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MORPHOLOGICAL AND MERISTIC STUDY FOR THE IDENTIFICATION OF *Rhinomugil corsula*, (HAMILTON - BUCHANON, 1822), RECORDED FROM RUPNARAYAN RIVER, WEST BENGAL, INDIA

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AUTHORS' CONTRIBUTIONS

This work was carried out in collaboration between both authors. Author AC designed the study, performed the statistical analysis and wrote the protocol of the manuscript. Author MMM wrote the first draft and managed the analyses of the study. Author MMM also managed the literature searches. Both authors read and approved the final manuscript.

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ABSTRACT

Rhinomugil is a monospecific genus which is commonly known as mullets with a worldwide distribution in tropical and subtropical marine water bodies. They are not only inhabited in the marine water but also available in brackish water or even in freshwater riverine system. Rupnarayan river is a small range river in West Bengal covered eighty kilometers from Bandar Ghat [22.67°N, 87.77°E], Paschim Midnapore district to Gadiara [22.22°N, 88.04°E] of Howrah district. Naturally this riverine water body is divided into two regions, the upstream with less tidal activity and low saline part and the downstream with high tide and comparatively more saline region. The surveys were conducted from February 2018 to February 2020 during pre monsoon, monsoon and post monsoon period. Specimens were collected by the use of traditional fishing methods operated by the local fishermen. The collected specimens were identified on the basis of existing literature and measurement taken upto one decimal place in the metric system. The present study is a survey work on fish faunal diversity of Rupnarayan River reveals that *Rhinomugil corsula* is first time reported from the said River and its distribution is being extended up to the upstream part of this river which is less influenced by the tidal flow in freshwater region of the river.

Keywords: Mullet; *Rhinomugil corsula*; Rupnarayan River; first record.

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1. INTRODUCTION

Rhinomugil corsula is a brackish water anadromous fish species belonging to the family Mugilidae and order Mugiliformes. This species is widely distributed throughout the Indian subcontinent. It is a very common species in Bangadesh Rahman, [1], Ara, S.I., et al., [2], Mayanmar Khin, [3]. This species is already reported on the Hoogly estuary (Nath A.K. Patra A., [4] and Ganga river Hamilton -Buchanon, [5] in west Bengal, India. *Rhinomugil corsula* Hamilton -Buchanon, [5] is an important commercial species which has a natural population. But now-a-days the population of *Rhinomugil corsula* Hamilton -Buchanon, [5] declined for various reasons such as overfishing, Pollution, destruction of breeding ground, enlargement of catchment area Hossain et.al., [6]. The present study reports that the occurrence of *Rhinomugil corsula* Hamilton -Buchanon, [5] in Rupnarayan river which is a tidal river shows the extension of the habitat with widely distribution of this species into different study sites up to the upstream region of this river in West Bengal.

2. MATERIALS AND METHODS

During the study period (from Feb 2018- Feb 2020) the specimens were collected by using different gears with the help of fishermen and also collected from local fish markets located on the banks of the river. After taking photographs the specimens were preserved in a wide mouth jar having 4% formalin solution Bagra, [7] and brought to the laboratory of Department of Zoology, Raja N.L. Khan Women's College (Autonomous) for proper identification and permanent preservation. The specimens were studied morphologically and meristically for proper identification by help of existing literatures like Talwar and Jhingran, [8]; Jayaram, K.C., [9] etc.

Material examined: Seven specimens (Total length 10-12.7 cm) were collected from Rupnarayan River and deposited in the museum of PG Department of Zoology, Raja N.L.Khan Women's College (Autonomous).

