International Journal of Zoology Studies
ISSN: 2455-7269
Impact Factor: RJIF 5.14
www.zoologyjournals.com
Volume 2; Issue 6; November 2017; Page No. 110-115

Diversity and Composition of fresh water fishes of Dudhi River: A Tributary of River Narmada, Central India

[1] Kripal Singh Vishwakarma, [2] Vipin Vyas
[1] SBS Govt. Degree College Ashta, Sehore, Madhya Pradesh, India
[2] Department of Biosciences, Barkatullah University, Bhopal, Madhya Pradesh, India

Abstract
The present work was conducted to generate a primary database on ichthyofaunal diversity of Dudhi River, a tributary of River Narmada, Madhya Pradesh, Central India. River consist of a complex mixture of distinctive habitats, which make it among the most productive and valuable ecosystem on earth. The Dudhi River is a tributary of the Narmada basin, which afford a lucrative field of ichthyological importance. River with its tributaries is a unique type of ecosystem which generally covers different types of climatic zones, landscapes and biogeographically regions. River is the natural drainage system of the land mass of the earth which move continuously. During the present investigation, rich ichthyofaunal diversity was observed in the Dudhi River a tributary of River Narmada represented by 19 fish species, 18 genera, 5 families and 4 orders. The Cyprinidae family is dominant group. Fisheries resources are on the decline in India due to over exploitation and inadequate management of her inland waters. For sustainability of these resources, an adequate knowledge of species composition, diversity and relative abundance of her water bodies must be understood and vigorously pursued.
Diversity assessment of Ichthyofauna plays an important role to determine water quality of any river because fishes respond instantly even to the minute change in physicochemical parameters of their habitats.

Keywords: ichthyofauna diversity, Dudhi River, conservation status, River Narmada

Introduction
Water is a basic need of all living organisms on the earth. Lakes, Rivers and Reservoirs are most important water resource and used for several purposes. River Narmada is one of the most important natural sources of water and important ecological diversity in the state of Madhya Pradesh. Rich biodiversity of fishes present in Narmada River, therefore fishing commonly practiced in the river is responsible for the livelihood for a large number of fishermen families living in the vicinity of the river. Riverside capture of fisheries in The Narmada region is a very important source of household welfare for many of rural poor, particularly for providing nutrition (specially the much need protein), income and employment.
Fish constitute almost half of the total number of vertebrates in the world 21,723 living species of fish out of 39,900 species of vertebrates are so for recorded [Jayaram, (1999)] [16]. In India, there are about 2,500 species of fishes, of which 930 freshwater and 1,570 marine, are estimated [Kar, (2003)] [18]. Fishes have been found to exhibit enormous diversity in their morphology, habitat and their biology. They live in almost all conceivable aquatic habitats. India is one of the mega biodiversity countries in the world and occupy-ing ninth position in terms of freshwater biodiversity [Uchchariya, *et al.*] A clear manifestation of the most well known global diversity gradient, namely species diversity increases with latitude [Kottelat, and Whitten, (1996)]. Narmada River has been extensively studied for its fish fauna for the past seven decade by various workers.
A few recent works on different aspects of fish diversity were also confined main stream in central part of Narmada (Vyas *et al.*, 2006). Very first record of fish diversity of Narmada was on hill stream of Satpura ranges (Hora & Nair 1941) [13]. Later Tawa and Barna tributaries were dammed to form reservoir and studies were done on these reservoirs. 52 species belonging to 28 Genera, 13 Families and 7 Orders was recorded in main tributaries of central Narmada (Vyas *et al.*, 2009). Recently few studies on fish diversity was carried in Sip and Jamner rivers, 29 species belonging to 17 Genera, 8 Families and 3 Orders was documented in Sip River a tributary of River Narmada (Vyas and Vishwakarma, 2013a) [36], While Jamner River recorded 27 species belonging to 4 order, 9 families and 16 genera (Vyas and Vishwakarma, 2013b) [37]. The comparative study of Sip and Jamner River was also carried out which documented 34 species belonging to 17 Genera, 8 Families and 3 Orders (Vyas and Vishwakarma, 2013c) [38]. Bose *et al.*, (2013) [4] documented 57 species, belonging to 35 Genera, 13 Families and 6 Orders from Middle Stretch of River Tawa. The Barna Stream Network in Narmada basin reported 33 fish species belonging to 5 orders, 9 families and 21 genera (Vishwakarma, *et al.*, 2014). No record of fish fauna of Dudhi River is available in the present literature.
Therefore, our objective in this study was to provide accounts of the fish diversity and species composition in Dudhi River. The information from this investigation will serve as a baseline data for carrying out further study on ecology, conservation, sustainability and management of fisheries

resources of this water body.

