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ICHTHYOLOGICAL FAUNA OF AMRAVATI DISTRICT (M.S.) INDIA



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ABSTRACT

Amravati district is a district of Maharashtra state in central India. It is transverse by many rivers like Tapi river, Purna river, Wardha river, Chandrabhaga river, Shahanoor river and river River with their numerous tributaries. The study was conducted during June 2013 to September 2014. These river hosts many of fish species; total of 36 species belonging to 11 families were recorded. These families were; Cyprinidae (20), Channidae (03), Mastocembelidae (03), Ambassidae (02), Bagridae (02), Siluridae (02), Gobiidae (01), Notopteridae (01), Saccobranchidae (01), Clariidae (01), and Belonidae (01). The river and tanks of studied area have faced

major alterations in the recent years due to several anthropogenic activities like increasing urbanization, industrialization and various recreational activities. Since the fish fauna in Amravati District also supports the livelihood of several economic classes. So there is an urgent need to understand the conservation priorities and to design and implement conservation action plans.

KEYWORDS: Amravati, Freshwater fish fauna, River ecosystem, Threats.

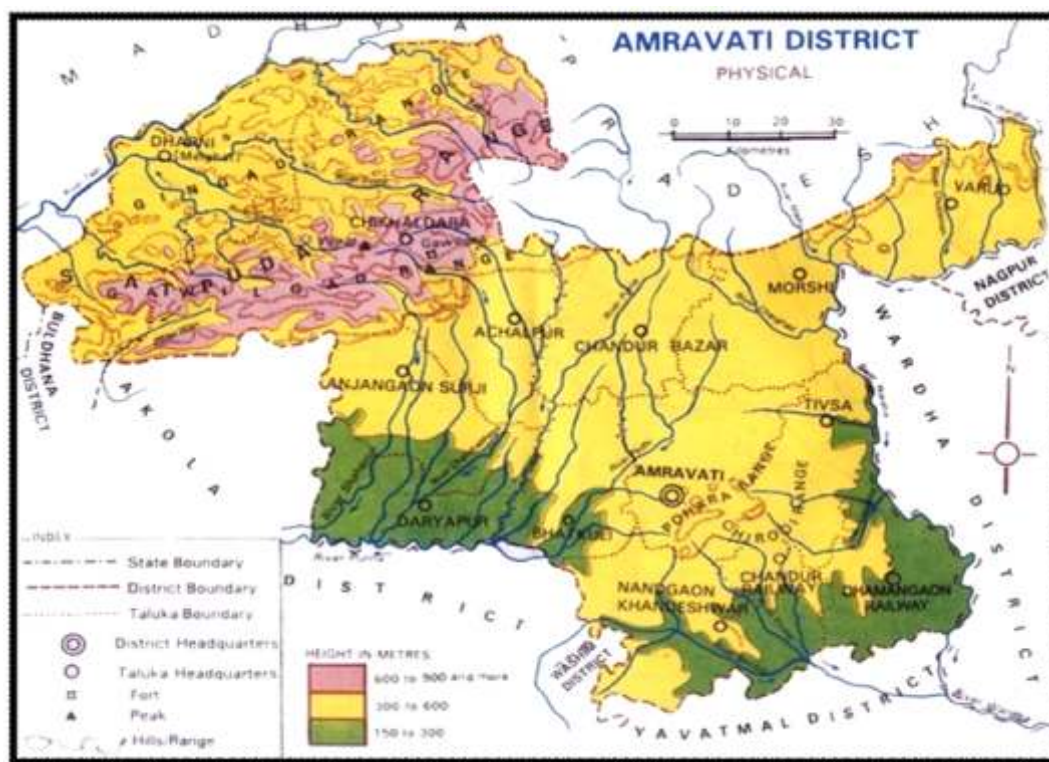
INTRODUCTION:

The biological diversity of the earth and its origins has long been a source of amazement and curiosity (Joshi et al., 2013). The diversity of fish has long been a source of amazement and curiosity. Around the world approximately 22,000 species of fishes have been recorded out of which 11 % are found in India that is about 2500 species of fishes of which, 930 live in freshwater and 1,570 are marine (Kar, 2003; Ubharane et al., 2011). From 18 century till to date various pioneers have been studied about Taxonomy and Ichthyofaunal diversity (Hamilton, 1822; Day, 1878; Menon, 1992) from different rivers. However scanty information is available on fishes hence an attempt has been made here to present piscine inventory from the Amravati District (M.S.).

