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RESEARCH ARTICLE

A TYPICAL STUDY ON FISH FAUNAL BIODIVERSITY OF THOTAPALLI AND GOTTA RESERVOIRS OF VIZIANAGARAM AND SRIKAKULAM DISTRICTS OF ANDHRAPRADESH, INDIA

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ABSTRACT

The present study is the first documentation of the fish faunal diversity in Thotapalli and Gottabarrage reservoirs of Nagavali and Vamsadhara rivers in Vizianagaram, Srikakulam districts respectively of Andhra Pradesh state. The study was conducted for a period of two years i.e. June 2012 to May 2014. The observations of the study showed the presence of 31 species with the occurrence of 28 species in Thotapalli reservoir and 26 species in Gottabarrage reservoir. The fish species belonged to the orders Cypriniformes, Siluriformes, Perciformes, Synbranchiformes, Osteoglossiformes and Anguilliformes. The status of each species of fishes has been listed out as per IUCN (2014.3) and CAMP (1998).

INTRODUCTION

Biodiversity may be broadly defined as the variety and variability among living organisms and the ecological complexes in which they occur. It is measured at different scales ranging from genus to ecosystem and the most commonly used, is at level of species. The Indian reservoirs harbour a variety of fish species and primarily express the fish faunal diversity. Fishes are rich in protein, vitamin, nutrients, thus are chief food resource and indicate a good measure of the ecological well being of the waters they inhabit. India, considered as one of the megadiversity countries is home to 930 fresh water species belong to 326 genera, 99 families and 20 orders (Talwar and Jhingran, 1991), is eighth in the world and third in Asia in fresh water fish diversity (Kottelat and Whitten, 1996). Diversity of fresh water fish species have been studied by Motwani and Saigal (1974), Ghate and Wagh (1995). Nagavali and Vamsadhara are major freshwater fishery resources in Vizianagaram and Srikakulam districts of Andhra Pradesh. Thotapalli and Gotta barrage are the reservoirs that have been constructed across the two rivers Nagavali and Vamsadhara respectively. Developing a baseline data on the natural population potential of the indigenous species is the need in the present scenario, together with identifying extreme risk areas for effective monitoring and conservation programs,

hence an attempt has been made to study the fish faunal diversity of the two reservoirs.

MATERIALS AND METHOD OF STUDY

Study Areas

Thotapalli is situated at (N 18°47'17.56" and E 83°29'50.60") in Vizianagaram district (Fig.1a) and Gotta barrage at (N 18°41'21.51" and E 83°57'41.35") in Srikakulam district (Fig.1b) of Andhra Pradesh and are manmade reservoirs. The water of reservoirs are mainly used for irrigation purposes and fishing is also observed. Fishes were collected from these reservoirs in different seasons by using different types of 'Nets & Gears' with the help of local fishermen. Fishes caught were thoroughly washed, photographed in fresh condition and preserved in 9-10% formalin solution (Jayaram, 1999). For larger fishes an incision on the abdomen was done and the gut contents were removed before preservation. The collections were made once in a month from June 2012 to May 2014. The fishes were identified with help of standard books (Talwar and Jhingran, 1991, Jayaram, 1999 and Nath and Dey, 2000). The conservation status of the fish species have been listed based on IUCN (2014.3), CAMP (1998).

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Table. 1 List of fishfaunal taxa in the Thotapalli reservoir during the study period

