Original Research Paper

VOLUME-6 | ISSUE-4 | APRIL - 2017 • ISSN No 2277 - 8179 | IF : 4.176 | IC Value : 78.46

ICHTHYO-FAUNAL ABUNDANCE IN WATER BODIES OF REWA REGION

Zoology

KEYWORDS: Fish. Abundance.

Shalini Kunder Department of Zoology, Govt. Girls' P.G. College Rewa (M.P.)

Vinod Kumar Mishra Department of Zoology, Govt. Girls' P.G. College Rewa (M.P.)

ABSTRACT

In the present investigation the abundance of fresh water fishes in water bodies of Rewa region of Madhya Pradesh has been studied. 61 species of the fish recorded, out of which 2 species were found endangered, 10 species were found vulnerable, 18 species were found near threatened and 4 species were found in lower risk category.

INTRODUCTION

India is fourth largest producer of fish in the world and second largest producer of inland fish. The current total fish production is over 6 million tons. The fisheries sector provides employment to seven millions fishermen and its share in GDP is around 1.4 % (Lakra, 2005; 2006). The major inland aquatic resources include 1.2 million hectares of brackish water area, 2.38 million hectare of fresh water ponds and tanks, 3.15 millions hectares of reservoirs besides about 0.19 million kilometers of rivers and canals. In India large and medium dams created almost 250 cubic million of water storage intercepting 30 % of available surface flow, with 70-80 % of the annual flow diverted for agriculture, industry and community use.

In Madhya Pradesh, aquatic biodiversity has always been playing an important role in the food and nutritional security of people. Nutritional security is the physical and economic access by all people at all times to the nutritionally adequate food they need. Therefore, it embodies stable, sustainable and predictable supply of nutritionally adequate food for live functions and it also maintains equity through access for all with reference to means of production and purchasing power .William (1996) In the matter of increasing food and water resources and ensuring economic access to balanced diet to all people of India particularly Madhya Pradesh, the authorities also face a huge task. As such there is no other way but to help produce more nutritive food and other commodities per unit of land and water. What is needed is a particular effort in assembling specialized genetic pools for sustainable farming and using them in genetic enhancement research.

Ultimate goal should be the development of a global grid conservation centre linked to a genetic enhancement centre capable of producing novel genetic combinations for use by breeders in the development of location of specific varieties. A wide range of water bodies of diverse nature exist in Madhya Pradesh ranging from cold water hill streams to fresh river of plains. Naturally, the fish population in these different waters comes from different families, genera with a wide range of species.

Madhya Pradesh is well known for its mega piscine diversity of biological wealth, harboring a large number of fishes. Fish faunal diversity is towards gradual and steady decline in reverine resources, due to anthropogenic stress (overfishing, wrong practices in fishing, pollution, use of pesticides and fertilizers in agriculture crops, dam and barrage construction) capture fisheries from reverine resources are steadily declined and reservoir fisheries are not giving good results. (Average nutritional production about 14.5/hac/year).

There have been extensive studies on the fresh and marine water fishes of India and others countries. Notably, they were Day (1878, 1889), Gupta (1907), Hora (1921), Shaw and Shebbare (1938), Hora and Nair (1944), Hora and Mukharjee (1953), Misra (1959), CSIR (1960), Saha (1970), Dey (1973), Menon (1974,1999), Ghosh and Liptor (1982), Sen (1982, 1985), Dey and Kar (1989, 1990), Talwar and Jhingaran (1991), Talwar et al. (1992), Sen (1982,1992,2000), Sinha (1994), Zoological survey of India (1995), Guha and Bakshi et al. (1999), Naskar (1999), Kar and Dey (2000, 2002), Kar and Bharbhuiya (2000 a, b; 2004), Kar et al. (2002 a, b, c 2003, 2004), Kar and Sen (2007), Kar (1990, 2003 a, b; 2004, 2005 a, b, c; 2007), etc.

MATERIAL AND METHODS

Fishes were collected from lotic and lentic water bodies of Rewa district (M.P.) with the help of the local fisherman using different type of nets i.e cast nets and drag nets. Immediately photographs were taken with the help of the digital camera. Fishes were brought to laboratory were preserved in 10% formalin solution, while large fishes were given an incision in their abdomen and preserved. The meristic and morphometric characters were measured and fishes were identified upto the species level, with the help of the standard keys and books 3,9.