Amravati district is district of Maharashtra state in central India. The district is situated between 20° 32' and 21° 46' north latitudes and 76° 37' and 78° 27' east longitudes with tropical climate.. The district occupies an area of 12,235 sq.km. The district is bounded by Baitul District of Madhya Pradesh state to north, and Nagpur district to northeast, Wardha to the east, Yavatmal to the

south, Washim to the southwest, and Akola and Buldhana district to the west. The district comprises of several rivers and impounded water sources. The Wardha river forms the eastern boundary of district and the eastern portion of the district lies within its water shade. The Purna drains the southwestern portion of district while the northwest is drained by the Tapti river. The other important rivers are Chandrabhaga, Shahanoor, Waan river etc. with their numerous tributaries (Amravati Gazetteer 2015).

Figure 1. Amaravati District (M.S.) India



These rivers and Tanks have faced major alterations in the recent years due to increasing urbanization, industrialization and various recreational activities. Reassessment of the fish fauna and identifying the threats, so as to build baseline information for possible conservation action plans are thus a priority. For the current study, stretches of the rivers were sampled to identify the current status and threats to the freshwater fish fauna of Amravati District (M.S.) India.

METHODOLOGY:

Fish were collected from local fisherman and local markets located on the rivers from June 2013 to September 2014. Fish were preserved in 4% formaldehyde and identified using available literature (Day, 1996; Menon, 1987, 1992; Talwar and Jhingran, 1991; Jayaram, 2010; Eschmeyer and Fricke, 2011). Assuming that the fishing effort for a given type of net (gill net or drag net) was constant, the relative abundance of the fish was grossly categorized (for each type of net separately) into four categories, namely: abundant (76–100 % of the total catch), common (51–75 % of the total catch), moderate (26–50 % of the total catch) and rare (1–25 % of the total catch). The Diversity data was quantified with the help of PAST Version 1.60 software (Hammer et al. 2001). The differences between the diversity and evenness indices of fishes among different rivers were statistically analyzed using Analysis of Variance.

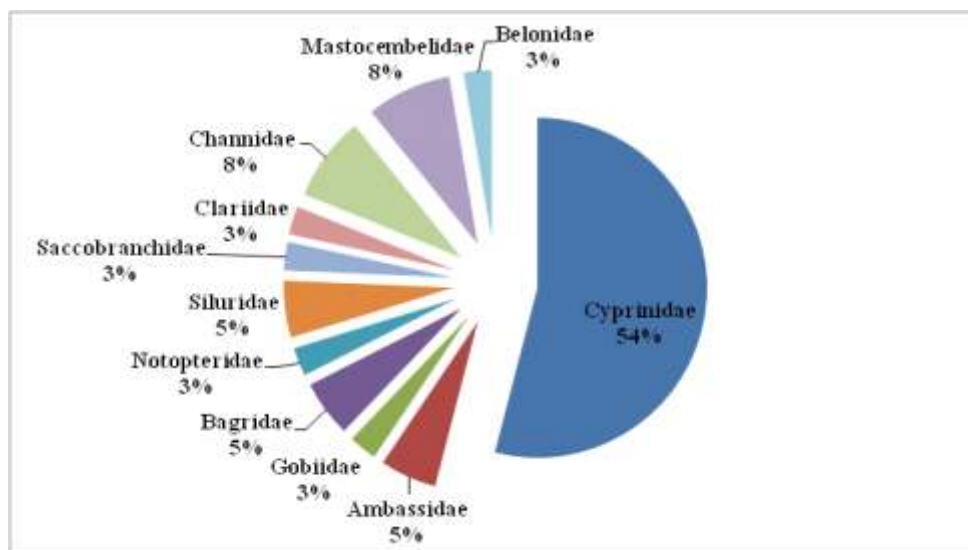
RESULTS AND DISCUSSION:

