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Status of indigenous ornamental fish diversity and abundance in Ghargharia river in Coochbehar district of West Bengal

Arpita Dey[1], Ankita Mukherjee[1], D. Sarkar[1]* and N. Ray[2]

[1]Fishery unit, Uttar Banga Krishi Viswavidyalaya,Pundibari-736165,Coochbehar,West Bengal, India

[2]Department of Zoology, Hoogly Mohsin College, Chinsura, Hoogly, West Bengal, India

*Corresponding Author E-mail: dsarkar1509@gmail.com

ABSTRACT

The present study was conducted to generate a primary database on the ornamental fish diversity in Ghargharia river flowing in Coochbehar district of West Bengal. Forty six indigenous ornamental fish species belonging to 11 orders, 21 families and 29 genera were identified and documented. Among the orders, Cypriniformes represented the largest diversity accommodating 11genera and 16 species and the genus Puntius ranked first among all the genera in terms of its numerical strength with 5 species. Out of 46, 19 species were detected with high ornamental value and 10 species were explored having potentially high ornamental values as well as commercial prospect. 11 species were found abundant, while 7 were commonly occurring and rest 28 were found rare in river Ghargharia. Therefore anthropogenic activities, commonly predominant in the natural water resources resulting in fish population decline seems to be operating in this case also needs immediate redressal so as to minimise the threats being operated on the aquatic life. At the same time conservation strategies must be adopted to sustain the huge potencial ornamental fish diversity in the natural resources like Ghargharia river and others.

Keywords*: potential ornamental fish, biodiversity, relative abundance, Ghargharia river.*

INTRODUCTION

Coochbehar district of West Bengal lying between 25057′47″ to 26036′2″ North latitude and between 89054′35″ to 88047′44″ East longitude, is very unique in its topography and climatic characteristics bearing terai agro-climatic characteristics and a total water stretch of more than 6121 ha including hill stream rivers, beels and others aquaculture resources. The total riverine network include some major rivers like Torsa, Ghargharia, Kaljani, Gadadhar etc which are the potencial source of huge indigenous fish diversity along with a considerable number of ornamental fish population. Swain *et.al.*[1] estimated more than 100 varieties of indigenous ornamental fishes from total Indian freshwater ecosystem. Barat *et.al.*,[2] reported 21 ornamental fish species from Darjeeling and Jalpaiguri district of West Bengal whereas some partial information on fish diversity in Torsa river of Coochbehar was reported by Sarkar and Ray[3] and Mukherjee *et al.*[4] Overall, the reports, till date, are very scanty and insufficient with respect to ornamental fish diversity in northern part of West Bengal which prompted the present investigation for generation of a primary database on the ornamental fish diversity and its status in Ghargharia river.

MATERIALS AND METHODS

The present study was carried out in the river Ghargharia , a tributary of the Torsa river and one of the main resources having a water stretch of 65 km flowing from Uttar Sonapur, Alipurduar district (origin) to Bhelakopa Pratham Khanda, Coochbehar district (meeting point with Sil Torsa river) and flowing majorly through the Coochbehar district of West Bengal covering mostly rural areas.

The data on occurrence and abundance of indigenous ornamental fish were collected during survey and sampling which were carried out for three years (Sep, 2010 to Aug, 2013) at monthly interval from three selected sites namely Baneswar, Maruganj and Bhelakopa (each located at a distance of 15-20 km) using cast nets and gill nets of different mesh sizes. The specific river sites and markets at Baneswar and Maruganj, fed with Ghargharia river production, were surveyed for species diversity and relative abundance study. The specimen were counted, photographed and preserved in formaldehyde solution and identified using standard taxonomic keys of Jayaram[5] and Talwar and Jhingran[6]. Data were analysed on the basis of availability of species at river sites and markets fed by the riverine resource. The IUCN[7] Red List of Threatened Species and CAMP[8] was followed to assign the conservation status of the fish species collected.

