RAFFLES BULLETIN OF ZOOLOGY **70**: 534–549
Date of publication: 2 December 2022
DOI: 10.26107/RBZ-2022-0030
http://zoobank.org/urn:lsid:zoobank.org:pub:C726BF1D-A640-4DA6-8F8C-D4AE7F83C7C9

Updated distribution of the endangered freshwater stingray *Urogymnus polylepis* in Malaysia, with notes on biology and genetics

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Abstract. The giant freshwater stingray *Urogymnus polylepis* (Bleeker, 1852) (family Dasyatidae) is an endemic species in the Southeast Asian region, but comprehensive records of the distribution of this species within local river systems and their biology are still lacking. We reviewed current information for this species based on media reports, published literature as well as field observations. Two direct encounters of this species in Mukah, Sarawak, and in Sandakan, Sabah, confirmed recent occurrences of this species in Malaysian Borneo with the finding of an adult female with four pups. Public wildlife sighting information also provided additional 29 novel sightings of this species in Malaysia, out of which four were first records at the locations of Kukup and Sungai Sembrong in Johor, Pulau Bruit in Sarawak, and Tanjung Batu Laut in Sabah. These records suggested relatively high capture rates by trawlers in coastal areas and that the animals are closely associated with clean river systems. Genetic analysis showed paraphyly in *U. polylepis* with the formation of two major clades; one from the Gulf of Thailand and Malaysian Borneo, and the other from the Andaman Sea region and Indonesia. Threats to *U. polylepis* due to their own biological uniqueness, rarity of their occurrence, increasing level of river pollution, and potentially isolated populations highlight the urgent need for formal protection of the species.

Key words. giant freshwater stingray, social media, occurrence, river, Borneo, Peninsular Malaysia

INTRODUCTION

Urogymnus polylepis (Bleeker, 1852) is a large species of freshwater stingray in the family Dasyatidae. Previously known as *Himantura chaophraya* and *H. polylepis*, this species has undergone recent taxonomic revisions upon comparison of the holotype of *Trygon polylepis* in Java, Indonesia with specimens from various countries (including Malaysia), supported by additional molecular evidence (Last & Manjaji-Matsumoto, 2008; Last et al., 2016a). *Urogymnus* was previously a monotypic genus with a single species (*U. asperrimus*, porcupine ray). The genus currently has five additional valid species, namely *U. acanthobothrium*, *U. dalyensis*, *U. granulatus*, *U. lobistoma*, and *U. polylepis* (Last et al., 2016a; Last et al., 2016b). Four of these species (*U. asperrimus*, *U. granulatus*, *U. lobistoma*, and *U. polylepis*) have been recorded in Malaysian waters (Kottelat, 1998; Yano et al., 2005; Manjaji-Matsumoto & Last, 2006; Last et al., 2010). These species are mainly found in marine environments except *U. dalyensis* and *U. polylepis* (Chin & Compagno, 2016; Kyne, 2016; Manjaji-Matsumoto et al., 2020; Sherman et al., 2020; Grant et al., 2021; Rigby et al., 2021).

The giant freshwater stingray appears to be restricted in distribution to major rivers in South Asia and Southeast Asia (Vidthayanon et al., 2016; Sen et al., 2020; Grant et al., 2021). Published records indicate that this species occurs in at least seven countries in the South and Southeast Asia region, ranging from India to eastern Indonesia (Last et al., 2010). Recent distributional records confirmed the occurrence of this species in Sumatra, Indonesia, an island located across the Malacca Straits from Peninsular Malaysia with at least 12 sightings from 2008 to 2016 (Iqbal & Yustian, 2016). The ray was reported to occur both in river mouths as well as all the way up to 170 km upstream (Iqbal & Yustian, 2016). In addition, this species has also been reported in Indonesian Borneo in Kalimantan rivers with at least 16 sightings within the same period (Iqbal et al., 2020a). The name 'freshwater stingray' is somewhat of a misnomer as *U. polylepis* is euryhaline in nature and uses freshwater, brackish and inshore marine environments (Grant et al., 2021).

The species is listed as Endangered in the 2021 International Union for Conservation of Nature (IUCN) Red List of Threatened Species (Grant et al., 2021). Genetic information on the species is highly limited but distinct molecular differences between specimens from India and Thailand suggest that subpopulations are likely geographically isolated with very limited exchange, if any, between the subpopulations (Sezaki et al., 1999). Given the freshwater

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ISSN 2345-7600 (electronic) | ISSN 0217-2445 (print)