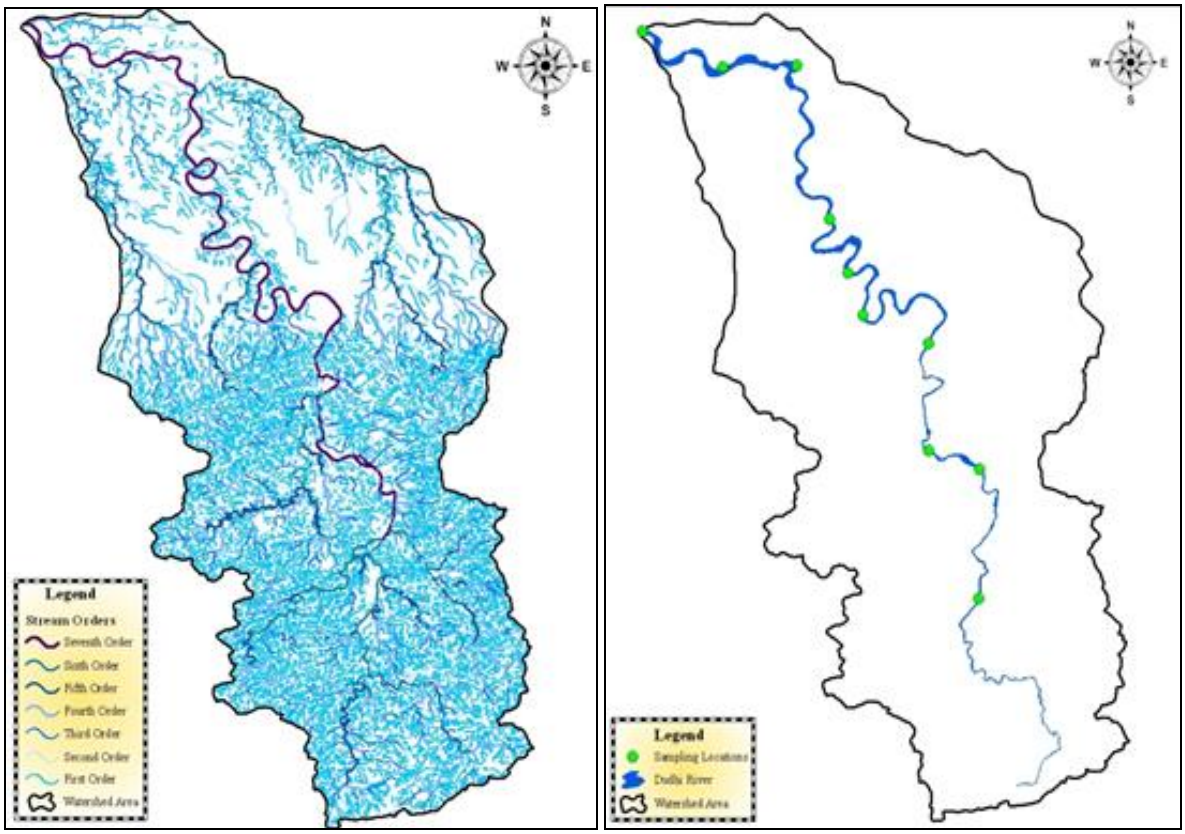
Materials and Methods

Study Area

River Narmada is one of the 13 prominent rivers of India, which covers 98,797 sq km of total watershed area. Narmada is considered to be the lifeline and west flowing river of the state of Madhya Pradesh. The Narmada is the longest west flowing river in India. It rises from a spring at a height of 1057m above MSL on the summit of Amarkantak Hill in Shahdol district of Madhya Pradesh in the Maikal hill range. Dudhi River is the tributary of River Narmada. This river originated from the hilly ranges of Satpura mountain range at 78^0 44' E longitude and 22^0 22' N latitude near Satalba village of Chindwara district of Madhya Pradesh and flows north westerly to join with River Narmada from left side near Umardha village of Hoshangabad district of Madhya Pradesh at 78^0 26' E longitude and 22^0 58' N latitude (Map- 02). This river basin covers an area of 1557 sq. km of its watershed. Salichauka reserved forest and Gaildubba protected forest fall under this river sub basin which provides hotspot for biodiversity point of view hosting Panthers, Sambars, barking and spotted Deer, Foxes and many others. During the study it was observed that six tributaries *viz.*, Sua Nalla, Goridhar Nalla, Titaria River, Omar River, Dhamin River and Oi River joined from different sides to the Dudhi River and contributes to its flow. Dudhi River covers total length of 135.80 km from its origin upto the confluence with River Narmada among which only 30.30 km falls under seasonal condition category and rest 105.50 km falls under perennial condition category (Map- 02).