3. RESULTS

Diagnosis (Table 1 & 2): The fresh fish have a shiny silver colour in abdomen and grayish brown colour in dorsal part of the body. The body shape is sub-cylindrical with an elevated eye in the upper anterior position of the head region which placed just above the water surface and helps them to swim. Head is moderate and depressed with scale. Mouth is ventral. The upper jaw is longer than the lower jaw. The upper lip is thick which makes the mouth protrusible. Presence of two well separated dorsal fins. The meristic analysis (Table 2, Fig. 2) shows that the first dorsal fin contains 4 fin rays showing webbed in which is slightly hard and the 2nd dorsal fin with 8 fin rays with soft impression and there is no adipose fin. The paired pectoral fin with 15 soft fin rays in each and the Pelvic fin contains 6 fin rays where the first one is slightly hard than the others. The anal fin with 9 soft fin rays and the caudal fin is slightly emarginated or furcated with 17 soft fin rays. Lateral line is absent. The least height of caudal peduncle is 1.3 cm and the length of caudal peduncle is 1.9cm. The number of circumpeduncular scale is 16-18.

Fin Formula: D1 IV, D2 I+7, P 15, V6, C17

Synonyms:

Mugil corsula: Hamilton, [5]; Day, [10,11], Jones, [12]; Bhuiyan, [13]

Rhinomugil gill: Gill [14]

Rhinomugil corsula: Schultz [15], Rahman, [16], Senou [17], Thomson [18], Eschmeyer and Fong [19].

Type Species: *Mugil corsula* Hamilton, 1822 *Fishes of the Ganges.* Archibald constable and company, Edinburgh. p. 221.

Type locality: Ganges river

Common name in Bengali: Taroi, Kharsula

English name: Corsula Mullet

Conservation Status: According to IUCN (3.1) this species is least concern (LC)

4. DISCUSSION

During the present study, most of the morphometric and meristic characters of *Rhinomugil corsula* Hamilton -Buchanon, [5] were studied which were collected from the different zones of the upstream and downstream of the river Rupnarayan. There are no discriminating characteristics present in male and female individuals morphologically. Present specimens are completely agreed with the diagnosis done by Talwar and Jhingran [8] except the second dorsal fin with seven rays, caudal fin with seventeen rays. Literature survey reveals that a very little work has been done on the fish faunal diversity of the river Rupnaryan except Mishra et al. [20] and Ghorai et al. [21] and listed seventeen and thirty-eight of species respectively.

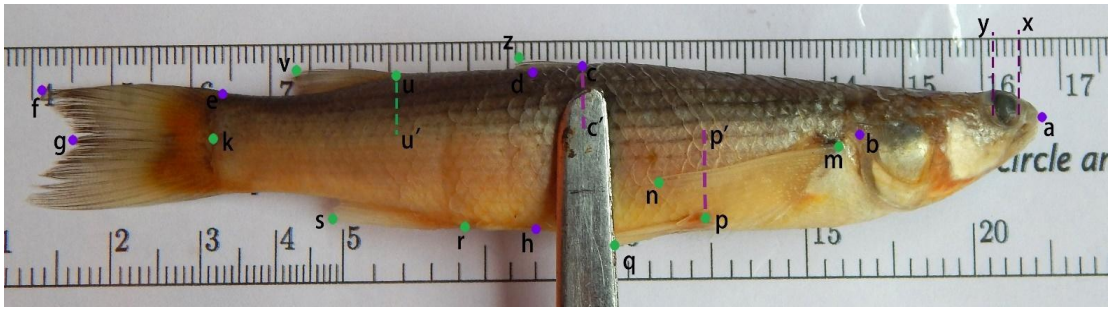

Fig. 1. Lateral view of *Rhinomugil corsula* (Hamilton -Buchanon, [22]) showing different body parts with measurements

af-Total Length, ag-Fork Length, ak-Standard Length, ab-Head Length, ax-Snout Length, xy-Eye Diameter, yb-Post Orbital Length, am-Pre Pectoral Length, ap-Pre Pelvic Length, ac-1st Pre Dorsal Length, au-2nd Pre Dorsal Length, dh-Body Depth, mn-Pectoral Fin Length, pq-Pelvic Fin Length, rs-Anal Fin Length, cz-1st Dorsal Fin Length, uv-2nd Dorsal Fin Length, ef-Caudal Fin Length.