S.No	Species	Local names	Family	Order
1	<i>Catla catla</i> (Hamilton,1822)	Boche		
2	<i>Labeo rohita</i> (Hamilton,1822)	Rohu		
3	<i>Labeo calbasu</i> (Hamilton,1822)	Kaki boche		
4	<i>Labeo ariza</i> (Hamilton,1807)	Yerra Mosu		
5	<i>Cirrhinus mrigala</i> (Hamilton,1822)	Merikalau		
6	<i>Cirrihinhs reba</i> (Hamilton ,1822)	Mosu	Cyprinidae	Cypriniformes
7	<i>Cyprinus carpio</i> (Linnaeus ,1758)	Bangaru teega		
8	<i>Ctenopharyngodon idella</i> (Valenciennes,1844)	Gaddi cheap		
9	<i>Punctius ticto</i> (Hamilton,1822)	Pittaparigi		
10	<i>Punctius sarana</i> (Hamilton ,1822)	Pittaparigi		
11	<i>Hemiculterella sauvagei</i> (warpachowaki ,1888)	Badusu		
12	<i>Punctius sophore</i> (Hamilton ,1822)	Pittaparigi		
13	<i>Mystus vitatus</i> (Bloch ,1794)	Jella		
14	<i>Mystus bleekeri</i> (Day,1877)	Errajella	Bagridae	
15	<i>Mystus cavasius</i> (Hamilton,1822)	Guddijella		
16	<i>Clarias batrachus</i> (Linnaeus,1758)	Marphoo	Clariidae	Siluriformes
17	<i>Heteropneustes fossilis</i> (Bloch,1794)	Inglikam	Heteropneustidae	
18	<i>Wallago attu</i> (Bloch&Schneider,1801)	Valugu	Siluridae	
19	<i>Glosogobius giuris</i> (Hamilton,1822)	Iske donti	Gobiidae	
20	<i>Oreochromis mossambicus</i> (peters,1852)	Tati gorasa	Cichlidae	
21	<i>Oreochromis niloticus</i> (Linnaeus ,1758)	Gorasa		Perciformes
22	<i>Channa punctatus</i> (Bloch,1793)	Mitta pilla		
23	<i>Channa striatus</i> (Bloch,1793)	Korramenu or Savada	Channidae	
24	<i>Mastacembelus armatus</i> (Lacepede,1800)	Maccala Bommidam		
25	<i>Macragnathus pancalus</i> (Hamilton ,1822)	Bommidam	Mastacemblidae	Synbranchiformes
26	<i>Macragnathus aculatus</i> (Bloch ,1786)	Bommidam		
27	<i>Notopterus notopterus</i> (pallas,1769)	Vollenka	Notopteridae	Osteoglossiformes
28	<i>Anguilla bicolar</i> (McCelland,1844)	Pamu cheap	Anguillidae	Anguilliformes

Table 2 List of fishfaunal taxa in the Gottabarrage reservoir during the study period

S.No.	Species	Local names	Family	Order
1	<i>Catla catla</i> (Hamilton,1822)	Boche		
2	<i>Labeo rohita</i> (Hamilton,1822)	Rohu		
3	<i>Labeo calbasu</i> (Hamilton,1822)	Kaki boche		
4	<i>Cirrhinus cirrhosus</i> (Bloch,1795)			
5	<i>Cirrhinus mrigala</i> (Hamilton,1822)	Merikalau		
6	<i>Cirrihinhs reba</i> (Hamilton ,1822)	Mosu		
7	<i>Cyprinus carpio</i> (Linnaeus ,1758)	Bangaru teega	Cyprinidae	Cypriniformes
8	<i>Ctenopharyngodon idella</i> (Valenciennes,1844)	Gaddi cheap		
9	<i>Hypophthalmichthys molitrix</i> (valenciennes,1844)	Panduchepa		
10	<i>Punctius ticto</i> (Hamilton,1822)	Pittaparigi		
11	<i>Punctius sarana</i> (Hamilton ,1822)	Pittaparigi		
12	<i>Punctius sophore</i> (Hamilton ,1822)	Pittaparigi		
13	<i>Amblypharyngodon mola</i> (Hamilton ,1822)	Lasa		
14	<i>Hemiculterella sauvagei</i> (warpachowaki ,1888)	Badusu		
15	<i>Mystus bleekeri</i> (Day,1877)	Errajella	Bagridae	
16	<i>Mystus cavasius</i> (Hamilton,1822)	Guddijella		
17	<i>Clarias batrachus</i> (Linnaeus,1758)	Marphoo	Clariidae	Siluriformes
18	<i>Heteropneustes fossilis</i> (Bloch,1794)	Inglikam	Heteropneustidae	
19	<i>Wallago attu</i> (Bloch&Schneider,1801)	Valugu	Siluridae	
20	<i>Glosogobius giuris</i> (Hamilton,1822)	Iske donti	Gobiidae	Perciformes
21	<i>Channa punctatus</i> (Bloch,1793)	Mitta pilla		
22	<i>Channa striatus</i> (Bloch,1793)	Korramenu or Savada	Channidae	
23	<i>Mastacembelus armatus</i> (Lacepede,1800)	Maccala Bommidam		
24	<i>Macragnathus pancalus</i> (Hamilton ,1822)	Bommidam	Mastacemblidae	Synbranchiformes
25	<i>Notopterus notopterus</i> (pallas,1769)	Vollenka	Notopteridae	Osteoglossiformes
26	<i>Anguilla bicolar</i> (McCelland,1844)	Pamu cheap	Anguillidae	Anguilliformes