Table 1: Geographic position of sampling stations in Dudhi sub basin

Dudhi River			
S. No.	**Sampling Station**	**Longitude**	**Latitude**
1	Singwani	78^0 43' 32" E	22^0 32' 39" N
2	Khapasani	78^0 43' 43.44" E	22^0 38' 37.13" N
3	Murgidhana	78^0 38' 1.9" E	22^0 45' 42.6" N
4	Junehta	78^0 37' 9.45" E	22^0 47' 38.2" N
5	Panagar	78^0 36' 11.6" E	22^0 50' 5.29" N
6	Sain Kheda	78^0 34' 31.8" E	22^0 57' 21.3" N
7	Mahragaon	78^0 30' 51.23" E	22^0 57' 16.05" N
8	Confluence with Narmada	78^0 27' 0.09" E	22^0 58' 55.8" N



Data Collection

Collection of fishes

The fishes were collected using monofilamentaous gill nets of 10-50 mm mesh sizes. We also used cast nets of 10-25 mm mesh sizes for collecting fish in shallow areas. Fish specimens were also collected from different fish landing sites. All the specimens were preserved in 4% formaldehyde solution at the field.

Laboratory Procedures

Fishes brought to laboratory were preserved in 10% formalin solution in separate specimen jar according to the size of specimen. The fishes were identified using standard keys of Jayaram (1981) [15], Qureshi & Qureshi (1983) [24], Jhingran (1991) [17, 29], Day Francis (1994), and Shrivastava (1998) [23]. Fish Base website was also referred for various aspects of fish fauna (www.fishbase.org).

Results and Discussion

Diversity and Composition

During the present investigation 19 Species belonging to 4 orders and 5 families were recorded from all sampling stations within the Dudhi River. The Cyprinidae family is dominant and sub dominant family is Cobitidae. The members of family Cyprinidae were dominated by 14 species, followed by Cobitidae two species, Notopteridae, Gobiidae, Ophiocephalidae, one species every family. Family Cyprinidae was represented by the *Oxygaster bacaila, Rasbora daniconius, Garra gotyla, Puntius sophore, Puntius conchonius, Puntius sarana, Puntius chola, Puntius ticto, Puntius titius, Amblypharyngodon mola, Cirrhinus mrigala, Crossocheilus latius, Danio devario, Labeo bata, Labeo boggut, Osteobrama cotio, Oseobrama vigarsii and Aspidoparia morar* was represented Families Cobitidae by *Lepido*cephalichthys *guntea* and *Nemacheilus botia*, Bagridae by *Mystus seenghala*, and *Mystus bleekeri*, Siluridae by *Wallogo attu* and *Ompok bimaculatus*, Belonidae by *Xenentodon cancila*, Mastacembelidae by *Mastacembelus armatus*, and Gobiidae by *Glossogobius giuris*, Ambassidae by *Chanda ranga* and *Chanda nama*, Ophiocephalidae by *Channa punctatus, Channa marulius and Channa gachua.* From all the stations, Cyprinidae formed the largest dominant family contributing the 18 species (54.54%); Ophiocephalidae formed the subdominant family contributing three species (09.09%) and rest of the family followed the order of abundance. During the studies 332 fish individuals were collected from six sites. There were from five Orders, nine families, 21 genera and 33 species (Table-2&3). Out of all these, *Rasbora daniconius* has the maximum number of individuals and found from all sites. The dominant species, *Rasbora daniconius* has total 56 individuals (16.86%), *Puntius ticto* 33 individuals (09.93%) and *Garra gotyla 29* individuals (08.73%) respectively. The least abundant fish was *Puntius chola, Cirrhinu mrigala, Crossocheilus latius,Osteobrama cotio, Aspidoparia morar, Mystus seenghala, Mastacembelus armatus, Channa punctatus* and *Channa gachua* with one individual each (0.30%).

