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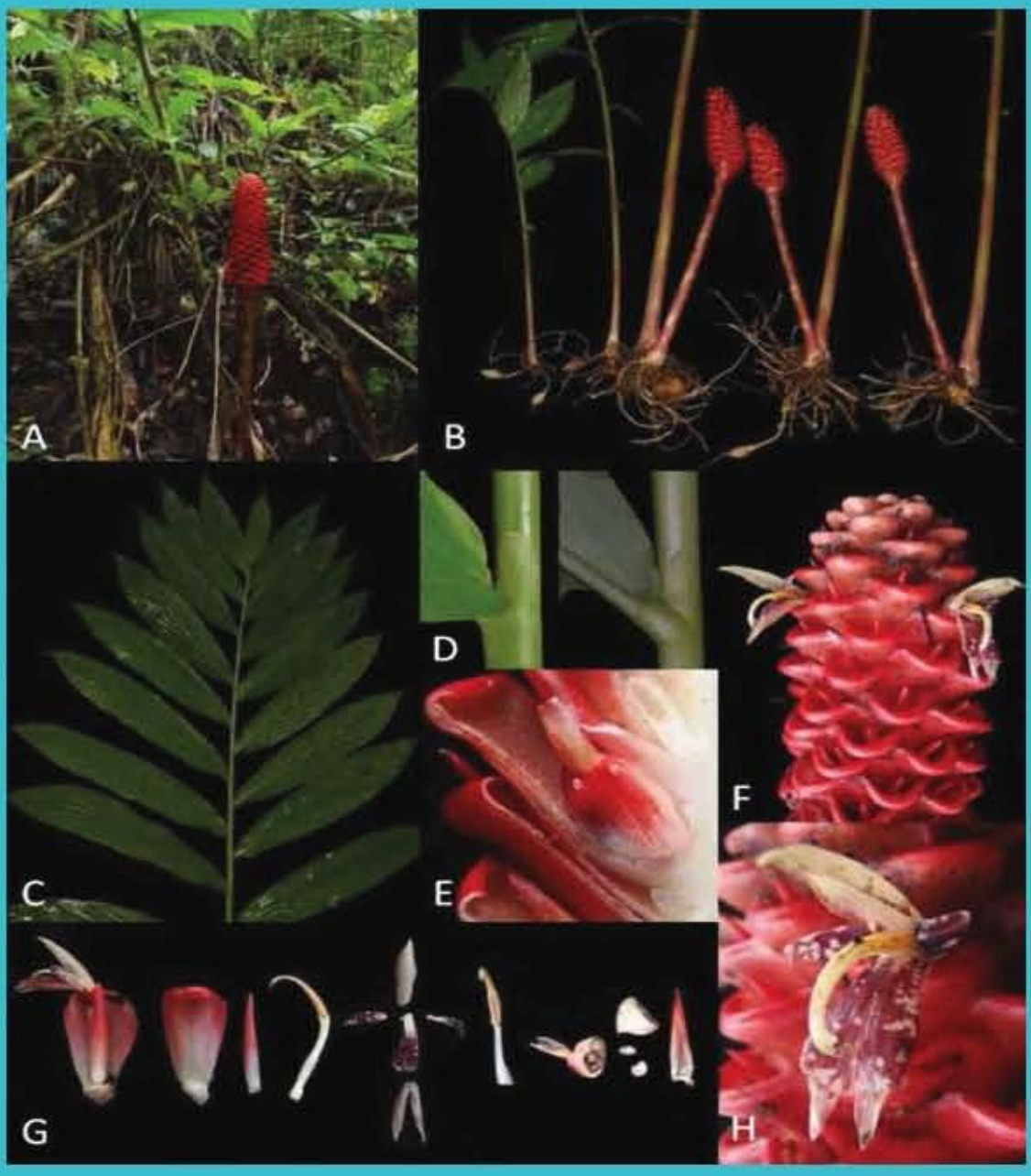

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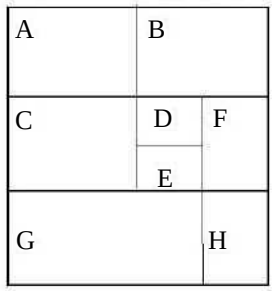

Cover images: *Zingiber engganoensis* Ardiyani. A. Habit B. Leafy shoot and the inflorescence showing rhizomes, roots and root-tuber C. Leaves D. Ligule and swollen petiole E. Dissection of inflorescence showing fruit F. Spike and flowers G. Dissection of flowers and fruits showing bract, bracteole, two lateral staminodes, two petal lobes, labellum, and the four appendages of the anther H. Flower. Source of materials: E190 (BO). Photo credits: B, C, D by Arief Supriatna. A, E, F, G, H by Marlina Ardiyani.

