii Mart. is one of the species being reported to be only distributed on Java. Henderson (2020) reported that the distribution of this species was only in the Western and Eastern Java. This study aims to confirm the presence of *C. reinwardtii* Mart. in Banyumas, Central Java by examining those herbarium specimens previously identified under different name. The morphological differences of *C. reinwardtii* from three regions of Java were compared and further discussed accordingly.

Material and Methods

The herbarium specimens of *C. reinwardtii* Mart. were examined at BO (Thiers, 2020). The species in voucher (AK 359) was first identified as *Calamus cf. ciliaris*, which was later recognized as *C. reinwardtii* Mart. after determination by J.P. Mogeia in 21 April 2009. The terminology used in the descriptions followed that of Dransfield and Manokaran (2008). Comparisons of morphological characters of specimens from those three regions were summarized in Table 1. The distribution of *C. reinwardtii* Mart. in Java was created using the SimpleMappr website (Shorthouse, 2010) as shown in Map 1.

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Taxonomic Treatment

Calamus reinwardtii Mart., Hist. Nat. Palm. 3: t. 112. 1831. *Lectotype* (designated by Reveal & Nixon, 2013): INDONESIA, **Java**, 1830, C.G.C. Reinwardt 495 (BR; isolectotype: BH). **Fig. 1**

Stems clustered, climbing, c. 2 m long, c. 2.5 cm in diam. Leaf sheath tubular, leaf sheath spine triangular, pale-yellow coloured, base stout, c. 1.5 cm long, dense, sparse arranged. Knee absent. Leaf sheath mouth spiny. Ocrea membranous, more than 1 cm. Petiole less than 50 cm, armed with single spine, spine 2–2.5 cm, triangular until recurved, base stout, yellowish, occur at abaxial and lateral of petiole. Leaf 76–78 cm long, 18–19 pairs, spine arranged at abaxial, single recurved spine, base stout, 2–2.5 cm, pale-yellow coloured. Leaflets c. 24 × c. 2.4 cm, linear, glaucous, similar, arranged regularly, obvious hair-like spine at the apex. Flagella well-developed, c. 1 m, single recurved spine, c. 1 cm, spine occur at base rarely

compound for two or three spines. Infructescence c. 1.5 m long, armed with a single recurved spine.

Flowering & Fruiting: Flowering not seen; fruiting specimens collected in April.

Habitat: Grows in dark brown soil, wet and humid areas, within c. 1000 m altitudes, lowland tropical rainforest, on hilly mountain slopes, close to a path but rather far from a creek.

Distribution: The species has been reported to occur in Banten, West Java, and East Java, now recorded at Central Java.

Specimens examined: INDONESIA, Mount Slamet, Baturraden, Banyumas, Central Java, 21.04.2005, *Ary Keim* 359 (BO!); Lengkong, Sukabumi, West Java, 16.07.1971. *John Dransfield* 1698 (BO!); Mount Salak, West Java, 22.02.2000, *H. Wiriadinata* & *W. S. Hoover* 31202 (BO!); Mount Galunggung, West Java, 13.07.1945, *Backer* 8578 (BO!); Curah manis, Jember, East Java, 26.10.1895,



Fig. 1. Representative Specimens of *Calamus reinwardtii* Mart. at BO Herbarium.

