**International Journal of Zoology and Applied Biosciences** **ISSN, 2455-9571**
**Volume 9, Issue 5, pp, 77-82, 2024**
**https://doi.org/10.55126/ijzab.2024.v09.i05.013** **http,//www.ijzab.com**

**Research Article**

# ICHTHYOFAUNAL DIVERSITY OF RATAPANI WILDLIFE SANCTUARY, RAISEN AND SEHORE DISTRICT OF MADHYA PRADESH

**Sanjay Paunikar**

Zoological Survey of India, Central Zone Regional Centre, Vijay Nagar, Jabalpur, Madhya Pradesh- 482 002

**Article History,** Received 11th August 2024; Accepted 23rd September 2024; Published 30th September 2024

## ABSTRACT

The present study has been conducted to assess the Ichthyofaunal biodiversity from different localities of Ratapani Wildlife Sanctuary, Raisen and Sehore district of Madhya Pradesh. The surveys were conducted different localities of the study areas during September 2022 to January 2024. The results of present investigation revealed the occurrence of 70 fish species belonging to 12 orders 27 families and 42 genera. The members of Order Cypriniformes were dominated by 35 species with five families followed by Siluriformes 14 species with six families, Anabantiformes 7 species in four families, Synbranchiformes 3 species in one family. The orders Perciformes, Osteoglossiformes and Cichliformes 2 species each were recorded. The other orders Angullifromes, Beloniformes, Clupeiformes, Cypronidontiformes, Gobiiformes 1 species each were also recorded from the study area. The results of this study are promising; it sheds light on the unknown fish biodiversity of Ratapani Wildlife Sanctuary, which needs to be strengthened through comprehensive future surveys.

**Keywords,** Freshwater, Ichthyofaunal diversity, Ratapani Wildlife Sanctuary, Madhya Pradesh.

## INTRODUCTION

Ratapani Wildlife Sanctuary, located in the Raisen district of Madhya Pradesh, in Vindhya Range in central India, is one of the finest teak forests in the state. It has been a wildlife sanctuary since 1976. As of March 2013, in-principle approval by the National Tiger Conservation Authority (NTCA) has been granted for upgrading it to a status of tiger reserve. The total forest area is around 824 square kilometres and the landscape is undulating, with hills, plateaus, valleys, and plains. Several seasonal streams irrigate the site in the monsoon, and water is retained in some pools along these streams even in the summer. Two large reservoirs, namely Barna Reservoir and Ratapani Dam (Barrusotlake) are among the major water bodies adjacent to or inside the sanctuary. The forest of Ratapani is dry deciduous and moist deciduous type, with teak (*Tectonagrandis*) as the main tree species. About 55% of the area is covered by teak. The remaining mixed forests consist of various dry deciduous species. Bamboo (*Dendrocalamus strictus*) overlaps the two aforementioned forest types and covers about one quarter of the forest area.

India is one of the mega diverse countries in the world enriched with varied taxonomic, genetic and ecosystem diversity. India is a rich country in biodiversity of important group of animals *viz*; Insects, Fishes, Amphibians, Reptiles, Birds, Mammals and others. India is an exceptional hotspot of freshwater fish diversity with a high degree of endemism contributing to the World's biological resources (Dahanukar *et al*., 2004 Gillette, *et al*., 2023).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. 32,300 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 and Mittermeier, 1997). Fish contribute faintly more than one half of the total of vertebrates and India contributes to about 7.7% of global fish diversity.

India is one of the mega biodiversity countries in the world and occupies the ninth position in terms of fresh water mega biodiversity (Myers *et al.*, 2000). Fishes are the important element in the economy of many nations as they have been a stable in the diet of many people ((Remadevi, 2003). Ichthyofaunal documentation is important to analyze

*Corresponding Author: Dr. Sanjay Paunikar, Scientist -E, Zoological Survey of India, Central Zone Regional Centre, Vijay Nagar, Jabalpur, Madhya Pradesh- 482002. Email: sanjaypaunikarzsi@gmail.com

status of fish species and also helps us for future planning to improve and conserve the biodiversity (Lakra *et al*., 2011; Bose, *et al.* 2013; Lisbeth, 2023) .The diversity of fishes found in different types of habitats of seas, rivers, wetlands, reservoirs, lakes and ponds all over the country (Gopi, *et al*., 2017; Paunikar, 2021). The freshwater fish fauna of India is diversified comprising between 1027 (Gopi *et al*. 2017) and 1030 species (Froese and Pauly 2020).