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Vol 14, No 2, pp: 307 – 310

A NEW SPECIES OF *ZINGIBER* (ZINGIBERACEAE) FROM ENGGANO ISLAND, INDONESIA

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ABSTRACT
ARDIYANI, M. 2015. — A new species of *Zingiber* (Zingiberaceae) from Enggano Island, Indonesia. *Reinwardtia* 14 (2): 307 – 310. — A species of *Zingiber* Miller (Zingiberaceae), *Z. engganoensis* Ardiyani, from Enggano Island, Indonesia is described. The species is only known from its type locality. It is similar to *Z. spectabile* Griff. but with some morphological differences. Three-loci DNA barcodes (*rbcL, mat* K and ITS2) of the new species were generated for its identification purposes.

Key Words: DNA barcode, Enggano Island, *Zingiber*, *Zingiberaceae*.

ABSTRAK
ARDIYANI, M. 2015. Satu jenis baru keluarga Jahe-jahean (Zingiberaceae) dari Pulau Enggano, Indonesia. *Reinwardtia* 14(2): 307 – 310. — Satu jenis baru keluarga Jahe-jahean (Zingiberaceae), *Zingiber engganoensis* Ardiyani dari Pulau Enggano, Indonesia dipertelakan. Jenis baru ini diketahui dari lokasi tipe saja, menyerupai *Zingiber spectabile* Griff., namun memiliki beberapa perbedaan karakter morfologi. Tiga buah lokus DNA barcode (*rbcL, mat*K dan ITS2) dari jenis baru ini telah disekuens untuk keperluan identifikasi jenis.

Kata Kunci: *DNA barcode,* Pulau Enggano, *Zingiber*, *Zingiberaceae.*

INTRODUCTION

In 1936, a Dutch botanist, Wilhelm Jan Lütjeharms did a botanical collection on Enggano Island (van Steenis, 1950), located *ca.* 100 km southwest of Bengkulu, Sumatra, Indonesia. Studying the geological history of this island revealed that it was never connected to Sumatra, hence its flora is most likely unique. Lütjeharms only recorded *Etlingera hemisphaerica* (Blume) R.M. Sm., but no *Zingiber*. In the intervening years, no further collections have been done on the Island. Recently, a group of researchers from Research Center for Biology, the Indonesian Institute of Sciences revisited Enggano Island. The expedition managed to collect one species of *Zingiber* which morphologically resembled *Z. spectabile*. Nevertheless, close morphological examination reveal the taxon to be different from *Z. spectabile.*

MATERIALS AND METHODS

The morphology of the new species was described from living plants collected in the field. Detailed morphological measurements were made using ruler and a calibrated eye piece under a dissecting microscope. The holotype was obtained from the living plants growing in the field.

DNA extraction, amplification and sequencing were carried out for three barcoding regions of *rbc*L and *mat*K, and the nuclear Internal Trancribed Spacer 2 (ITS2). DNA amplification was performed using published primers under standard conditions (see Kress and Erickson, 2007). GenBank accession numbers for the three barcoding regions are summarized in Table 2.

SPECIES DESCRIPTION

Zingiber engganoensis Ardiyani, *spec. nov*. Fig. 1, Plate 1. — Type: Indonesia, Bengkulu Province, Enggano Island, Jangkar River, 17 m, 5°21'37"S, 102° 16'57"E, 25 April 2015, *M. Ardiyani, W. Wardani & D. Rosalina, Enggano190* (holo: BO).

Zingiber engganoensis differs from *Zingiber spectabile* in its thin, and plicate leaves, glaucous leaf underside, structure of labellum which narrows towards the base, rounded and emarginate at the apex, and separated from the lateral staminodes.

Leafy shoot to 5 m tall, not clumping, with ± 25 leaves; base light green, pubescent, 3 cm in diameter. *Rhizome* light brown externally, cream internally, with a few tubercles. *Tubercle* narrow elliptic, cream to light brown externally, cream internally. *Leaf sheath* covered with pubescent light red scales. *Ligule* bilobed and split to the base, apex acute-round, 0.5−1.7 × 1.2−1.3 cm, pubescent, light green, thin, papery in dried specimen. *Petiole* swollen, tilted to left or right 45^{o}, light green, pubescent. *Leaves* linear-elliptic towards basal, linear-lanceolate towards terminal, 18.5 × 3.5 to 46 × 9.5 cm, pubescent, light green above, glaucous underside, base obtuse-round, oblique, apex acuminate-caudate (cauda 1−1.5 cm long), plicate (seen as thick lines in dried specimen), thin (papery in dried specimen). *Inflorescence* radical, attached

