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First record of the uncommon spiny eel *Mastacembelus notophthalmus* Roberts, 1989 (Synbranchiformes: Mastacembelidae) for Bangka Island, Indonesia

by

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Résumé. – Premier signalement de l'anguille épineuse peu commune *Mastacembelus notophthalmus* Roberts, 1989 (Synbranchiformes Mastacembelidae) pour l'île de Bangka, Indonésie.

Ce travail rapporte pour la première fois la présence de *Mastacembelus notophthalmus* Roberts, 1989 (Synbranchiformes Mastacembelidae) sur l'île de Bangka (Indonésie), plus spécifiquement pour la rivière Bumang Kemuja, district de Bangka Induk, province de Bangka Belitung. Ce signalement permet une extension méridionale de la répartition géographique de cette espèce. La nouvelle occurrence est à environ 500 km au sud de la localité la plus proche de la péninsule malaise, à environ 450 km au sud-est de la localité la plus proche à Sumatra et à environ 750 km au sud-ouest de la localité la plus proche à Bornéo. Par conséquent, ce nouveau signalement comble une lacune importante dans la répartition géographique de l'espèce, ainsi que l'enregistrement de l'espèce pour une île supplémentaire. De plus, nous fournissons une carte détaillée et mise à jour sur la répartition géographique de l'espèce, basée à la fois sur les données publiées et sur le matériel examiné. Ce nouveau signalement est basé sur deux spécimens collectés le 22 juillet 2022. Ils ont été identifiés comme *M. notophthalmus* car ils présentent une barre verticale sombre sous l'œil ; pas de motif réticulé sur le corps, région dorsale principalement brun foncé avec quelques marques vermiculées irrégulières jaunâtres ; région ventrale jaunâtre avec une bande horizontale brune foncée incomplète ; et les nageoires caudale, dorsale et anale jaunâtres avec des barres verticales brun foncé. De plus, les deux spécimens présentent des caractéristiques méristiques similaires aux données de la littérature pour l'espèce.

Key words. – Borneo – Distribution extension – Freshwater fishes – Peninsular Malaysia – Rare species – Sumatra.

The spiny eels of the family Mastacembelidae are typically elongated, eellike, vary in size from small to large species, and occur in several freshwaters systems across Africa, the Middle East,

southern Asia, Indo-China, and southeast Asia (Berra, 2001). This highly diverse family comprises more than 60 species (and some species complexes), many of them being important as commercial fisheries (Britz, 2007; Vreven and Stiassny, 2009).

Mastacembelus notophthalmus Roberts, 1989 is a spiny eel species found in the southeast Asian region. This species was described from Tapah Fisheries Station in Perak, West Malaysia (Roberts, 1989; Fricke *et al.*, 2022), and is currently only known to occur in two southeast Asian countries – Malaysia and Indonesia. The distribution of *M. notophthalmus* is thought to be restricted to the western portion of Peninsular Malaysia (Malaysia) (Roberts, 1989; Shafiq *et al.*, 2014; Ahmad, 2020; Fricke *et al.*, 2022); the northern and central portions of Sumatra (Indonesia) (Roberts, 1989; Ng *et al.*, 2019; Ahmad, 2020; Ng and Tan, 2020; Fricke *et al.*, 2022); and the western portion of Borneo (Indonesia) (Roberts, 1989; Kotletat *et al.*, 1993). This species is found in freshwater environments, inhabiting large flowing rivers with clear or slightly murky water with pebbles as substrate (Ahmad, 2020).

This work records for the first time *M. notophthalmus* in Bangka Island (Indonesia). This record represents the southernmost record for this species. In addition, we provide a detailed and updated map on the geographic distribution of *M. notophthalmus*.

MATERIAL AND METHODS

Records of *M. notophthalmus* (two specimens – Fig. 1A, B) were obtained from one collection site in the Bumang Kemuja River, Bangka Island (Indonesia). Both specimens were caught by local fishers using fishing lines with small hook, on 22 July 2022. The sampled habitat was in the central channel of the river (ca. 10–20 m wide), along a river bend with a rocky and sandy substrate and fast-flowing water (Fig. 2). These two specimens were fixed in formalin 10% (Hasan *et al.*, 2019), and deposited in the Ichthyological Collection of the Environmental and Fisheries Resources

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Figure 1. – Specimens of *Mastacembelus notophthalmus*, EFRM 0077, 244 mm TL (A), head of EFRM 0078, 261 mm TL (B), collected from the Bumang Kemuja River, Bangka Island, Indonesia.



Figure 2. – Collection site on the Bumang Kemuja River in Bangka Island, Indonesia where *Mastacembelus notophthalmus* was found.

Management Laboratory (EFRM), Faculty of Fisheries and Marine Science, Universitas Airlangga, Surabaya, Indonesia. Morphological observations followed Roberts (1989).

The updated map of the geographic distribution of *M. notophthalmus* was based on both published data (e.g., Roberts, 1989; Kottelat *et al.*, 1993; Ng *et al.*, 2019; Ahmad, 2020; and Ng and Tan, 2020) and on the new record presented here.

Material examined

Indonesia: Bangka Island, Bangka Belitung Province, Bangka Induk District, EFRM 0077, 244 mm TL (Fig. 1A); EFRM 0078, 261 mm TL (Fig. 1B), Bumang Kemuja River, 2°05'08"S, 105°57'24"E, local fishers, 22 Jul. 2022.

