



Present status of indigenous freshwater ornamental fish of undivided Paschim Medinipur of West Bengal, India

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Abstract

Present study reveals the existence of 61 species of indigenous freshwater ornamental fish under 40 genera, 24 families of 8 Orders. A thorough survey has been conducted from April 2018 to December 2022 on the subject under study and achieved the aforesaid results. Main objectives of the current investigation are to collect, identify and narrate conservation strategies for indigenous freshwater ornamental fish species of undivided Paschim Medinipur. Present contribution enlisted the up-to-date status of the freshwater ornamental fish faunal diversity of the study area. The work will certainly be helpful to the fishery managers, researchers and aqua-culturists for their future planning.

Key Words: Conservation, Diversity, Indigenous, Ornamental fish, Paschim Medinipur

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Introduction

In the south-eastern part of West Bengal, 21° 38' N–22° 57' N; 86° 34' E–88° 12' E is the geographical position of the present study area, i.e., Paschim Medinipur and Jhargram districts (Fig. 1). The Paschim Medinipur district was formed on 1st January, 2002, from undivided historical Midnapore. Another part is designated as Purba Medinipur. Further, recently, Paschim Medinipur has been divided to create Jhargram district on 4th April, 2017.

The area came into focus during the last decades due to the political conflict between the West Bengal Government and Maoists and is known to us as "Jangalmahal" along with Bankura and Purulia districts. In 2006, the Ministry of Panchayati Raj, Government of India declared Paschim Medinipur as one of the most backward districts in the country, along with a total of 250 most backward districts. A total of 88% of the people in these districts live in villages (2011). The economic condition of

the villagers does not permit them to live a sophisticated life, and they have to largely depend on the cultivation and capturing of small fish, prawns, crabs, and molluscs from different freshwater resources as well as different forest resources for their daily diet and livelihood. But they do not know that there are so many freshwater indigenous small and medium-sized fish that have immense ornamental value, they traditionally used these fishes as food fish. There is no document of such resources for the study area for such poorly developed districts, especially like undivided Paschim Medinipur. In this study area various researchers (Mishra *et al.*, 2003, Jana *et al.*, 2015, Kar *et al.*, 2016, Pahari *et al.*, 2017, Kisku *et al.*, 2017) have studied the diversity of indigenous freshwater fish, where they have reported to some fish as ornamental fish but have not studied indigenous ornamental fish diversity individually. Here, only Paul and Chanda (2014), has reported indigenous ornamental fish diversity in the study area and reported 48 species of ornamental fish from the study area but their rearing, breeding, and marketing have not yet been studied except recent study on breeding of *Puntius chola* and *P. ticto* by Sit *et al.* (2023) and Sit *et al.* (2022) respectively. Present work is the up-to-date study on vast freshwater ornamental fishes of undivided Paschim Medinipur District through a potential survey work. If such indigenous aqua-resources were properly studied, managed, and utilised for the development of the socioeconomic status of village people, it would certainly be a step towards improving livelihoods for village people of this backward district.

Materials and Methods

Block wise survey and collection of ornamental fishes from different markets, aquarium shops and natural water bodies of the district by hand, net and from village people who capture by traditional method. Preserve dead ornamental fishes using formaldehyde (6%) and live

ornamental fishes were kept in the aquarium for culture in the Department of Zoology. Identification of fish specimen were done through existing literature such as, Talwar and Jhingran (1991) and Jayaram (2010). Distribution of different ornamental fish species has been recorded block wise and district wise. Documentation of freshwater indigenous fish, potential for ornamental fish marketing of the study area was recorded.

Study site

The south-eastern part of West Bengal, $21^{\circ} 38' N$ – $22^{\circ} 57' N$; $86^{\circ} 34' E$ – $88^{\circ} 12' E$ is the geographical position of the present study area, i.e., Paschim Medinipur and Jhargram districts (Fig. 1). A total of 29 developmental blocks, eight under Jhargram district and 21 under Paschim Medinipur district are the study sites of the present investigation.

