Rec. zool. Surv. India: Vol. 120(4)/401–407, 2020
DOI: 10.26515/rzsi/v120/i4/2020/150628

ISSN (Online) : 2581-8686
ISSN (Print) : 0375-1511

A preliminary study on the Ichthyofaunal Diversity of the Mej River in Bundi District, Rajasthan

Harinder Singh Banyal* and Sanjeev Kumar

Desert Regional Centre, Zoological Survey of India, Jodhpur – 342005, Rajasthan, India
Email: dr.harinderbanyal@gmail.com

Abstract

The present paper documents ichthyofaunal diversity of the Mej River, a part of Chambal Riverine system, in Rajasthan state. Eleven species of fishes belonging to 9 genera, 6 families and 4 orders were recorded from the Mej River. This is the first attempt to explore fish diversity of Mej River.

Keywords: Chambal, Fish, Tributaries, Vertebrates, Water pool

Introduction

Ichthyofaunal diversity denotes variability among fish species; it may possibly also speak of genotypes in fish population, comprising various species across aquatic ecosystems (Burton *et al.*, 1992). Biodiversity is similarly vital for equilibrium of biomes, as well as for understanding fundamental value of all species on the earth (Ehrlich & Wilson, 1991). Fish constitutes virtually half of the total number of vertebrates in the world. Fish dwell in almost all feasible aquatic habitations; over one-half i.e. 32,000 species of the world's living vertebrates – more than 60,000 species – are fishes (Nelson *et al.*, 2016). India is at the ninth position in terms of freshwater diversity in the world (Mittermeier & Mittermeier, 1997). (Gopi *et al.*, 2017) have given an account of 1027 species of freshwater fishes from India.

Rajasthan is a state with diverse water resources including rivers, lakes, reservoirs, and tanks. Stony landscape of southern Rajasthan encompasses good vegetal cover and harbours ideal habitat for water resource and potential for development.

Chambal and Mahi are the main rivers which along with their tributaries drain north eastern, eastern, and southern part of Rajasthan. Ichthyofaunal diversity of the Chambal River and its basin is known to us mainly due to the research work of Dubey & Mehra (1962) who, described 71 species from the Chambal River; (Ridhi *et al.*, 2012) has recorded 22 species of fish from Madhya Pradesh portion of River Chambal; Nair & Krishna (2013) have given literature based checklist of 147 species from Chambal River basin; Verma *et al.* (2008) have documented 39 fish species from Rana Pratap Sagar reservoir part of Chambal River; whereas, Banyal & Kumar (2015a) have recorded 54 species of fish from Rajasthan portion of the River Chambal.

The Mej River is one of the main tributaries of Chambal River in Rajasthan. The Mej River is a left bank tributary of Chambal River. Wajan, Kural, Mangali, Ghoda and Pachhad are the main tributaries of Mej River. The semi-circular sub-basin of Mej River has an area of 24,848 sq km with perimeter of 1104 km in Rajasthan. The catchment area of the river extends over Bhilwara, Bundi District, and Tonk District of Rajasthan. Mej River originates from Aravalli hills (25°12'50.40" N 75°18'13.09" E) at an elevation of 1687ft in Mandalgarh area of Bhilwara district traverses for 190 kms and joins Chambal River near Bhaius Khana village in Kota district at (25°40'30.73" N, 76°17'34.18" E) with elevation of 709ft in the sandstone rock of Vindhyan Super Group in Rajasthan.

The water of Mej River is auctioned every year by the Rajasthan State Fisheries Department and, thus, contributes to the economy of the Rajasthan state. The information regarding fish fauna of the Mej River is virtually nonexistent. Since, this river feeds Chambal River and is vital from fish faunal diversity perspective

* *Author for correspondence*

Article Received on: 01.02.2020 Accepted on: 20.07.2020

because, many important aquatic animals are dependent on fishes as food in the Chambal Riverine ecosystem. Hence, authors have investigated fish faunal diversity of Mej River in Bundi district of Rajasthan.