RESULTS AND DISCUSSION

I. Species Diversity

Forty six (46) indigenous ornamental fish species belonging to 11 orders, 21 familes , 29 genera were collected and identified from three locations of Ghargharia river and its adjacent landing centres and markets. The list of fish were collected together with their local names, commercial values and categorized into highly ornamental (ho), potencial ornamental (po) or food fish (fo) species and relative adundance are illustrated in Table 1. Among the orders, Cypriniformes exhibited the largest representation with 10 genera 16 species followed by Siluriformes with 6 genera 12 species. Persiformes with 6 species, Channiformes and Cyprinodontiformes each with 3 species trailed behind the above orders. Rest of six orders like Clupiformes, Anabantiformes represented single species each.

The family-wise interpretation (Fig 1) revealed Cyprinidae as the largest family accomodating 5 genera and 8 species and the genus *Puntius* ranked first among the genera with its numerical strength of 5 species. Family Cobitidae with 3 genera and 4 species, family Bagridae and Sisoridae with 1 and 2 genera and 4 species respectively were the next higher representatives. Belontidae with 2 genera and 3 species and Channidae with 1 genera and 3 species ranked next.. Family Balitoridae, Chandidae, Siluridae and Mastacembelidae showed 2 members from each and other 11 families like Clupeidae, Anabantidae etc represented single member from each.

II. Evaluation of fish germplasm for commercial utilization

While assessing the potential utilization of the collected fishes, it was realized that among 46 species, 19 species like *Botia dario, Botia lohachata , Aplocheilus panchax, Colisa lalia, Mystus vittatus, Esomus danricus, Conta pectinata, Hara sp etc are of high* ornamental value (i.e.41.30% were identified as 'ho'). 10 species like *Mastacembelus pancalus, Macrognathus aculeatus, Danio devario, Puntius sophore, Puntius ticto, Nemacheilus botia, Nemacheilius arunachalensis* etc are potential ornamental fishes and simultaneously that can be exploited for commercial purpose (i.e. 21.74% were identified as 'po'). Rest 17 Species (36.89%) such as *Amblypharyngodon mola, Barilius barna, Puntius sarana, Gudusia chapra, Salmostoma bacaila, Ophiocephalus gachua, Ophiocephalus striatus, Ophiocephalus punctatus, Pseudotropius aterenoides* etc are primarily used as food fish which can also additionally be explored for their ornamental qualities(identified as 'fo').

III. Relative abundance of fish species

Data on the above showed that 11 species such as *Gudusia chapra, Puntius ticto, Puntius sarana, Esomus danricus, Amblypharyngodon mola , Pseudotropius atherenoides , Macrognathus aculeatus, Mastacembelus pancalus* etc were abundant in the system and were collected from all locations throughout the year. Whereas 7species were found commonly in all the locations, but the number of specimens collected with respect to each species was relatively less. Species such as *Mystus vittatus, Colisa fasciatus, Puntius sophore and Salmostoma bacaila* belong to this category. Rest 28 species like *Chanda ranga, Tetradon cutcutia, Psilorhynchus balitora, Colisa sota, Colisa labiosus etc* were found **rare** in this area, which could not be collected from more than one locations and also the number of specimen collected were very less.

IV. Conservation status of fish

An insight into the conservation status of fishes as per CAMP[8] (Fig 2) revealed only one species under 'Data Deficient' (DD) category. Ten species were found vulnerable and four were endangered. Eleven species were accounted under the 'low risk near threatened' category and twenty fish species were under 'low risk least concern' category. Interestingly some exceptional result was achieved for species like *Gudusia chapra, Puntius sarana, Notopterus notopterus, Mystus cavasius, Ompok pabo* etc whose conservation status are either **vulnerable** or **endangered** according to CAMP whereas ghargharia resource is reflecting their **low risk least concern** status indicating a better environment and less exploitation for those. On contrary, all the *Hara sp, Oreichthys casuatis, Ophiocephalus gachua, Chanda ranga* etc reflected just reverse situation probably being under threat in the riverine resource under study. Irrespective of all the results achieved, it can undoubtedly be surmised that all the species under threat need adequate attention towards conservation of the individual species as well as their natural habitat with a holistic approach.