The State of Madhya Pradesh with six major river basins, viz., Ganga, Narmada, Tapti, Mahanadi, Mahi and Godavari is one of the finest watersheds in the country. Madhya Pradesh has vast potential of fish faunal diversity. The fish fauna of the state has been earlier documented by several workers. The fish faunal diversity compiled from various National Parks, Wildlife Sanctuaries and Biosphere reserves of the state by Ramakrishna *et al*. (2006). There is no any information of fish fauna Ratapani WLS. Keeping in view the present studies has been undertaken to work out the fish fauna of the different localities of the study areas.

## MATERIAL AND METHODS

Fishes were collected from different localities of Ratapani Wildlife Sanctuary such as Jholiapur reservoir, Kheri & around, Ginnargarh Pond located in the Raisen and Sehore district; Madhya Pradesh, India with the help of local fishermen using different type of nets. Immediately photographs were taken with help of digital camera. Fishes were brought to laboratory and preserved in 10% formalin solution in separate specimen jars according to the size of species. Small fishes were directly placed in the 10% formalin solution. While the large fishes were given an incision in their abdomen and preserved.

The sampling was carried out seasonally covering premonsoon, monsoon, post-monsoon and winter season. Smaller fishes were directly placed in the formalin solution, while larger fishes were given an incision on the abdomen before they were fixed. Plastic jar were used for the collection and preservation. Fishes were labeled based on the serial number, common name, scientific name, locality and date of collection. Fishes were identified with the help of taxonomic key, Days (1994) and Talwar and Jhingran (1991), Jayaram (1999). Fish Base website was also referred for various aspects of fish fauna (www.fishbase.org). Specific identifying characters on the body was observed and noted. The collection is registered and included in the National Zoological Collection of Zoological Survey of India at Central Zone Regional Centre, Jabalpur (MP).

## RESULTS AND DISCUSSION

During the study period different fish varieties have been observed, collected and identified from various localities of the Ratapani Wildlife Sanctuary, Raisen and Sehore district of Madhya Pradesh. The results showed that the area was rich in fish diversity. Fishes belonging to 12 orders and 24 families were collected during course of the study period. In the present fish diversity study of 70 fish species belonging to 12 orders, 24 families and 42 genera were recorded (Table-1, Figure, 1). Among the collected species, order Cypriniformes was most dominant constituting 35 species (49.29%) followed by order Siluriformes constituting 14 species (20.00%) order Anabantiformes constituting 7 species (10.10%) orders and Synbranchiformes constituting 3 species (4.28%) of the total fish species.

The members of Order Cypriniformes were dominated by 35 species with five families followed by Siluriformes 14 species with six families, Anabantiformes 7species in four families, Synbranchiformes 3 species in one family. The orders Perciformes, Osteoglossiformes and Cichliformes2 species each were recorded. The orders Angullifromes, Beloniformes, Clupeiformes, Cypronidontiformes, Gobiiformes 1 species each were also recorded from the study area. Cyprinidae fishes are the most important group of vertebrates, it have a vast variety of fish species. Cyprinidae family forms the important form of diet in many area of our country (Rafique, 2000; Paunikar 2021). The ichthyofauna diversity in several rivers, lakes, ponds, dams and reservoirs systems of Madhya Pradesh has been carried out by many studies since 1938. Hora (1938, 1940), Hora and Nair (1941), Dubeyand Mehra (1959), Malviya (1961), Mathur and Mishra (1976), Desai (1994) documented fish diversity from Madhya Pradesh