During study, total of 36 species belonging to 11 families were recorded (Table 1). These families were; Cyprinidae (20), Channidae (03), Mastocembelidae (03), Ambassidae (02), Bagridae (02), Siluridae (02), Gobiidae (01), Notopteridae (01), Saccobranchidae (01), Clariidae (01), and Belonidae (01) were recorded(Figure 1). Of these species; 08 were Abundant, 09 were Common, 14 were Moderate while 05 were Rare. From the observed species, Catla catla, Labeo rohita and Clarias batrachus are most commercially important fishes. Previously Lohar and Borse (2003) was reported 24 fish species belonging to 7 families in Tapi river. As well Joshi et al., (2012) were reported 20 species of 7 families from Purna river. In these reported fishes, Cyprinidae family was more dominant. Many researchers reported the strong dominance of Cyprinidae family in their investigations.

| Table 1: Ichthyological Fauna of Amravati District of Maharashtra (India). | | | | |
|--|-----------------|--------------------------------|--------------------|-----------|
| Sr. | Family | Species | Author | Abundance |
| 1. | Cyprinidae | <i>Acanthocobites murreh</i> | Sykes, 1839 | Abundant |
| 2. | | <i>Amblypharyngodon mola</i> | Hamilton, 1822 | Moderate |
| 3. | | <i>Catla catla</i> | Hamilton, 1822 | Abundant |
| 4. | | <i>Cirrhina mrigala</i> | Hamilton, 1822 | Abundant |
| 5. | | <i>Crossocheilus latius</i> | Hamilton, 1822 | Moderate |
| 6. | | <i>Ctenopharyngodon idella</i> | Steindachner, 1866 | Moderate |
| 7. | | <i>Cyprinus carpio</i> | Linnaeus, 1758 | Rare |
| 8. | | <i>Garra Mullya</i> | Sykes, 1839 | Common |
| 9. | | <i>Labeo baggut</i> | Sykes, 1839 | Rare |
| 10. | | <i>Labeo bata</i> | Hamilton, 1822 | Rare |
| 11. | | <i>Labeo calbasu</i> | Hamilton, 1822 | Moderate |
| 12. | | <i>Labeo rohita</i> | Hamilton, 1822 | Common |
| 13. | | <i>Osteobrama cotio</i> | Hamilton, 1822 | Moderate |
| 14. | | <i>Pethia ticto</i> | Hamilton, 1822 | Common |
| 15. | | <i>Puntius saphore</i> | Hamilton, 1822 | Common |
| 16. | | <i>Puntius sarana</i> | Hamilton, 1822 | Rare |
| 17. | | <i>Puntius ticto</i> | Hamilton, 1822 | Moderate |
| 18. | | <i>Rasbora daniconious</i> | Hamilton, 1822 | Common |
| 19. | | <i>Salmophasia bacaila</i> | Hamilton, 1822 | Common |
| 20. | | <i>Salmophasia balooki</i> | Sykes, 1839 | Common |
| 21. | Ambassidae | <i>Chanda nama</i> | Hamilton, 1822 | Moderate |
| 22. | | <i>Parambassis ranga</i> | Hamilton, 1822 | Common |
| 23. | Gobiidae | <i>Glossogobius giuris</i> | Hamilton, 1822 | Moderate |
| 24. | Bagridae | <i>Mystus cavasius</i> | Hamilton, 1822 | Abundant |
| 25. | | <i>Sperata seenghala</i> | Sykes, 1839 | Moderate |
| 26. | Notopteridae | <i>Notopterus notopterus</i> | Gunther, 1839 | Rare |
| 27. | Siluridae | <i>Ompok bimaculatus</i> | Bloch, 1793 | Moderate |
| 28. | | <i>Wallago attu</i> | Schlegel, 1839 | Moderate |
| 29. | Saccobranchidae | <i>Heteropneustes fossilis</i> | Bloch, 1793 | Moderate |
| 30. | Clariidae | <i>Clarias batrachus</i> | Linnaeus, 1758 | Abundant |
| 31. | Channidae | <i>Channa punctatus</i> | Bloch, 1793 | Abundant |
| 32. | | <i>Channa striatus</i> | Bloch, 1793 | Abundant |
| 33. | | <i>Channa orientalis</i> | Bloch, 1793 | Common |
| 34. | Mastocembelidae | <i>Mastocembelus armatus</i> | Lecepede, 1800 | Moderate |
| 35. | | <i>Mastocembelus pancalus</i> | Hamilton, 1822 | Moderate |
| 36. | Belonidae | <i>Xenentodon cancila</i> | Hamilton, 1822 | Abundant |

