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Updated Diversity of Costaceae in Java with the First Record of *Monocostus* K.Schum.

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ABSTRACT

Muhammad Hisyam Baidlowi, Arifin Surya Dwipa Irsyam, Muhammad Rifqi Hariri 2026. Pembaruan keanekaragaman Costaceae di Jawa dengan catatan pertama *Monocostus* K.Schum. Floribunda 9(1) 9 – 13 — Costaceae Nakai terdiri atas delapan marga yang tersebar di wilayah tropis, namun di Pulau Jawa famili ini sebelumnya hanya diwakili oleh dua marga, yaitu Costus dan Hellenia. Penelitian-penelitian terbaru telah memperbarui informasi mengenai keanekaragaman Costaceae di Jawa, khususnya dalam marga Costus, melalui pencatatan spesies introduksi yang dibudidayakan, ternaturalisasi, dan lepas dari budi daya berdasarkan survei lapangan, kajian herbarium, serta analisis morfologi, sehingga jumlah spesies yang tercatat meningkat menjadi 15. Investigasi lapangan yang dilakukan pada periode 2023 hingga 2025 selanjutnya mengungkap keberadaan satu marga tambahan di Jawa, yaitu Monocostus, yang saat ini hanya diketahui dari spesimen hasil budi daya. Temuan ini memperluas representasi marga Costaceae di pulau tersebut serta menyediakan dasar penting untuk pemantauan taksa tanaman hias introduksi, penilaian potensi naturalisasinya, serta mendukung penelitian floristik, taksonomi, dan konservasi di masa mendatang.

Kata kunci: Malesia, *Monocostus*, Ornamental, Pacing, Zingiberales.

Muhammad Hisyam Baidlowi, Arifin Surya Dwipa Irsyam, Muhammad Rifqi Hariri 2026. Updated diversity of Costaceae in Java with the first record of *Monocostus* K.Schum. Floribunda 9 (1) 9 – 13 — Costaceae Nakai comprises eight genera distributed throughout tropical regions, but in Java the family was previously represented by only two genera, *Costus* and *Hellenia*. Recent studies have updated the diversity of Costaceae in Java, particularly within *Costus*, by documenting newly cultivated, naturalized, and escaped introduced species based on field surveys, herbarium studies, and morphological analyses, increasing the number of recorded species to 15. Field investigations conducted between 2023 and 2025 further revealed the occurrence of an additional genus, *Monocostus*, in Java, currently known only from cultivated specimens. This finding expands the generic representation of Costaceae on the island and provides an important baseline for monitoring introduced ornamental taxa, assessing their potential for naturalization, and supporting future floristic, taxonomic, and conservation studies.

Keywords: Malesia, *Monocostus*, Ornamental, *Pacing*, Zingiberales.

INTRODUCTION

Costaceae Nakai comprises eight genera, namely *Chamaecostus* C.D.Specht & D.W.Stev., *Costus* L., *Dimerocostus* Kuntze, *Hellenia* Retz., *Monocostus* K.Schum., *Paracostus* C.D.Specht, *Parahellenia* N.H.Xia, Juan Chen, L.Y.Zeng & S.Jin Zeng, and *Tapeinochilos* Miq., which are distributed throughout tropical regions (POWO, 2026). In Java, however, the family is represented by only two genera: *Costus* and *Hellenia* (Backer & Bakhuizen van den Brink, 1968; Maas, 1979; Nisyawati & Mustaqim, 2017).

Recent studies have significantly updated the diversity of Costaceae in Java, particularly within the genus *Costus*, by documenting newly cultivated, naturalized, and escaped non-native species that were previously unrecorded in the Flora of Java (Irsyam *et al*., 2019; Mustaqim & Setiawan, 2021; Irsyam *et al*., 2024; Kurniawan *et al*., 2025). Through intensive field surveys, herbarium examinations, and detailed morphological assessments, these works have clarified the taxonomic status and distribution of several introduced African and Neotropical taxa, some of which have established spontaneous populations in the wild (Irsyam *et al*., 2019; Mustaqim & Setiawan, 2021; Irsyam *et al*., 2024). As a result of these cumulative findings, the total number of *Costus* species currently recorded in Java has increased to 15 species, reflecting both deliberate ornamental introductions and subsequent processes of naturalization and escape (Irsyam *et al*., 2024; Kurniawan *et al*., 2025).

During our recent investigations conducted between 2023 and 2025, we documented the occurrence of an additional genus of Costaceae in Java, namely *Monocostus*. This finding represents a significant extension of the family's generic diversity in Java.

