



Three new species of *Etilingera* (Zingiberaceae) from Samar Island, Philippines

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Keywords

critically endangered
endangered
Etilingera brevilabrum
Etilingera pilosa
Etilingera sayapensis
SINP

Abstract Botanical field surveys performed in the largest terrestrial protected area in the Philippines, Samar Island Natural Park (SINP), led to the discovery of three new species of *Etilingera* (Zingiberaceae) herein described. *Etilingera cinnabarina* sp. nov. can easily be distinguished by its red orange flowers, at least among Philippine species. *Etilingera funakoshii* sp. nov. was first identified and recorded in the Philippines as *Etilingera brevilabrum*, but the absence of black patches in the ligule, absence of reddish cloudy patches in the laminae, and 1-2 flowers per flowering shoot makes it a unique species. *Etilingera rigida* sp. nov. is closely resembling *Etilingera pilosa* but unique by the sessile leaves, purplish to reddish abaxial side of the lamina and rigid young fertile bracts. Each new species is provided with a detailed description, colour plate, and information on distribution, phenology, and habitat. *Etilingera cinnabarina* matches the criteria of the IUCN red list as Endangered (EN), whereas *E. funakoshii* and *E. rigida* as Critically Endangered (CN), since all three species have narrow distributions and threats in their respective habitats. A key to the *Etilingera* of Samar Island is also provided.

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INTRODUCTION

Etilingera Giseke is one of the largest genera within Zingiberaceae consisting of more than 150 species distributed from India in the west to the Pacific Islands in the east, and with the center of diversity in Southeast Asia (Poulsen 2006, 2012, Poulsen & Docot 2018, Ardiyani et al. 2020). The genus can be distinguished from genera with radical inflorescences in the tribe *Alpinieae* (e.g., *Amomum* Roxb., *Meistera* Giseke, *Wurfbainia* Giseke) by the condensed rachis and domed-shaped receptacle. Whereas it differs from its closely related genus *Hornstedtia* Retz. (Kress et al. 2007) by the presence of a filament and a more pronounced staminal tube (Leong-Škornicková & Newman 2015). Among the 20 genera currently recognised in the Philippines, *Etilingera* is the 2nd largest (Pelser et al. continuously updated), however, *Alpinia* Roxb. (the largest with 36 species) is not monophyletic and will diminish in size if clades are recognised separately (Kress et al. 2005, 2007, Docot et al. 2019a, b).

An account of *Etilingera* in the Philippines by Poulsen & Docot (2018) and two species described by Naive et al. (2020, 2024) increased the number of *Etilingera* species in the country to 18, and this number is expected to increase again in the coming years as more gingers will be collected in the Philippines. Poulsen & Docot (2018) emphasised that one should first compare with species from neighbouring areas, before publishing new species of *Etilingera*, especially if the description is based only on one collection. The species from nearby areas are likely to occur in the Philippines too.

Samar Island Natural Park (SINP) is the largest terrestrial protected area in the Philippines, with a surface of 3333 Km², situated in the centre of Samar Island. While it is well known that the protected area harbours an unparalleled natural heritage with its unique fauna and flora, it is continuously threatened by destructive anthropogenic activities (Madulid 2000, Patindol 2016). Thus, numerous biological explorations have been performed in SINP and across Samar Island in recent history to provide essential baseline information, especially on its flora (Ordas et al. 2019; Fernandez et al. 2021; Obeña et al. 2021; Villanueva et al. 2021a, b, 2022; delos Angeles et al. 2022a, b, c; Romero et al. 2024), in a grand effort towards increasing its protection and conservation. Many new species currently only found in SINP are being described as a result (Tandang et al. 2019; Chavez et al. 2020; Adorador et al. 2021; Rubite et al. 2021; delos Angeles et al. 2022a, b; Ordas et al. 2022; Tandang et al. 2022; delos Angeles et al. 2024; Fontarum-Bulawin et al. 2024) and more undescribed species are expected to be uncovered as more botanical expeditions are being conducted in SINP.

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This paper describes three new species of *Etlingera* as a result of botanical expeditions performed in SINP. This increases the number of *Etlingera* species in Samar Island to six and in the Philippines to 21. A key to the *Etlingera* of Samar Island is also provided.

MATERIAL AND METHODS

Specimens were collected during botanical field surveys performed within SINP and vicinities in October 2021 and July 2022. Protologues and specimens deposited at various herbaria including types of relevant published names in genera with radical inflorescence distributed in the Philippines (*Amomum*, *Etlingera*, *Hornstedtia*, *Meistera*, *Wurfbainia*) and neighbouring geographical areas were scrutinised and examined. Acronyms of herbaria follow Index Herbariorum (Thiers continuously updated). Detailed descriptions and colour plates were provided for each new species. The area of occupancy (AOO) of the three new species was calculated using the Geospatial Conservation Assessment Tool (GeoCAT) (Bachman et al. 2011) after which the criteria of the International Union for Conservation of Nature (IUCN) criteria were applied (IUCN Standards and Petitions Subcommittee 2024). The distribution map produced in this study was generated using SimpleMapp (Shorthouse 2010).