Material and Methods

Fish sampling was mainly done in Bundi district at Dolunda village (25°23.687'N, 076°19.626'E) in the month of December, 2018. The sampling site was selected in consultation with Rajasthan State Fisheries Department, depending upon appropriateness of riverine habitat from water availability point of view. Fishes were collected mainly by using cast nets. Gill, hand, scoop and drag net were also used. The fish catch of fishermen was also analyzed. The fishes were preserved in 5-10% formalin. The collected fishes were identified following Talwar & Jhingran (1991), Jayaram (2013) and other relevant literature including web-based information like Fish Base (Froese & Pauly, 2019).

Results

Eleven species of fishes belonging to 9 genera, 6 families and 4 orders fishes were recorded from the Mej River.

Systematic account of the fishes is given below:

Order CYPRINIFORMES

Family CYPRINIDAE

1. *Osteobrama cotio* (Hamilton, 1822) (Cotio)

1822. *Cyprinus cotio* Hamilton, *Fish. Ganges*: 339, pl. 39. fig. 93.

2018. *Osteobrama cotio*: Singh *et al., Mitochondrial DNA:* Part A **29**(3): 361-366.

Material examined: V/3919, 18 ex., 12–14 cm.

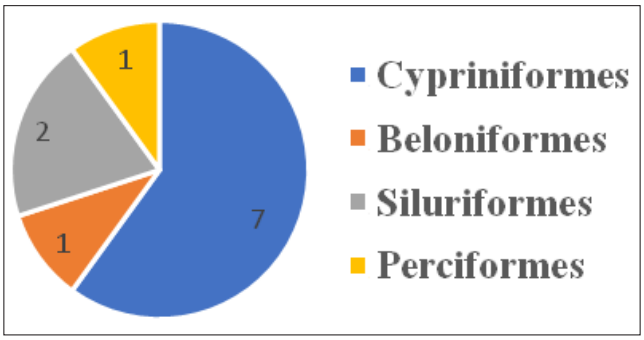


Figure 1. Chart showing order wise composition of fish species.

Figure 2. A view of Mej River at area of Study.

Figure 3. Map showing area of Study (Source: Google Earth).

Distribution: It is a commonly found minnow in the Indian inland waters.

Remarks: Extensively found in variety of habitats, prefers stagnant water and is a good larvicidal fish.

2. *Cirrhinus mrigala* (Hamilton, 1822) (Mrigal carp)

1822. *Cyprinus mrigala* Hamilton, *Fish. Ganges*: 279, 386, pl. 6. fig. 79.

2013. *Cirrhinus mrigala*: Jayaram, *The freshwater fishes of the Indian region*: 145, 146.

Material examined: V/3916, 01 ex., 35.5 cm.

Distribution: This fish is widely stocked in Indian inland waters.

Remarks: It is an important freshwater commercial fish which occurs in rivers, lakes and culture ponds.

3. *Cirrhinus reba* (Hamilton, 1822) (Reba Carp)

1822. *Cyprinus reba* Hamilton, *Fish Ganges*: 280, 386.

2013. *Cirrhinus reba*: Jayaram, *The freshwater fishes of the Indian region*: 145-146.

Material examined: V/3917, 28 ex., 19–24 cm.

Distribution: Commonly found in India.

Remarks: This fish mainly feeds on plankton and detritus and is found in variety of aquatic habitats.

4. *Labeo calbasu* (Hamilton, 1822) (Calbasu/ Black rohu)

1822. *Cyprinus calbasu* Hamilton, *Fish. Ganges*: 297, 387, pl. 2, fig. 83.

2013. *Labeo calbasu*: Jayaram, *The freshwater fishes of the Indian region*: **149**: 152.

Material examined: V/3921, 02 ex., 32–35 cm.

Distribution: Found throughout India including Rajasthan.

Remarks: Prefers sluggish moving aquatic habitats and feeds on plants, filamentous algae and diatoms.