Ramakrishna *et al*. (2006)compiled fishes from the different National Parks of Madhya Pradesh.Sharma (2007) updated the checklist of fish fauna of Madhya Pradesh and Chhattisgarh states and reported 172 species.Lakra and Sarkar(2007) studied fishes of Central India. Tilak (2009) and (2011) reported several fish species from Bandhvgarh Tiger reserve and Singhori Wildlife Sanctuary, Raisen district of Madhya Pradesh. Further, Vyas *et al*. (2012) and Johnson *et al*. (2012) added information on fish diversity of Khan, Khashipra, Betwa and Ken rivers of the state. Paunikar *et al*. (2012) recorded 33 species of fishes from Gour River, Jabalpur district. Bose *et al*. (2013) recorded fish fauna of middle stretch of River Tawa. Bakawale and Kanhere (2013) documented 51 Species of fish belonging to 7 orders and included under 15 families were collected in river Narmada in Western Zone. Wani and Gupta (2015) studied and documented 21 species in6 orders 11 families and 7 genera from Sagar Lake, Madhya Pradesh. Bhat and Rao (2018) reported 40 species, belonging to 6 orders, 10 families and 22 genera of fishes from Tighra reservoir Gwalior. Bhakta *et al*. (2020) has been reviewed the diversity of finfish in river Narmada and its tributaries in central and western India and 196 species from both freshwater and brackish water habitats, under 14 orders, 51 families, and 126 genera. Bhagat and Sharma (2023) reported 44 species of fishes belonged to 14 families, 8 orders and 27 genera, out of which 22 belongs to family Cyprinidaes were identified. Karode and Khan (2023) reported37 species of fishes belong to 7 orders and included under 10 families in Narmada River at Dindori District. Paunikar *et al*. (2023) compiled the list of fishes

from different rivers of Jabalpur district. Madhya Pradesh. Recently, Khichi (2024) identified 37 species of fishes belong to 7 order and included under 10 families from Narmada River, Maheshwer district, Khargone.

**Table 1**. Ichythyofaunal diversity of Ratapani Wildlife Sanctuary, Raisen and Sehore district of Madhya Pradesh.

| Sl. No. | Family | Species | Common Name |
|---|---|---|---|
| | | **I-Order, ANBANTIFORMES** | |
| 1 | Anabatidae Bonaparte, 1831 | *Anabas testudineus* (Bloch, 1792) | Climbing Perch |
| 2 | Badidae Barlow, Liem and Wickler, 1968 | *Badis badis* (Hamilton, 1822) | Blue perch |
| 3 | Channidae Fowler, 1934 | *Channa gachua* (Hamilton, 1822) | Dwarf Snakehead |
| 4 | | *Channa punctata* (Bloch, 1793) | Striped Snakehead |
| 5 | | *Channastriata*(Bloch, 1793) | Striped Snakehead |
| 6 | | *Channa marulius* (Hamilton, 1822) | Giant Snakehead |
| 7 | NandidaeBleeker, 1852 | *Nandus nandus* (Hamilton, 1822) | Gangetic leaf fish, mottled nandus, mud perch |
| | | **II-Order, ANGUILLIFORMES** | |
| 8 | Anguillidae Rafinesque, 1810 | *Anguilla bengalensis* (Gray, 1831) | Indian Mottled eel, Indian Longfin eel |
| | | **III-Order, BELONIFORMES** | |
| 9 | Belonidae Bonaparte, 1835 | *Xenetodonc ancila* (Hamilton, 1822) | Needle fish |
| | | **IV-Order, CICHLIFORMES** | |
| 10 | Cichlidae Bonaparte, 1835 | *Oreochromis mossambicus* (Peters, 1852) | Mozambique tilapia |
| 11 | | *Oreochromis niloticus* (Linnaeus, 1758) | Nile tilapia |
| | | **V-Order ,CLUPEIFORMES** | |
| 12 | Clupeidae Cuvier, 1816 | *Gudusia chapra* (Hamilton, 1822) | Indian River Shad |
| | | **VI-Order, CYPRINIFORMES** | |
| 13 | CobitidaeSwainson, 1838 | *Lepidocephalichthys guntea* (Hamilton, 1822) | Guntea loach |
| 14 | Cyprinidae Rafinesque, 1815 | *Cirrhinus mrigala* (Hamilton, 1822) | Mrigal |
| 15 | | *Cirrhnus reba* (Hamilton, 1822) | Reba carp |
| 16 | | *Cirrhinus cirrhosus* (Bloch, 1795) | White carp |
| 17 | | *Cyprinus carpio* (Linnaeus, 1758) | Common Carp |
| 18 | | *Crossocheilus latius* (Hamilton, 1822) | Minor carp |
| 21 | | *Garra lamta* (Hamilton, 1822) | Sucker |
| 20 | | *Garra gotyla* (Gray, 1830) | Stone sucker |
| 21 | | *Garra mullya* (Sykes, 1839) | Mullyagarra |
| 22 | | *Labeo bata* (Hamilton, 1822) | Bata labeo |
| 23 | | *Labeo boga* (Hamilton, 1822) | Bogalabeo |
| 24 | | *Labeo boggut* (Sykes, 1839) | Boggutlabeo |
| 25 | | *Labeo calbasu* (Hamilton, 1822) | Orangefinlabeo |
| 26 | | *Labeo catla* (Hamilton, 1822) | Catla |
| 27 | | *Labeo gonius* (Hamilton, 1822) | Kurialabeo |
| 28 | | *Labeo rohita* (Hamilton, 1822) | Rohu |
| 29 | | *Osteobrama cotio* (Hamilton, 1822) | Cotio |
| 30 | | *Pethia conchonius* (Hamilton, 1822) | Rosy Barb |
| 31 | | *Pethia ticto* (Hamilton, 1822) | Ticto Barb |
| 32 | | *Puntius sophore* (Hamilton, 1822) | Pool Barb |
| 33 | | *Puntius sarana* (Hamilton, 1822) | Pool Barb |
| 34 | | *Tor tor* (Hamilton, 1822) | Tor Mahaseer |
| 35 | | *Tor putitora* (Hamilton, 1822) | Golden Mahaseer |
| 36 | DanionidaeBleeker, 1863 | *Amblypharyngodon mola* (Hamilton, 1822) | Molacarplet |
| 37 | | *Chela* (*Chela*)*laubuca* (Hamilton, 1822) | Winged rasbora, Chiluwa |
| 38 | | *Chela cachius* (Hamilton, 1822) | Silver hatchet chela |
| 39 | | *Esomus danrica* (Hamilton, 1822) | Indian Flying Barb |
| 40 | | *Laubuka laubuca* (Hamilton, 1822) | Indian Glass Barb |
| 41 | | *Rasbora daniconius* (Hamilton, 1822) | Black-line rasbora |
| 42 | | *Salmostoma bacaila* (Hamilton, 1822) | Large razorbelly minnow |
| 43 | | *Salmostoma boopis* (Day, 1874) | BoopisRazorbelly Minnow |
| 44 | Nemacheilidae Regan, 1911 | *Paracanthocobitis botia* (Hamilton, 1822) | Mottled zipper loach |