RESULTS

Specimen identification

The specimens collected in Bangka Island (Indonesia) (Fig. 1), more specifically from the Bumang Kemuja River, Bangka Induk District, Bangka Belitung Province (2°05'08"S, 105°57'24"E) (Figs 2, 3), were identified as *M. notophthalmus* based on the diagnostic features of this species as described by Roberts (1989).

The diagnostic features exhibited by the specimens include a dark vertical bar below eye; no reticulate pattern on body, dorsal region mostly dark brown with some yellowish irregular vermiculated marks; ventral region yellowish with incomplete dark brown horizontal stripe; and caudal, dorsal and anal fins yellowish, with vertical dark brown bars (see Fig. 1). Meristic characters of *M. notophthalmus* are presented in Table I. These morphological

Table I. – Meristic counts of *Mastacembelus notophthalmus*.

Character	<i>M. notophthalmus</i>		
	EFRM 0077	EFRM 0078	Roberts (1989)
Dorsal-fin spines	38	38	37-39
Dorsal fin rays	78	79	73-86
Anal fin rays	70	76	69-85
Pectoral fin rays	24	26	24-26
Caudal fin rays	16	18	15-18

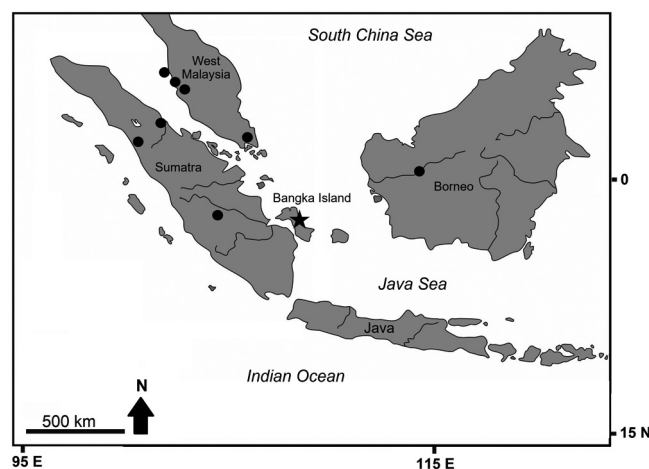


Figure 3. – Map of the known distribution of *Mastacembelus notophthalmus*. New record in Bangka, Indonesia (black star); published records (black circles) are based on Roberts (1989), Kottelat *et al.* (1993), Ng *et al.* (2019); Ahmad (2020); and Ng and Tan (2020).

features support the identification of the species as *M. notophthalmus*.

Updated map on the geographic distribution of *M. notophthalmus*

An updated map with the detailed geographic distribution of *M. notophthalmus*, based on published data and material examined by the present work, is presented in Fig. 3.

DISCUSSION

The new record of *M. notophthalmus* provided here for Bangka Island is the southernmost record for this species. In addition, the new record site is about 500 km south of the nearest locality in Peninsular Malaysia, about 450 km southeast of the nearest locality in Sumatra, and about 750 km south-west from the nearest locality in Borneo. Therefore, this new record fills an important gap in the geographic distribution of the species, as well as registering an additional island for the species (Fig. 3). New records of native fish species are essential contributions to the natural sciences. Without accurate species inventories it is impossible to create species-specific management and protection plans. In particular, new records which expand the spatial range of a species are necessary to support appropriate conservation related decisions and environmental impact assessments (Hasan *et al.*, 2021, 2022; Nurjirana *et al.*, 2022). Further documentation of the extent of the unknown ranges of native species, such as eels of the genus *Mastacembelus* Scopoli, 1777, may provide evidence on the way speciation and population fragmentation have occurred over time and space. For example, it

would be interesting to compare the evolutionary processes acting on the Mastacembelidae family in southeast Asia compared with the Afrotropics (Brown *et al.*, 2010; Day *et al.*, 2017).

It is possible that *M. notophthalmus* is present in other islands close to the West Malaysia mainland, Sumatra, and Borneo. While some *Mastacembelus* species can be quite abundant in West Malaysia, Sumatra and Borneo, *e.g.*, *M. unicolor* Cuvier, 1832, *M. erythrotaenia* Bleeker, 1850, and *M. favus* Hora, 1923 (Kottelat, 2013; Ng and Tan, 2020), *M. notophthalmus* is probably naturally rare, despite a conservation status of LC (Least Concern) in the International Union for Conservation of Nature (IUCN) Red List (Ahmad, 2020). The distinct lack of information on *M. notophthalmus* ecology, biology, range and fine-scale distribution makes it difficult to draw any meaningful conclusions regarding the actual conservation status, ecological functions and niche of this species. Extrapolating from the functional morphology and from what is known about other *Mastacembelus* spp., *M. notophthalmus* is most likely a benthic-associated predatory species relying on high benthic habitat complexity; thus it will be at risk from fisheries exploitation and habitat destruction in the region (Ward and Azizi 2004; Ahmad, 2020; Vreven and Stiassny 2009). We emphasize the urgency for more comprehensive and accurate data on the ecology and distribution of native taxa, including this species, to facilitate species-specific conservation assessments and management in Indonesia.

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