Table3 Number and percentage contribution of Families, Genera, and Species in Thotapalli

S.No	Order	Families	Genera	Species	Families % in an order	Genera % in an order	Species % in an order
1	Cypriniformes	1	7	12	9.090	38.888	42.857
2	Siluriformes	4	4	6	36.363	22.222	21.428
3	Perciformes	3	3	5	27.272	16.666	17.857
4	Synbranchiformes	1	2	3	9.090	11.111	10.714
5	Osteoglossiformes	1	1	1	9.090	5.555	3.571
6	Anguilliformes	1	1	1	9.090	5.555	3.571

Table 4 Number and percentage contribution of Families, Genera and Species in Gottabarrage

S.No	Order	Families	Genera	Species	Families % in an order	Genera % in an order	Species % in an order
1	Cypriniformes	1	9	14	10	47.368	53.846
2	Siluriformes	4	4	5	40	21.052	19.230
3	Perciformes	2	2	3	20	10.526	11.538
4	Synbranchiformes	1	2	2	10	10.526	7.692
5	Osteoglossiformes	1	1	1	10	5.263	3.846
6	Anguilliformes	1	1	1	10	5.263	3.846

Table 5 Abundance and CAMP (1998), IUCN (2014.3) status of the fish species

S.No	Family	Species	Abundance			IUCN status 2014.3
			Thotapalli	Gottabarrage	CAMP status	
1	Cyprinidae	<i>Catla catla</i> (Hamilton,1822)	M	L	VU	NE
2		<i>Labeo rohita</i> (Hamilton,1822)	M	L	LRnt	LC
3		<i>Labeo calbasu</i> (Hamilton,1822)	L	M	LRnt	LC
4		<i>Labeo ariza</i> (Hamilton,1807)	L	NP	DD	LC
5		<i>Cirrhinus mrigala</i> (Hamilton,1822)	M	L	LRnt	LC
6		<i>Cirrhinhs reba</i> (Hamilton,1822)	A	M	VU	LC
7		<i>Cirrhinus cirrhosus</i> (bloch,1795)	NP	A	VU	VU
8		<i>Cyprinus carpio</i> (Linnaeus,1758)	L	L	NE	VU
9		<i>Ctenopharyngodon idella</i> (Valenciennes,1844)	L	L	NE	NE
10		<i>Hypophthalmichthys molitrix</i> (valenciennes,1844)	L	NP	NE	NE
11		<i>Punctius ticto</i> (Hamilton,1822)	M	M	LRnt	NE
12		<i>Punctius sarana</i> (Hamilton,1822)	L	L	VU	LC
13		<i>Punctius sophor e</i> (Hamilton,1822)	A	A	LRnt	NE
14		<i>Amblypharyngodon mola</i> (Hamilton,1822)	A	NP	LRnt	LC
15	Bagridae	<i>Hemiculterella sauvagei</i> (warpachowski,1888)	L	L	NE	LC
16		<i>Mystus vitatus</i> (Bloch,1794)	L	M	VU	NE
17		<i>Mystus bleekeri</i> (Day,1877)	L	M	VU	NE
18	Claridae	<i>Mystus cavasius</i> (Hamilton,1822)	L	M	LRnt	LC
19		<i>Clarias batrachus</i> (Linnaeus,1758)	R	R	VU	LC
20	Heteropneustidae	<i>Heteropneustes fossilis</i> (Bloch,1794)	R	R	VU	NE
21	Siluridae	<i>Wallago attu</i> (Bloch&Schneider,1801)	L	M	LRnt	NT
22	Gobiidae	<i>Glossogobius giuris</i> (Hamilton,1822)	L	M	LRnt	NE
23	Cichlidae	<i>Oreochromis mossambicus</i> (peters,1852)	R	NP	NE	NT
24		<i>Oreochromis niloticus</i> (Linnaeus,1758)	A	NP	NE	NE
25	Channidae	<i>Channa punctatus</i> (Bloch,1793)	M	L	LRnt	NE
26		<i>Channa striatus</i> (Bloch,1793)	A	L	LRlc	NE
27	Mastacembelidae	<i>Mastacembelus armatus</i> (Lacepede,1800)	M	L	VU	LC
28		<i>Macrognathus pancalus</i> (Hamilton,1822)	M	NP	LRnt	LC
29		<i>Macrognathus aculates</i> (Bloch,1786)	M	L	NE	NE
30	Notopteridae	<i>Notopterus notopterus</i> (pallas,1769)	A	M	LRnt	LC
31	Anguillidae	<i>Anguilla bicola r</i> (McClland,1844)	A	M	NE	NT



Figure 1 Study area map showing sampling stations a) Thotapalli and b) Gotta barrage.