Various workers have done work on main river whereas very little is known about the tributaries of Narmada river. First detailed work on Narmada was done by Hora and Nair (1941) [13] attempted to study fish fauna of river Narmada and surveyed only hill stream, which flow into Narmada in Satpura range and identified 40 species. Karamchandani *et al.*, (1967) [19] carried out biological investigations on the fish and fisheries of River Narmada and revealed the status of fish diversity, production and location of spawning grounds. A total 77 fish species belonging to 41 Genera, 19 Families and seven Orders were recorded. In a stretch from Jabalpur to Khalghat, Anon (1971) [2] reported 46 species belonging to 27 Genera, 14 Families and seven Orders. Rao *et al.*, (1991) [25] have undertaken pre impoundment survey at Punasa, Omkareshwar, Mandleswar, Maheshwar and Barwani pertaining to the river and have enlisted 84 fish species belonging to 45 Genera, 20 Families and six Orders. Unni (1996) [30] studied ecology of Narmada River, which showed various environmental aspects of the River. Nath and Shrivastava (1999) [28] reported declining trend of carp fisheries of Narmada River in the context of construction of dam on the river and tributaries. Arya *et al.*, (2001) [3] studied biodiversity and fisheries potential of Narmada basin with special reference to fish conservation and divided fish species of Narmada into five categories of which four categories containing 17 species might be adversely affected by dam whereas one category of fishes comprising 25 species were likely to be increased in the reservoir. Dubey (2006) [7] studied the fish biodiversity of River Narmada in relation to its physical, chemical and economic aspects. Vyas *et al.*, (2006) reported 47 fish species belonging to 29 genera, 15 families and six orders in River Narmada.

Very first record of fish diversity of Narmada was on hill stream of Satpura ranges (Hora & Nair 1941) [13] reported 41 species. Vyas *et al.*, (2009) studied on fish fauna of tributaries and recorded 52 species belonging to 28 Genera, 13 Families and 7 Orders. Vishwakarma, *et al.*, (2016) [34] more recently worked on Sip and Jamner tributary of river Narmada which Joins Narmada River near the backwaters of Indira Sagar reservoir and have been recorded 52 fish species belonging to 34 Genera, 12 Families and Six Orders. Bose *et al.*, (2013) [4] have reported 57 species, belonging to 35 Genera, 13 Families and six Orders from Middle Stretch of River Tawa. Vishwakarma and Vyas (2014) [33] have been reported 27 fish species were recorded under four orders, nine families and 16 genera. 21 species of Cypriniformes, three species of Ophiocephaliformes, two species of Perciformes and one species of Mastacembeliformes.

Table 2: Systematic Position of fish fauna in Dudhi basin

S. No	Order	Family	Genus	Species Name
1	Clupeiformes	Notopteridae	Notopterus	*Notopterus notopterus*
2	Cypriniformes	Cobitidae	Noemacheilus	*Nemacheilus botia*
3				*Nemacheilus duyi*
4		Cyprinidae	Chela	*Chela labuca*
5			Oxygaster	*Oxygaster gora*
6			Rasbora	*Rasbora daniconius*
7			Garra	*Garra gotyla*
8			Puntius	*Puntius sophore*
9			Puntius	*Puntius conchonius*
10			Puntius	*Puntius chola*
11			Puntius	*Puntius ticto*
12			Amblypharyngodon	*Amblypharyngodon mola*
13			Catla	*Catla catla*

14			Cirrhinus	*Cirrhinus reba*
15			Labeo	*Labeo angra*
16			Labeo	*Labeo boggut*
17			Barilius	*Barilius barila*
18	Perciformes	Gobiidae	Glossogobius	*Glossogobius giuris*
19	Ophiocephaliformes	Ophiocephalidae	Channa	*Channa punctatus*