TAXONOMY

Etlingera cinnabarina Docot & Ordas, sp. nov. — Fig. 1

Similar to *Etlingera sayapensis* A.D.Poulsen & Ibrahim but differing by the sericeous ligule (vs pubescent); 10–15 mm long petiole (vs 50–70 mm); non-plicate lamina (vs prominently plicate); red orange labellum (vs deep red); lateral lobes of the labellum folded over the stamen forming a 13–16 mm long tube (vs adhering only to the sides of the stamen); and retuse anther crest (vs entire). — Type: *R.V.A. Docot et al. 357* (holo: PNH; iso: CAHUP, FEUH incl. spirit, SING, USTH), Philippines, Visayas, Samar Island, Samar, Paranas, Barangay Pagsaogan, 11°51'23.9" N 125°05'10.1" E, 3 Jul. 2022. Paratype: *D.A. Madulid et al. PNH 118407* (PNH), Eastern Samar, Balangiga, Barangay Guinmaayohan, 11°12' N, 125°24' E, 290 m a.s.l., 17 Jan. 1972.

Etymology. The specific epithet refers to its vermilion/red orange corolla lobes and labellum.

Terrestrial herb in loose clumps. *Rhizome* creeping, axis 1–2 cm across, becoming sericeous towards base of leafy shoot; scales to 12–20 mm long, dark brown, pubescent in lower half; stilt roots absent. *Leafy shoots* up to 4.5 m long, arching at various degrees, 15–30 cm apart; pseudostem 2–4 m long, with up to 12–18 leaves per leafy shoot, base to 2–3 cm across, yellowish brown, sericeous at base; sheath light green, glabrous, reticulate, margin brownish, pubescent; ligule ovate with rounded to obtuse apex, 15–20 by 7–10 mm, light green, sericeous, the hairs white, becoming brown with age; petiole 10–15 mm long, light green, pubescent; lamina oblong, 53–68 by 12–15 cm, mid green above, light green beneath, glabrous on both sides, non-plicate, base attenuate, margin entire, pubescent, apex attenuate. *Flowering shoot* 8–22 cm long, arising from rhizome up to 50 cm away from the base of the leafy shoot, with 10–20 flowers and 4–9 open at a time; peduncle subterranean, ascending, 4–10 cm long, sericeous, the hairs white; peduncular bracts distichous,

ovate, 15–25 by 9–15 mm, light brown, adaxial side sericeous at the base, becoming glabrous towards the apex, abaxial side glabrous, apex acute; spike (including flowers) 70–90 by 25–35 mm, c 3 cm of the base subterranean, narrowly ovoid to cylindrical, flowers extending 20–35 mm above fertile bracts; sterile bracts 6–8, narrowly oblong, 35–48 by 15–20 mm, light brown, sericeous at the base, becoming puberulous towards the apex, margin pubescent, apex acute; fertile bracts oblong, 35–50 by 5–10 mm, light brown, sericeous at the base, becoming puberulous towards the apex, margin pubescent, apex bifid, dark brown; pedicel absent; bracteole tubular, 25–38 mm long, with 10–12 mm long fissure, base white, becoming reddish towards the apex, base sericeous, becoming glabrous toward the apex, apex 2–3-dentate, tufted with hairs; *flowers* 7.5–9 cm long; calyx 50–55 mm long, white at the base, becoming reddish towards the apex, slightly pubescent, apex 3-dentate; floral tube 40–50 mm long, white, glabrous outside and inside; corolla lobes narrowly oblong, white at the base, becoming red orange toward the apices, glabrous, apex cucullate, dorsal corolla lobe 22–34 by 4–6 mm, lateral corolla lobes 20–30 by 4–6 mm, insertion straight and equal; staminal tube 12–16 mm long, light orange, glabrous outside and inside; labellum triangularly ovate, 30–35 by 15–20 mm, red orange, the lateral lobes folded over the stamen forming a 13–16 mm long semi-tube, margin reflexed, apex rounded to obtuse; stamen 12–16 mm long, angled c 170°; filament 7–9 by 3–5 mm, light red, glabrous; anther 8–11 by 4–5 mm, the connective bright red, glabrous; anther crest petaloid, 1–2 mm long, dark red, slightly puberulent, apex retuse; thecae 4–6 by 1–2 mm, yellow, slightly puberulent, apex of the base tufted with hairs, dehiscing 2–3 mm from apex and c 2 mm from base; style 6–7 cm long, white, slightly pubescent just below the stigma, becoming glabrous towards the ovary; stigma 2–3 mm wide, dark red, ostiole transverse elliptic, facing downwards, c 1.5–2 mm, margin pubescent; epigynous gland subulate, 5–7 mm long, not enclosing the style, yellow, glabrous; ovary subglobose, 6–8 by 4–5 mm, light brown, sericeous with white hairs. *Fruits* not seen.

Distribution — *Etlingera cinnabarina* is endemic to the Philippines in the provinces of Eastern Samar and Samar (Fig. 2).

Habitat & Ecology — The species inhabits disturbed roadside forests and primary forests at 50–290 m elevation. Flowering at least in January and July.

Vernacular name — Katkatan (Waray language).

Provisional IUCN conservation status — Based on the IUCN red list categories and criteria (IUCN Standards and Petitions Subcommittee 2024), *Etlingera cinnabarina* is preliminarily assessed as Endangered (EN B2ab(iii), D). The area of occupancy (AOO) is estimated to be less than 500 km² (total AOO is c 32 km²). The species is known at two locations. *Etlingera cinnabarina* is abundant from San Jose de Buan to Paranas, Samar with c 300 mature individuals observed and inhabits disturbed roadside forests. Whereas in Eastern Samar, the *E. cinnabarina* was collected in primary forest. Threats include road widening projects and the conversion of forests into agricultural and residential lands.



