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HANGUANA RUBINEA ŠKORNIČK. & P.C.BOYCE (HANGUANACEAE), A NEW RECORD FOR INDONESIA

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ABSTRACT
IRSYAM, A. S. D., GALINGGING, A., WIJAYA, K., DEWI, A. P., PENIWIDIYANTI, AL ANSHORI, Z., HARIRI, M. R., ROSLEINE, D. & LEONG-ŠKORNIČKOVÁ, J. 2025. *Hanguana rubinea* Škorničk. & P.C.Boyce (Hanguanaceae), a new record for Indonesia. *Reinwardtia* 24(1): 33–39. — *Hanguana rubinea* Škorničk. & P.C.Boyce, originally described from and reported to be endemic to Singapore, has been discovered in Batam, Riau Islands, Sumatra and is reported here as a new record for Indonesia. The distinguishing features of *H. rubinea* include the silky indumentum on the abaxial surface of its leaves, the striking ruby-red hue of fruits, and the unique bowl-shaped seeds. Description and colour plates prepared from the ripe fruiting material in Batam are included together with additional notes and a map reflecting the current distribution of this species.

Key words: Batam, *Hanguana*, Malesia, Singapore, Sumatra.

ABSTRAK
IRSYAM, A. S. D., GALINGGING, A., WIJAYA, K., DEWI, A. P., PENIWIDIYANTI, AL ANSHORI, Z., HARIRI, M. R., ROSLEINE, D. & LEONG-ŠKORNIČKOVÁ, J. 2025. *Hanguana rubinea* Škorničk. & P.C.Boyce (Hanguanaceae), sebuah rekaman baru untuk Indonesia. *Reinwardtia* 24(1): 33–39. — *Hanguana rubinea* Škorničk. & P.C.Boyce, yang awalnya dideskripsikan dan dilaporkan sebagai jenis endemik Singapura, telah ditemukan di Batam,

Kepulauan Riau, Sumatra sebagai catatan rekaman baru untuk Indonesia. Ciri khas *H. rubinea* meliputi indumentum halus seperti sutera pada permukaan abaksial daunnya, rona merah delima yang mencolok pada buahnya, dan biji berbentuk mangkuk yang unik. Deskripsi dan foto berwarna buah masaknya disertakan bersama dengan catatan tambahan dan peta yang mencerminkan distribusi terkini dari jenis ini.

Kata kunci: Batam, *Hanguana*, Malesia, Singapura, Sumatra.

INTRODUCTION

Hanguana Blume is the sole genus of Hanguanaceae (Commelinales), comprising of about 23 species of small to large rhizomatous dioecious herbs. Members of this genus are distributed across a relatively large geographical range, encompassing Sri Lanka, Thailand, Indochina, the Philippines, New Guinea, Northeastern Australia, and Caroline Island. The Malesian region is the center of diversity for *Hanguana* (Leong-Škorničková & Boyce, 2015; Leong-Škorničková & Niissalo, 2017; POWO, 2024).

A series of taxonomic studies have been carried out in various countries and are currently in progress. A total of 10 species were recorded in Peninsular Malaysia, while seven species are known to occur in Singapore including two non-native species (Rahman *et al.*, 2010; Niissalo *et al.,* 2014; Leong-Škorničková & Boyce, 2015; Leong-Škorničková & Kiew, 2016; Leong-Škorničková & Niissalo, 2017). Eight species are known from Borneo, of which three species, *H. karimatae* Randi & Škorničk., *H. sitinurbayae* Randi and *H. deflexa* Hroneš & Dančák, have been described recently (Airy Shaw, 1980; Tillich & Sill, 1999; Rahman *et al.,* 2011; Mohd Fahmi *et al.,* 2012; Hroneš *et al.,* 2021; Randi *et al.,* 2021; Randi *et al.,* 2023). Based on preliminary studies of herbarium material by Leong-Škorničková & Boyce (2015), it is projected that the species count in the genus will surpass 50 in future.

During a field study in 2023, a *Hanguana* with vibrant ruby-red fruits was encountered on Batam, Riau Islands, Sumatra, Indonesia. Subsequently, our collection was identified as *H. rubinea* Škorničk. & P.C.Boyce, a species previously thought to be endemic to Singapore based in the lack of any herbarium material or photographic evidence from elsewhere in Malesia (Leong-Škorničková & Boyce, 2015). In this paper, we formally report the extended geographic distribution of *H. rubinea* and add this species as a new national record for the Flora of Indonesia, thereby contributing to our understanding of the Malesian *Hanguana*.

