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NOTES ON GEOGRAPHIC DISTRIBUTION

Orlitia borneensis (Gray, 1873) (Testudines, Geoemydidae), Malaysian Giant Turtle, from Belitung Island, Indonesia: filling a distribution gap

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Abstract. *Orlitia borneensis* (Gray, 1873), Malaysian Giant Turtle, is a freshwater turtle native across Southeast Asia and has been assessed as Critically Endangered by the IUCN Red List. We report the first record of this species in Belitung, a remote island in Indonesia, based on photographs. The new record is approximately 200 km to the west of the nearest locality in Borneo, and 250 km to the east of the nearest locality in Sumatra. This species was found at a site with slow-flowing waters and forested hills 70 m above sea level.

Key words. Conservation status, Critically Endangered, freshwater turtle

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INTRODUCTION

Asian freshwater turtles are currently suffering massive regional declines, mostly driven by unsustainable harvesting for the international pet trade and for traditional food (Cheung and Dudgeon 2006; Gong et al. 2009). Wildlife trade is a key driver of the economy throughout Southeast Asia, and freshwater turtles are suffering massive regional population declines as a result (Jensen and Das 2008). *Orlitia borneensis* (Gray, 1873), Malaysian Giant Turtle, is the largest freshwater turtle in Southeast Asia, with a carapace reaching a length of up to 80 cm (Figueroa et al. 2023). This species typically inhabits streams and shallow bodies of water in freshwater swamp-forest habitats. *Orlitia borneensis* is a generalist feeder, foraging mainly on aquatic vegetation and fallen forest fruits, fish, and aquatic invertebrates (Ernst et al. 1989; Cox et al. 1998).

Critical habitat for *O. borneensis* has been degraded and lost due to many anthropogenic pressures such as pollution, deforestation, mining, aquaculture, and commercial industries. In addition it is often caught as bycatch in commercial and artisanal fisheries. Like most freshwater turtles, *O. borneensis* has a slow reproductive cycle and requires years to reach maturity; small clutch size is relatively small, with nine eggs per laying (Brockman et al. 2013). Due to the combination of these factors, *O. borneensis* has been assessed as Critically Endangered according to the IUCN Red List criteria (Horne et al. 2020), and under CITES, there is a zero total-take quota (CITES 2025)

The global distribution of this species includes Thailand (southern Thailand, Malaysia border areas), Malaysia (western Malay Peninsula and Borneo, Sarawak), and Indonesia (eastern Sumatra, western and eastern Borneo) (Cox et al. 1998; Chan-ard et al. 1999; Das 2010; Rhodin et al. 2017; Horne et al. 2020). This species has

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also been reported to be introduced to Singapore (Figueroa et al. 2023). During a recent field expedition, photographic evidence of *O. borneensis* was recorded from Belitung Island, a remote island in Karimata Strait, between Sumatra and Borneo, Indonesia. The new record is approximately 200 km to the west of the nearest locality in Borneo, and 250 km to the east of the nearest locality in Sumatra.

METHODS

A live specimen of *Orlitia borneensis* (Figures 1, 2) was obtained from a local fisher during fieldwork on 15 May 2023 at the Tebat Rasau Geosite (02°54′06.0″S, 108°03′43.0″E) Simpang Renggiang Subdistrict, East Belitung District, Bangka Belitung Province, Indonesia (Figure 3). This area is under the management of the Protected Forest of Gunung Duren, Bangka Belitung Province. Due to the area being protected, the collection of rare species is prohibited, unless special permits are obtained. As we did not have a permit for collecting *O. borneensis*, no voucher specimen was retained. The turtle was photographed, measured using a ruler, examined in detail following Gray (1855) and de Rooij (1915) to determine its identification, and released at the point of capture. The photographs have been deposited in the Airlangga Museum Natural History (AMNH), Airlangga University, Indonesia. The map was created using files from d-maps.com, then manually edited using Microsoft Power Point 2024.

RESULTS

***Orlitia borneensis* (Gray, 1873)**
Figures 1, 2

New records. INDONESIA — Belitung Island • Belitung District, Tebat Rasau Geosite; 02°54′06.0″S, 108°03′43.0″E; 15.V.2023; V. Hasan obs.; turtle trap; 1 adult♀, 57 cm straight carapace length, AMNH37.