to the base of the leafy shoot, erect, 40.5−49.5 cm long. *Scape* covered by up to 10 pubescent scales, 35−40 cm long, 2−2.5 cm diameter, pubescent, light green; scales overlapped but free, getting broader towards terminal, 2−5 cm long, light red, with dark brown longitudinal stripes in dried specimen. *Spike* cylindrical and tapering towards terminal, 13.5−18 × 4−4.5 cm, composed of overlapped, spirally arranged bracts. *Bracts* obovate with truncate apex, 2.9−3.5 × 3.1−3.5 cm, pubescent, bright red, getting white towards the base, with yellow-brown lines and black-dotted edge in spirit material, apex curled inward (curly part 2−2.5 mm long). *Bracteoles* cylindrical, split to the base, apex acute, cucullate, 3.6−4 × 0.5 cm, red, getting white towards the base, 3−5 mm top part protruding beyond the edge of the bracts. *Calyx* teethed, deeply split in one side, 1.6−1.7 × 1.3 cm, white transparent. *Corolla* total length 5.7 cm, cream white with reddish-brown tinge, with black-dotted edge and black lines in spirit material; dorsal lobe boat-shaped, elliptic, apex acute, slightly cucullate, 2.4−2.7 × 1 cm; lateral staminodes lobes linear-lanceolate, 2.3−2.4 × 5−6 mm. *Labellum* narrow at the base, getting broader towards the emarginate apex, 2.2 × 1.1 cm, reddish-brown with cream blotch; side lobes lanceolate, deeply incised, 14−16 × 4−5 mm, reddish-brown with cream dots. *Anther* bent ± 50°, 14 × 4 mm, 2 mm thick, yellow. *Anther crest* with S-shaped tip, 1.4 cm long, yellow. *Stigma* cup-shaped with fimbriate edge, white transparent. *Ovary* 5 × 4.5 mm, cream. *Stylodes* 2, subulate with acute apex, 9 × 1 mm, white. *Fruit* round, with cream-white calyx remnant, 1.6 × 1 cm, red, getting white towards the base. *Locule* contains 4 seeds, 1.4 × 7 mm. *Seed* oval, 8 × 4.5 mm, black, covered with white aril.

Distribution. At present this species is known only from the type locality.

Habitat. Grows in secondary forest along the steep river bank on thin soil over coral.

Etymology. The specific epithet is derived from the locality of the type, Enggano Island.

Phenology. *Zingiber engganoensis* was observed in flower and fruit when it was collected at the end of April 2015.

Conservation status. Not assessed.

Notes. This species from Enggano Island resembles *Z. spectabile* especially in its inflorescence and red curved inward apex of the bracts. However, the habit is actually different as the Enggano species was found almost solitaire separated from other plant. Close morphological observation revealed that the species from Enggano Island have some differences from *Z. spectabile,* tabulated in Table 1.

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Table 1. Comparison of morphological characters of *Z. engganoenis* Ardiyani and *Z. spectabile*

	Z. engganoensis Ardiyani	*Z. spectabile*
Habit	Non-clumping	Clumping
Ligule	Bilobed, split to the base with rounded apex	Entire
Petiole	Subsessile, swollen, tilted to left or right 45°	Subsessile, slightly swollen, slightly tilted
Leaf colour	Light green with no clear greenish-white midrib above	Dark green with clear greenish-white midrib above
Leaf coating	Glaucous underside	Glaucous
Leaf shape	Linear-elliptic to linear-lanceolate with obtuse-round base and acuminate-caudate apex	Linear-lanceolate with obtuse-round base and acuminate apex
Leaf surface	Plicate, thin	Non-plicate, thick
Flower labellum	Narrow at the base with rounded and emarginate apex	Broad at the base, getting narrow towards the apex with deeply incised side lobes
Lateral staminodes	Separated from labellum	Joined with the labellum

Table 2. Voucher information and Genbank accession numbers for *Zingiber engganoensis*

Species	Gene region	Genbank accession number	Voucher (Herbarium location)
Zingiber engganoensis	*rbcL*	KT026199	Enggano190 (BO)
	matK	KT026200	Enggano190 (BO)
	ITS2	KT026201	Enggano190 (BO)