Table 1. Morphometric measurement of examined *Rhinomugil corsula* (Hamilton -Buchanon, [22]) from Rupnarayan river

S. NO	Parameters	Length (cm)
1.	Total length	12.7
2.	Standard length	10.2
3.	Fork length	11.5
4.	Head length	1.7
5.	Pre dorsal length	5.5 (1^{st}) 7.8 (2^{nd})
6.	Post dorsal length	4.9(1^{st}) 2.5(2^{nd})
7.	Snout length	0.4
8.	Pre pectoral length	2.8
9.	Pre pelvic length	4.4
10.	Body depth	1.8
11.	Eye diameter	0.4
12.	Caudal peduncle height	1.3
13.	Caudal peduncle length	1.9
14.	Length of pectoral fin	2.15
15.	Length of pelvic fin	1.5
16.	Length of First dorsal fin	1.1
17.	Length of second dorsal fin	1.4
18.	Length of anal fin	1.7
19.	Length of caudal fin	2.4

Table 2. Meristic count of *Rhinomugil corsula* (Hamilton -Buchanon, [22])

Sl. No	Meristics data	Number
1.	1^{st} dorsal fin rays	4
2.	2^{nd} dorsal fin rays	8
3.	Pectoral fin rays	15
4.	Pelvic fin rays	6
5.	Anal fin rays	9
6.	Caudal fin rays	17
7.	Circumpeduncular scales	16-18

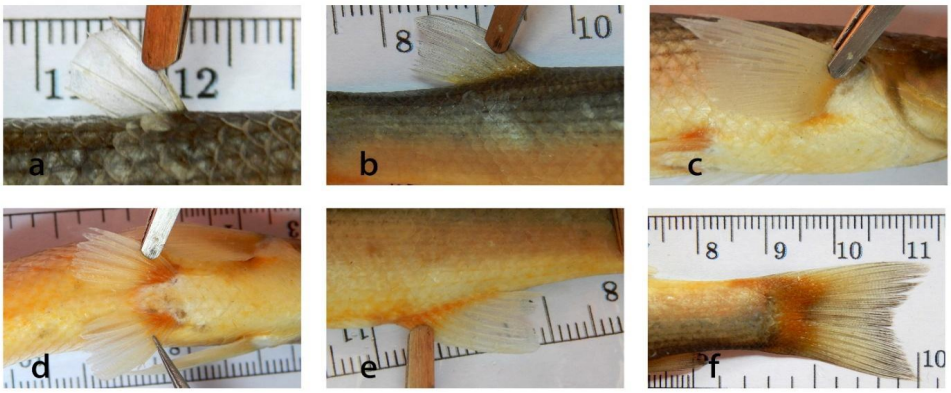

Fig. 2. a. First dorsal fin, b. Second dorsal fin, c. Pectoral fin, d. Pelvic fin, e. Anal fin, f. Caudal fin of Rhinomugil corsula (Hamilton -Buchanon, [22])

This species was abundant in this river throughout the whole year but especially in the rainy season in the month of April to July-August a huge number of populations occur. According to Bhuiyan, et al. 1994 reported the breeding season of *Rhinomugil corsula* Hamilton -Buchanon, [5] is in the month of April to July. This species is a surface feeder that's why it takes some leaves of plants, small insects, zooplanktons, small fishes etc. as a feed. It has very soft and tasty flesh which is sold in the market for 120-150 Rs/kg in matured fish. This species extended their habitat and geographical location due to environmental changes and depends on variable water parameters.

5. CONCLUSION

Present study reveals that the presence of *Rhinomugil corsula* Hamilton -Buchanon, [5] in Rupnarayan river certainly enhances the macrofaunal diversity of the river. The first time report of the species is useful knowledge for future researchers, policy planners and also all stakeholders related to fishery management.

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COMPETING INTERESTS

Authors have declared that no competing interests exist.

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