* Taxonomic status as per Jayaram (2010)

Figure 1. Percent Occurrence of different Ichthyological families from Amravati District (M.S.) India



The differences between the diversity and evenness indices of fishes among different rivers were statistically analyzed (Table 2).

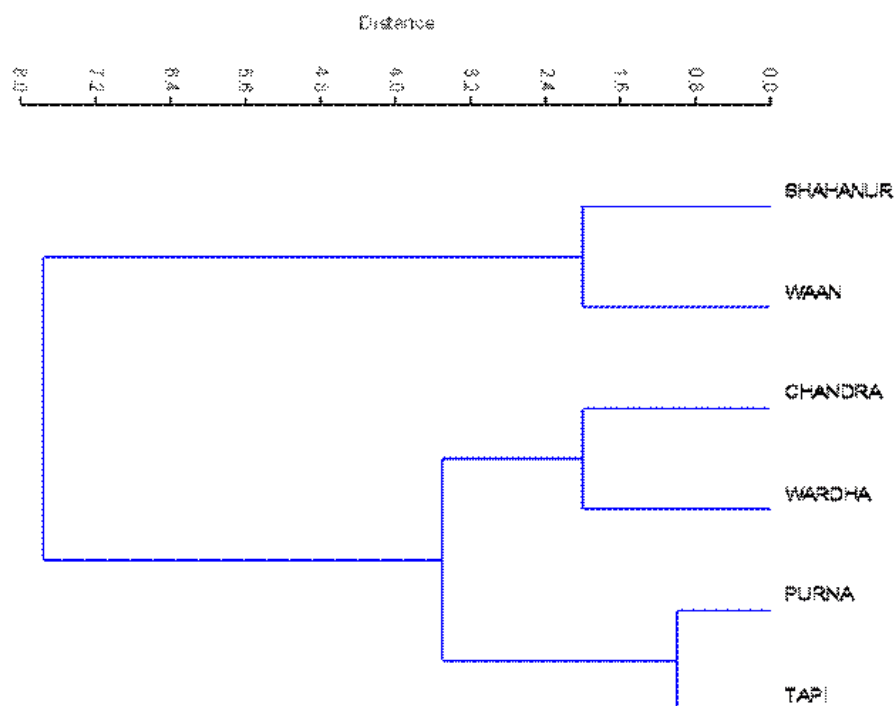
Table 2: Diversity measures Ichthyological fauna in different seasons during June 2012 to May 2014 from Amravati District, Maharashtra (India)

| Year / Month | No. of species | Relative abundance ^a | Shannon diversity ^b | Equitability ^c | Species richness ^d |
|---------------------|----------------|---------------------------------|--------------------------------|---------------------------|-------------------------------|
| Tapi | 36 | 19.25 | 3.045 | 0.8941 | 5.413 |
| Purna | 35 | 18.71 | 2.870 | 0.9267 | 5.124 |
| Wardha | 33 | 17.64 | 2.853 | 0.8761 | 4.278 |
| Chandrabhaga | 31 | 16.58 | 2.740 | 0.9219 | 4.713 |
| Shahanoor | 27 | 14.43 | 2.569 | 0.9279 | 4.659 |
| Waan | 25 | 13.36 | 2.553 | 0.9068 | 4.038 |

a = Mean percent abundance among different rivers were significantly different ($F=28.138$, $df=05$, $p<0.05$). b = Diversity values among different rivers were significantly different ($F=8.206$, $df=05$, $p<0.05$). c = Species equitability among different rivers were significantly different ($F=15.176$, $df=05$, $p<0.05$). d = Species richness among different rivers were significantly not different ($F=1.536$, $df=05$, $p>0.05$).