| | | | |
|---|---|---|---|
| 45 | XenocyprididaeGünther, 1868 | *Ctenopharyngodon idella* (Valenciennes, 1844) | Grass carp |
| 46 | | *Hypophthalmichthys nobilis* (Richardson, 1845) | Bighead carp |
| 47 | | *Hypophthalmichthys molitrix* (Valenciennes, 1844) | Silver Carp |
| | | 48 | |
| 48 | Poeciliidae Bonaparte, 1831 | *Gambusia affinis* (Baird and Girard, 1853) | Mosquito fish |
| | | **VIII-Order, GOBIIFORMES** | |
| 49 | Gobiidae Cuvier, 1816 | *Glossogobius giuris* (Hamilton, 1822) | Tank Goby |
| | | **IX-Order, OSTEOGLOSSIFORMES** | |
| 50 | NotopteridaeBleeker, 1851 | *Notopterus notopterus* (Pallas, 1769) | Feather back |
| 51 | | *Notopterus chitala* (Hamilton, 1822) | Indian Feather back |
| | | **X-Order, PERCIFORMES** | |
| 52 | AmbassidaeKlunzinger, 1870 | *Chanda nama* (Hamilton, 1822) | Elongate Glassy Perchlet |
| 53 | | *Parambassis ranga* (Hamilton, 1822) | Indian Glassy Fish |
| | | **XI- Order, SILURIFORMES** | |
| 54 | BagridaeBleeker, 1858 | *Mystus bleekeri* (Day, 1877) | Day's mystus |
| 55 | | *Mystus cavasius* (Hamilton, 1822) | Gangaticmystus |
| 56 | | *Mystus tengara* (Hamilton, 1822) | Tengara catfish |
| 57 | | *Mystus vittatus* (Bloch, 1794) | Striped Mystus |
| 58 | | *Sperata aor* (Hamilton, 1822) | Long whiskered catfish |
| 59 | | *Sperata seenghala* (Sykes, 1839) | Giant River Catfish |
| 60 | Clariidae Bonaparte, 1845 | *Clarias gariepinus* (Burchell, 1822) | African Catfish |
| 61 | | *Claria smagur* (Linnaeus, 1758) | Magur |
| 62 | HeteropneustidaeHora, 1936 | *Heteropneustes fossilis* (Bloch, 1794) | Stinging catfish |
| 63 | PangasiidaeBleeker, 1858 | *Pangasius pangasius* (Hamilton, 1822) | Pangas catfish |
| 64 | Siluridae Rafinesque, 1815 | *Ompok bimaculatus* (Bloch, 1794) | Butter catfish |
| 65 | | *Ompok pabda* (Hamilton, 1822) | Pabdah catfish |
| 66 | | *Wallago attu* (Bloch and Schneider, 1801) | Freshwater Shark |
| 67 | SisoridaeBleeker, 1858 | *Bagarius bagarius* (Hamilton, 1822) | Dwarf goonch, Devil catfish |
| | | **XII-Order SYNBRANCHIFORMES** | |
| 68 | MastacembelidaeSwainson, 1839 | *Macrognathus pancalus* (Hamilton, 1822) | Barred spiny eel |
| 69 | | *Mastacembelus armatus* (Lacepède, 1800) | Zig-zag Eel (Tire-track Eel) |
| 70 | | *Macrognathus aculeatus* (Bloch, 1786) | Lesser spiny eel |