Fig. 1 *Etilingera cinnabarina* Docot & Ordas. **a.** Habit. **b.** Ligule. **c.** Lamina; **d.** Inflorescence. **e.** Inflorescence. **f.** Fertile bract. **g.** Bracteole. **h.** Calyx. **i.** Flower (calyx removed). **j.** Dorsal corolla lobe. **k.** Lateral corolla lobes. **l.** Labellum. **m.** Stamen (front and back view). **n.** Epigynous glands. **o.** Ovary (R.V.A. Docot et al. 357). Photos by R.V.A. Docot. Scale bars = 1 cm.

Notes — 1. Before describing any new species of *Etilingera* in the Philippines, it is important to consider names already published elsewhere in the Philippines, especially species described by Elmer (1919) from Mount Bulusan, Sorsogon (c 150 km from Paranas, Samar; see Fig. 2). *Etilingera purpurea* (Elmer) A.D.Poulsen was described using a set of fruiting specimens and characterised by the purplish to atropurpureus (dark purplish-red) abaxial surface of the lamina even with age, submembranous ligule, and acuminate lamina apex. *Etilingera cinnabarina* deviates in the light green abaxial surface of the lamina, non-membranous ligule, and attenuate lamina apex. Another species also from Mt Bulusan, *E. sorsogonensis* (Elmer) A.D.Poulsen, was described to have a reddish ligule and deep purple upper parts of the flower. The colour of the ligule and upper parts of the flower of *E. cinnabarina*, however, are light green with brown hair and orange respectively.

2. The species most resembling *E. cinnabarina* based on morphology is *E. sayapensis* A.D.Poulsen & Ibrahim of Borneo. Both species have leafy shoots that can reach up to four m long, but *E. cinnabarina* can easily be differentiated by the sericeous ligule (vs pubescent in *E. sayapensis*), the leaf lamina (non-plicate in *E. cinnabarina*, prominently plicate in *E. sayapensis*), the apex of the fertile bract (bifid in *E. cinnabarina*, entire in *E. sayapensis*), the lateral lobes of the labellum (in *E. cinnabarina* folded over the stamen, forming a 13–16 mm long tube, in *Etilingera sayapensis* adhering only to the sides of the stamen).

3. In the Philippines, the widely distributed *Etilingera philippinensis* (Ridl.) R.M.Sm. resembles the new species the most. It differs by the white at the base becoming red towards the apex fertile bracts (vs light brown in *E. cinnabarina*); red corolla lobes (red orange in *E. cinnabarina*); spatulate and red labellum (vs triangularly ovate and red orange in *E. cinnabarina*); and ecrystate anther (vs 1–2 mm long in *E. cinnabarina*). So far, *E. cinnabarina* is the only *Etilingera* with orange flowers in the Philippines.

4. A specimen from the province of Biliran, *M.D. Sulit* PNH 21494, matches *E. cinnabarina* in the red-orange flower, but a recollection is recommended in order to ascertain its identity. The petiole of *M.D. Sulit* 21494 is shorter than in the type of *E. cinnabarina* (4–5 vs 10–15 mm long, respectively). *M.D. Sulit* 21494 is here placed, tentatively, in *E. cinnabarina*. Biliran is c 65 km away from Paranas (Fig. 2).

***Etilingera funakoshii* Docot sp. nov. — Fig. 3**

Similar to *Etilingera brevilabrum* (Valeton) R.M.Sm. but differing by the glabrous ligule with black patches (vs scabrid without black patches); narrowly ovate lamina without reddish cloudy patches (vs oblong obovate with reddish cloudy patches); 1–2 flowers per flowering shoot (vs 1–6); mid pink corolla lobes (vs red); ecrystate anther (vs 3 mm long anther crest); and dark purple stigma (vs dark red or white) — Type: S.G.S. Zamudio et al. S21–189 (holo PNH; iso FEUH incl. spirit, L, SING, USTH), Philippines, Visayas, Samar Island, Northern Samar, Las Navas, Barangay San Isidro, near 3 km Cave, 12°14'47.4" N 125°03'16.4" E, 30 Oct. 2021.

