



## Fish species richness and diversity of an unmanaged fish pond, Nalbari, Assam

### KEYWORDS

Fish, pond, Nalbari, Assam

Hitesh Das

Department of Zoology, Gauhati University

**ABSTRACT** Richness and diversity of fish species was studied during 2010-2011 in an unmanaged fish pond of Nalbari district, Assam, locally called as *Tinikonia Pukhuri*. The results of present study reveal the occurrence of 35 fish species belong to 6 orders, 12 families and 25 genera. Among these Cypriniformes contributes dominant order (43%) and Clupeiformes along with Cypridontiformes found as less dominant order (3%).

### INTRODUCTION

Ichthyodiversity refers to the variety of fish species; depending on context and scale, it could refer to alleles or genotypes within fish population to species of life forms within a fish community and to species or life forms across aqua regimes (Burton *et al.*, 1992). Fish constitutes half of the total number of vertebrates in the world (Shinde *et al.*, 2009).

In the Indian subcontinent, there are 2,500 species of freshwater fish species (Jayaram, 1999). There are a few reports on fisheries of lentic water bodies of Assam were documented. In this respect works of Dey (1981), Hazarika and Dutta, (1994), Sarma *et al.*, (2007), Acharya *et al.*, (2008), Bhuyan *et al.* (2009) are worth mentioning. But there is a scare of sufficient knowledge about fish diversity of lentic water ecosystems of Nalbari district, Assam. With this background, the present study was conducted to generate a primary survey on richness and diversity of ichthyofauna of a pond (*Tinikonia Pukhuri*) of Nalbari district. This is an unmanaged pond and the same is usually emended by flood water in every monsoon season.



Fig.1. Satellite image of *Tinikonia Pukhuri* in Nalbari district, Assam  
(Source Google Earth)

### MATERIALS AND METHODS

Diversity of fish fauna was monitored during 2010-2011 in *Tinikonia Pukhuri*, an ancient pond of Nalbari district of Assam. It is a man made pond and situated in Nalbari Town (26° 26' 19.18" N, 91° 25' 50.29"). Sampling was done during four different seasons *viz.*, pre-monsoon (March-May), monsoon (June-September), retreating monsoon (October-November) and winter (December-February) after Borthakur (1986). Fish specimens were collected with different types of fishing nets

and were preserved in 10% formalin solution in separate jar. Small fishes were directly placed in the 10% formalin solution, while large sized fishes were given an incision in their abdomen and preserved. Identification of collected fish samples were done after Day (1878), Jayaram (1981), Talwar & Jhingran (1991), Nath & Dey (2000). The latest scientific names of the fish species were followed after the website <http://research.calacademy.org/research/ichthyology/catalog/SpeciesByFamily.asp>.

### RESULTS AND DISCUSSION

In total of 35 fish species belonging to 25 genera, 12 families and 6 orders have been recorded from the *Tinikonia Pukhuri* during study period. The fish species of this pond belong to following orders- Osteoglossiformes, Cypriniformes, Siluriformes, Perciformes, Synbranchiformes and Cyprinodontiformes. Out of these 35 species, 1 belong to family Notopteridae, followed by Cyprinidae (14), Cobitidae (1), Bagridae (3), Siluridae (2), Ambassidae (2), Anabantidae (1), Osphronemidae (3), Channidae (4), Gobiidae (1), Belontiidae (1), Mastacembelidae, (2), Aplocheilidae (1). Among these fish species Cypriniformes contributes highest (43%) and Clupeiformes with Cyprinodontiformes contribute lowest (3%) species composition respectively.

According to the point of view of economic value 9 species were assessed for non-classified ornamental fish (NCOF), 19 for classified ornamental fish (COF), 5 for cultivable food fish (CFF) and 2 for non-cultivable food fish (NCF). The list of fish species recorded from *Tinikonia Pukhuri* along with their economic values is depicted in Table-1.

Table-1: An account of occurrence of fish species in *Tinikonia Pukhuri* with their and economic value

Order	Family	Name of the species	Economic Value
Osteoglossiformes	Notopteridae	<i>Notopterus notopterus</i> (Pallas)	NCOF
Cypriniformes	Cyprinidae	<i>Amblypharygodon mola</i> (Hamilton)	COF
		<i>Catla catla</i> (Hamilton)	CFF
		<i>Laubuca laubuca</i> (Hamilton)	COF
		<i>Cirrhinus mrigala</i> (Hamilton)	CFF
		<i>Devario devario</i> (Hamilton)	COF
		<i>Danio rerio</i> (Hamilton)	COF
		<i>Esomus danrica</i> (Hamilton)	COF