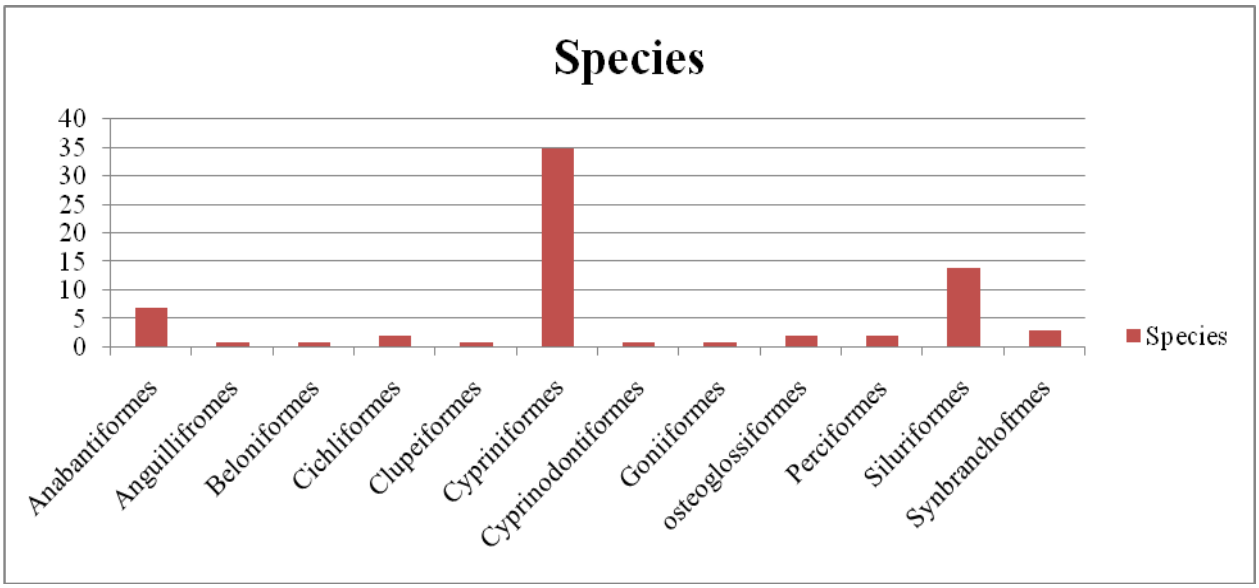


**Figure 1.** Different orders and species of fishes showed dominance in the study area.

Fish plays a significant role in the human economy. India has vast potential for the development of inland fisheries. In the present study on Ratapani WLS, it has been concluded that the Cyprinidae family (50%) was found to be most dominant among all groups. It contains 35 fish species.