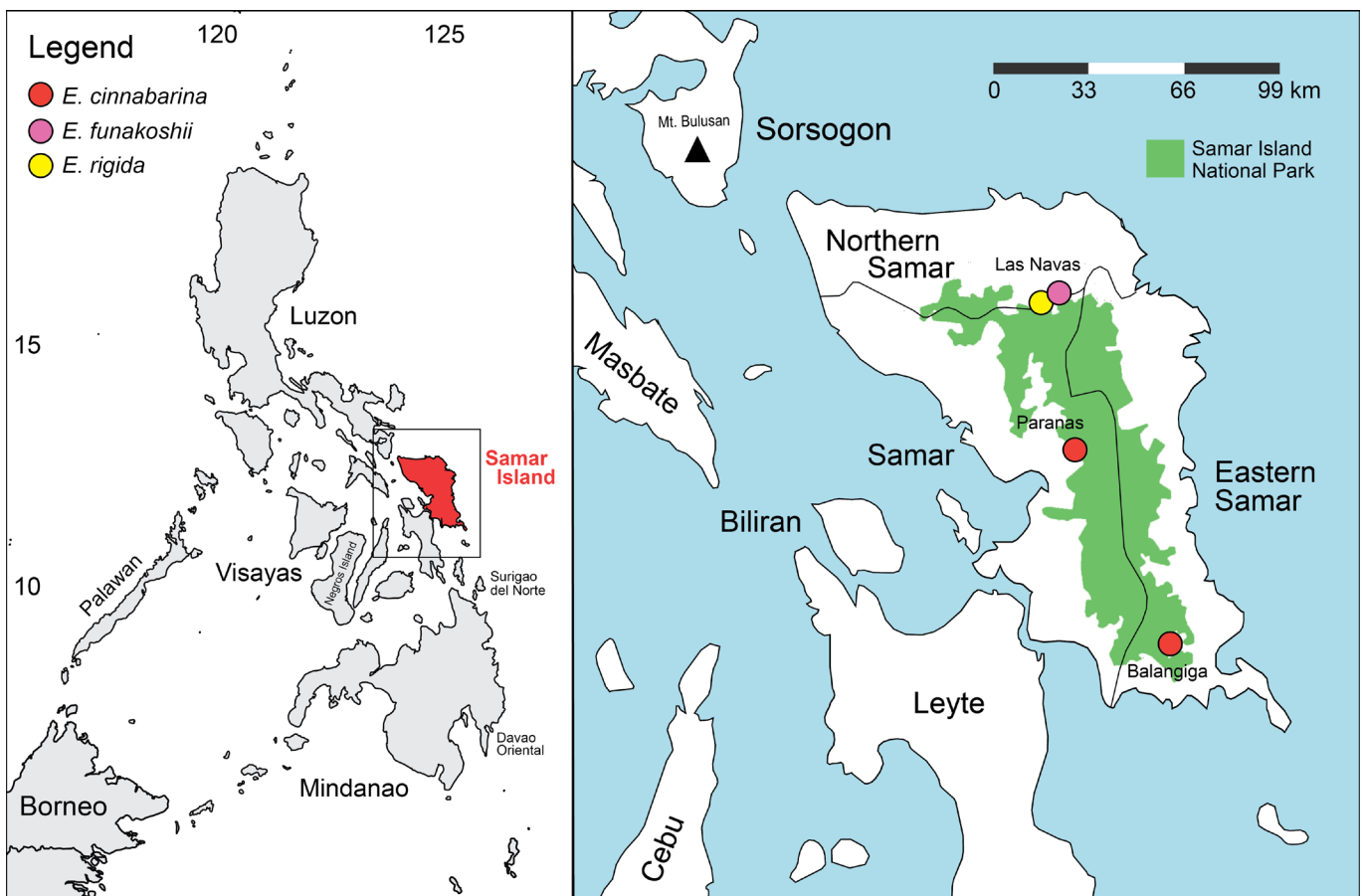


Fig. 2 Distribution map of *Etilingera cinnabarina*, *E. funakoshii*, and *E. rigida*.