5. *Labeo gonius* (Hamilton, 1822) (Kuria labeo)

1822. *Cyprinus gonius* Hamilton, *Fish Ganges*: 292, 387.

2018. *Labeo gonius*: Bleher, *Indian Ornamental Fishes,* **1**: 585.

Material examined: V/3920, 02 ex., 60-64 cm.

Distribution: This fish is widely distributed in India including Rajasthan.

Remarks: Adults reside mainly in rivers. They spawn during the southwest monsoon. This fish is cultured in ponds along with other carp species. It is a valuable fish.

6. *Systomus sarana* (Hamilton, 1822) (Olive barb)

1822. *Cyprinus sarana* Hamilton, *Fish. Ganges*: 307, 388.

2013. *Systomus sarana*: Kottelat, *Raffles Bull. Zool.* Suppl. 27: 166.

Material examined: This species was identified from the fisherman's catch, 8.7–10.2 cm.

Distribution: Throughout India including Rajasthan.

Remarks: Dwells in rivers, streams, lakes, and backwaters. It can tolerate salinity. Breeds in running waters among inundated boulders and vegetation.

Family DANIONIDAE

7. *Salmostoma bacaila* (Hamilton, 1822) (Large Razor belly minnow)

1822. *Cyprinus bacaila* Hamilton, *Fish. Ganges*: **265:** 384.

2018. *Salmostoma bacaila*: Bleher, *Indian Ornamental Fishes,* **1**: 774.

Material examined: V/3918, 27 ex., 12.3–14.5 cm.

Distribution: Widely distributed in India including Rajasthan.

Remarks: This species is a surface feeder and a preferred food for the piscivorous birds.

Order SILURIFORMES

Family BAGRIDAE

8. *Sperata seenghala* (Sykes, 1839) (Giant river-catfish)

1841. *Platysoma seenghala* Sykes, *Trans. Zool. Soc. Lond.*, **2**: 371, pl. 65. fig. 2.

2013. *Sperata seenghala*: Kottelat, *Raffles Bull. Zool.* Suppl. **27:** 266.

Material examined: This species was identified from the fisherman's catch, 74.5 cm.

Distribution: Widely distributed in India.

Remarks: Dwells in rivers, canals, beels, ditches, inundated fields, and other freshwater areas; admirable sport fish; carnivore in nature.

Family SILURIDAE

9. *Ompok bimaculatus* (Bloch, 1794) (Butter catfish)

1797. *Silurus bimaculatus* Bloch, *Syst. Ichth.* **11**: 17, Pl. 369.

2013. *Ompok bimaculatus*: Kottelat, *Raffles Bull. Zool.* Suppl. **27**: 235.

Material examined: This species was identified from the fisherman's catch, 33.0–34.2 cm.

Distribution: Throughout India including Rajasthan

Remarks: Found in sluggish and frequently muddy water, in sandy streams, rivers and tanks.

Order PERCIFORMES

Family AMBASSIDAE

10. *Chanda nama* Hamilton, 1822 (Elongate glass perchlet)

1822. *Chanda nama* Hamilton, *Fish. Ganges*: 109, 371.

2013. *Chanda nama*: Kottelat, *Raffles Bull. Zool.,* Suppl. **27**: 321.

Material examined: This species was identified from the fisherman's catch, 7.4–9.2 cm.

Distribution: Extensively found in India including Rajasthan.

Remarks: Prefers still and moving waters; common for aquarium purposes can be used as a larvicidal fish.

Order BELONIFORMES

Family BELONIDAE

11. *Xenentodon cancila* (Hamilton, 1822) (Freshwater Garfish)

1822. *Esox cancila* Hamilton, *Fish. Ganges*: 213, 280, Pl. 27, fig. 70.

2013. *Xenentodon cancila*: Kottelat, *Raffles Bull. Zool.,* Suppl. **27**: 298.

Material examined: V/3915, 05 ex., 27.6–29.4 cm.

Distribution: Distributed throughout India including Rajasthan.

Remarks: This fish is mainly surface feeder and may perhaps plays a significant role as larvicidal fish.