**ACKNOWLEDGEMENTS**

The author is highly thankful to Dr. Dhriti Banerjee, Director, Zoological Survey of India, Kolkata for providing necessary facilities and encouragement. Heartfelt thanks is also due to the Principal Chief Conservator of Forest, Wildlife Division, Bhopal, Madhya Pradesh for constant supports and field permission when and wherever required during the course of study. Sincere thanks are also due to the District Forest Officers, RFO's, Field Guides of Ratapani Wildlife Sanctuary for logistic supports rendered during the study period.

**REFERENCES**

Bakawale, S. J. & Kanhere, R.R. (2013).Study on the Fish Species Diversity of the River Narmada in Western Zone. *Research Journal of Animal, Veterinary and Fishery Sciences*, *1*(6), 18-20.

Bhat, H. &Rao, R.J. (2018).Studies on fish diversity of Tighra reservoir Gwalior, Madhya Pradesh, India. *International Journal of Zoology Studies*, *3*(2),68-73.

Bhagat, M. &Sharma, M. (2023).Fishes of Cyprinidae family in Gopi Krishna Sagar Dam, Guna, Madhya Pradesh.*International Journal of Biology Sciences*, 5(1), 30-31.

Bhakta, D., Solanki, S., Vadhel N., Meetei, W.A.,Kamble, S., Chandra, G., Samantha, S. & Das, B.K. (2020). Finfish Diversity of River Narmada and its Tributaries.*Proceedings of the Zoological Society*, Kolkata.

Bose A. K., Jha B.C., Suresh V. R., Das A .K., Parasar A. &Ridhi (2013). Fishes of the Middle Stretch of River Tawa, Madhya Pradesh, India. *Journal of Chemical, Biology and Physilogy Science Sectio-. A*, *3*(1), 706-716.

Dahanukar, N., Raut, R. &Bhat, A. (2004).Distribution, endemism and threat status of freshwater fishes in the Western Ghats of India. *Journal of Biogeography*, 31, 123- 136

Desai, V.R. (1994). Endangered, vulnerable and rare fishes of river systems (Western and Central) of Madhya Pradesh.Threatened fishes of India. *Nature conservation Publication*, 4, 97-108.

Day Francis FLS, FZS.(1994).The fishes of India. Jagmander book agency, New Delhi.1,2.

Froese, R. &Pauly, D. (2020). FishBase. 2020. World Wide Web Electronic Publication. Available at, Http,//Www. Fishbase. Org (Accessed on 8 January 2018).

Gillette, D. P., Edds, D. R. &Jha, B. R. (2023). Identifying imperilled fish species and potential causes of decline in the Himalaya biodiversity hotspot. Aquatic Conservation, Marine and Freshwater Ecosystems.

Gopi K.C., S.S. Mishra and L. Kosygin (2017).Pisces. In, Chandra K., K.C. Gopi, D.V. Rao, K. Valarmathi& J.R.B. Alfred (eds.). *Current Status of Freshwater Faunal Diversity in India*. Zoological Survey of India, Kolkata, 624pp.

Hora, S.L., and Nair,K.K. (1941).Fishes of Satpura Range, Hoshangabad District, Central Province. Rec. Indian Mus. 43, 361–373.

Jayaram KC (1999).The freshwater Fishes of Indian region.Narendra Publishing House, New Delhi.

Johnson, J.A., R. Parmar, K. Ramesh, S. Sen& R.S. Murthy (2012). Fish diversity and assemblage structure in Ken River of Panna landscape, central India. *Journal of Threatened Taxa,4* (13), 3161–3172.

Khichi,Yogesh (2024). Seasonal Variation of Fish Diversity in Narmada River at Maheshwer District Khargone, Madhya Pradesh, India.*International Journal of Environmental Sciences*, *13*(1),1-5.

Karode, A. & Khan, B. (2023).Seasonal Variation of Fish Diversity in Narmada River at Dindori District, Madhya Pradesh, India. *International Journal for Multidisciplinary Research*, *5*(2),1-5.

Lakra, W. S. &Sarkar, U. K. (2007).Freshwater fish diversity of Central India.*Proceedings, Conservation assessment offreshwater fish diversity for Central India.*ICAR-National Bureau of Fish Genetic Resources, Lucknow, Uttar Pradesh, India.