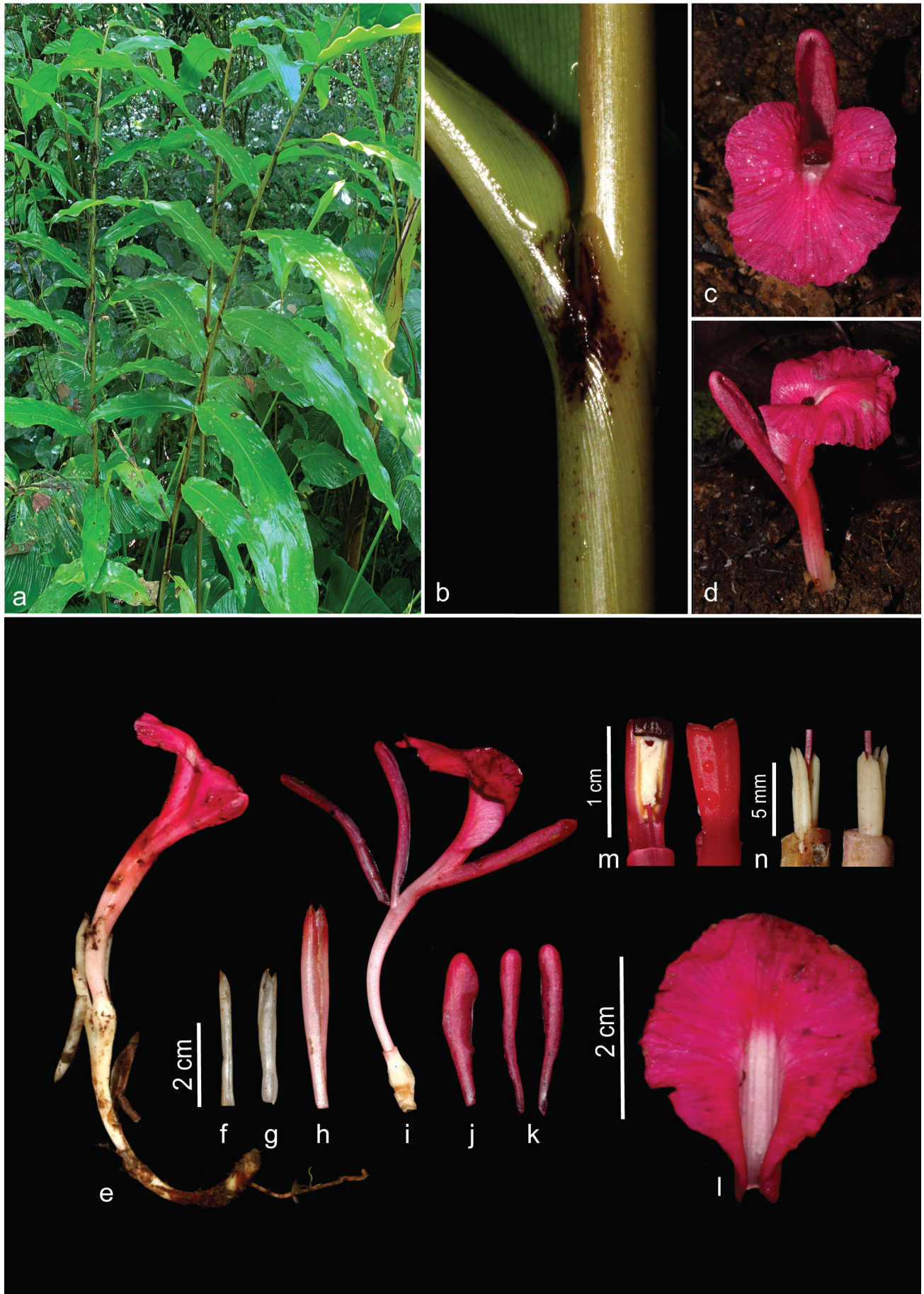


Fig. 3 *Etilingera funakoshii* Docot. **a.** Habit. **b.** Ligule. **c.** Inflorescence (top view). **d.** Inflorescence (side view). **e.** Inflorescence (detached from the plant). **f.** Fertile bract. **g.** Bracteole. **h.** Calyx. **i.** Flower (calyx removed). **j.** Dorsal corolla lobe. **k.** Lateral corolla lobes. **l.** Labellum. **m.** Stamen (front and back view). **n.** Epigynous gland (front and back view) (S.G.S Zamudio et al. S21–183). Photos by R.V.A. Docot.

Etymology The first author named this species in honour of Dr. Hidenobu Funakoshi, who first saw and documented the species in the type locality. Since the early 2000's, Dr. Funakoshi continues to share his interest in studying Philippine gingers up to the writing of this paper.

Terrestrial herb in loose clumps. *Rhizome* creeping, axis 10–15 mm across, becoming sericeous towards base of leafy shoot; scales to 2–4 cm long, dark brown, pubescent in lower half; stilt roots absent. *Leafy shoots* up to 1.8 m long, arching at various degrees, 10–20 cm apart, pseudostem 1–1.5 m long, with up to 12–20 leaves per leafy shoot, base to 2–3 cm across, reddish brown, sericeous at base; sheath light green, glabrous, smooth; ligule ovate with rounded apex, 4–6 by 3–4 mm, light green with black patches, glabrous; petiole 4–6 mm long, light green with black patches, glabrous; lamina narrowly ovate, 30–40 by 6–7 cm, mid green above, light green beneath, glabrous on both sides, non-plicate, base attenuate, margin slightly undulating, reddish, apex caudate. *Flowering shoot* 10–15 cm long, arising from rhizome up to 40 cm away the base of the leafy shoot, with 1–2 flowers and 1 open at a time; peduncle subterranean, erect, 11–18 mm long, sericeous; peduncular bracts distichous, ovate, 7–9 by 4–6 mm, dark brown, adaxial side pubescent, abaxial side glabrous, apex acute; spike (including flowers) 8–10 by 1–2 cm, c 3 cm of the base subterranean, flowers extending 20–25 mm above the fertile bracts; sterile bracts 2–3, ovate, 5–7 by 3–4 mm, brown, apex acute; fertile bracts split to the base, 30–40 by 4–5 mm when flattened, light brown, glabrous, apex acute, the tip dark brown; pedicel 3–6 mm long, sericeous; bracteole tubular, attached at the base of the pedicel, with 9–10 mm long fissure, 3–4 cm long, light brown, glabrous, apex 2-dentate; flowers 7–10 cm long; calyx 45–55 mm long, light pink at the base, becoming mid pink towards the apex, glabrous, apex 3-dentate, slightly pubescent; floral tube 3–3.5 cm long, light pink at the base, becoming mid pink towards the staminal tube, glabrous outside and inside; corolla lobes narrowly oblong, mid pink, glabrous, apex cucullate; dorsal corolla lobe 30–40 by 8–11 mm, lateral corolla lobes 25–45 by 4–6 mm, insertion oblique and diverging; staminal tube 20–25 mm long, light pink, glabrous outside except the pubescent lateral side; labellum ovate, 14–18 by 4–6 mm, flattened, the base of the lateral lobes recurved, the central channel fleshy and light pink, the lobes petaloid and mid pink, glabrous, margin slightly crisped, apex rounded; stamen pressed against the central channel of the labellum, 9–17 mm long, angled c 130°; filament 4–6 by 3–4 mm long, mid pink, slightly pubescent; anther 9–11 by 4–5 mm, the connective mid pink, glabrous except the puberulent top surface; anther crest absent (ecristate); thecae 9–11 by 2–2.3 mm, yellow, pubescent, dehiscent c 1 mm from apex and c 1.5 mm from base; style 6–7.5 cm long, mid pink, glabrous; stigma flattened triangular, 2–3 mm wide, dark purple, ostiole elliptic facing downwards, c 2 mm, margin pubescent; epigynous gland deeply bilobed, 5–6 mm long, yellow, glabrous, apices emarginate; ovary subglobose, 8–11 by 5–6 mm, light brown, sericeous with white hairs. *Fruits* not seen.