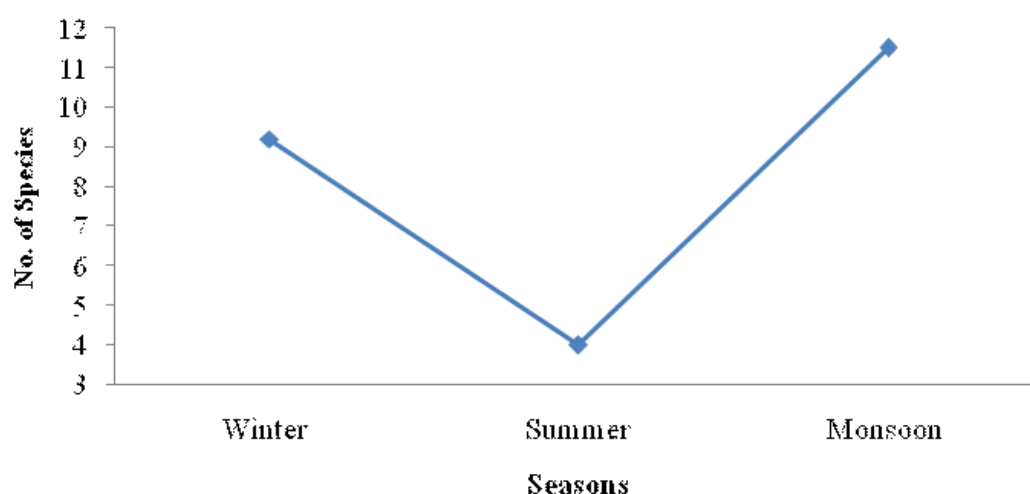
Cluster analysis was carried out to assess the similarity in number of fish's species composition among the studied rivers. The similarity association matrix upon which the cluster based was computed using the nearest neighbour pair linkage algorithm of Euclidean distance index for presence and absence data. Cluster shows the maximum number of species were reported from Tapi followed by Purna, Wardha, Chandrabhaga, Shahanoor and lowest from Waan (Figure 2).

Figure 2. Dendrogram showing similarity in number of fish species composition among the different seasons



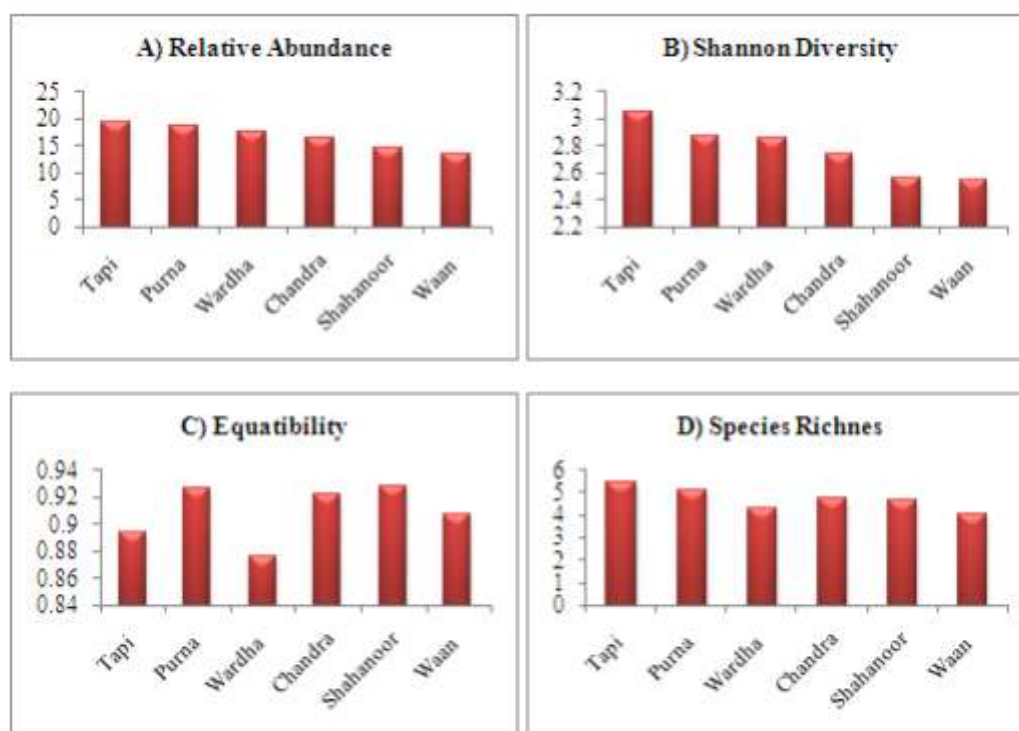
During study, the average number of specimens collected in different seasons. For comparing the catch success in different season, the average values of catch success were used as a simple mean of total species collected per attempt. Catch success was highest in Monsoon months followed by winter while it was comparatively low in Summer (Figure 3).

