

Distribution and Taxonomic Study of a Newly Recorded Species *Trichopsis vittata* in Bangladesh

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Abstract: *Trichopsis vittata* (Cuvier, 1831), the croaking gourami, is a non-native species among the small freshwater fishes of the perch group. The fish was identified by morphometric and meristic characteristics under the Family Osphronemidae. A total of eleven specimens were collected during the period from April, 2012 to June, 2015 in the river such as Kalidas Paharia, Feni, Muhuri and Buriganga River, the GPS coordinates are 22°54'22.1"N, 91°28'29.6"E; 22°54'40.2"N, 91°27'52.5"E and 22°55'17.1"N, 91°30'25.5"E and 22°42'36.81"N and 90°21'45.6"E respectively.

Key words: Osphronemidae, ecosystem, estuaries, biodiversity.

Introduction

Trichopsis vittata (Cuvier, 1831), the croaking gourami, is a non-native species among the small freshwater fishes of the perch group. They are native to still waters in Southeast Asia and are distributed worldwide such as Java, Borneo, Sumatra, Malaya, Thailand, Laos, Cambodia, and Vietnam (Robin *et al.*, 1991). The fish, however, was recently identified in the Meghna and adjacent floodplain. Croaking gouramis are mostly insectivorous feeding on insects and insect larvae. They have a natural capability of producing a 'croaking' noise using their pectoral fins (Ladich *et al.*, 1992).

This species is usually not fished commercially, occasionally sold as part of mixed catches in markets and regularly seen in the aquarium fish trade (Rainboth, 1996). They can reach an average size of about 3.8 cm (Hugg, 1996), though some individuals can grow as large as 7 cm (Baird *et al.*, 1999). Coloration is highly variable, ranging from pale brown and green to dark purple with black or red spots on the fins. The iris of the eye is bright blue or purple (Sterba, 1983). A clearly visible spot of two to four brown or black stripes or rows are present on both sides of their body (Rainboth, 1996).

To develop a sustainable conservation strategy on any species and to create a systematic approach in their implementation, information on the Biology and population structure of that species is a prime prerequisite. So far, very limited works have been carried out on this species under discussion which is why they have still kept most part of their life unrevealed to us. It is expected that the findings of this research work will enlighten the existence and adaptability of them in this water. Moreover, this information can be applicable for conducting short-term studies on some more environmentally induced variations.

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Herein, information has been relayed on a fortuitous collection and subsequent follow-up documentation of a population of the croaking gourami *Trichopsis vittata*. Though it is now known to be reproducing in a localized area, this species was previously considered as extirpated (Shafland, 1996).

The aim of this study is to find out the meristic and morphometric characteristics on this fish species, *Trichopsis vittata*. The distribution of this species in the rivers of Kalidas Paharia, Feni, Muhuri and Buriganga.

Materials and Methods

Sampling sites and study period

Trichopsis vittata (Cuvier, 1831) was collected from some rivers of Dhaka region in Bangladesh which are interconnected with the River Buriganga in 11.40am on December 14th, 2013. The GPS coordinate of the sampling area was 22°42'36.81"N and 90°21'45.6"E. Several specimens were also collected from the adjacent areas of the Buriganga River. Fish sample collection has conducted in the same area in August 2014.

It has been conducted a survey in May 29th, 2014 in Kalidas Paharia, Feni and Muhuri River of Feni district; the GPS coordinates are 22°54'22.1" N, 91°28'29.6"E; 22°54'40.2" N, 91°27'52.5"E and 22°55'17.1" N, 91°30'25.5"E respectively. The three rivers are interconnected with each other and the biological information extracted from those sampling areas was quite similar as well.

Collection and preservation

Sampling was conducted using a variety of gear types (Dip nets, seines and chai trap) in canals, ditches and swamps. Native and non-native both fishes were collected and were preserved in 10% formaldehyde for taxonomic study. The samples were then transferred into 30% ethanol solutions, 50% and finally 70% concentrations for long time preservation (Talwar and Jingran, 1991).

The morphometric of this fish species followed by Murdy and Shibukawa (2001) are as follows:-

TL= Total Length; HL= Head Length; P₂FB= Pelvic Fin Base; PL= Peduncle Length; IOL= Inter Orbital Length; PD=Peduncle Depth; P₁FB= Pectoral Fin Base; PDL=Pre-Dorsal Length; Po. OL= Post Orbital Length; SALL= Scale Above Lateral Line; DFB=Dorsal Fin Base; SL= Standard Length; Pr. OL= Pre-Orbital Length; SAL= Scales Along Lateral Line; SBL= Scales Below Lateral Line; FL= Fork Length; P₁FL= Pectoral Fin Length; P₂FL= Pelvic Fin Length; ED= Eye Diameter; AFB= Anal Fin Base; BD= Body Depth; Br= Branchiostegal rays; D₁, D₂= 1st and 2nd Dorsal Fin.