The documentation of this genus is important for several reasons. First, it contributes to a more comprehensive and up-to-date account of Costaceae diversity in Java, particularly in light of ongoing ornamental introductions. Second, early taxonomic recognition of newly introduced genera enables better monitoring of their cultivation status and potential to naturalize, which is essential for anticipating ecological impacts. Finally, this study provides a baseline reference for future floristic, taxonomic, and conservation research, ensuring that changes in the distribution and establishment of Costaceae taxa in Java can be accurately assessed over time.

MATERIALS AND METHODS

Fieldwork for this research was carried out between 2023 and 2025 in several areas of West Java and East Java as part of a continuing effort to document non-native plant species in Java. Specimens were collected directly from the field in accordance with the collection standards of the Royal Botanic Garden Edinburgh (2017). The collected materials were processed and preserved using herbarium preparation methods described by Bridson and Forman (1998). All voucher specimens were subsequently deposited at the Herbarium Bandungense (FIPIA), School of Life Sciences and Technology, Institut Teknologi Bandung, as well as at the Herbarium UI Depok (UIDEP) (Thiers 2026–continuously updated).

The identification of specimens was carried out using principal taxonomic references, particularly Maas (1972) and Leong-Škorničková & Gallick (2010). The preparation of morphological descriptions adhered to the terminology and standards established by Beentje (2016).

RESULTS AND DISCUSSION

Updated key to the Costaceae in Java

1. A. Flowers arranged into a dense, multi-flowered spicate inflorescence 2
   B. Flowers solitary, axillary, arising from the axils of the uppermost leaves ..... *Monocostus*
2. A. Labellum typically tubular to funnel-shaped, not widely open, bracts with or without appendages .....*Costus*
   B. Labellum usually more open and spreading, widely open, bracts unappendaged .... *Hellenia*

Monocostus is a monotypic genus represented solely by *M. uniflorus* (Poepp. ex Petersen) Maas. It comprises small herbaceous plants restricted to northern Peru (Maas, 1972; POWO, 2026). This genus is morphologically distinct within Costaceae in bearing solitary, axillary flowers arising from the upper leaf axils rather than forming a spicate inflorescence. In Java, this species is maintained in cultivation as an introduced ornamental plant, occurring in home gardens and small-scale cultivated plant collections. To date, *M. uniflorus* has been documented from West Java, specifically Bogor Regency, and East Java, particularly Malang Regency.

Although currently known only from cultivation, the presence of *M. uniflorus* in multiple localities in Java suggests repeated introductions via the ornamental plant trade. Given its apparent adaptability to local environmental conditions, the species may have the potential to escape cultivation and establish naturalized populations, as observed in several *Costus* species in Java (Irsyam *et al*., 2019; Mustaqim & Setiawan, 2021; Irsyam *et al*., 2024). Continued monitoring is therefore necessary to assess its long-term establishment and possible ecological impacts.

Monocostus K.Schum. in H.G.A.Engler (ed.), Pflanzenr., IV, 46: 427 (1904). — TYPE: *Monocostus ulei* K.Schum. (= *Monocostus uniflorus* (Poepp. ex Petersen) Maas).

Monotypic genus; a detailed description is provided under the species account.

Monocostus uniflorus (Poepp. ex Petersen) Maas, Rev. Palaeobot. Palynol. 7: 37 (1968). — *Costus uniflorus* Poepp. ex Petersen in C.F.P.von Martius & auct. suc. (eds.), Fl. Bras. 3(3): 58 (1890). — *Dimerocostus uniflorus* (Poepp. ex Petersen) K.Schum. in H.G.A.Engler (ed.), Pflanzenr., IV, 46: 427 (1904). — TYPE: Peru, San Martín, Yurimaguas, Dec. 1830, *Poeppig 2116 B* (holo W, destroyed); Neotype: Peru, San Martín, Chazuta, Río Huallaga, 260 m, May 1935, *Klug 4156* (neo GH; isoneo BM, E, F, K, MO, NY, S, U, US, designated by Maas (1972)).

Monocostus ulei K.Schum. in H.G.A.Engler (ed.), Pflanzenr., IV, 46: 429 (1904). — TYPE: Peru, San Martín, near mouth of Río Mayo, Juan-Guerra near Tarapoto, Oct. 1902, *Ule 6333* (lecto MG; isolecto HBG, designated by Maas (1972)).