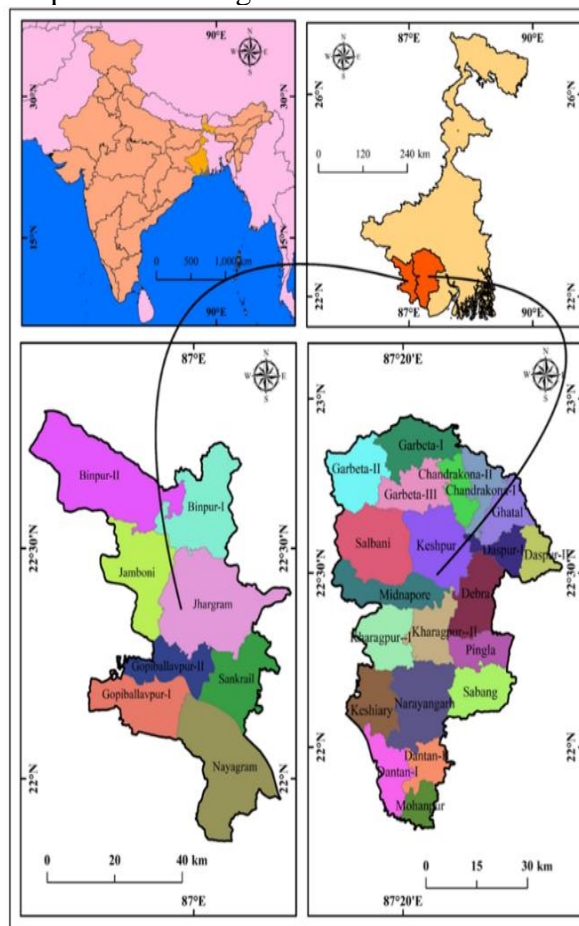


Figure 1. Map showing location of study site.

Results

Through this investigation a total number of 61 species of Ornamental fish fauna has been identified from the study area, belonging to 40 different genera under 24 different families and 8 different orders (Table-1). Maximum number of Ornamental fish species (18) recorded under family Cyprinidae (Fig.3) followed by family Ambassidae (4 species), Siluridae (4 species), Bagridae (4 species), Mastacembelidae (3 species), Channidae (3 species), Cobitidae (3 species), Osphronemidae (2 species), Notopteridae (2 species), Nemachilidae (2 species), Sisoridae (2 species), Tetraodontidae (2 species) and Oryziidae, Aplocheilidae, Claridae, Gobioidae, Anabantidae, Branchidae, Nandidae, Heteropneustidae, Botiidae, Belonidae, Badidae, Amblycedae (1 species each). This study depicts the restricted distribution of various Indigenous ornamental fish species in few blocks of Jhargram and Paschim Medinipur district. Maximum number of ornamental fish diversity has been recorded from Gopiballavpur –I block of Jhargram district and followed by Ghatal, Sabang, Debra, Midnapore sadar, Daspur, Garbeta-I and II and Keshiary blocks of Paschim Medinipur District (Table-1). As per IUCN status, it has been observed that the majority of the freshwater ornamental fish species of the area are under Least Concern category (43 species), 7 species are under not evaluated categories, 1 species is under data deficient category and 7 species are under near threatened categories, 1 species, namely *Monopterus albus* (Hamilton, 1822) is under vulnerable and 2 species namely *Leodon cutcutia* (Hamilton, 1822) and *Carinotetraodon travancoricus* (Hora and Nair, 1941) are under endangered category (Fig.2 and Table-1), needed immediate conservation.

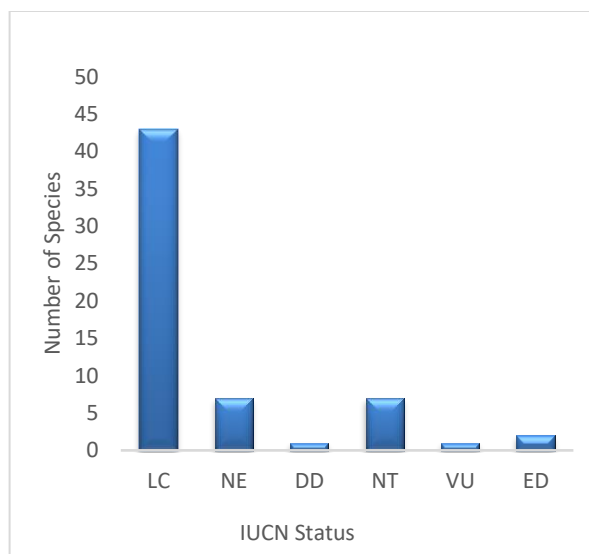


Figure 2. IUCN status of indigenous ornamental freshwater fish of the area under study