Table 3: Fish Diversity of Dudhi basin

Stations		S1	S2	S3	S4	S5	S6	S7	S8
S. No	Species Name								
1	*Notopterus notopterus*	+	-	-	-	-	-	-	-
2	*Nemacheilus botia*	-	+	-	+	-	-	+	+
3	*Nemacheilus duyi*	-	-	-	-	-	-	+	+
4	*Chela labuca*	-	-	-	-	-	+	-	-
5	*Oxygaster gora*	-	-	+	-	-	-	-	-
6	*Rasbora daniconius*	-	-	-	-	-	-	+	-
7	*Garra gotyla*	-	-	-	-	-	-	-	+
8	*Puntius sophore*	+	+	-	-	-	-	-	-
9	*Puntius conchonius*	-	-	+	+	-	-	-	-
10	*Puntius chola*	-	-	+	+	+	-	-	-
11	*Puntius ticto*	-	+	-	-	-	-	-	+
12	*Amblypharyngodon mola*	-	-	-	-	-	-	-	+
13	*Catla catla*	+	-	-	-	-	-	-	-
14	*Cirrhinus reba*	+	+	+	-	+	+	-	-
15	*Labeo angra*	-	-	-	+	-	-	-	-
16	*Labeo boggut*	+	-	-	-	-	-	-	-
17	*Barilius barila*	-	-	+	+	+	-	-	-
18	*Glossogobius giuris*	-	-	-	+	-	-	-	-
19	*Channa punctatus*	-	-	-	-	-	-	+	-

Family wise fish percentage composition in Dudhi basin

Family wise fish composition in Dudhi basin is presented below. In the present Ichthyofaunal study, a total of 19 fish species belonging to 5 families were recorded. On the basis of percentage composition and species richness, family Cyprinidae was dominant 14 species, followed by Cobitidae 2 species (Table 4 and Fig. -1).

Table 4: Family wise fish percentage composition in Dudhi basin

S.No.	Family	No. of Species	Composition (%)
1	Notopteridae	1	5.26
2	Cobitidae	2	10.52
3	Cyprinidae	14	73.68
4	Gobiidae	1	5.26
5	Ophiocephalidae	1	5.26

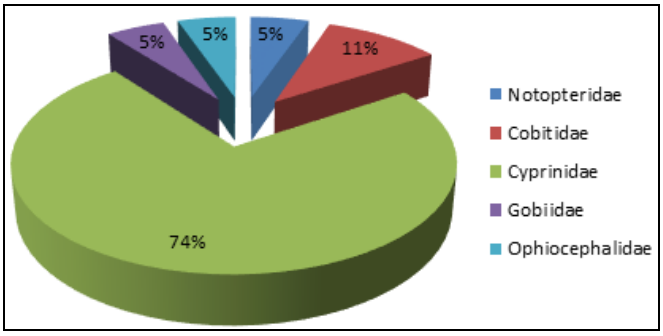


Fig 1: Family wise percentage composition of fishes in Dudhi basin

Family wise composition of fish individuals

Family wise fish composition of individuals of fishes recorded in Dudhi basin is given below. The family Cyprinidae was found dominant with the highest percentage 87.82%, composition followed by the family Cobitidae 9.61%, (Table 5 and Fig. -2).

Table 5: Family wise composition of fish individuals

S. No	Family	No. of Individuals	Composition (%)
1	Notopteridae	2	1.28
2	Cobitidae	15	9.61
3	Cyprinidae	137	87.82
4	Gobiidae	1	0.64
5	Ophiocephalidae	1	0.64

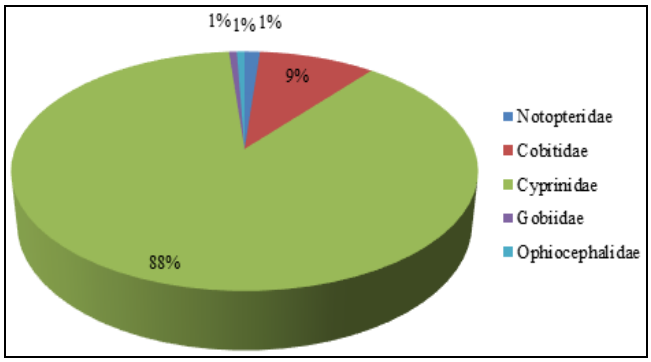


Fig 2: Family wise fish composition of individuals in Dudhi sub-basin

Conclusion

Documentation of biodiversity has become very much important aspect to understand different ecosystem and influences on them. The present study mainly focuses on fish

diversity and distribution in Dudhi River. Total number of species recorded during this study period has show a good indication of rich biodiversity. The Dudhi river support many unique ecosystems and a wide array of globally threatened species. In terms of species number, Dudhi River can be considered as an ecological hotspot since it has a biodiversity close to or greater than that of many other rivers in Madhya Pradesh. So, formulation of sustainable strategies to save fish population of this river system as a whole is required. Destruction of ecosystem and environmental degradation seriously affect the fish species. Conservation of fish diversity is an important issue under changing situation of gradual habitat destruction (Vijaylaxmi *et al.*, 2010) [32]. Data on available resources and identification of faunal biological characteristics is the key for resource conservation and maintenance. This study will provide future strategies for development and fish conservation.