Lakra, W.S., Das,P. &Sarkar, U.K.(2011). Fish Genetic Resources and their Conservation.In, Handbook of Fisheries and Aquaculture, Ed. Sharma, R.P., Verma, S.V., Kumar, A.T., Rahman, O. and Pradhan, S., Directorate of knowledge management in agriculture, ICAR, New Delhi. II Edn. pp, 32-65.

Lisbeth, L. (2023).Fish Biodiversity and the Health of Aquatic Ecosystems. *Poultry Fish Wildlife Science*, 11,234.

Malviya, R.B. (1961). A list of fishes from Jabalpur, M.P. Proc. *National Academy of Science India* Section B, *31*(3), 349-354.

Mathur, D.S. & Mishra, S.K.(1976).Addition to the fish fauna of Jabalpur district (M.P.).*Newsletter of Zoological Survey of India*, *2* (4), 156-158.

Mittermeier, R.A. &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.

Myers, N., Mittermieir, R.A., Mittermieir, C.G., Da Fonseca, G.A.B & Kent.J. (2000). Biodiversity hot spots for conservation priorities. *Nature*, 403, 853-858.

Nelson, J.S., Grande T.C. &Wilson M.V.H. (2016). Fishes of the World. 5th ed. New York, John Wiley & Sons.

Pathak, A.K., Sarkar, U.K., Rajesh Dayal, Chaturvedi, R. & Ravikumar (2021).Freshwater fish diversity database of Central India, Implementation and utility.*Indian Journal of Fisheries*, *68*(2), 43-51.

Paunikar, S., Tiple, T., Jadhav S.S. & Talmale S.S. (2012). Studies on Ichthyofaunal Diversity of Gour River, Jabalpur, Madhya Pradesh, Central India. *World Journal of Fish and Marine Sciences*,*4* (4), 356-359.

Paunikar, S.D. (2021).Species diversity, population structure and conservation status of fishes inhabiting in six different wetlands of Uttar Pradesh. *International Journal of Fisheries and Aquatic Studies*, 9(5), 30-38.

Paunikar, S.D., Kushwaha, S. &Mashi, S**.** **(**2023). Fish fauna of Jabalpur district of Madhya Pradesh.*Journal of natural Resources and Development*, *18*(1)156-162.

Ramakrishna, Chandra, K., NemaAhirwar&Alfred, J. R. B. (2006). Faunal resources of National parks of Madhya Pradesh and Chhattisgarh. *Conservation Area Series*, 30, 1-123+27.

Rafique M. (2000).Fish diversity and distribution in Indus River and its drainage system. *Pakistan Journal of Zoology*, 32(4), 321-332.

Remadevi K. (2003).Freshwater fish biodiversity. In Venkataraman K (Ed) National Aquatic ecosystem of India, Zoological survey of India, Chennai, 217-224.

Sharma, H.S. (2009). "Pisces" Fauna of Pachmarhi Biosphere Reserve (M.P.), Conservation Area Series, Zoological Survey of India, 39, 135-173.

Sharma, H.S. (2007). Freshwater fish fauna of Madhya Pradesh (including Chhattisgarh), State Fauna Series, Zoological Survey of India;15(1),147-244.

Talwar P.K. and Jhingran, A.G. (1991). Inland Fishes of India and Adjacent Countries, Oxford and IBH Publishing Co., New Delhi, 12,1158.

Tilak, J. (2011).On a collection of Fishes from Singhori Wildlife Sanctuary, district Raisen, Madhya Pradesh. *Bionotes*, 13(1)21-22.

Tilak, J. (2009). "Pisces" Fauna of Bandhavgarh Tiger Reserve, Conservation Area Series. Zoological Survey of India, 40, 147-160.

Vyas, V., Damde, D. &V. Parashar (2012). Fish biodiversity of Betwa River in Madhya Pradesh, India with special reference to a sacred ghat. *International Journal of Biodiversity and Conservation*, *4*(2), 71–77.

Wani, O.A. &Gupta, U.S. (2015). A study on ichthyofaunal diversity of Sagarlake, Madhya Pradesh. India. *International Journal of Biodiversity Conservation*, *7*(3), 126-129.