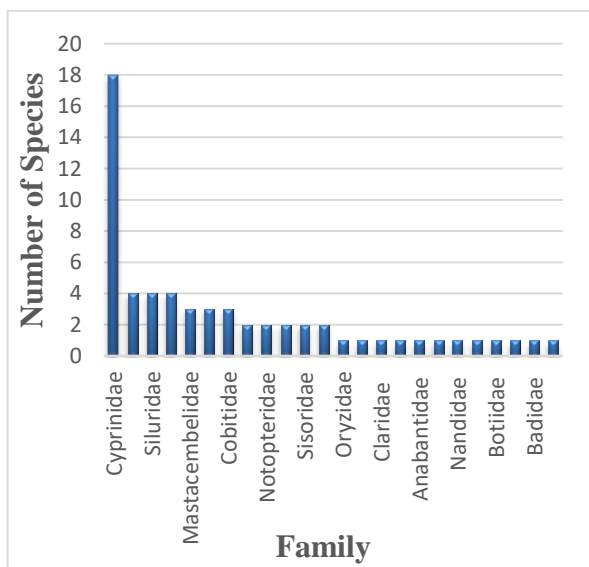






















Figure 3. Family-level distribution of indigenous ornamental freshwater fish of the area








Table 1. Indigenous Ornamental fishes of Jhargram and Paschim Medinipur Districts of West Bengal with their block wise distribution (Identification based on literature, Talwer and Jhingran, 1991 and K. C. Jayaram, 2010)








Order	Family	Name of the species	IUCN status	Distribution (block wise)
Cypriniformes	Cyprinidae	 <i>Danio rerio</i> (Hamilton, 1822)	LC	Jhargram: Gopi-I, Binpur-I, Sankrail, Jhargram Paschim Medinipur: Midnapore, Daspur-I, II, Debra, Dantan-I, II, Garbeta-I, II and III, Chandrakona-I, II, Keshiary, Keshpur
		 <i>Esomus danricus</i> (Hamilton, 1822)	LC	Jhargram: Binpur-I and II, Gopiballavpur-I and II, Nayagram, Sankrail, Jamboni, Jhargram Paschim Medinipur: Salboni, Keshpur, Ghatal, Khargpur-I and II, Pingla, Debra, Narayangarh, Sabang Midnapore, Daspur-I, II, Debra, Dantan-I, II, Garbeta-I, II and III, Chandrakona-I, II, Keshiary.
		 <i>Opsarius barna</i> (Hamilton 1822)	LC	Jhargram: Gopi-I Paschim Medinipur: Midnapore
		 <i>Barilius vagra</i> (Hamilton, 1822)	LC	Jhargram: Gopi-I Paschim Medinipur: Midnapore
		 <i>Amblypharyngodon mola</i> (Hamilton, 1822)	LC	Jhargram: Binpur-I and II, Gopiballavpur-I and II, Nayagram, Sankrail, Jamboni, Jhargram Paschim Medinipur: Salboni, Keshpur, Ghatal, Khargpur-I and II, Pingla, Debra, Narayangarh, Sabang Midnapore, Daspur-I, II, Debra, Dantan-I, II, Garbeta-I, II and III, Chandrakona-I, II, Keshiary, Keshpur
		 <i>Puntius chola</i> (Hamilton, 1822)	LC	Jhargram: Binpur-I, Jamboni, Gopi-I and II, Sankrail, Jhargram Paschim Medinipur: Daspur-I, Debra, Sabang, Pingla, Salboni, Keshpur., Garbeta-I, II, Chhandrakona-II, Keshiary, Dantan-II







	LC	Jhargram: Binpur-II, Gopi-I Paschim Medinipur: Daspur-I, Sabang, Midnapore, Garbeta-I, II, Keshiary
<i>Pethia conchonius</i> (Hamilton 1822)	LC	Jhargram: Binpur-I, Gopi-I and II Paschim Medinipur: Ghatal, Debra, Sabang
	LC	Jhargram: Binpur-I and II, Gopi-I, Sankrail Paschim Medinipur: Midnapore, Sabang, Salboni, Keshpur, Daspur-I, Khargpur-I and II, Narayangarh
	LC	Jhargram: Gopi-I and II, Binpur-II, Sankrail, Nayagram Paschim Medinipur: Daspur-I, Ghatal
	NE	Jhargram: Gopi-I, Paschim Medinipur: Midnapore: Garbeta-I, II, III, Chandrakona-I, II
	LC	Jhargram: Gopi-I Paschim Medinipur: Midnapore: Garbeta-I, II, III, Chandrakona-I, II.
	LC	Jhargram: Binpur-II, Gopi-I Paschim Medinipur: Midnapore, Debra, Sabang. Khargpur-I and II
	LC	