Distribution — *Etilingera funakoshii* is known only from its type locality (Fig. 2).

Habitat & Ecology — The species inhabits semi-shaded

areas of secondary forest at c 100 m elevation. Flowering from April to November.

Provisional IUCN conservation status — *Etilingera funakoshii* is provisionally assessed as Critically Endangered (CN, B2ab(iii), D). The area of occupancy (AOO) is estimated to be less than 10 km² (total AOO is c 4 km²) as the species is only known from the type locality. Approximately 100 mature individuals were observed within Barangay San Isidro and no other populations were seen in nearby barangays. Efforts were also made to see if there were previously collected specimens at several herbaria, but we failed to find any. Although the location of *E. funakoshii* is far from residential areas, threats include the conversion of forest into agricultural lands (e.g., coconut plantations are common in the area).

Notes — 1. *Etilingera funakoshii* was first identified as *E. brevilabrum* (Valeton) R.M.Sm. and reported as a new species record for the Philippines by Poulsen & Docot (2018) using the photographs of an inflorescence taken by Dr. Funakoshi also in Las Navas. Now with material to examine, we concluded that it represents a new species and thus restricting again the distribution of *E. brevilabrum* to Borneo, which is c 500 km away from the type locality (Fig. 2).

2. *Etilingera funakoshii* and *E. brevilabrum* differ greatly in their vegetative parts, especially in the leaf lamina. The lamina of *E. brevilabrum* is oblong-obovate with reddish cloudy patches whereas it is narrowly ovate and without patches in *E. funakoshii*. Other differences are in the ligules (glabrous in *E. funakoshii* with black patches, scabrid without black patches in *E. brevilabrum*), number of flowers per flowering shoot and number of flowers open at a time (1–2 flowers with one open at a time in *E. funakoshii*, 1–6 with 1–2 open at a time in *E. brevilabrum*), the colour of the labellum (in *E. brevilabrum* it varies from red to mid pink, only mid pink in *E. funakoshii*, colour of the stigma (in *E. brevilabrum* either dark red or white, in *E. funakoshii* dark purple only), and in the anther crest (present in *E. brevilabrum*, absent in *E. funakoshii*).

3. In the Philippines, the most closely resembling species is *E. sessilanthera* R.M.Sm., which is also distributed in Borneo. They share a similar flower structure but can be easily differentiated using the morphology of their labellum: red with a yellow patch in the central part and an involute base forming a tube in *E. sessilanthera* while mid-pink with a white patch in the central part and a flat base in *E. funakoshii*.

Etilingera rigida Docot, sp. nov. — Fig. 4

Similar to *Etilingera pilosa* A.D.Poulsen & Docot but differing by the red and truncate apex of the ligule (vs greenish brown and rounded); sessile leaves (vs petiolate); red to greenish red abaxial side of the lamina (vs light green); rigid young fertile bracts (vs soft); pubescent dorsal side of the anther (vs glabrous); and fruit with few small warts near the apex when mature (vs prominently carinated). — Type: S.G.S *Zamudio et al.* S21–213 (holo PNH; iso CAHUP, E, FEUH incl. spirit, P, SING, USTH), Philippines, Visayas, Samar Island, Northern Samar, Las Navas, Barangay San Isidro, near 3 km Cave, 12°14'49.0" N 125°03'24.0" E, 30 Oct. 2021.

Etymology The specific epithet refers to the rigid bracts.

Terrestrial herb in clumps. *Rhizome* creeping, axis 2–4 cm across, becoming sericeous towards base of leafy shoot;