MATERIALS AND METHODS

The plant specimens were collected from January to June 2023 in the Sei Harapan Protected Forest, located in Batam City, Riau Islands, Sumatra, following the collection method outlined by van Balgooy (1987). The collected specimens were initially examined at the Herbarium Bandungense (FIPIA), which is located in the School of Life Sciences and Technology, ITB, as well as at the Bogor Botanic Gardens, the National Research and Innovation Agency (BRIN). Further examination of specimens was conducted at the Herbarium Bogoriense (BO) – BRIN and the Singapore Botanic Gardens Herbarium (SING). The plant description was based on fruiting female specimens and follows the style and detail as given in Leong-Škorničková & Boyce (2015) and largely followed by most subsequent works published since. Terminology follows Beentje (2016). The distribution map was prepared using QGIS version 3.30.2. The preliminary conservation assessments are based on the most recent version of the guidelines of the IUCN (2024). The extent of occurrence (EOO) and area of occupancy (AOO) were calculated using GeoCAT (https://geocat.iucnredlist.org/) following Bachman *et al.* (2011).

RESULT AND DISCUSSION

TAXONOMY

Hanguana rubinea Škorničk. & P.C.Boyce, Gard. Bull. Singapore 67: 12 (2015) (Figs. 1–2).

Description. *Herbaceous*, dioecious mesophyte, non-stoloniferous, up to 1.65 m height; underground stem terete, ± 2 cm in diam., horizontal, above-ground stem covered by leaf sheaths, terminally ascending with crown of up to 20 leaves. Leaves to 160 cm long, erect, spreading then arching, base sheathing the stem; pseudopetiole 53–67 cm long, roundly channeled, with hyaline margin near the base at the abaxial surface; leaf blade lanceolate, 60–99 × 28–32 cm, base cuneate to atenuate, apex narrowly attenuate with apicule 15–20 mm long, coriaceous, with close-set longitudinal nerves and numerous thin cross nervules, adaxially mid- to dark-green, sparsely hairy, abaxially purplish green when juvenile meanwhile turning lighter green when adult, with silky appressed hairs sparsely and evenly distributed and denser on lower than upper surface; midrib adaxially weakly impressed, of the same colour as the rest of the lamina, abaxially round-raised, mid-green, almost

Fig. 1. The habitat of *Hanguana rubinea* in Batam. A. A small stream within the Sei Harapan Protected Forest. B. Moist area with *Pandanus* sp. (Pandanaceae). C. Fruiting individual. D. The habit of *H. rubinea* compared to human height (Ades Galingging in the image). Photos by Ades Galingging & Kesuma Wijaya.

glabrous and shiny. *Male and female inflorescences* not observed. *Infructescence* erect, up to 83 cm height, comprising up to 5 partial, whorled, alternate-secund, thyrsoid infructescences plus a terminal spike, with up to 500 fruits; partial infructescences spreading almost perpendicularly to rachis; peduncle 51 cm long, rachis 32 cm long, dark purple-brown when fresh, conspicuously pale brown-grey flocculose; one sterile bract per peduncle, foliaceous, persistent, narrowly ovate with a basal claw, 44 × 11 cm, apex narrowly acute; bract subtending partial infructescences similar to sterile bracts, the bract supporting most basal partial infructescence diminishing in size distally along the infructescence and fully reduced in uppermost partial infructescences, basal bract *ca.* 24 × 4.5 cm and upper bract *ca.* 11 × 4 mm; partial infructescences each comprising 3–6 branches, 6.5–11.5 cm long, fewer and shorter toward apex of rachis, 3.2–5.5 cm long. *Fruit* globose, 5–7 mm in diam., ripening from bright green through cream-white to dark pink-red, pulp 1–2 mm thick, cream-white, fairly hard, exuding yellow juice when disturbed; perianth composed of 6 tepals in two whorls tightly clasping ovary/fruits in fresh material, all tepals with prominent bulbous thickening at base and hyaline translucent white margin, outer tepals semicircular in shape, 1–1.5 × 1–2 mm, inner tepals 2.5 –3 × 2–3 mm; staminodes not examined; stigma 3-lobed, each lobe *ca.* 1 mm long, ovate with round apex, lobes connate basally (sometimes imperfectly) with free apices forming bluntly triangular structure with points of connation seen as grooves; seeds 1–2 per fruit, bowl shaped, *ca.* 5 × 3–4 mm, with a triangular appendage on the distal part of the rim, deeply excavated, cavity filled with placental tissue.