Acknowledgement
The authors are thankful to the University Grants Commission, New Delhi for providing funds in the form of Major Research Project during the course of the present investigation.

References

1. Alam MS, Hossain MS, Monwar MM, Hoque ME. Assessment of fish distribution and biodiversity status in Upper Halda River, Chittagong, Bangladesh. Int. J Biodiv. Con. 2013; 5(6):349-357.
2. Anon. Fisheries department, M.P. Fisheries survey in Narmada River, 1971, 1967-71.
3. Arya SC, Rao KS, Shrivastava S. Biodiversity and Fishery potential of Narmada river Basin western zone M.P. India with special reference to Fish Conservation. Environment, Agriculture and pollution in Ssouthern Asia, 2001; 108-112.
4. Bose AK, Jha BC, Suresh VR, Das AK, Parasar A, Ridhi. Fishes of the Middle Stretch of River Tawa, Madhya Pradesh, India. J. Chem. Bio. Phy. Sci. Sec. A, 2013; 3(1):706-716.
5. CAFF. Fresh water fish diversity of central India, Ed. By Lakra, W.S. and Sarkar, U.K. Workshop proceeding. Organized by NBFGR at ICAR, Bhopal, M.P., and India, 2006, 1-183.
6. Day F. The Fishes of India, Jagmander Book Agency, New Delhi, 1994.
7. Dubey GP. 50 years of developing fisheries scenario of Narmada valley in M.P. Depicting progress in fish production from reservoirs etc. Fishing Chimes. 2006; 26(1):123-132.
8. Dubey GP. Fish fauna of Madhya Pradesh 1956-2001 and its present status. Fishing Chimes, 2007; 26:83-88.
9. Dubey GP, Mehra RK. Fish and fisheries of Chambal River Proceedings of the first all - Indian Congress of Zoology, Part-2, Scientific Papers, The zoological Socity of India, Calcutta, 1962; 647-665.
10. Dubey GP, Verma MN. A Preliminary study of the Fish fauna of Madhya Pradesh. The Vikram University Journal. The Vikram. 1965; 8(4):53-59.
11. Dutta SK, Kundu R. Socio-economic appraisal of culture based fishermen: case study in West Bengal. J. Soc. Sci. 2007; 15(3):255-262.
12. Harper DAT. Numerical Palaeobiology. John Wiley & Sons, 1999.
13. Hora SL, Nair KK. Fishes of Satpura Range, Hoshangabad District, Central Province, Rec. Indian Mus., 1941; 43:361-373.
14. Hora SL. The Fish fauna of Rihand river and its zoogeographical significance. Zool. India, 1949; 1:1-7.
15. Jayaram KC. The Freshwater fishes of India, Pakistan, Bangladesh, Burma and Srilanka, A handbook of Edited by Zoological, Survey of India Calcutta, 1981, 12.
16. Jayaram KC. The freshwater fishes of Indian region. Narendra Publishing House, New Delhi, 1999, 1-551.
17. Jhingran VG. Fish and Fisheries of India, Hindustan Pub. Co., New Delhi, 1991, 727.
18. Kar DA, Kumar C, Bohra, Sigh LK Eds. Fishes of Barak drainage, mizaram and Tripura; In: Environment, pollution and management, APH publishing corporation, New Delhi, 2003, 604:203-211.
19. Karamchandani SJ, Desai VR, Pisolkar MD, Bhatnagar GK. Biological investigation on the fish and fisheries of Narmada River 1958-66. Bull cent. Inland Fish. Res. Inst. Barrackpore, 1967, 10:40.
20. Maguran AE. Ecological diversity and its measurement. Prenceton University Press. Princeton, 1988.
21. Margale R. Perspectives in Ecological theory. University of Chiago press, Chicago, IL, 1968, 111.
22. Motwani MP, David A. Fishes of the river Sone with observations on the Zoogeographical Significance. J Zool. Soc. India. 1957; 9(1):9-15.
23. Nath D, Shrivastava NP. Decline in carp fisheries in Narmada in the context of construction of dama on the river and its tributaries. J. Inland Fish. Soc. India. 1999; 31(2):25-27.
24. Qureshi TA, Qureshi NA. Indian fishes, Publisher: Brij Brothers, Sultania Road, Bhopal. M.P., 1983, 5-209.
25. Rao KS, Chatterjee SN, Singh KA. Studies on preimpoudment fishery potential of Narmada Basin Western Region in the context of Indira Sagar, Maheshwar, Omkareshwar and Sardar Sarovar reservoirs. J.Inland Fish India. 1991; 23(1):34-91.
26. Romos S, Cowen RK, Re P, Bordalo AA. Temporal and Spatial distribution of larval fish assemblages in the Lima estuary Portugal. Estuarine, Coastal and Shelf Science, 2006; 66:303-314.
27. Sharma HS. Freshwater fish fauna of Madhya Pradesh including Chhattisgarh, State Fauna Series, 15 Part-1. Zool. Surv. India, 2007, 147-244.
28. Shrivastava G. Fishes of U.P. and Bihar, Sevnth edition, Vishwavidalaya Prakashan, Chowk Varanasi India Pub, 1998.
29. Talwar PK, Jhingran AG. Inland Fishes of India and Adjacent Countries. Oxford & IBH Publishing, New Delhi, 1991; 1&2:1158.
30. Unni K, Sankaran. Ecology of River Narmada. A.P.H. Publishing house, New Delhi, 1996; 1-371.
31. Verma D, Kanhere RR. Threatened Ichthyofauna of the River Narmada in western zone. Life Sciences Bulletin, 2007; 4(1&2):17-20.