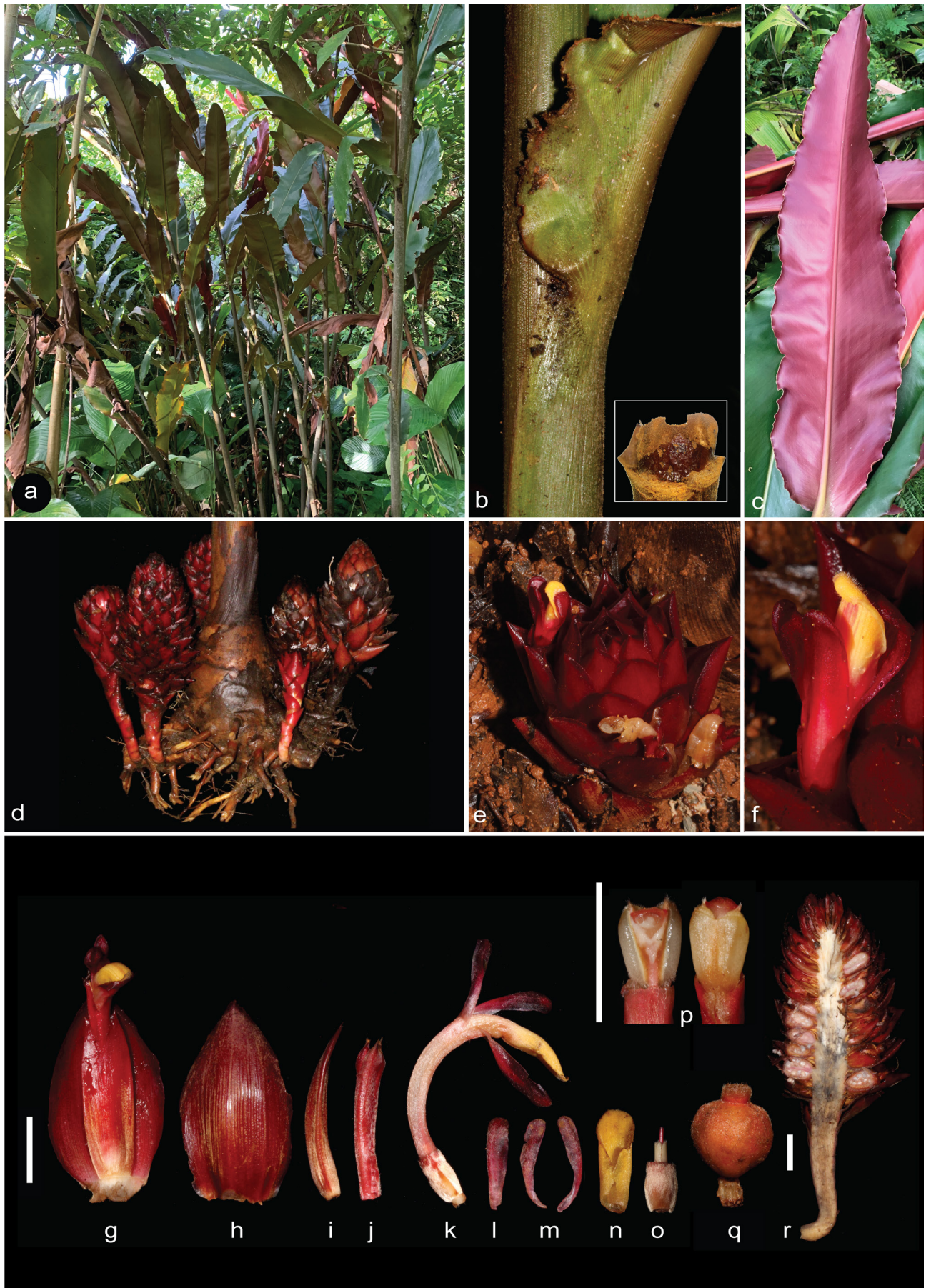


Fig. 4 *Etilingera rigida* Docot. **a.** Habit. **b.** Lamina attachment (inset: ligule). **c.** Lamina (abaxial side). **d.** Inflorescences and infructescences. **e.** Inflorescence. **f.** Flower. **g.** Flower attached in the fertile bract. **h.** Fertile bract. **i.** Bracteole. **j.** Calyx. **k.** Flower (calyx removed). **l.** Dorsal corolla lobe. **m.** Lateral corolla lobes. **n.** Labellum. **o.** Ovary with epigynous gland. **p.** Stamen (front and back view). **q.** Young fruit. **r.** Infructescence (longitudinal section) (S.G.S Zamudio *et al.* S21–213). Photos by R.V.A. Docot. Scale bars = 1 cm.

scales to 2–5 cm long, dark brown, pubescent in lower half; stilt roots absent. *Leafy shoots* up to 5.3 m long, arching at various degrees, 4–10 cm apart, pseudostem 3–5 m long, with up to 18–22 leaves per shoot, base to 6–9 cm across, yellowish brown, sericeous at base; sheath reddish green, pubescent, reticulated; ligule ovate with truncate apex, 14–16 by 19–22 mm, lower half dark red, glabrous, upper half green, sericeous; lamina sessile, oblong, 70–82 by 15–18 cm, midgreen above, red beneath when young, becoming greenish red with age, glabrous on both sides, slightly plicate, base cuneate, margin coarsely undulating, pubescent, apex acute. *Flowering shoot* 10–16 cm long, arising from rhizome near the base of the leafy shoot, numerous flowers and 1–4 flowers open at a time; peduncle 4–6 cm long at flowering state, elongating to 7 cm long at fruiting state, ascending, sericeous; peduncular bracts distichous, ovate, 15–30 by 20–35 mm, red, rigid, adaxial side sericeous at the base, becoming glabrous towards the apex, abaxial side glabrous, apex sharply acuminate; spike 8–10 by 4–6 cm, narrowly ovoid, flowers extending 1.5–2.5 cm above bracts; sterile bracts 7–9, ovate, 20–40 by 20–32 mm, red, adaxial side sericeous at the base, becoming glabrous towards the apex, abaxial side glabrous, apex sharply acuminate; rachis 6–10 cm long; fertile bracts ovate, 25–42 by 20–28 mm, becoming narrower towards the apex, red, rigid, adaxial side sericeous at the base, becoming glabrous towards the apex, abaxial side glabrous apex sharply acuminate; pedicel c 1 mm long (subsessile); bracteole split to the base, attached at the base of the pedicel, 25–32 mm long, whitish at the base, becoming red towards the apex, sparsely pubescent, apex acute; flowers 5–7 cm long; calyx 27–30 cm long, red, pubescent outside, glabrous inside, apex 3-dentate, tufted-ciliate; floral tube 2–2.5 cm long, reddish white, pubescent outside, glabrous inside; corolla lobes oblong, becoming dark red toward the apex, pubescent, apex cucullate, dorsal corolla lobe 23–25 by 5–6 mm; lateral corolla lobes 20–25 by 4–5 mm, attachment oblique and diverging; staminal tube 1.5–2 cm long, reddish white, pubescent outside, densely pubescent inside; labellum wrapping the stamen, ovate when flattened, fleshy, 14–18 by 4–6 mm, yellow, with red band at the dorsal side, pubescent, apex truncate; stamen 8–11 mm long, angled 100–110°; filament 3–4 by 2–3 mm long, red, pubescent; anther triangular, 4–6 by 4–5 mm, the connective yellow, slightly pubescent, lining of the apex tufted with hairs; anther crest absent; thecae 4–6 by 1.5–2 mm, yellow, sericeous, apex with horn and tufted with hairs, dehiscent throughout its length on the inner lateral sides; style 38–42 mm long, whitish red, glabrous; stigma 2–3 mm wide, red, ostiole elliptic facing upwards, margin pubescent; epigynous gland narrowly ovoid, 18–23 mm long, yellow, glabrous except the pubescent apex; ovary subglobose, 8–12 by 4–6 mm, red, sericeous with white hairs. *Infructescence* narrowly ovoid, 12–20 by 6–9 cm; *fruits* globose to subglobose, 15–27 by 14–25 mm, red, sericeous, smooth when young, few warts appear at the apex when mature; *seeds* c 2 mm wide, black with white aril.