As per the same source, the Meristic measurements are:-

SL/TL; HL/SL; Pelvic Fin Length, P₂FL/SL; P₂FL /HL; Pectoral Fin Length, P₁FL/SL; P₁FL/HL; P₁FL/ P₂FL; Body Depth, BD/SL; Pre-Dorsal Length, PDL/SL; Inter Orbital Length, IOL/SL.

Results and Discussion

A total of eleven specimens of *Trichopsis vittata* were collected from four different localities of Bangladesh from April, 2012 to June, 2015. Two of those were main river streams; two other locations were in the freshwater swamp interconnected with river. The collection localities are grouped in a relatively small area. Five specimens were collected from the River Buriganga and adjacent areas, four from Kalidas Paharia River, one from Feni River and one from Muhuri River. Besides, some native fish species from different order (Such as Siluriformes, Cypriniformes, and Perciformes etc.) were collaterally collected from adjacent localities.

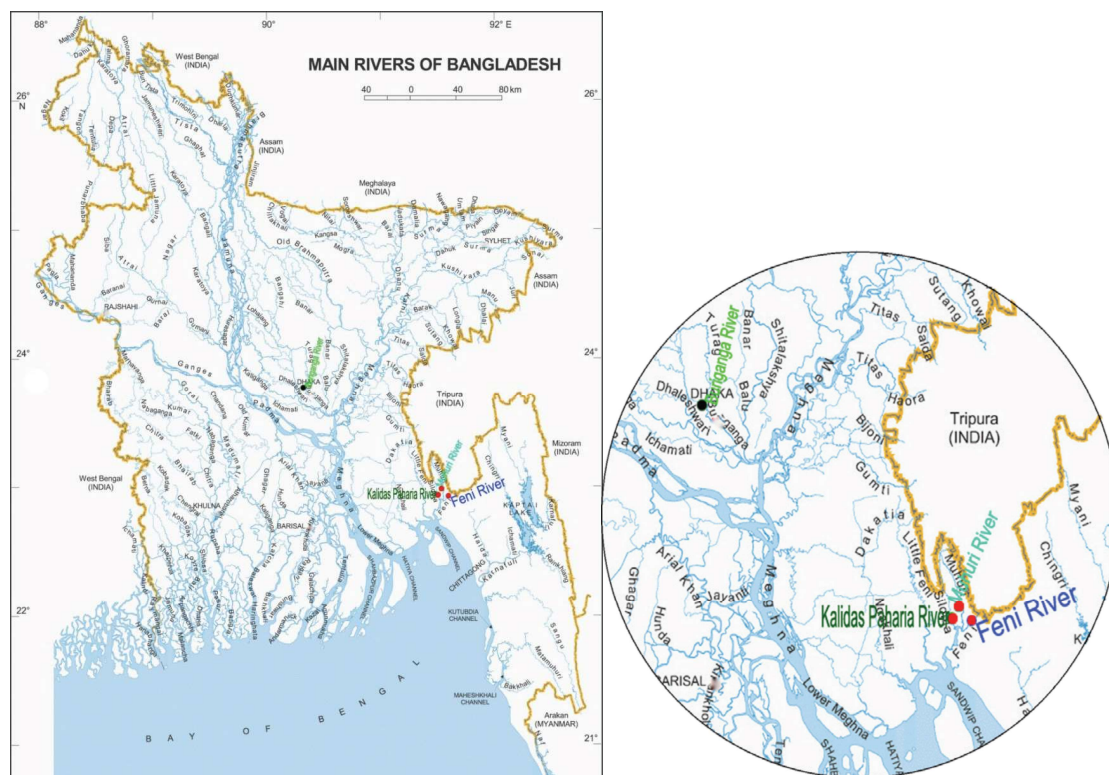


Figure 1. Map of occurrences of *Trichopsis vittata* in Bangladesh. Zigzag black lines indicate rivers. One black dots represent collections made in Buriganga river, other three black dots represent collections made in Feni, Kalidas paharia and Muhuri river.