During present work, fish collections were made from five water bodies of Rewa region of Madhya Pradesh. Following two types of water bodies were selected for present study-

A. Lotic sites
(i) Beehar river (B1), Rewa.
(ii) Bichhiya river (B2), Rewa.
B. Lentic sites
(i) Govindgarh lake (G1), Rewa.
(ii) Gorma dam (G2), Hanumana, Rewa.
C. Beehar barrage (B3), Sirmour, Rewa.

RESULTS & DISCUSSION

In the present Ichthyofaunal study, 61 species of 39 different genera, 18 families and 8 orders were recorded from lotic and lentic water bodies of Rewa region. The members of the order Cypriniformes were dominated followed by the 26 species followed by Siluriformes 16 species, Perciformes with 8 species, Ophiocephaliformes with 4 species, Mastacembeliformes with 3 species, Clupeiformes with 2 species and Beloniformes and Symbranchiformes with 1 species.

61 fish species representing by 8 orders, Order: Cypriniformes was dominant with 26 species was dominant group in the assemblance composition in which Catla catla, Labeo rohita, Labeo calbasu, Cirrhinus mrigala, Puntius sarana, Ctenopharyngodon idella, Cyprinus carpio were found abundant, where as Cirrhinus reba, Labeo bata, Labeo gonius, Discognathus modestus, Hypopthalmichthyes molitrix, Lepidocephalichthyes guntea, Oxygaster bacaila, Osteobrama cotio, Puntius chola, Puntius sophore, Puntius conchonius, Puntius ticto were found in moderate form and Danius devario, Nemachilus botia, Rasbora daniconius, Puntius phutinio, Labeo boggut, Aspidoparia morar, Ambylopharyngodon mola were found rare. Followed by Order: Siluriformes in which Wallago attu, Mystus seenghala, Mystus tengara, Clarius batrachus were found in abundant form, Ompok bimaculatus, Ailia coila, Mystus bleekeri, Mystus cavasius, Mystus oar, Mystus vittatus, Clupisoma garua, Psuedotropius atherinoides, Heteropneustes fossilis were found in moderate form and Rita rita, Bagarius bagarius, Eutropichthyes marius were found in rare form.
Similarly, followed by order Perciformes in which Tilapia mossambica. Chanda nama, Chanda ranga were found in abundant form where as Nandus nandus, Chanda baculis, Glossogobius giuris,

were found in moderate form and Anabas testudineus, Badis badis were found in rare form.

Followed by order Ophiocephaliformes, Channa marulius, Channa striatus, and Channa punctatus were found in abundant where as Channa gachua were found in moderate form. In order Mastacembeliformes, only Mastacembalus armatus were found abundant, Mastacembalus punctatus and Macrognathus aculeatus were found in moderate form. In order Clupeiformes, both Notopterus notopterus and Notopterus chitala were found in moderate form. Now, followed by the order represented by only one species, in order Beloniformes, Xenentodon cancila were found in moderate form, while in order Symbranchiformes, Amphinous cuchia was found rarely.

From the above observations, it is to be very clear that the species Labeo rohita, Labeo calbasu, Puntius sarana, Tilapia mossambica, Catla catla, Chanda nama, Chanda ranga Ompok bimaculatus, Wallago attu, Mystus seenghala, Mystus tengara, Ailia coila, Ctenopharyngodon idella, Cirrhinus mrigala, Channa marulius, Channa striatus, Channa punctatus, Mastacembalus armatus were the most dominating species where as Danius devario, Nemachilus botia, Rasbora daniconius, Puntius phutinio, Labeo boggut, Aspidoparia morar, Ambylopharyngodon mola, Rita rita, Bagarius bagarius, Eutropichthyes marius, Anabas testudineus, Badis badis, Amphinous cuchia were the most rare species of the Rewa region (Table 1 & Graphs 1 , 2).

Tilapia mossambica, an exotic species of great commercial value, due to its higher growth rate even at unfavourable conditions. In my observation, it was recorded only in the river Beehar, Bicchiya and Beehar barrage, and while in Govindgarh lake and Gorma dam it was not recorded.

Before 1949, when Madhya Pradesh state did not exist, fish fauna of rivers of central India was reported by the well known Ichthyologist, Dr. S.L. Hora (1941, 1949).

