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Cover: Emperor Tamarin *Saguinus imperator*: a look into a better world through the mustache lens – mixed media illustration. © Maya Santhanakrishnan.



First record of Croaking Gourami *Trichopsis vittata* (Cuvier, 1831) from West Bengal, India

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Abstract: The Croaking Gourami *Trichopsis vittata* (Cuvier, 1831) is a native fish to southeastern Asia and Sundaland, with introduction reports from the USA, Philippines, and many other countries including India. In India, this species was first reported from Chembarampakkam Lake situated in Chennai during the year 2015. This study reports the presence of this fish for the first time in the Magra Beel, a wetland in the district of Nadia, West Bengal, in 2021, 2022, 2023. The laboratory evaluated the fish samples taken from the marsh to determine their fin ray counts and morphometric data. The results identified the species as *T. vittata* and supported previous research.

Keywords: Aquarium trade, distribution, invasion, Magra Beel, meristic count, morphometry, osphronemid fish, species identification.

Trichopsis vittata (Cuvier, 1831), known as Croaking Gourami in the ornamental fish trade, is a small air-breathing osphronemid fish, reported as native from Java, Borneo, Sumatra, Peninsular Malaysia, Thailand, and the Mekong basin in Cambodia, Laos, and Vietnam (Kottelat 1985; Baird et al. 1999). The species is an obligate air-breathing fish that prefers to live in shallow sluggish or standing-water habitats with abundant vegetation (Rainboth 1996). It can survive in brackish water up to 20 ppt salinity, and in temperatures down to 7.2°C (Schofield & Schulte 2016). It feeds on small planktonic crustaceans and insect larvae (Rainboth 1996). This species comprises more-extended filamentous anal-fin rays extending almost to the tip of the caudal-fin and also possesses

three dark lateral stripes on the body. A typical dark spot is present above the pectoral fin of the fish as a unique identifying character. Unlike other osphronemid fishes, *T. vittata* is popularized for the production of audible sounds or “croaks” (Ladich & Yan 1998).

Trichopsis vittata has shown invasiveness and introduced itself to a larger extent. Since its description by Cuvier in 1831 it has extended its range. The feral population has been documented in the USA (Florida) and the Philippines (Shafland 1996; Schofield & Pecora 2013; Schofield & Schulte 2016). The southeastern Asian countries including Indonesia, Thailand, Java, Borneo, Sumatra (Rainboth 1996; Kottelat 1985; Liengpornpan et al. 2007; Beamish et al. 2010), Vietnam (Freyhof et al. 2000; Herder & Freyhof 2006), Mekong tributaries of Indochina (Robins 1992; Baird et al. 1999; Kottelat 2013), Laos (Martin et al. 2011), Singapore (Alfred 1996; Low & Lim 2012), Cambodia (Rainboth 1996), Malaysia (Beamish et al. 2003) are reported to be the native places of *T. vittata*.

The non-native population of *T. vittata* has been documented from Myanmar and Bangladesh (Noren et al. 2017; Akash et al. 2018; Hossain et al. 2019). Literature depicts that in India *T. vittata* was first reported from the Chembarampakkam Lake situated in southern (Knight & Balasubramanian 2015); but its existence has not yet

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been reported from West Bengal.

STUDY AREA AND METHODS

The fish samples were first collected on 1 August 2021 from the Magra Beel. The collection was done by using a hand held drag net as per the conventional method. Then in quest of other populations of fish, multiple field visits were done between August 2021 and July 2023 in different fishing points of the Magra Beel within a distance of 1.5 km (Point-1: Opposite to Bijra Primary School; Point-2: Concrete bridge at 3 number Magra Beel; Point-3: Kheya Ghat opposite to Birahi Union Tapashili Fishermen’s Cooperative Society Limited office). The sampling sites of the Magra Beel are presented in Image 1.

After collection, the fish specimens were immediately preserved in 10% formalin for taxonomic study (Joshi et al. 2015). Different morphometric characteristics including total length, standard length, pectoral fin base length, pelvic fin base length, and anal fin base length were measured as per the conventional method and different meristic counts for dorsal fin rays, anal fin rays,

pectoral fin rays, pelvic fin rays were observed accordingly (Murdy & Shibkawa 2001). The preserved fish samples were submitted to the Fresh Water Fish Section of the Zoological Survey of India, Kolkata for identification and documentation. Some fish samples were subsequently transferred into 30%, 50%, and 70% ethanol for long-term preservation (Sterba 1962; Talwar & Jhingran 1991) for further study.