V. Antropogenic Interference

Anthropogenic interference on riverine as well as wetland resources in the form of improper and irrational fish catch , disposal of municipal wastes into the water resources, aquatic weed infestation, agricultural run-off, pesticide use in upper stretch of river etc were also found to be very common in the present study area which needs proper redressal [3]. However, the chance of industrial pollution is very less in the said area due to lesser growth of industrial sector.

Table 1. Ornamental fish diversity along with their relative abundance, conservation status and category of use in Ghargharia river of Coochbehar district

S. No	Local name	Scientific name	cons status	Order	Family	Number / Collection	Relative abundance	Category of use
1	Chapila	*Gudusia chapra*	VU	Clupiformes	Clupeidae	50	+++	Fo
2	Koi	*Anabas testudineus*	VU	Anabantiformes	Anabantidae	02	+	Fo
3	Loach	*Nemacheilus botia*	LRnt	Cypriniformes	Balitoridae	03	+	Po
4	Gang magur	*Amblyceps mangois*	EN	Siluriformes	Amblycipitidae	01	+	Ho
5	Beth Rongi	*Botia Dario*	VU	Cypriniformes	Cobitidae	02	+	Ho
6	Panchax	*Aplocheilus panchax*	LRlc	Cyprinodontiformes	Aplocheilidae	04	+	Ho
7	Lohachata	*Botia lohachata*	EN	Cypriniformes	Cobitidae	01	+	Ho
8	Ghutum	*Noemacheilus arunachalensis*	LRlc	Cypriniformes	Balitoridae	32	++	Po
9	Kukur botia	*Somileptes gongota*	VU	Cypriniformes	Cobitidae	05	+	Ho
10	Mowa	*Amblypharyngodon mola*	LRlc	Cypriniformes	Cobitidae	44	+++	Fo
11	Boroli	*Barilus barna*	VU	Cypriniformes	Cyprinidae	04	+	Fo
12	Devario puthi	*Danio devario*	LRnt	Cypriniformes	Cyprinidae	08	+	Po
13	Darikana	*Esomus danricus*	LRlc	Cypriniformes	Cyprinidae	63	+++	Ho
14	Puti	*Puntius sophore*	LRnt	Cypriniformes	Cyprinidae	47	+++	Po
15	Puti	*Puntius sarana*	VU	Cypriniformes	Cyprinidae	43	+++	Fo
16	Puti	*Punitius ticto*	LRnt	Cypriniformes	Cyprinidae	64	+++	Po
17	Puti	*Oreichthys casuatis*	LRlc	Cypriniformes	Cyprinidae	02	+	Ho
18	Chala	*Salmostoma bacaila*	LRlc	Cypriniformes	Cyprinidae	23	++	Fo
19	Puti	*Oreichthys crenuchoides*	DD	Cypriniformes	Cyprinidae	01	+	Ho
20	Balitora	*Psilorhynchus balitora*	VU	Cypriniformes	Psilorhynchidae	01	+	Fo
21	Chang	*Ophiocephalus gachua*	LRlc	Channiformes	Channidae	03	+	Fo
22	Lata	*Ophiocephalus punctatus*	LRnt	Channiformes	Channidae	18	+	Fo
23	Shoal	*Ophiocephalus striatus*	LRlc	Channiformes	Channidae	15	+	Fo
24	Kholsa	*Colisa fasciatus*	LRlc	Cyprinodontiformes	Belontidae	27	++	Po
25	Kholsa	*Colisa lalia*	LRlc	Cyprinodontiformes	Belontidae	14	+	Ho
26	Kakila	*Xenentodon cancila*	LRnt	Beloniformis	Belonidae	36	++	Fo
27	Meni	*Nandus nandus*	LRnt	Perciformes	Nandidae	12	+	Po
28	Chanda	*Chanda nama*	LRlc	Perciformes	Chandidae	15	+	Po
29	Chanda	*Chanda ranga*	LRnt	Perciformes	Chandidae	02	+	Ho
30	Balia	*Glossogobius guris*	LRnt	Perciformes	Gobiidae	14	+	Fo
31	Gochi	*Macrognathus aculeatus*	LRlc	Persiformes	Mastacembelidae	42	+++	Po
32	Gota	*Mastacembelus pancalus*	LRlc	Persiformes	Mastacembelidae	60	+++	Po
33	Tangra	*Mystus vittatus*	LRnt	Siluriformes	Bagridae	59	+++	Ho
34	Tangra	*Mystus gulio*	LRlc	Siluriformes	Bagridae	28	++	Fo