However, after the formation of Madhya Pradesh in 1956, Dubey and Verma (1965) worked on preliminary study of the fish fauna of Madhya Pradesh. Further, during the period of five decades, (1950-2001) many scientists reported the fish fauna from the different localities of Madhya Pradesh. 43 species reported from Satpura range of Hoshangabad by Hora and Nair (1941) 42 fish species from Rihand river by Hora (1949), 42 fish species from Sagar lake of Sagar by Swaroop (1953), 95 fish species from Son river by Motwani and David (1957), 43 fish species from the Upper lake Bhopal and 35 fish species from the Lower lake Bhopal by Soni (1960, 1962), 71 fish species from Chambal river by Dubey and Mehra (1959), 77 species of fishes from Narmada river by Karamchandani et al. (1959), 52 fish species from Tapti river by Karamchandani and Pisolkar (1967), 46 fish species from Kunwari river (tributary of Chambal river) by Saksena and Shrivastava (1989), 189 fish species from rivers of Madhya Pradesh and Chattisgarh by Dubey (2007).

The natural fish biodiversity of water bodies were threatened and many of fish species were found to disappear from the environment. The Global agency, 'The International Union for Conservation of Nature and Natural Resources' (IUCN) proposed the criteria to include species of fishes in Red list under following categories-

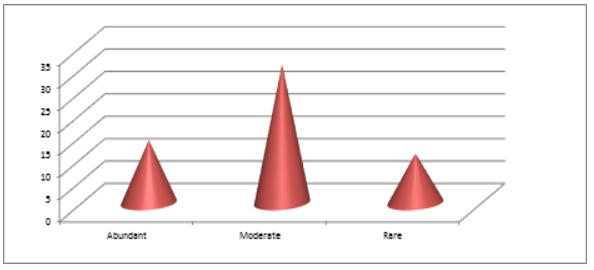
(i) Extinct (Ex)
(ii) Endangered (E)
(iii) Vulnerable (V)
(iv) Rare (R)

In a recent communication of NFBGR, has made a few changes in the criteria are as under-
(i) Extinct (Ex)
(ii) Endangered (E)
(iii) Vulnerable (Vu)
(iv) Near threatened (Nt)
(v) Least concern (LC)
(vi) Not evaluated (Ne)

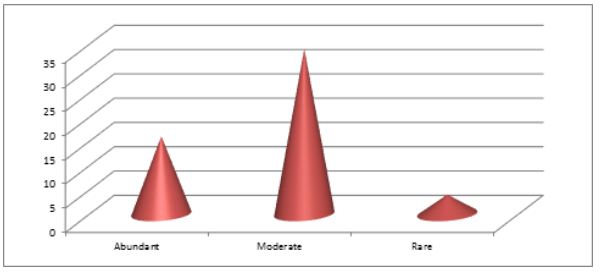
Dubey (2007) had been worked on the Ichthyofaunal status of Madhya Pradesh and given a list of Endangered, Vulnerable and Near threatened fish species of M.P. region as per criteria defined by NBFGR, Lucknow.

During the present observation, I compared the list proposed by Dubey (2007) and found that, out of 61 species of the fish recorded, 2 species were found endangered, 10 species were found vulnerable, 18 species were found near threatened and 4 species were found in lower risk category.

It is concluded on the basis of above observation that due to recent geographical developmental changes i.e., construction of dams and canals, changed riverine water sources, introduction of exotic species in riverine system, abundance of most of the fish species have been changed.



Graph1: Ichthyofaunal abundance of Lentic water bodies of Rewa region



Graph 2: Ichthyofaunal abundance of Beehar barrage of Rewa region

S.No.	Species	Selected aquatic bodies of Rewa region		
		Lotic water	Lentic water bodies	Beehar Beehar barrage
1	*Notopterus*	M	M	M
2	*Notopterus*	M	M	M
3	*Ambylopharyn*	R	R	*
4	*Aspidoparia*	R	R	*
5	*Cirrhinus*	A	A	A
6	*Cirrhinus reba*	A	M	*
7	*Discognathus*	M	M	M
8	*Catla catla*	A	A	A
9	*Ctenopharyngo*	A	A	A
10	*Cyprinus*	A	A	A
11	*Hypopthalmich*	M	M	A
12	*Labeo rohita*	A	A	A
13	*Labeo boggut*	R	R	*
14	*Labeo bata*	M	M	*
15	*Labeo gonius*	A	M	M
16	*Labeo calbasu*	A	A	A
17	*Osteobrama*	M	M	M
18	*Oxygaster*	A	M	M