Osteoglossiformes, one to Anguilliformes. Family wise distribution showed dominance of Cyprinidae with twelve species Bagridae and Mastacembelidae of three species each Channidae and Cichlidae of two species each and Siluridae, Heteropneustidae, Claridae, Gobiidae, Notopteridae, and Anguillidae of one species each.

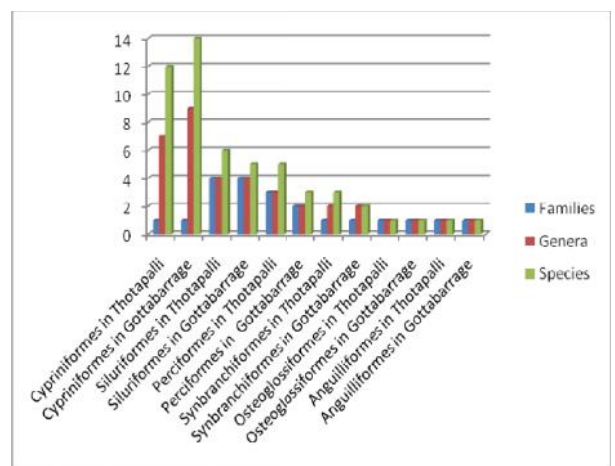


Fig 33 Number of Families, Genera, and Species at study areas

RESULT AND DISCUSSION

The fish species identified are presented in Tables 1 & 2 and in Plates-I and II (Figs. 2 to 32). Number and percentage of families, genera and species in an order are shown in Tables 3 & 4 and Figs 33 and 34.

At Thotapalli reservoir, among the species identified twelve belonged to order Cypriniformes, six of Siluriformes, five of Perciformes, three of Synbranchiformes, one

At Gottabarrage reservoir among the species identified fourteen belonged to order Cypriniformes, five of Siluriformes, Order Cypriniformes showed its dominance in both reservoirs, Similar observations were earlier made by Talwar and Jhingran (1991), Devi (1997), Vijayalaxmi, *et al* (2008), Vijayalaxmi, *et al.*, (2010), Uchchhariya, *et al.*, (2012), Jchandra Sekhara Rao *et al* (2013), Renuka and Heena Mubeen, (2014), Basavaraja *et al*(2014). Among the families Cyprinidae was more dominant in the present study and is in agreement with earlier studies made by Raghavan *et al.*, (2008), Ubharhande and Sona Wane, (2012), Laxmappa *et al.*, (2015).