35	Tarkata	*Conta pectinata*	LRlc	Siluriformes	Sisoridae	08	+	Ho
36	Batasi	*Pseudeutropius atherenoides*	LRlc	Siluriformes	Schilbeidae	45	+++	Fo
37	Tangra	*Mystus tengara*	LRlc	Siluriformes	Bagridae	38	++	Ho
38	Tarkata	*Hara hara*	LRlc	Siluriformes	Sisoridae	02	+	Ho
39	Pipe fish	*Microphis deocata*	VU	Syngnathiformes	Syngnathidae	09	+	Ho
40	Pholi	*Notopterus notopterus*	EN	Osteoglossiformes	Notopteridae	46	+++	Fo
41	Tarkata	*Hara Jerdoni*	LRlc	Siluriformes	Sisoridae	02	+	Ho
42	Cutcutia	*Tetraodon cutcutia*	LRnt	Tetraodontiformes	Tetraodontidae	04	+	Ho
43	Tangra	*Mystus cavasius*	VU	Siluriformes	Bagridae	32	++	Ho
44	Tarkata	*Hara koladynensis*	LRlc	Siluriformes	Sisoridae	06	+	Ho
45	Pabda	*Ompok pabda*	VU	Siluriformes	Siluridae	10	+	Fo
46	Pabda	*Ompok pabo*	EN	Siluriformes	Siluridae	20	+	Fo

Ho-highly ornamental; **Po**- potential ornamental; **Fo**- food ornamental; **EN**- endangered; **VU**- vulnerable; **DD**- data deficient; **LRnt**- low risk near threatened; **LRlc**- low risk least concern.

Fig. 1: Family wise representation of ornamental fish species diversity in Ghargharia river