VOLUME-6 | ISSUE-4 | APRIL - 2017 • ISSN No 2277 - 8179 | IF : 4.176 | IC Value : 78.46

19	*Puntius ticto*	M	M	M
20	*Puntius sarana*	A	A	A
21	*Puntius chola*	M	M	M
22	*Puntius*	M	M	M
23	*Puntius*	M	M	M
24	*Puntius*	R	R	M
25	*Danius devario*	R	R	M
26	*Lepidocephalic*	M	*	M
27	*Rasbora*	R	R	M
28	*Nemachilus*	R	R	M
29	*Ompok*	A	M	M
30	*Wallago attu*	A	A	A
31	*Mystus bleekeri*	A	M	M
32	*Mystus tengara*	A	A	A
33	*Mystus*	A	A	A
34	*Mystus vittatus*	M	M	M
35	*Mystus*	M	M	M
36	*Mystus oar*	M	M	M
37	*Rita rita*	R	*	*
38	*Bagarius*	R	*	*
39	*Ailia coila*	A	M	M
40	*Clupisoma*	M	M	M
41	*Eutropichthyes*	R	R	R
42	*Psuedotropius*	M	M	M
43	*Heterpneustes*	A	M	M
44	*Clarius*	A	A	M
45	*Channa gachua*	A	M	M
46	*Channa*	A	A	A
47	*Channa*	A	A	A
48	*Channa*	M	A	A
49	*Xenentodon*	M	M	M
50	*Amphinous*	R	*	R
51	*Chanda nama*	A	M	A
52	*Chanda ranga*	A	M	A
53	*Chanda baculis*	M	M	M
54	*Badis badis*	R	R	R
55	*Nandus nandus*	M	M	M
56	*Anabas*	R	R	R
57	*Glossogobius*	M	R	M
58	*Tilapia*	A	*	A
59	*Mastacembalus*	A	A	A
60	*Mastacembalus*	M	M	M
61	*Macrognathus*	M	M	M