Perennial herbs, small, 30–40 cm tall, non-rhizomatous. Stem erect, cylindrical, succulent, unbranched, covered by foliar sheath, glabrous. Leaves simple, monostichous; blade elliptic, 4–8 × 2–3.5 cm, base obtuse to rounded, apex acuminate, margin entire with red edge, coriaceous, adaxial surface glabrous and shiny green, abaxial surface glabrous and pale green. Foliar sheath green with red shades; ligule absent or very short, ca. 1 mm long, red edged. Flowers abaxially oriented, borne singly in the axils of the upper leaves; pedicels ca. 5 mm long, glabrous; bracteole tubular, green, glabrous, ca. 17.5 × 7.1 mm, 2-lobed; lobes deltate, ca. 5 mm long; calyx tubular, green, glabrous, ca. 41.7 × 6.7 mm, 3-lobed; lobes triangular, ca. 6.7 × 3.7 mm; corolla

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3-lobed; tube ca. 32 mm long, white, glabrous; lobes narrowly elliptic, ca. 23.9 × 8.0 mm, apex rounded, membranous, cream, glabrous; labellum yellow, with orange-striped throat, upper portion horizontally spreading, broadly obovate to nearly circular in outline, ca. 50.0 × 62.5 mm, margin crenulate; stamen cream to yellow, with the anther attached at the middle, ca. 55.4 × 0.8 mm, apex with orange stripes, irregularly dentate, anther ca. 4 mm long; ovary 2-locular; style white, filiform, ca. 40 mm long; stigma yellow, flabellate, ca. 2.1 wide. Fruits not observed.

Distribution and ecology. The species is native to Peru (Leong-Škorničková & Gallick, 2010; POWO, 2026). In the present study, *M. uniflorus* was recorded from West and East Java, where it was observed growing in open habitats at elevations of up to 786 m above sea level.

Specimens examined. INDONESIA. JAVA — **West Java**: Bogor Regency, Dramaga, Perumahan Salak View, 21.XII.2025, *MR Hariri 1471* (FIPIA, UIDEP). — **East Java**: Malang Regency, Poncokusumo, Karanganyar village, Karanganyar Kidul, Jl. Pancuran, 25.VI.2024, *MH Baidlowi s.n.* (FIPIA).

Figure 1. *Monocostus uniflorus*. A. Habit, B. Flowering leafy shoot, C. Flower, D. Detailed floral parts (an= anther; *= stigma; br= bracteole; ca= calyx; co= corolla; lb= labellum; sta= stamen; sty= style). (Photographed by M.H. Baidlowi).

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REFERENCES

Backer CA & Bakhuizen van den Brink RC JR 1968. *Flora of Java. Vol. III*. N.V.P. Noordhoff. Groningen, The Netherlands.

Beentje H 2016. *The Kew Plant Glossary: An illustrated dictionary of plant terms. Second Ed*. Royal Botanic Gardens. Kew.

Bridson D & Forman L 1998. *The Herbarium Handbook*. Royal Botanic Gardens, Kew. Kew.

Irsyam ASD, Irwanto RR, Hariri MR 2019. Catatan keberadaan *Costus afer* Ker Gawl. (Costaceae) di Pulau Jawa. *Floribunda* 6 (2): 64–71.

Irsyam ASD, Hariri MR, Fadhil MH, Al Anshori Z, Dewi AP, Peniwidiyanti, Kurniawan MFR, Baidlowi MH & Rosleine D 2024. Three newly reported escaped non-native *Costus* L. species (Costaceae) in Java, Indonesia. *Check List* 20(6): 1404–1410.

Kurniawan MFR, Fadhil MH, Anshori ZA, Dewi AP, Peniwidiyanti, Baidlowi MH, Hariri MR, Irsyam ASD, Rosleine D 2025. Expansion of *Costus* Diversity: Documenting the Occurrence of Six Newly Cultivated Species on Java. *Floribunda* 8 (1): 1–10.

Leong-Škorničková J & Gallick D 2010. *The Ginger Garden Volume 2 of Singapore Botanic Gardens pictorial pocket guide*. Singapore Botanic Gardens, National Parks Board. Singapore.

Maas PJM 1972. *Flora Neotropica, Vol. 8, Costoideae (Zingiberaceae)*. Hafner Publishing Company. New York.

Maas PJM 1979. Notes on Asiatic and Australian Costoideae (Zingiberaceae). *Blumea* 25(2): 543–549.

Mustaqim WA & Setiawan E 2021. An addition to the alien flora of Java: the first record of adventive *Costus dubius* (Costaceae). *Jurnal Biologi Tropis* 21(2): 496 –500.

Nisyawati & Mustaqim WA 2017. *A Guide to the Urban Plants of Universitas Indonesia: Spermatophytes*. UI Press. Jakarta.

POWO 2026. Plants of the World Online. Facilitated by the Royal Botanic Gardens, Kew. Published on the Internet; https://powo.science.kew.org/ Retrieved 10 February 2026.

Royal Botanic Garden Edinburgh 2017. *Guide to Collecting Herbarium Specimens in The Field*. Royal Botanic Garden Edinburgh. Inverleith Row, Edinburgh.

Thiers B 2026-continuously updated. Index Herbariorum: A global directory of public herbaria and associated staff. New York Botanical Garden's Virtual Herbarium. http://sweetgum.nybg.org/ih Accessed 10 February 2026.

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