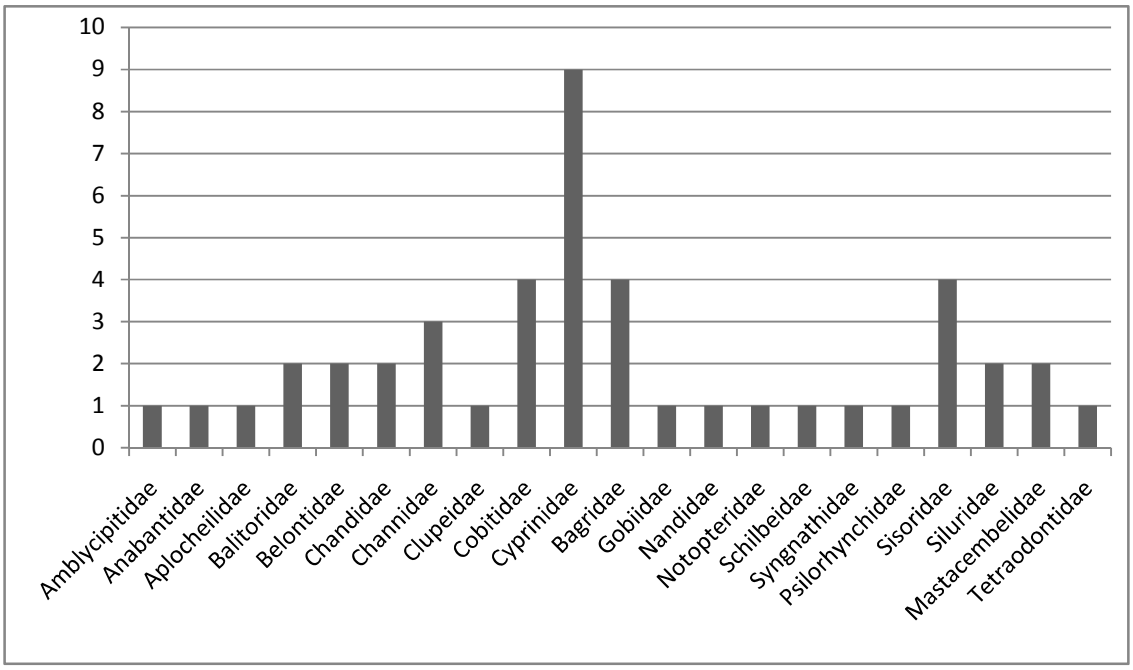
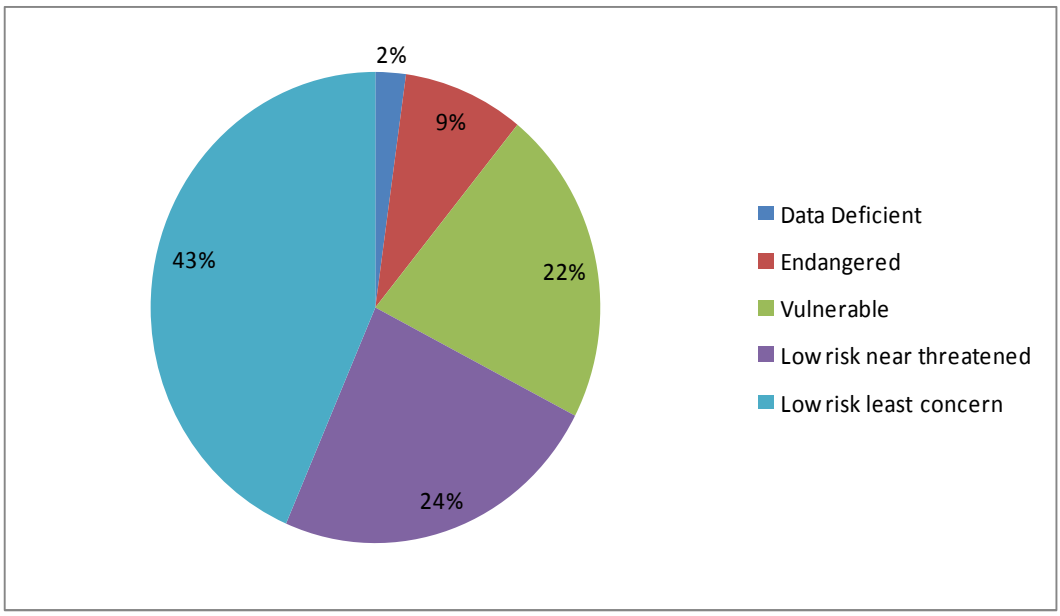


Fig. 2: Overall conservation status of ornamental fish species in Ghargharia river



CONCLUSION

The results of the present study reveals that Ghargharia river flowing through the Coochbehar district harbours a rich diversity of ornamental fish fauna having potential commercial value in terms of market consumption. At the same time the current scenario also reflects that ornamental fish like *Colisa lalia, Chanda ranga, Puntius conchonius* have high ornamental value and species like *Mastacembelus pancalus, Somileptes gongota, Danio devario, Xenentodon cancila, Nemacheilus botia, Noemacheilus arunachalensis, Notopterus notopterus* which are potential ornamental species for commercial exploition are under threat found as rare in relative abundance study that was rightly alarmed by Sarkar and Roy[3]. It is, therefore, appropriate need of the hour to generate awareness towards minimizing exploitation of the natural resources and to save and conserve those as well as the lives existing there.

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