A - Abundant, M- moderate, R-Rare, * - Not available

BIBLIOGRAPHY

1. William M.J. (1996). The transition in the contribution of living aquatic resources
2. to food security. International Food Policy. Res. Just. Washington, D.C. Hora, S.L. and K.K. Nair (1941). Fishes of Satpura range Hoshangabad district. Central Province. Rec. Indian Muslim. 43(3): 361-373.
3. Discussion paper. pp.13.
4. Day F. (1889). The Fauna of British India, including Ceylon and Burma: Fishes, Vols. 1&2: 548-509.
5. 3. Day, F. (1878). The Fishes of India being a Natural History of the fishes known to inhabit the Seas the Freshwaters of India Burmaand Ceylon. Text and Atlas in 4 parts, Wm Dawson and Sons Ltd. (London) pp.xx778-195.
6. 4.Gupta, K.G. (1907). Preliminary report on fishers of Bengal. Govt. of Bengal.
7. 5.Hora, S.L. (1921). Indian cyprinoid fishes belonging to the genus Garra, with notes on related species from other countries. Rec. Ind. Mus. 51(4): 538.
8. 6.Shaw, G.E. and Shebbeare, E.O. (1938). The fauna of North Bengal. J. Roy. Asiat. Soc. Beng. Sci. Calcutta, 3:1-317.
9. 7.Hora, S.L. and K.K. Nair (1944). Fishes of Satpura range Hoshangabad district. Central Province. Rec. Indian Muslim. 43(3): 361-373.
10. 8.Hora, S.L. and Mukherjee, D.D. (1953). Table for Identification of Indian Fresh water fishes with description of certain families and observation on relative utility of the probable larvivorous fishes of India. Govt. of India. Health bull. 12, Malaria Bureau No. 4.
11. 9.Misra, K. S. (1959). An aid to the identification of the commercial fishes of India and Pakistan. Rec. Indians. Mus. 57(1-4):1-320.
12. 10.Central Inland Fisheries Research institute (CIFRI) (1956-66). Survey of the Central Inland Fisheries Research Institute Bulletin :No.10.
13. 11.Saha, K.C. (1970). Fisheries of West Bengal. Govt. of West Bengal.pp.138.
14. 12.Dey, S.C. (1973). Studies on the distribution and taxanomy of the Ichthyofauna of the hill streams of Kampup-Khasi-Garo Regions of Assam with special reference to the functional morphology of some rheophillic fishes, D.Sc. Thesis. University of Calcutta. (India). XI:299.
15. 13.Menon, A.G.K. (1974). A check list of the fishes of the Himalayan and the Indo Gangetic plains. Spl. Pub. Inl. Fish. Soc. India. pp.1360.
16. 14.Menon, A.G.K. (1999). Checklist: Freshwater fishes of India. Occasional Paper No. 175, Zoological Survey of India (Calcutta).pp. xxviii+366.
17. 15.Ghosh, S. K. and Liptor, A. P. (1982) Ichthyofauna of the NEH Region with special reference to their economic importance. ICAR Reseach Complex, NEH Region, Shillong. Spl. Bull. 1: 119-127.
18. 16.Sen, N. (1982). Studies on the systematics, distribution and ecology of the Ichthyofauna, Meghalaya and their bearing on the fish and fisheries of the State. Ph.D. Thesis, University of Gawhati (Assam).
19. 17.Sen, T.K. (1985). The fish fauna of Assam and the neighboring North-eastern States of Zoological Survey of India, Occasional paper No. 64:1-216.
20. 18.Dey, S.C. and Kar, D. (1986). An account of Hilsha ilisha (Hamilton) of Lake Sone in the Karimganj district of Assam. Bangladesh J. Zoology. 17(1):69-73.
21. 19.Dey, S.C. and Kar, D. (1990). Fish yield trend in Sone, a tectonic lake of Assam. Matsya. 15-16:39-43.
22. 20.Talwar, P.K. and Jhingaran, A.G. (1991). Inland fishes of India and adjacent countries. Vol.1and 2. Oxford and IBH Publishing Co. Pvt. Ltd. New Delhi. 12:115-6.
23. 21.Talwar, P.K. (1992). Fauna of West Bengal, Marine and Estuarine fishes, Calcutta. New Delhi, Pub. ZSI. 1&2:2.
24. 22. Sen, N. (1982). Studies on the systematics, distribution and ecology of the Ichthyofauna, Meghalaya and their bearing on the fish and fisheries of the State. Ph.D. Thesis, University of Gawhati (Assam).
25. 23.Sen, T.K., (1992). Fauna of West Bengal, Pt. 2. Freshwater fishes, Pub. Zoological Survey of India. pp.101-242.
26. 24.Sen, N. (2000). Occurrence, distribution and status of diversified fish fauna of north-east India. pp.31-48. In: Fish diversity of North-East India (Eds.). Ponniah, A.G. and Sarkar, U.K., NBFGR, ICAR. Lucknow.pp. 228.
27. 25.Zoological Society of India (ZSI). (1995). Estuarine ecosystem sciences. The Hooghly-Matla estuary, West Bengal.