In the sampling areas around the River Buriganga and Kalidas Paharia, this species was found in an incredibly low density in both the sampling times, though in two different times of a year. On the other hand, around the river Feni and Muhuri, the species was found to be available only in a lesser amount than in Buriganga and Kalidas Paharia Rivers. Interestingly, the counts of the same months of two different years were pretty same. As a matter of fact, around Feni region, the count was subsequently lesser in different times of a year. Plainly, the overall count of this species was very low but sufficiently strong to prove their surprising existence in these waters, proving their biological information exceedingly valuable for further studies on them.

Another important fact is *T. vittata* has been a common aquarium fish, but for the first time this species is found in some rivers such as Kalidas Paharia River, Feni River, Muhuri River and Buriganga River of Bangladesh.

There are immense scopes and possibilities of further research works which will undoubtedly enhance our understanding on their geographic ranges, physiological tolerances, life cycle, behavioral interactions, their impacts and most importantly, their evolution characteristics. Currently, there are no conservation strategies and measures in place for this species and further research is required on its possible future threats (IUCN, 2015).



Figure 2. *Trichopsis vittata*.

Taxonomic position: Phylum: Chordata,
Class: Actinopterygii-ray-finned fishes, spiny rayed fishes;
Order: Perciformes- perch like fishes;
Family: Osphronemidae- gouramies;
Genus: *Trichopsis*
Species: *Trichopsis vittata*.

Local Name: Poddopata, napit.

Common English Name: Croaking gourami.

Taxonomic Formula: D.II/7, P₁ 9, P₂.I/5, A.VI/22-24.

Distribution: *Trichopsis vittata* the croaking gouramy is a small freshwater fish. *Trichopsis vittata*(Family: Osphronemidae) is wide ranging throughout tropical Asia, from Thailand to Indonesia, including Java, Borneo, and Sumatra (Kottelat 1985; Rainboth 1996). Information about its biology and ecology has been published in Malaysia (Beamish *et al.* 2003), Vietnam (Herder and Freyhof 2006), Thailand (Beamish *et al.* 2010), Cambodia (Rainboth 1996) and Singapore (Low and Lim 2012). There's also a feral population in Palm Beach Country, Florida, USA (Shafland, 1996).

Description: Morphometric measurements of the fish are as follows, Number of Fin Rays/Spines: Total dorsal fin spines /rays II/7; Pectoral fin rays 9; Pelvic fin spine/raysI/5; Anal fin spines/rays VI/22-24; Anal fin narrowly jointed with caudal fin base, Caudal fin rays 16; Branchiostegal rays 5; Body measurement: Maximum total length 53mm; Standard length 36.4mm; Pre-dorsal length 23.6; Body Depth 13.0; Head

measurement: Eye diameter 3.7mm; Pre-orbital length 3.6mm; Post- orbital length 6.7mm; Inter-Orbital length 4.2mm; Fin base length; Dorsal Fin base length 19.5mm; Pectoral Fin base length 10.0mm; Pelvic Fin base length 21.7; Pelvic Fin length; Anal fin base length 15.0mm.

Meristic measurements are as follows: SL/TL = 0.687; HL/SL= 0.50; Pelvic Fin Length, $P_2FL/SL = 0.596$; $P_2FL /HL = 1.19$; Pectoral Fin Length, $P_1FL/SL = 0.275$; $P_1FL/HL=0.549$; $P_1FL/ P_2FL=0.461$; Body Depth, $BD/SL = 0.357$; Pre-Dorsal Length, $PDL/SL=0.648$; Inter Orbital Length, $IOL/SL=0.115$.

Morphological Characteristics

Body shape is laterally elongated. Dorsal fin origin far behind base of pectoral fin. 24-28 branched fin rays are present in the anal fin (Rainboth, 1996). In case of anal fin, and six to eight spines are present (Smith, 1945) Pelvic fin with 1 spine followed by a filament and 4 branched rays. Dorsal fin contains two to four spines. Two or more stripes along the body (Rainboth, 1996). Anal fin with a few elongate, filament-like rays extending backwards almost to tip of caudal fin; black blotch above pectoral base (Kottelat, 2001). About 13 transverse scale rows are present in their body and Lateral line absent (Rainboth, 1996).

Acknowledgements

We are grateful to acknowledge the “Faunal survey and Enrichment of Facilities for Biodiversity Research” in the Department of Zoology, Dhaka University under the Sub-project (CP-2216), HEQEP, UGC, Bangladesh and World Bank for the financial support. Also acknowledge all the Researchers and staffs of FSEFBR/HEQEP (CP-2216) for their great support.

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