Habitat. The capture site is characterized by having slow water flow and abundant vegetation on the banks of the river (Figure 3). The topography is forested hills at 70 m above sea level**.**

Identification. The specimen was identified as an adult *O. borneensis* based on characters proposed by Gray (1855) and de Rooij (1915). Carapace very convex, tectiform, smooth, and rounded, with an obtuse median keel. Nuchal shield broad, anteriorly narrowed. Plastron smaller than opening of shell, anteriorly truncate, posteriorly deeply notched. Axillary and inguinal shields present. Head short, broad, covered with smooth skin and small shields on its posterior part only. Snout short. Upper jaw notched at middle. Fore limbs with five claws; hind limbs with four claws. Digits webbed to claws. Fore limb with large transverse shields only on outer side. Tail short. Coloration: blackish-brown above; yellowish below.

Figure 1. Lateral view of *Orlitia borneensis* (AMNH37).

Figure 2. *Orlitia borneensis* (AMNH37) from Tebat Rasau Geosite, Belitung District, Belitung Island, Indonesia. **A.** View of head. **B.** View of tail. **C.** View of plastron. **D.** Dorsal view of carapace. (Photographs by W. Kusumah.)

Figure 3. Tebat Rasau Geosite, on Belitung Island, Indonesia, where *O. borneensis* was found. (Photograph by W. Kusumah.)

DISCUSSION

The discovery of *Orlitia borneensis* at the Tebat Rasau Geosite, Simpang Renggiang Subdistrict, East Belitung District, Bangka Belitung Province, is the first official record of this species from Belitung Island. It represents a range extension of approximately 200 km to the east of the nearest locality in Borneo and 250 km to the

Figure 4. Distribution map of *O. borneensis*. The black star indicates the new record from Belitung Island, Indonesia. The black square is an unverified voucher from iNaturalist (2020). Black circles indicate previous records (Cox et al. 1998; Chan-ard et al. 1999; Das 2010; Rhodin et al. 2017; Horne et al. 2020), while the red circle is the location where it was introduced in Singapore (Figueroa et al. 2023).

west of the nearest locality in Sumatra (Figure 4). Moreover, there is an additional unverified record of an immature individual on iNaturalist (2020) from Gantung Subdistrict, approximately 7 km from the Tebat Rasau Geosite. The presence of multiple populations across a fragmented distribution suggests that the conservation status for *O. borneensis* should be reassessed, and further research be conducted to determine population abundance and distribution across Belitung Island. The Tebat Rasau Geosite has abundant aquatic plants, providing ideal, complex, habitat for *O. borneensis* (Ernst and Barbour 1989; Iskandar 2000). The status of the population on Belitung should be determined to establish a baseline for future monitoring and conservation efforts.

It is essential that up-to-date population distribution assessments are carried out to across poorly studied freshwater systems of Southeast Asia, particularly as the IUCN's Critically Endangered category is based on population data and geographic range. Conservation initiatives of *O. boreneensis* would greatly benefit from better knowledge on the full range and distribution of this species, including molecular data to better understand population dynamics within restricted populations. Using freshwater turtle distributions across the Indonesian archipelago would inform more tailored conservation initiatives which account for complex island biogeography (Kusumah et al. 2023; Hasan et al. 2023).

Confirming and updating new records of endangered freshwater turtles is crucial due to the widespread decline of the genera in Asia (Nguyen et al. 2018; Hasan and South 2023). However, ecological data on *O. borneensis* remains scarce, fragmented, and general. A clearer understanding of its habitat requirements and population dynamics is essential to inform conservation policies and legislation (Ernst and Barbour 1989; Kendrick and Ades 2009). Despite the CITES no-take quota for *O. borneensis*, regional fishing permits often issue quotas for unspecified freshwater turtles, which may undermine conservation efforts (Samedi and Iskandar 2000). Urgent action is needed to fully assess *O. borneensis,* and other overlooked Indonesian freshwater turtle species such as *Siebenrockiella crassicollis* (Gray, 1831) and *Notochelys platynota* (Gray, 1834) to ensure protection of key habitat areas. Better, comprehensive data is needed to strengthen conservation efforts and policies while also acknowledging their cultural and economic significance.

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ADDITIONAL INFORMATION

Conflict of interest

The authors declare that no competing interests exist.

Ethical statement

No ethical statement is reported.

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Author contributions

Conceptualization: VH, IIP, JG. Data curation: JS, VH, ASK. Formal analysis: VH, FSV, MBT, ABH, SA, N. Funding acquisition: VH. Investigation: VH, IIP, JG. Methodology: JS, VH. Project administration: VH, IIP. Writing – original draft: VH. Writing – review and editing: VH, JS, IIP.

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Data availability

All data that support the findings of this study are available in the main text.

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