		<i>Labeo bata</i> (Hamilton)	CFF
		<i>L. calbasu</i> (Hamilton)	NCOF
		<i>L. gonius</i> (Hamilton)	CFF
		<i>L. rohita</i> (Hamilton)	CFF
		<i>Puntius sophore</i> (Hamilton)	COF
		<i>Pethia ticto</i> (Hamilton)	COF
		<i>Rasbora daniconius</i> (Hamilton)	COF
	Cobitidae	<i>Lepidocephaliches guentia</i> (Hamilton)	COF
Siluriformes	Bagridae	<i>Sperata seenghala</i> (Sykes)	NCFF
		<i>Mystus tengara</i> (Hamilton)	COF
		<i>M. vittatus</i> (Bloch)	COF
	Siluridae	<i>Ompok pabo</i> (Hamilton)	NCOF
		<i>Wallago attu</i> (Bloch-Schneider)	NCFF
Perciformes	Ambassidae	<i>Chanda nama</i> (Hamilton)	COF
		<i>Parambassis ranga</i> (Hamilton)	COF
	Anabantidae	<i>Anabus testudeni</i> (Bloch)	NCOF
	Osphronemidae	<i>Trichogaster fasciata</i> (Bloch & Schneider)	COF
		<i>T. lalius</i> (Hamilton)	COF
		<i>T. chuna</i> (Hamilton)	COF
	Channidae	<i>Channa gachua</i> (Hamilton)	NCOF
		<i>C. punctata</i> (Bloch)	NCOF
		<i>C. Stewartii</i> (Playfair)	NCOF
		<i>C. striata</i> (Bloch)	NCOF
	Gobiidae	<i>Glossogobius giuris</i> (Hamilton)	NCOF
Synbranchiformes	Mastacembelidae	<i>Macragnathus aral</i> (Bloch-Schneider)	COF
		<i>M. pancalus</i> (Hamilton-Buchanan)	COF
Cyprinodontiformes	Aplocheilidae	<i>Aplocheilus panchax</i> (Hamilton)	COF

Note: COF=Classified Ornamental Fish, NCOF=Non Classified Ornamental Fish, CFF=Cultivable Food Fish, NCFF=Non Cultivable Food Fish

Species abundance found maximum during monsoon and minimum during pre-monsoon. Species richness noted maximum during monsoon and minimum during pre-monsoon. Species diversity estimated maximum during monsoon and minimum during winter. Evenness observed maximum during pre-monsoon along with monsoon and minimum during winter.

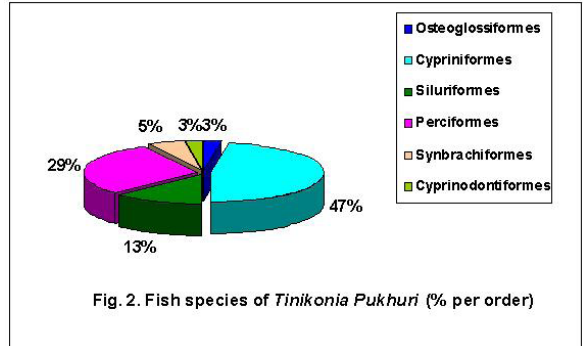


Fig. 2. Fish species of Tinikonja Pukhuri (% per order)

Table-2: Seasonal variation in species abundance, species richness, species diversity and evenness of fish species in Tinikonja Pukhuri

Seasons	Pre-monsoon	Monsoon	Retreating monsoon	Winter
Number of individuals (N) (Species Abundance)	165	690	261	267
Number of species (Richness)	19	35	26	15
Species diversity (H)	3.41	3.44	3.43	3.33
Evenness (E)	0.95	0.96	0.96	0.93

REFERENCE

1. Acharya, B., Dutta, A. and Sharma, D. K. 2008. Ecological status and fisheries potential of two wetlands in Assam. Proceedings of the National Seminar on Wetland and livelihood held on 24th and 25th ,October,2008 at J.N.College ,Boko,:120-132. | 2. Bhuyan, K. C., Dutta, A. and Kalita, B. 2009. Hydrobiology and fishery status of Sondoba beel, Morigaon, Assam. J. Inland Fish. Soc. India, 41 (2): 48-53. | 3. Borthakur, M. 1986. Weather and climate in N. E. India. Northeastern Geographer 18 (1 & 2) 20-27. | 4. Burton, P. J., Balisky, L. P., Coward, Cumming, S. G., Kneschwaw, D. D. 1992. The value of managing biodiversity. The forest Chronicle 68(2): 225-237. | 5. Day, F. 1899. The Fauna of British India (Fishes), Vol I & II, Gobt of India Press (Delhi). | 6. Dey, S.C. 1981. Studies on the hydrobiological conditions of some commercially importance lakes (Beels) of Kamrup District of Assam and their bearing of fish production, Final Technical Report to NEC, 177p. | 7. Hazarika, A. K. and Dutta, A. 1994. Limnological studies of two freshwater ponds of Guwahati, Assam. Environment and Ecology. 12(1):26-29. | 8. Jayaram, K. C. 1999. The fresh water fishes of Indian region. Narendra Publishing House, New Delhi | 10. Nath, P. and Dey, S. C. 2002. Fish and Fisheries of North Eastern India (Arunachal Pradesh), 1st Edn. Narendra Publishing House, New Delhi. | 11. Sarma, D., Dutta, A. and Choudhury, M. 2007. Limnology and fisheries of Urpod Beel, Goalpara, Assam. J. Inland Fish. Soc. India. 39 (1): 51-54. | 12. Shinde, S. E., Pathan, T. S., Bhandare, R. Y. and Sonawane, D. L. 2009. Ichthyofaunal diversity of Harsool Savangi Dam, District Aurangabad, (M.S.) India. World Journal of Fish and Marine Sciences 1 (3): 141-143. | 13. Talwar, P. K. and Jhingran, A. G. 1991. Inland fishes Vol. 1&2, Oxford & IBH Publishing Co. Pvt. Ltd. New Delhi.