Figure 3. An average catch Success in different Seasons



A comparison of species diversity attributed to fish fauna among different rivers of Amravati District revealed that faunal diversity was highest at Tapi followed by Purna, Wardha, Chandrabhaga, Shahanoor then lowest observed from Waan river. A trend in Mean % Abundance was noted to be nearly similar to that of Shannon Diversity though Species Richness and Species Equitability shows contradictory pattern (Figure 4. A to D).

Figure 4: (A to D): Diversity measures of Ichthyological fauna in major rivers from Amravati district (M.S.) India



Previously, Sakhare (2001) was reported 23 species belonging to 07 order where Cyprinidae family is dominant with 11 species from Jawalgaon reservoir Solapur district Maharashtra. Battul et al. (2007) reported 18 species from Ekruckh lake Solapur district where Cyprinidae family is dominant with 8 species, Khedkar and Gynanath. (2005) reported 37 species from Issapur dam district Yavatmal where Cyprinidae family is dominant with 20 species. Sharma (2008) reported 87 species under 36 genera under the Cyprinidae family from freshwater of Nepal. Shinde (2009) observed 11 species under 10 genera under the Cyprinidae family from Harsul Savangi dam district Aurangabad (M.S). Ubharane et al (2011) observed that the 27 species belongs to 11 families where Cyprinidae family was dominant with 13 species from Ambadi dam of Aurangabad (M.S.) India.

The fishing operation goes on by the local fisherman throughout the study period with low catches in monsoon compare to high harvest in post monsoon season. river ecosystem of Amravati district hosts a number of fish species. But the ichthyological fauna of rivers is under threat as a result of several anthropogenic interferences. Other anthropogenic activities such as deforestation leading to siltation, recreational activities and sand mining are common in most of the stretches of the river. The fish fauna of rivers is also subjected to over fishing for consumption. Inorganic pollution of the river due to industrial and agricultural activities is another important threat to the fish fauna.

In conclusion, the rivers of Amravati District hosts a number of freshwater fish species.

However, the fish fauna in the study area is threatened due to several anthropogenic activities like deforestation, over fishing, sand mining, recreational activities, brick kiln, and organic and inorganic pollution. Since the fish fauna in Amravati District also supports the livelihood of several economic classes. So there is an urgent need to understand the conservation priorities. Fishery department should adopt Legislative measure for conservation of commercially significant fishes which may disappear from rivers of Amravati District (M.S.) India.