Distribution. Indonesia (Riau Islands, Sumatra) and Singapore.

Habitat. In Batam, this species is found only in one location within the Sei Harapan Protected Forest, where it grows in secondary lowland tropical forest that is situated adjacent to small streams and typified by sandy and stony soils at an elevation of 46 meters above sea level. The soil in this area is characterized by its red–yellow podzolic composition and clay loam texture, adorned with a scanty layer of litter. The soil pH is 4.3.

Specimen examined. Indonesia, Sumatra, Riau Islands, Batam City, Sekupang Subdistrict, Sei Harapan Protected Forest, 1°04'59"N 103°58'07"E, 46 m asl., 7 June 2023, fruiting. *A. Galingging 42* (FIPIA!).

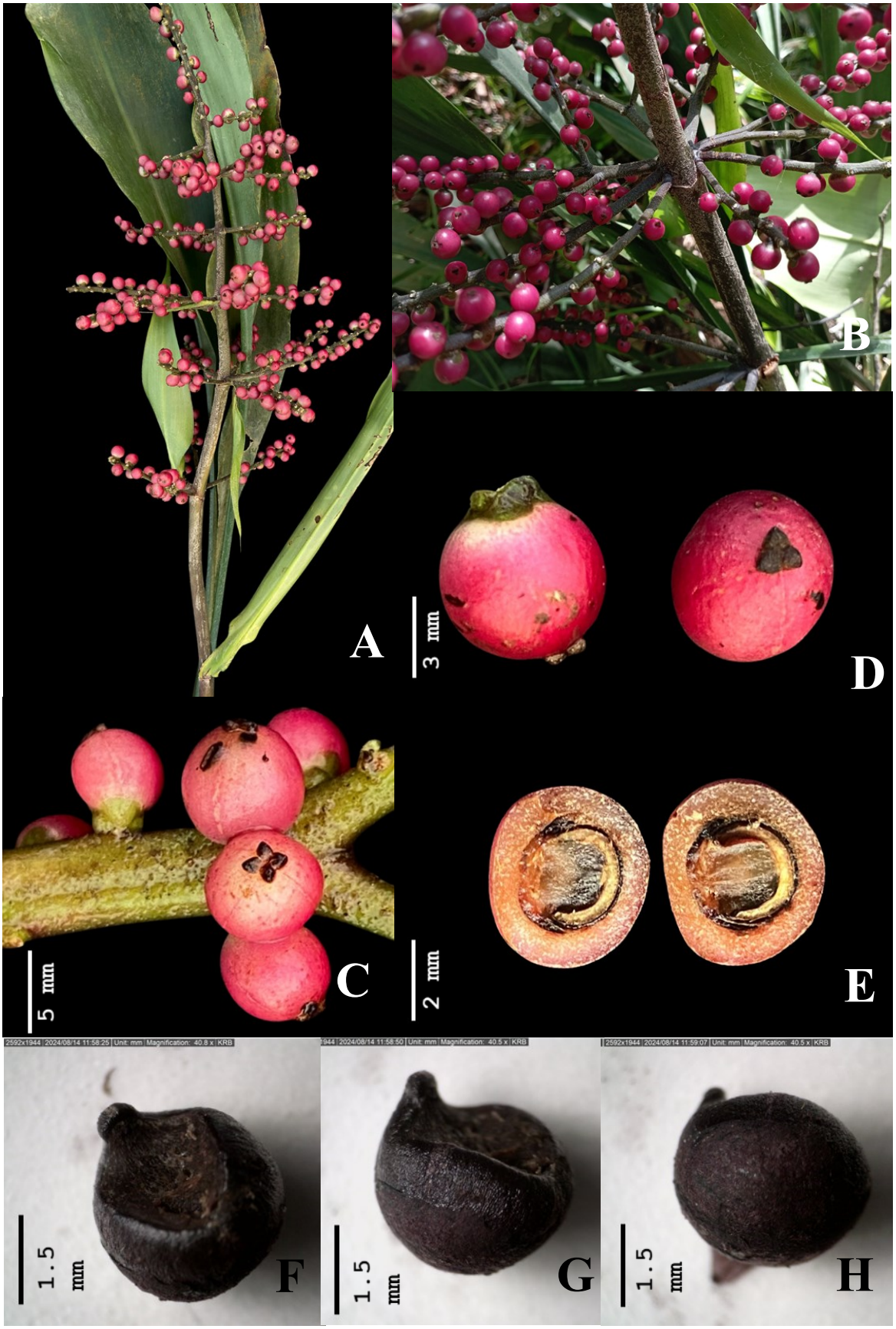

Fig. 2. The morphological characteristics of *Hanguana rubinea* A. Leafy shoot with infructescence. B. Close up view of infructescence. C. Close up view of fruit with aberrant four-lobed stigma (blue arrow). D. Lateral and dorsal view of fruit. E. Cross section of fruit showing the seed shape. F–H. Details of seed viewed from different angles. Photos by Ades Galingging (A–E) and Muhammad Rifqi Hariri (F–H).