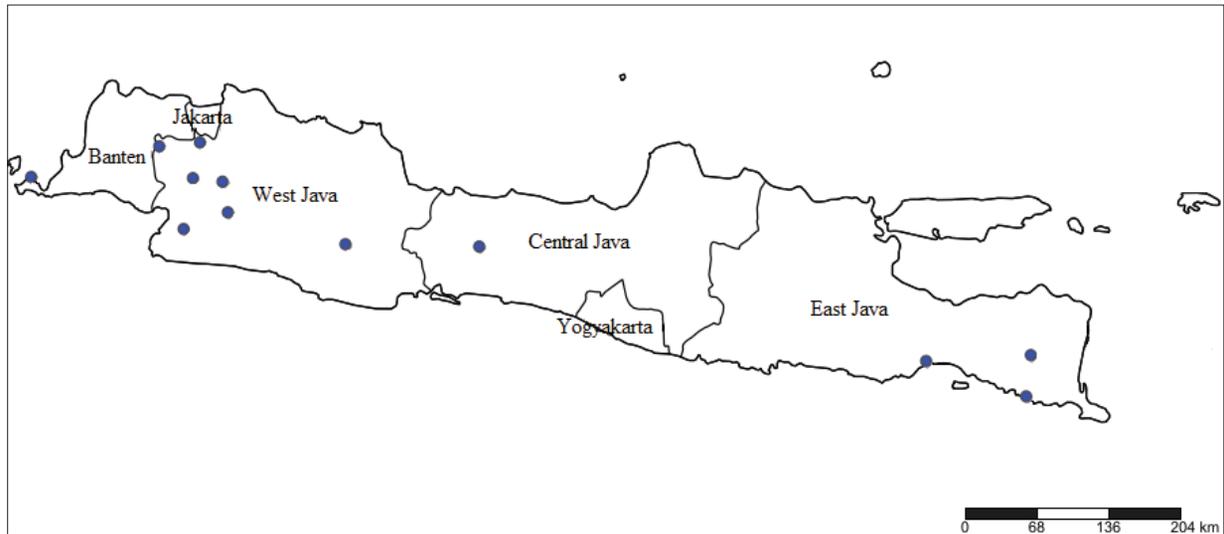


Fig. 2. Distribution of *Calamus reinwardtii* Mart. in Java.

Koorders 21692b (BO!); Gondoroso, Lumajang, East Java, 06.1935, *Chr. Versteegh* 3485 (BO!); Mount Angsana, West Java, 16.12.1917, *Backer* 23121 (BO!); Ung Kulon, West Java, 14.04.1971, *John Dransfield* 1420 (BO!, BH); Depok, West Java, 03.1924, *Beumée* 6717 (BO!); Sukamade, Meru Betiri Nature Reserve, East Java, 21.05.1973, *John Dransfield* 3530, 3526 (BO!); Cibodas, West Java, 24.08.1955, *W. Meijer s.n.* (BO).

Notes: According to local people, this rattan is not very common and is unused. The herbarium voucher that wrote *C. cf. ciliaris* in the first determination was probably due to the relatively similar size of these two species. Both are relatively small rattans, not large rattans like *C. burckianus* Becc. In contrast, *C. ciliaris* Bl. has long dense golden hair that covers the entire sheath, petiole

and rachis of the leaf. This characteristic is not shared by *C. reinwardtii* Mart.

The morphological differences of *C. reinwardtii* Mart. between each region were compared in Table 1. As mentioned by Henderson (2020), *C. reinwardtii* Mart. is the sympatric of *C. heteroideus* Bl. and both are difficult to distinguish from each other, except for the obvious absence of knees in *C. reinwardtii* Mart. Nonetheless, there are several vegetative characters that distinguish the two species themselves. Compared to *C. heteroideus* Bl., *C. reinwardtii* Mart. has a larger stem diameter, longer ocrea, longer rachis and petioles, more dense spines on petioles, well-developed hairy spines on the margin of the leaflet apex and undeveloped hairy spine on verne leaflet.

Table 1. Comparison of *C. reinwardtii* Mart. among regions in Java

Characters	<i>C. reinwardtii</i> Mart.		
	Western Java	Central Java	Eastern Java
Petiole length	Less than 50 cm	Less than 50 cm	Up to 80 cm
Rachis length	2 m	76–78 cm	2 m
Leaflets length	15.5–21.6 cm	24 cm	24–30.8 cm
Leaflets width	1.2–1.5 cm	2.4 cm	1.2–1.5 cm
Young fruits	April	April	May
Mature fruits	August	Not recorded	October

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