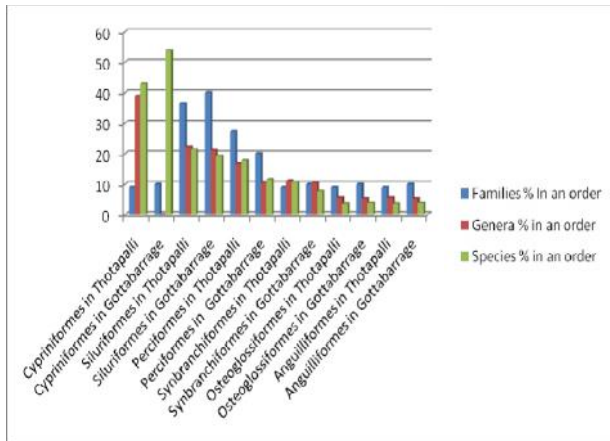


Fig 34 Percentage of Families, Genera, and Species at study areas

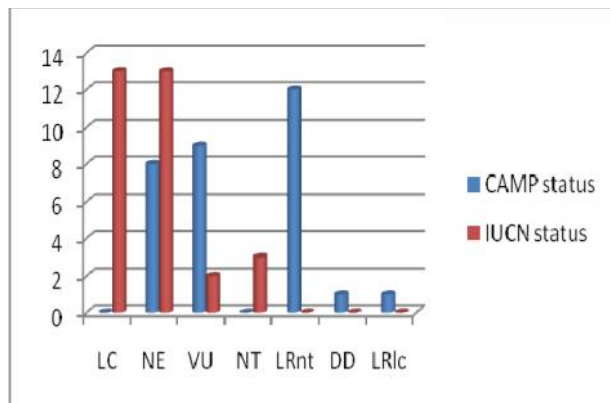


Fig 5 CAMP (1998), IUCN (2014.3) status chart

Plate-I: Fish species

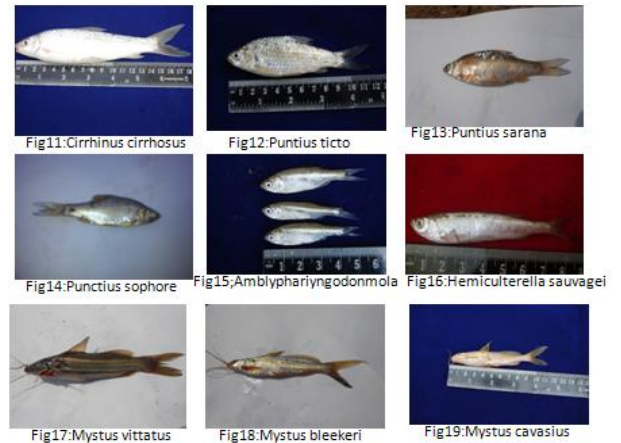
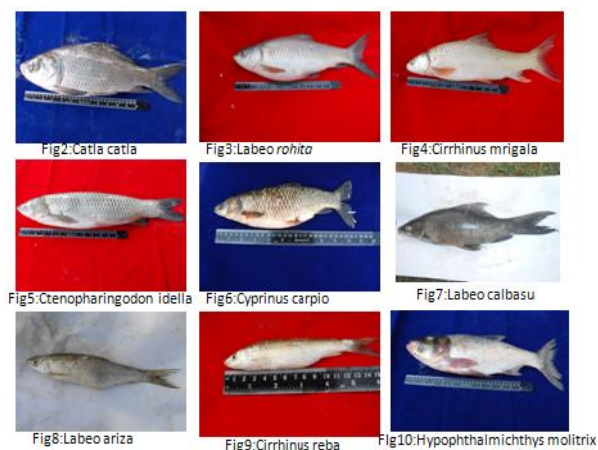


Plate-II: Fish species



three of Perciformes, two of Synbranchiformes, one Osteoglossiformes, and one to Anguilliformes.. Family wise distribution showed dominance of the Cyprinidae with fourteen species, Bagridae, Channidae and Mastacembelidae of two species each and Claridae, Heteropneustidae, Siluridae, Gobidae, Notopteridae and Anguillidae of one species each, were observed. Out of the total 31 species in both reservoirs as per the CAMP(1998) status, 12 Lower risk near threatened, 9

vulnerable, 8 Not evaluated, 1 Lower risk least concerned, and 1 Data deficient. According to IUCN (2014.3) status 13 Least concerned, 13 Not evaluated, 3 Near threatened, 2 Vulnerable (Table 5 and Fig. 35). According to the IUCN (2014.3) status *Anguilla bicolar* and *Wallago attu*, are nearly threatened species but in Thotapalli reservoir *Anguilla bicolar* is abundantly available and *Wallago attu* is moderately available in Gotta Reservoir.

The diversity of fish fauna can be said to be good in both Thotapalli and Gottabarrage reservoirs. All the species are having edible value. It is found that the reservoirs can be considered being in good condition for fish production and also further studies about the period of availability of the fish species in abundance for fishing and improving and protecting their habitats can be done. The period when abundance of fish species becomes low can be a holiday from the capturing of fish species and that time a chance to secondary fish production like only shell fish capture at low water levels can be taken up.