Fig. 3. The locality of *H. rubinea* in Batam, Sumatra, Indonesia (marked by the orange dot), along with previously recorded localities in Singapore, based on specimens at SING.

Additional specimens examined. Singapore, Bukit Timah Nature Reserve: along with South View Path, 24 April 2019, *P. Leong, S. L. Koh, M. A. Niisalo, M. A. et al. SING2019-356* (SING!); Singapore, Bukit Timah NR, 25 January 2019, *M. A. Niisalo SING 2019-044* (SING!); Singapore, Central Catchment Nature Reserve: MacRitchie NR, 17 October 2020, *M. A. Niisalo, S. W. Lahiru SING 2020-918* (SING!); Singapore, MacRitchie Sector 53, 29 April 1992, *J. W. H. Yong, G. C. H. Tan, D. P. Y. Lim, Marinah Marzuki NRS 598* (SING!); Singapore, Nee Soon, Chan Chu Kang, 14 April 1890, *J. S. Goodenough s.n.* (SING!); Singapore, Plot Q408 of the "Nee Soon Swamp Forest Biodiversity and Hydrology Baseline Studies — Phase 2" project, 14 November 2013, *K. Y. Chong, L. Neo, S. Y. Tan, C. Y. Koh NSSF2-Q408U61* (SING!); Singapore, Mandai, Mandai Forest, off Plot 39 Peninsula, 6 Jan 2009, *A. T. Gwee, P. T. Chew, Ali Ibrahim et al. SING 2009-09* (SING!); Singapore, Ponggol, 1905, *H. N. Ridley s.n.* (SING!).

Hanguana rubinea is here newly recorded for Indonesia, Sumatra. The collections from Batam, the Riau Islands, are distanced less than 40 km from localities in Singapore, where it was previously considered endemic. In Singapore the species grows predominantly in proximity of small seasonal streams in primary or partially disturbed lowland forest (Leong-Škorničková & Boyce, 2015). In Batam, the species have been found growing alongside a small stream, with a substrate consisting of sandy and stony soil. The surrounding area was characterized by a rather open secondary forest (Fig. 1). Notably, its natural occurrence in the Sei Harapan Protected Forest area of Batam confirms that the species is not a result of human-mediated introduction via waterways. Instead, *H. rubinea* is indigenous to Batam, demonstrating that its native range extends beyond Singapore to include parts of Indonesia. The current distribution map of *H. rubinea* is shown in Fig. 3.

According to our observations and the prior report by Leong-Škorničková & Boyce (2015), *H. rubinea* was reported from five sites in Singapore (Bukit Timah, Mandai, MacRitchie, Ponggol – historical specimen with no extant population, and Nee Soon Swamp Forest) and one site in Batam

(Sekupang). The extent of occurrence (EOO) is approximately 298 km², while the area of occupancy (AOO) is 24 km². Additionally, the number of adult individual observed in Batam is *ca.* 20. *Hanguana rubinea* was previously considered Critically Endangered (CR C.2) locally in Singapore, as well as globally (CR B1ab(iii,v); C2a(i)) (Leong-Škorničková & Boyce, 2015). Based on the new data, *H. rubinea* should be classified globally as Endangered (EN B1a, C2a(i)).

Hanguana rubinea displays following combination of morphological features, such as silky indumentum on the abaxial leaf surface, ripe fruits with an eye-catching vibrant red ruby color, and seeds that are bowl-shaped in appearance. In addition, it is quite easy to identify juvenile plants as their abaxial leaf surfaces are shaded pink and gradually turn greener as they mature, a feature also observed on Singapore. The species may be suitable for introduction into ornamental plant as the ruby-red fruits last several months. During our field observations, we have noticed fruits exhibiting deviations in morphology such as stigmas with four lobes instead of three (Fig. 2C) or stigmatic lobes imperfectly joined. These aberrations are infrequent, and observed in Singapore not only in *H. rubinea*, but also other species.

Our findings highlight the need for more extensive research on *Hanguana* in Indonesia and other parts of Malesia, given the large number of unidentified species yet to be described.

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