Discussion

Fishes are vital alternative source of providing nourishing security for the growing Indian population and contributing considerably in economic upliftment

of fishermen. Positive correlations between biomass production and species abundance have been recorded in various earlier studies (Nikolsky, 1978). Chambal and Mahi Rivers hold immense importance in Rajasthan state from commercial fisheries perspective. Due to perennial nature and availability of additional diverse heterogenous habitats in Chambal River more fish diversity is recorded than Mahi River (Khatri *et al.* 1986, Nair & Krishna, 2013; Banyal & Kumar, 2015 a, b, 2019). However, due to ever increasing demand of water in the basin of Chambal River, the fishes are experiencing serious threats in terms of diversity and abundance of fishes. They are disappearing from the environment due to several anthropogenic factors like urbanization, damming, abstraction of waters for irrigation and power generation and pollution, which have subjected our natural water bodies in general and rivers, in particular to severe stress with devastating effects on fresh water fish diversity (Nair & Krishna, 2013; Banyal & Kumar, 2015a, 2019).

The same has been observed in the present study due to increased demand of water, Mej River was almost waterless at the point of study only few isolated shallow pools were observed and this habitat was predominant in the river channel, besides, muddy bed with few cobbles and undulating agricultural land around banks with few trees and less grass cover were noticeable at the point of study. It is further observed that water pools are indisputably the hot spots in said river because, they comprise of bulk of fish diversity and most of the aquatic diversity including fishes find shelter in these water holes during deficit period and offer ideal habitat for many wetland birds. During present work 11 species of fishes belonging to 9 genera, 6 families and 4 orders were recorded from the Mej River in Bundi district of Rajasthan. Cypriniformes order was recorded with maximum species diversity (7) followed by Siluriformes with 2 spp. whereas, Perciformes and Beloniformes represented by only one species each. The most dominant genera are *Cirrhinus* and *Labeo* of order Cypriniformes and family Cyprinidae represented by 2 species each, rest of genera were represented by single species (Fig.1 and Plate 1).This is the first attempt to explore fish diversity of this river.

According to IUCN (2019) all the fish species recorded from the Mej River are included under Least Concern category except for *Ompok bimaculatus* (Bloch, 1794) which is under Near Threatened category.

Furthermore, it is proposed to revise the approach and management of the important riverine ecosystems like present one to maintain ecological integrity and restore and control the quantum of loss of fish faunal diversity for the betterment of all the stakeholders.

Acknowledgements

Authors are thankful to Dr. Kailash Chandra, Director, Z.S.I., Kolkata for providing necessary facilities to undertake present work.

References

Banyal, H.S. and Kumar, S. 2015a. Fish diversity of Chambal River, Rajasthan State. In: Rawat M. *et al.* (Eds.), *Aquatic Ecosystem, Ecology & Conservation,* Springer Publishers, India, **15**: 271-281.

Banyal, H.S. and Kumar, S., 2015b. Exploration of fish diversity in the Mahi River at Semliya village near to Banswara city of Rajasthan state. *J. Env. Bio-Sci*., **28**(2): 323-324.

Banyal, H.S. and Kumar, S. 2019. Studies on Fish diversity of the Mahi River, Rajasthan State. *Rec. zool. Surv. India*, **119**(1): 1-8.

Burton, P.J., Balisky, A.E., Coward, L.P., Cumming, S.G. and Kneeshaw, D.D. 1992. The value of managing for biodiversity. *The Forestry Chronicle,* **68**(2): 225-237.

Dubey, G.P. and Mehra, R.K. 1962. Fish and Fisheries of Chambal River. *Proceedings of the 1st All India Congress of Zoology,* **1**(2): 647-665.

Ehrlich, P.R. and Wilson, E.O. 1991. Biodiversity Studies: Science and Policy. *Science*, **253**: 758-762.

Froese, R. and Pauly, D. (eds) 2019. Fish Base. World Wide Web electronic publication. *www.fishbase.org,* [version 12/2019)].