Distribution — *Etilingera rigida* is known only from its type locality (Fig. 2).

Habitat & Ecology — The species inhabits semi-shaded areas of secondary forest at c 100 m elevation. Flowering and fruiting from April to November.

Uses — Members of the Mamanwa tribe living in Las Navas, Northern Samar, eat the fruits as forest snacks, which are reported to have a sweet and sour taste.

Provisional IUCN conservation status — *Etilingera rigida* is provisionally assessed as Critically endangered (EN, B2ab(iii), D). The area of occupancy (AOO) is estimated to be less than 10 km² (total AOO is c 8 km²) as the species is only known from the type locality. *Etilingera rigida* has the same distribution as *E. funakoshii* but populations of *E. rigida* were observed on nearby barangays with c 200 matured individuals observed. The population of the new species may decline significantly if the Mamanwa tribe in Las Navas does not regulate its collection as a forest snack in addition to the observed threats mentioned in the locality earlier. The assessment shall be updated as more information on this species becomes available.

Notes — 1. *Etilingera rigida* shares the character of having a purplish to reddish lamina with *E. purpurea* of Sorsogon, which is ca 120 km away from Las Navas, Northern Samar (Fig. 2). The ligule, lamina apex, and fruit of *E. rigida*, however, are non-membranous, acute and globose whereas in *E. purpurea* it is membranous, acuminate and obconic.

2. The most resembling species is *Etilingera pilosa* A.D. Poulsen & Docot distributed in the provinces of Davao Oriental, Negros Oriental (type locality), and Surigao del Norte. Both species inhabit secondary forests and can reach up to four m tall. The two species, however, differ in petiole presence and abaxial lamina colour: *E. rigida* lacks a petiole (sessile) and has a red to greenish-red abaxial surface, whereas *E. pilosa* has a petiole and a light-green abaxial surface. Both species have narrowly ovoid spikes with red fertile bracts. The fertile bracts of *E. rigida* are rigid throughout its age while it is soft and becoming rigid with age in *E. pilosa*. In *E. rigida*, the bracteole is split to the base, in *E. pilosa* the bracteole is fused 2–4 mm from the base. One of the most striking difference between the two species is in the fruits, those of *E. rigida* smooth when young and a few small warts near the apex appear when mature, while in *E. pilosa*, the apex is prominently carinated and with warts throughout its development.

KEY TO THE *Etilingera* SPECIES OF SAMAR ISLAND

- 1 Flowering shoot 100–200 cm long *E. elatior*
- 1 Flowering shoot 10–22 cm long 2
- 2 Ligule with black patches; lamina narrowly ovate; spike with 1–2 flowers *E. funakoshii*
- 2 Ligule without black patches; lamina oblong; spike with more than 3 flowers 3
- 3 Ligule sericeous at upper part with brown hairs; lamina abaxial surface red; rachis 6–10 cm long; thecae horn at apex present; fruits smooth when young *E. rigida*
- 3 Ligule sericeous throughout with light brown hairs; lamina abaxial surface light green; rachis < 2 mm long (contracted); thecae horns at apex absent; fruits with warts when young 4

- 4 Labellum spatulate, trilobed *E. coccinea*
 4 Labellum triangularly ovate, entire 5
- 5 Flowers 80–90 per flowering shoot, yellow; anther crest
 2.5–3 mm long, orange to yellow; labellum 18–24 mm long
 *E. fimbriobractea*
- 5 Flowers 10–25 per flowering shoot, orange; anther crest
 1–2 mm long, dark red; labellum 30–35 mm long
 *E. cinnabarina*

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