32. Vijaylaxmi C, Rajshekhar M, Vijaykumar K. Freshwater fishes distribution and diversity status of Mullameri River, a minor tributary of Bheema River of Gulbarga District, Karnataka. Int. J. Sys. Bio., 2010, 2:1-9.
33. Vishwakarma KS, Vyas V. Study on species diversity and assemblage of Fish fauna of Jamner River: A tributary of River Narmada. International Journal of Applied Biosciences, 2014; 02(3):134-141.
34. Vishwakarma KS, Vyas V. Comparative study of ichthyofaunal diversity of Sip and Jamner River: A tributary of river Narmada Central India. International Journal of Fisheries and Aquatic Studies. 2016; 4(3):604-610.
35. Vishwakarma KS, Mir AA, Bhawsar A, Vyas V. Assessment of Fish assemblage and distribution in Barna Stream Network in Narmada basin Central India. International Journal of Advanced Research IJAR. 2014; 2(1):888-897.
36. Vyas V, Vishwakarma KS. Species diversity and assemblage of fish fauna of Sip River: A tributary of Narmada River. Journal of Research in Biology. 2013a; 3(5):1003-1008.
37. Vyas V, Vishwakarma KS. Study on Ichthyofaunal Diversity of Jamner River: A Tributary of Narmada River. International Journal of Theoretical & Applied Sciences. 2013b; 5(2):50-55.
38. Vyas V, Vishwakarma KS. Fish Diversity in two Tributaries of River Narmada, Central India. Journal of Chemical, Biological and Physical Sciences. 2013c; 3(4):2722-2730.
39. Vyas V, Vishwakarma KS. Ecological study of river Moran and Ganjal: A tributary of river Narmada. Shodh Narmada, 2015; 3:81-85.
40. Vyas V, Bara S, Parashar V, Damde D, Tuli RP. Temporal variation in fish biodiversity of River Narmada in Hoshangabad Region. Fishing Chimes, 2006, 27:49-53.
41. Vyas V, Damde D, Parashar V. Fish diversity of Narmada in submergence area of Indra Sagar Reservair. Journal of Inland Fish Soc. India. 2009; 41(2):18-25.
42. Vyas V, Damde D, Parashar V. Fish Biodiversity of Betwa River in Madhya Pradesh, India with Special reference to Sacred Ghat. Int. J. Biodiv. Con., 2012; 4(2):71-77.
43. Vyas V, Parashar V, Damde D. Documentation of Aquatic Biodiversity in Rivers and Ponds of M.P. Report submitted to M.P. State Biodiversity Board, 2010.
44. Vyas V, Parashar V, Bara S, Damde D. Fish catch composition of River Narmada with reference to common fishing gears in Hoshangabad area. National bulletin of life sciences. 2007; 4(1&2):1-6.