RESULTS

Morphometric and meristic characters

The collected samples have laterally elongated bodies with a standard length of 4.10 cm (Table 1). The dorsal fin originates far behind the base of the pectoral fin corroborating the previous findings of Hossain et al. (2019) and Shefat et al. (2020). A thin black line is found below the eye (Noren et al. 2017). Stripes and black spots are visible on the fin of both sides of the body. The morphometric measurements including total length, standard length, pectoral fin base length, pelvic fin base length, and anal fin base length of the fish have been

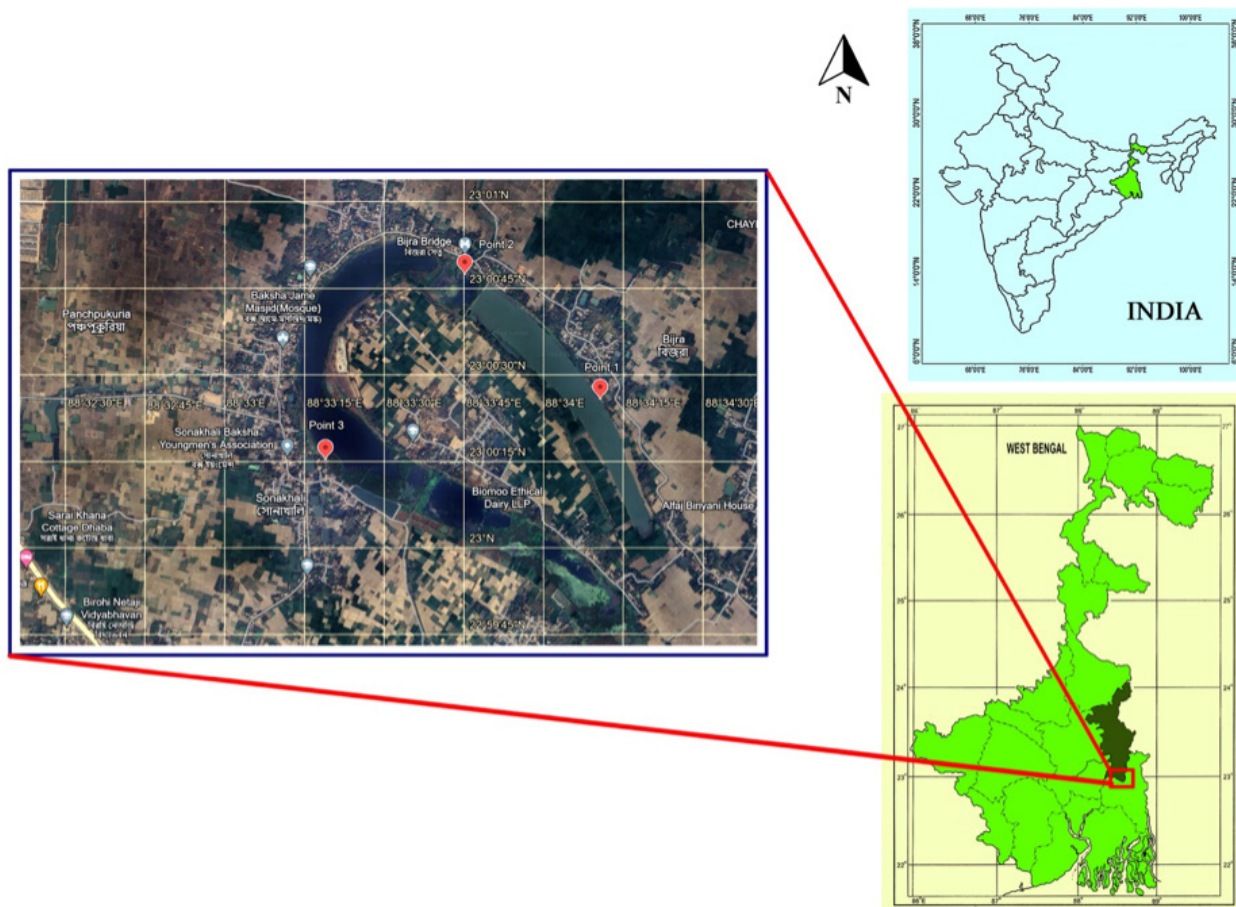


Image 1. The sampling points during study in Magra Beel.

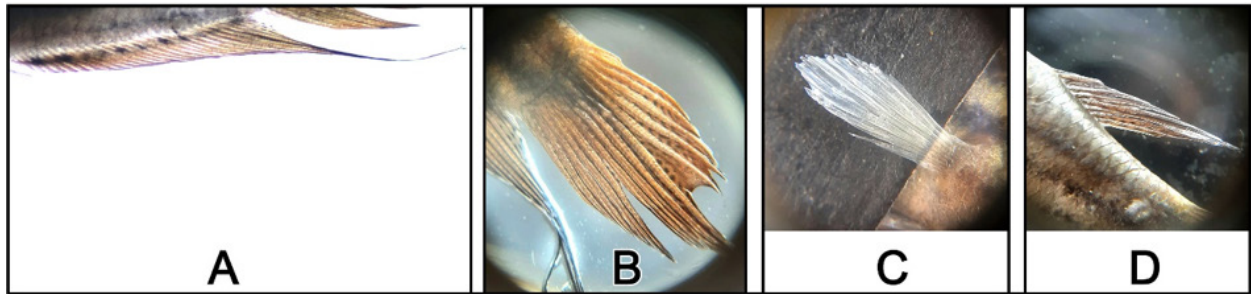


Image 2. *Trichopsis vittata* collected from Magra Beel: A—Anal fin | B—Caudal fin | C—Pectoral fin | D—Dorsal fin. © Bakul Biswas.