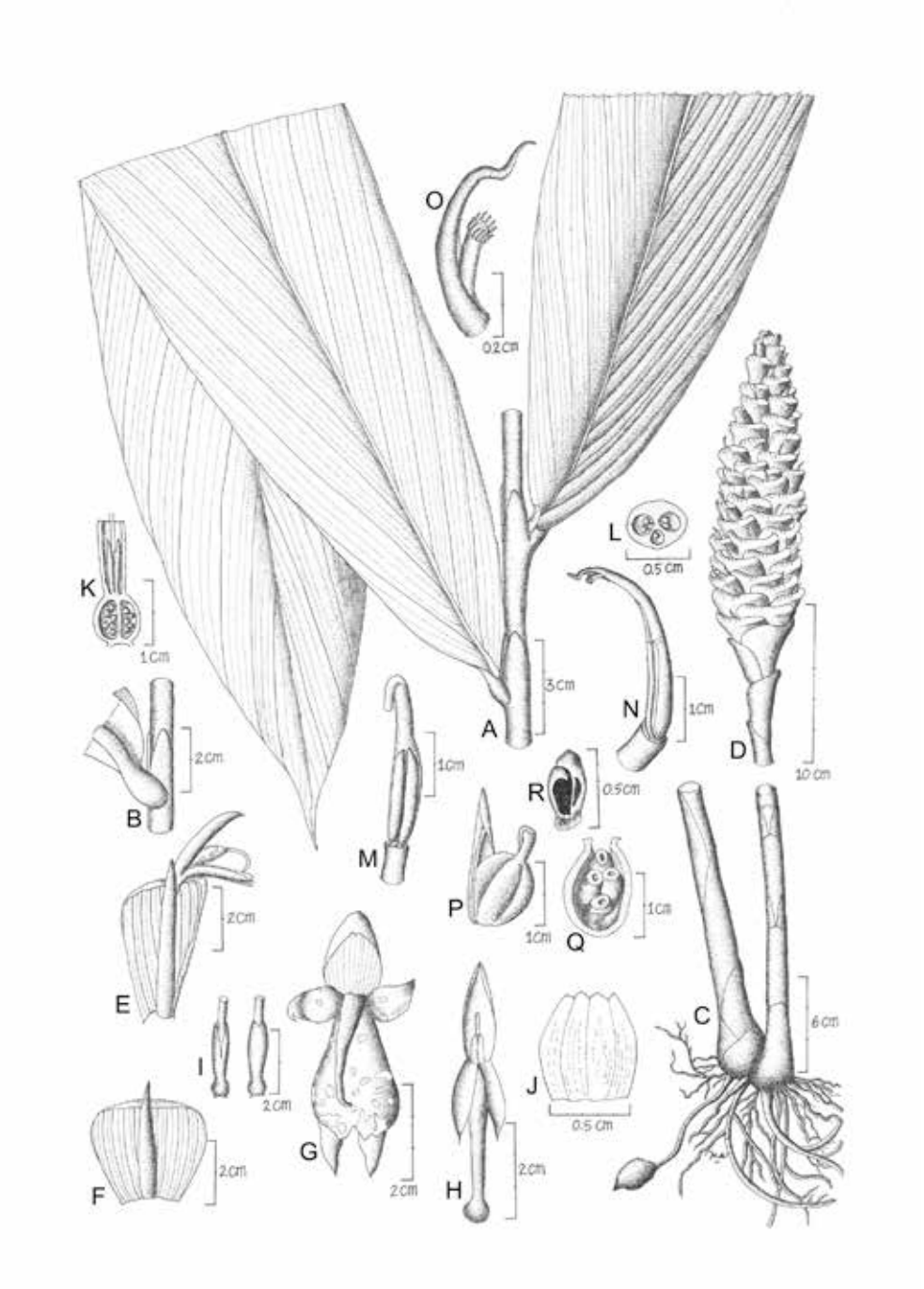

Fig. 1. Line drawing of *Zingiber engganoensis* Ardiyani. A. Leaves B. Swollen petiole and split ligule C. Leafy shoot, inflorescence peduncle and root system D. Inflorescence E. A single flower sits on the bract F. Bract and bracteole G. Whole flower H. Flower with labellum and lateral staminodes removed I. Calyx J. Calyx spread up K. Ovary longitudinal section with stylodes L. Ovary cross section M & N. Anther and appendage O. S-shaped appendage and pistillum P. Fruit Q. Locule containing seeds R. Individual seed covered with arils. (Line drawing by Marlina Ardiyani).

Plate 1. *Zingiber engganoensis* Ardiyani. A. Habit B. Leafy shoot and the inflorescence showing rhizomes, roots and root-tuber C. Leaves D. Ligule and swollen petiole E. Dissection of inflorescence showing fruit F. Spike and flowers G. Dissection of flowers and fruits showing showing bract, bracteole, two lateral staminodes, two petal lobes, labellum, and the four appendages of the anther H. Flower. Source of materials: E190 (BO). Photo credits: B, C, D by Arief Supriatna. A, E, F, G, H by Marlina Ardiyani.

INSTRUCTION TO AUTHORS

Scope. *Reinwardtia* is a scientific irregular journal on plant taxonomy, plant ecology and ethnobotany published in December. Manuscript intended for a publication should be written in English.

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Map/line drawing illustration/photograph. Map, line drawing illustration, or photograph preferably should be prepared in landscape presentation to occupy two columns. Illustration must be submitted as original art accompanying, but separated from the manuscript. The illustration should be saved in JPG or GIF format at least 350 pixels. Legends or illustration must be submitted separately at the end of the manuscript.

References. Bibliography, list of literature cited or references follow the Harvard system as the following examples.

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