Gopi, K.C., Mishra, S.S. and Kosygin, L. 2017. Pisces. In: Kailash Chandra, Gopi, K.C., Rao, D.V., Valarmathi, K. and Alfred J.R.B. (eds). *Current Status of Freshwater Faunal Diversity in India*, Zoological Survey of India, Kolkata; p. 527-570.

IUCN 2019. The IUCN Red List of Threatened Species. Version 2019-1. *www.iucnredlist.org.* Downloaded on 2019.

Jayaram, K.C. 2013. *The Freshwater Fishes of the Indian region*, Narendra Publishing House, Delhi, India; p. 1-616.

Khatri, I.C., Kakkar V.K. and Sharma, K.P. 1986. Impact of dams on fisheries of river Mahi. *Intl. J. Acad. Ichthyol*; **7**(1): 21-26.

Mittermeier, R.A. and Mitemeier, C.G. 1997. Megadiversity Earth's Biological Wealthiest Nation. In: Allister, Me., Lttamiltion, D.E.A. and Harvey, B. (eds.), *Global Fresh Water Biodiversity.* Sea Wind Cemex, Mexico City; p. 1-140.

Nair, T. and Krishna, Y. 2013. Vertebrate fauna of the Chambal River Basin, with emphasis on the National Chambal Sanctuary, India. *Journal of Threatened Taxa*, **5**(2): 3620-3641.

Nelson, J.S., Grande, T.C. and Wilson, M.V.H. 2016. *Fishes of the world*. John Wiley & Sons, USA: 707 pp.

Nikolsky, G.V. 1978. *The Ecology of Fishes*. T.F.H Publications, USA: 352pp.

Ridhi (no initial), Jha, B.C., Parashar, A., Das, A.K., Bose, A.K. 2012. Ichthyofaunal diversity of Chambal River in Madhya Pradesh. In: Pandey, B.P.; Sharma, A.P.; Pandey P.N; Katiha, P.K. and Jaiswal, K. (eds.), *Biodiversity, issues threats and conservation*, Narendra Publishing House, Delhi, India: 47–53.

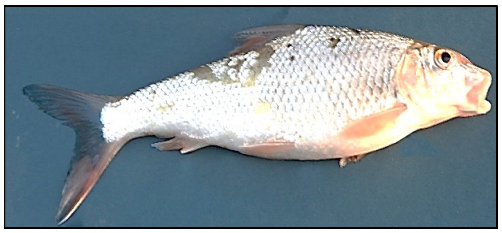
Talwar, P.K. and Jhingran, A.G. 1991. *Inland Fishes of India and Adjacent Countries.*Oxford and IBH Publishing Co. Pvt. Ltd. New Delhi 1&2: 1-1158.

Verma, P. C. Sharma, L.L. and Hegde, A.G. 2008. Aquatic Biodiversity of Rana Pratap Sagar Lake, In: Sengupta, M. and Dalwani, R (eds.), *Proceedings of Taal 2007: The 12th World Lake Conference*: 1967-70.

Plate 1

Labeo gonius (Hamilton, 1822)

Labeo calbasu (Hamilton, 1822)



Cirrhinu smrigala (Hamilton, 1822)

Systomus sarana (Hamilton, 1822)

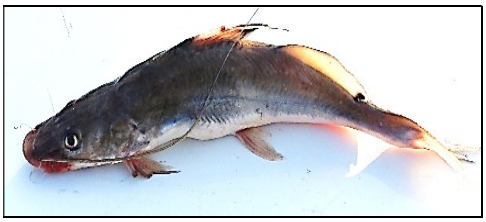
Cirrhinus reba (Hamilton, 1822)

Salmostoma bacaila (Hamilton, 1822)

Osteobrama cotio (Hamilton, 1822)

Chanda nama Hamilton, 1822

Xenentodon cancila (Hamilton, 1822)



Sperata seenghala (Sykes, 1839)

Ompok bimaculatus (Bloch, 1794)