28. 26.Guha, Bakshi, D.N., Sanyal, P. and Naskar, K.S. (1999). Sunderbans Mangal (ed).
29. 27.Naskar, K.R. (1999). Eco-dynamics and importance of mangroves in sustaining the coastal fisheries and aquatic biodiversity. In. Sundarbans. Mangal. pp. 493-525.
30. 28.Kar, D. and Barbhuiya, M. H. (2000a). Length-weight relationship and condition factor in Gadusia chapra (Ham-Buch) and Botio dario (Ham-Buch) from Chatla haor (flood plain wetland) in Cachar District of Assam. Environment and Ecology. 18(1):227-229.
31. 29.Kar, D. and Barbhuiya, M. H. (2000b). Ichthyodiversity of Chatla Haor: A Flood plain wetland in Barrak valley region of Assam. pp.3-6. In: Advances in Zoology and Environmental Degradation and Biodiversity, Pandey, B.N. and Singh, B.K., Daya Publishing House (New Delhi). pp.279.
32. 30.Kar, D. and Barbhuiya, M. H. (2007). Systematic list and distribution of fish biodiversity in Mizoram, Tripura and barrake drainage of north-east India. Zoo's Print journal. 22(3): 2599-2607.
33. 31.Kar, D. (2005 b). Fish fauna of river Barak of Mizoram and of Tripura with a note on conservation j. Freshwater Biol. 16.
34. 32.Kar, D. (2005a). Fish genetic resources and habitat diversity of Barrake drainage pp.68-76. In: Aquatic Ecosystems, Conservation, Restoration and Management (Eds.) Ramachandra, T.V. Ahalya, N. and Rajsekara Murthy, C. Capital Publishing Company (Bangalore). XIII:396.
35. 33.Kar, D. (2007). Fundamentals of Limnology and Aquaculture Biotechnology. Daya publishing House (New Delhi). XIV:609.
36. 34. Kar, D. A. Kumar, C. Bohra, and Singh, L.K. (2003a). Fishes of Barak drainage, Mizoram and Tripura: pp. 203-211. In: Environment, pollution and Management (Eds.) Kumar, A., Bahora, C. and Singh, L.K., APH Publishing Corporation (New Delhi). 604:203-211.
37. Dubey, G.P. and Verma, M.N. (1965). A preliminary study of the fish fauna of the Madhya Pradesh. Vikram University Journal. 8(4): 52-59.
38. Hora, S.L. and K.K. Nair (1941). Fishes of Satpura range Hoshangabad district. Central Province. Rec. Indian Muslim. 43(3): 361-373.
39. Hora, S.L. (1953). Furthur evidence from fish distribution of rise in salinity of the river Hooghly. Current Science 22: 89-90.
40. Swarup, H. (1953). Fish Fauna of Sagar Lake, Madhya Bharati, 2: 239-244.
41. Motwani, M.P. and David, A. (1957). Fishes of the river Son with observations on the Zoogeographical significance. Zool. Soc. India. 9(1):9-15.
42. Soni, D.D. (1960). Fish fauna of upper lake, Bhopal (Betwa river), Proc. Indian Soc. Congress. 47(3):47.
43. Soni, D.D. (1962). Fish fauna of lower lake, Bhopal (Betwa river), First All India Congress Zool. (ZSI): 639-64.
44. Dubey, G. P. and Mehra, R. K (1959). Fish and fisheries of Chambal river. Proc. All India Congress Zool. (2): 647-65.
45. Karamchandani. S.J., Desai, V.R., Pisolkar, M.D. and Bhatnagar, G.K. (1959). Biological Investigation on the fish and fisheries of Narmada river. 1958-1966, Bull. Cent. Ind. Fish. Res. Inst. Barrackpore, 10:1-39.
46. Karamchandani. S.J. and Pisolkar, M.D. (1957). Survey of the fish and fisheries of the Tapti river. Surv. Rep. Cent. Inl. Fish. Res. Inst. Barrackpore, 4:29.
47. Saksena, Rajiv and Pradeep Shrivastava. (1989). A check list of Fish fauna of Kunwari river (tributary of the Chambal river) North. M.P. J. Inlanf Fish Soc. India. 21(2): 41-44.
48. Dubey, G. P. (2007). Fish Fauna of Madhya Pradesh (1956-2001) and its Present Status. Fishing Chimes. 26(10).
49. Kar, D. and Barbhuiya, A., Thangjam, Geetanjali, Devi, M.Sapna, Deb, S. Bubul, Das, Chanu, H. and Nishima. (2008). Panorama of fish biodiversity in certain rivers and wetlands in Manipur. Proc. Zool. Soc. India 7(2):123-134.
50. Rathod, S.D., Malu, R.A. Dhabade, D.S. Patil, P.S. Charjan, A.P. and H.U. Wanjari, (2008). Diversity of fish fauna of Umra (Shamsudin) reservoir Wasim district Maharashtra J. Aqua, Biol, 23(2):17-20.
51. Saha, Sushmita and Bardoloi, Sabitry (2009). Ichthyofaunal diversity of two Beels of Goalpara district, Assam, India. Journal of Threatened Taxa. 1(4): 240-242.
52. Shinde, S.E., Pathan, T.S., Bhandare, R.Y. and Sonwane, D.L. (2009). Ichthyofaunal diversity of Harsool savangi dam, district Aurangabad, (M.S.) India. Journal of Fish and marine Sciences. 1(3):141-143.