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LITERATURE CITED

1. Battul, P.N., R.A Rao, K.R. Navale, M.B. Bagale and N.V Shah. (2007). Fish Diversity from Ekruk Lake Near Solapur Maharashtra. J. Aqua. Biol., 22 (2): 68-72.
2. Day, F. (1878). The fishes of India, being a natural history of the fishes known to inhabit the seas and fresh waters of India, Burma and Ceylon. Vol. I and II. Ceylon text and atlas in 4 pts., London
3. Day, F. (1986). The Fishes of India; Being A Natural History of the Fishes Known to Inhabit the Seas and Fresh Waters of India, Burma, and Ceylon. Vol. 1 and 2. Today and Tommorrow's Book Agency, 778pp.
4. Eschmeyer, W.N. and R. Fricke (eds.) (2011). Catalog of Fishes electronic version. <http://research.calacademy.org/ichthyology/catalog/fishcatmain.asp>. Online version dated 29 March 2011. Downloaded on 22 April 2011.
5. Hamilton Buchanan (1822). An account of the fishes found in the river Gangas and its branches. Vol. I-VII. Printed for Archibald constable and company, Edinburgh and Hurst, Robinson and Co - 90, Cheapside London. pp: 405.
6. Hammer Ø, Harper DAT and PD Ryan, (2001). Paleontological statistics software package for education and data analysis. Paleontologia Electronica. 4(1): 9 pp
7. Jayaram, K.C. (2010). The Freshwater Fishes of the Indian Region. Second Edition. Narendra Publishing House, Delhi, 616pp.
8. Joshi P. S., S. A. Tantarapale, V. T. Tantarapale and K.M. Kulkarni. (2012). Ichthyological fauna of Buldhana District, Maharashtra (India.). Onl. I. Inter. Res. J. 2(2): 111-115
9. Joshi P. S., V. T. Tantarapale and K.M. Kulkarni. (2013). Fishing Methods Commonly Employed In Buldhana District and Neighborhood, Maharashtra State (India) Bioscience Discovery, 4(1): 54-57.
10. Kar. D. (2003). Fishes of Baraka drainage Mizoram and Tripura in A. Kumar, C. Bhaora and L.K. Singh, (eds.). APH Publishing cooperation, New Delhi. : 202-211.
11. Khedkar G.D. and G. Gynanath. (2005). Biodiversity and distribution of the fishes from the back waters of Issapur reservoir dist Yeotmal, Maharashtra state India. Trends in Life Science (India) 2005, 20 (2): 117-126.
12. Lohar, P. S. and S. K. Borse (2003). Diversity of fish fauna in River Tapi, Maharashtra J. Aqua. Biol. 18(1): 47-49
13. Menon A.G.K. (1999). Check List of Freshwater fishes of India (ZSI) Culcutta Occasional paper no.175.ZSI Culcutta pp-306.
14. Menon, A.G.K. (1987). The Fauna of India and Adjacent Countries, Pisces, Vol-4, Teleostei-Cobitoidea, Part-1, Homalopteridae. Zoological Survey of India, Kolkata, 259pp.
15. Menon, A.G.K. (1992). The Fauna of India and Adjacent Countries, Pisces, Vol-4, Teleostei-Cobitoidea, Part-2 Cobitidae. Zoological Survey of India, Kolkata, 113pp.

- 16.Sakhare .V.B. (2001). Ichthyofauna of Jawalgaon reservoir in Solapur district of Maharashtra. J. Aqua Biol., 16(1 and 2): 31-33.
- 17.Sharma C. M. (2008). Freshwater Fishes, Fisheries and Habitat prospects of Nepal, Aquatic ecosystem, health and management vol. 11 (3):75-82.
- 18.Shinde S.E., Paithane, R.Y Bhandare and D.L Sonawane. (2009). Ichthyofaunal diversity of Harsool Savangi Dam district Aurangabad (M.S) India. World J. Fresh Mar.Sci.1(3):141-143.
- 19.Talwar, P.K. and A.G. Jhingran (1991). Inland Fishes of India and Adjacent Countries. Oxford-IBH Publishing Co. Pvt. Ltd., New Delhi, 1158pp.
- 20.Ubarhande S.B , J.T. Jagtap and S.R. Sonawane (2011). Ichthyofanal Diversity from Ambadi Dam, Taluka Kannad, District –Aurangabad (M.S.) Recent Research in Science and Technology 3(6): 34-37
- 21.Wilson E.O. (1992) . The Diversity of life. Belknap press, Harvard Univ., Cambridge. MA.

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