CONCLUSION

The present study has been taken up to produce a checklist of the fish species and is the first ever documentation of fish fauna of Thotapalli and Gotta barrage reservoirs. The study reveals there are sufficient number of species contributing significantly towards the reservoir fishery of the two districts of Vizianagaram and Srikakulam, in Andhra Pradesh India. Therefore this study provides the basic step for detail studies on freshwater fish fauna of riverine systems mainly with regards to taxonomic, ecological and conservation studies

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References

1. Basavaraja D., J. Narayana, B. R. Kiran and E. T. Puttaiah. (2014) Fish diversity and abundance in relation to water quality of Anjana pura reservoir, Karnataka, India. *Int. j. Cuurr. Microbiol. App. Sci* 3(3):747-757
2. CAMP, Organized by Zoo Outreach Organization and NBFGR, Lucknow, 1998
3. Chandra sekhar Rao, J., G. Simhachalam & CH. Sebastian Raju (2013) A Study on Ichthyofaunal Diversity, Conservation status and Anthropogenic stress of River Champavathi, Vizianagaram District (AP) India. *ASIAN J. EXP. BIOL. SCI.* VOL4(3):418-424.
4. Ghatge H. and Wagh G. K. (1995): Additional information on the grey mullet *rhingmugil inornatona corsula* (Hamilton), from western Maharashtra, *Journal of Bombay nat. hist. soci.* 92:273-274
5. IUCN Red List of threatened species. Version 2014.3 www.iucnredlist.org downloaded on 2 January 2015

6. Jayaram, K. C. 1981. Fresh water fishes of India handbook. *zool. surv. India.*, Calcutta.
7. Jayaram, K. C. 1999. The Freshwater Fishes of the Jhingran, A. G. and Pathak. 1987. Ecology and
8. Indian Region. Narendra Publishing House, New Delhi, pp. xxvii+551. management of beels in Assam—a case study of three beels, pp. 16-36. In Compendium of Workshop on Development of Beel Fishery in Assam. Assam Agricultural University, Khanapara, Guwahati
9. Kottelat M Whitten T (1996) Freshwater Biodiversity in Asia with special reference to fish. World Bank Technical Paper No. 343. Washington.
10. Laxmappa, B., S. Jithender Kumar Naik and S. Vamshi (2015). Ichthyofaunal diversity of Koilsagar reservoir in Mahabubnagar district, Telangana, India. *Int. J. Fish. Aqua. Stud* 2(3):23-30
11. Motwani, M. P. and Saigal B. N. (1974): Fish Fauna of Sarda Sagar Reservoir in Pilibhit (U.P.) and Some Recommendations for Development of Reservoir Fisheries, *India J. Fish.* 21 (1): 109 - 119..
12. Nath, P. and S. C. Dey. 2000. Fish and fisheries of North Eastern India (Arunachal Pradesh). New Delhi. Narendra Publishing House, pp. 217
13. Raghavan, R., Prasad, G., Anvar Ali, P. H. and Pereira, B. (2008) Fish fauna of chalakudy River, part of western Ghats biodiversity hotspot, Kerala, India. Patterns of distribution, threats and conservation needs. *J. Biodiv. Conser.*, 17:3119-3131
14. Renuka K., and Heena Mubeen (2014) Checklist on Ichthyofaunal Diversity of Katisanghavi (Bhima river) and Tntni (Krishna river) of Northern Karnataka. *Int. J. Enviorn. Sci.*, 3(4):183-184
15. Talwar, P. K., and A. G. Jhingran; Inland fishes of India and adjacent countries, Vol. 1 & 2. Oxford & IBH Publishing Co. Pvt. Ltd., 1991, 1158pp
16. Ubharhande, S. B., and Sona Wane, S. R. (2012) Study of freshwater fauna and Water quality at Paintakli dam from Buldhana district, (M.S) India. *J. Exp. Sci.*, 3(7):04-08
17. Uchchariya, D. K., Meenakshi Saxena and Saksena, D. N. (2012) Fish biodiversity of Tighra reservoir of Gwalior, Madhyapradesh, India. *J. Fish. Aqua.*, 3(1):37-43
18. Vijayalaxmi, C., Rajasekhar, M. and Vijaykumar, K. (2010) Fresh water fishes distribution and diversity status of Mullameri River, a minor tributary of Bheema River of Gulbarga District, Karnataka. *Int. J. Syst. Biol.*, 2(2):1-9
19. Vijayalaxmi, C., Vijaykumar, K., Zeba Parveen and Anil Kumar Chavan (2008) Fish fauna of Bheema river, Gulbarga District, Karnataka. *J. Ecophysiol. Occup. Health*, 8:237-240
20. Vishwanath, W. 2002. Fishes of North East India a field guide to species identification. Agricultural Technology Project, Department of Life Sciences, Manipur University, India