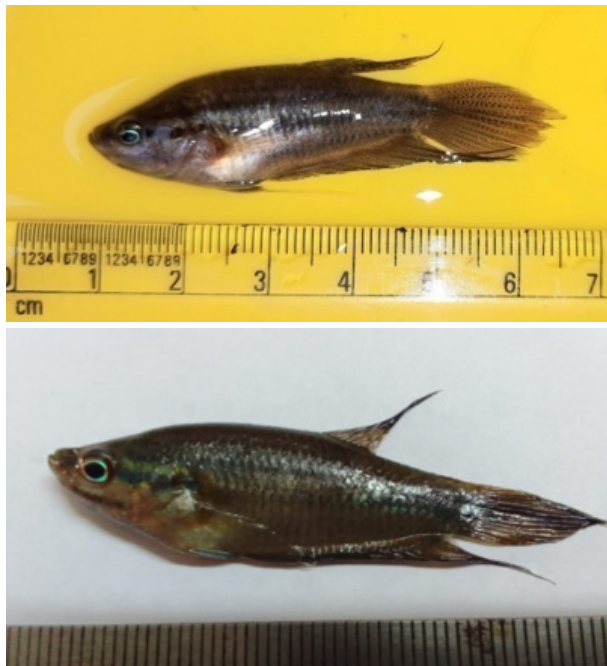


Image 3. *Trichopsis vittata* collected from Magra Beel. © Bakul Biswas, Sujal Dutta.

presented in Table 1. The anal fin is comprised of multi-branched fin rays with 6–8 spines and a few elongated filaments-like rays which are extended almost to the tip of the caudal fin. The dorsal fin of *T. vittata* has 2–4 spines, while the pelvic fin contains one spine followed by a filament and four rays. On the posterior half of the body, there are three longitudinal dark bands, which help to distinguish *T. vittata* from the related species *T. schalleri* and *T. pumila* (Noren et al. 2017). The fin ray counts are detailed in Table 1 and are consistent with the findings reported by Hossain et al. (2019).

Identification and cataloguing

After collecting the samples of fish from three different spots, the specimens were submitted to the Zoological Survey of India (ZSI) for identification and cataloguing.

Table 1. The morphometric measurement and meristic count of fin rays in *Trichopsis vittata*.

Morphometric characters	Length (cm)	Meristic characters	Number (range)
Total length	5.70	Dorsal fin ray	7–8
Standard length	4.10	Pectoral fin ray	10–11
Pectoral fin base length	1.20	Ventral fin ray	7–9
Pelvic fin base length	2.30	Anal fin ray	31–33
Anal fish base length	1.60	Caudal fin ray	12–16
-	-	Lateral line scales	29

The ZSI has identified the species and registered the submitted specimens as *Trichopsis vittata* (Cuvier, 1831) [Regd. No. ZSI FF 9935 dt. 24. 08. 2023].

DISCUSSION

In this present study, *T. vittata* was found in a lower abundance than the other native fish species; but the overall count is sufficient to prove its strong adaptability to this new environment. *T. vittata* is an efficient invader that can survive in a small volume of water and can tolerate high pollution and low dissolved oxygen level conditions (Wongsiri, 1982). Knight & Balasubramanium (2015) reported that in India *T. vittata* may compete for niche space with native species such as *Trichogaster lalius* (Hamilton, 1822) and Spiketail Paradise Fish *Pseudosphromenus cupnus* (Cuvier, 1831). The negative effects of *T. vittata* may also include aggressive displacement of native species or it may also act as a vector for parasites or pathogens such as trematode, *Euclinostomum heterostomum* (Purivirojkul & Sumontha 2013). Thus, the spreading of *T. vittata* across the country over the years will affect the native fish biodiversity. Of late, the particular impact of this species on other indigenous fish species is currently unknown, therefore, further in-depth study regarding its biology, ecology, and inter-specific interactions among the non-native range in

India are required at the earnest level.

The way of introduction of the fish species in the Magra Beel is not known. However, the most probable mechanism of introduction may be the release from the aquarium trade (Noren et al. 2017). As per the first recommendations of ZSI, Kolkata, “is an exotic species and distributed worldwide via aquarium trade. The specimen shows some variations from the description of *Trichopsis vittata* and may be a hybrid also. It needs further study based on freshly collected specimens for confirmation”. Later on ZSI Kolkata identified and registered the specimen as *Trichopsis vittata* (Cuvier, 1831), family Osphronemidae [Regd No. ZSI FF 9935 dt. 24. 08. 2023]. Deliberate aquaculture efforts could serve as a vector for invasion (Akash & Hossain 2018). Given that *T. vittata* has been previously reported in various rivers across Bangladesh (Noren et al. 2017), some of which are in close proximity to the state of West Bengal, it is plausible that this species could migrate to West Bengal via these river routes.

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