		LC	Paschim Medinipur: Ghatal, Midnapore, Debra, Garbeta-II, Chandrakona-II, Keshiary
	<i>Salmostoma phulo</i> (Hamilton 1822)		
		LC	Paschim Medinipur: Midnapore, Ghatal, Sabang, Garbeta –I, II Salboni, Keshpur, Khargpur-I and II, Narayangarh, Daspur, Keshiary, Garbeta-II, III Chandrakona-II
	<i>Salmostoma sardinella</i> (Valenciennes, 1844)		
		LC	Paschim Medinipur: Daspur-I, Ghatal
	<i>Laubuca laubuca</i> (Hamilton, 1822)		
		LC	Jhargram: Gopi-I, Gopi-II, Binpur-I Paschim Medinipur: Midnapore, Khargpur-I and II, Garbeta-II, Chandrakona-II, Keshiary
	<i>Osteobrama cotio</i> (Hamilton, 1822)		
		LC	Paschim Medinipur: Midnapore, Ghatal, Sabang, Garbeta –I, II and III Salboni, Keshpur, Khargpur-I and II, Narayangarh, Daspur, Keshiary, Chandrakona-I
	<i>Rasbora rasbora</i> (Hamilton, 1822)		
Botiidae		NE	Jhargram: Jhargram, Gopi-I
	<i>Botia lohachata chaudhuri, 1912</i>		
Cobitidae		LC	Jhargram: Binpur-I, Sankrail, Gopi-I and II Paschim Medinipur: Midnapore, Ghatal, Sabang, Garbeta –I, Salboni, Keshpur, Khargpur-I and II, Narayangarh,
	<i>Lepidocephalichthys guntea</i> (Hamilton, 1822)		






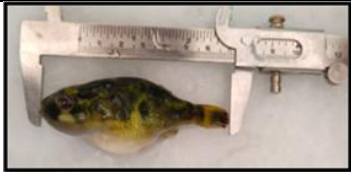
			LC	Jhargram: Jamboni, Gopi-I Paschim Medinipur: Midnapore, Debra, Sabang, Chandrakona-I, II, Garbeta-I, II and III
		<i>Lepidocephalichthys thermalis</i> (Valenciennes, 1846)		
			LC	Paschim Medinipur: Midnapore, Ghatal, Garbeta-I, II and III Salboni, Keshpur, Daspur, Keshiary, Chandrakona-I,
		<i>Lepidocephalichthys manipurensis</i> Arunkumar, 2000		
Nemachilidae			NE	Paschim Medinipur: Midnapore, Ghatal, Garbeta-II, Keshpur, Daspur, Chandrakona-I,
		<i>Paracanthocobitis Mackenziei</i> (Chaudhuri, 1910)		
			NE	Paschim Medinipur: Midnapore, Garbeta-II and III, Keshiary, Chandrakona-I,
		<i>Paracanthocobitis botia</i> (Hamilton, 1822)		
Siluriformes	Bagridae		LC	Jhargram: Jamboni, Gopi-I, Binpur-I and II, Sankrail Paschim Medinipur: Daspur-I, Debra, Salboni, Sabang, Keshpur, Khargpur-I and II, Narayangarh
		<i>Mystus cavasius</i> (Hamilton, 1822)		
			LC	Jhargram: Gopi-I and II, Binpur-I and II, Nayagram, Sankrail, Jhargram Paschim Medinipur: Ghatal, Midnapore, Salboni, Keshpur, Khargpur-I and II, Debra, Sabang, Narayangarh
		<i>Mystus vittatus</i> (Bloch, 1794)		
			LC	Paschim Medinipur: Midnapore, Ghatal, Sabang, Garbeta -I, II, Salboni, Keshpur, Khargpur-I and II, Narayangarh, Keshpur, Daspur, Chandrakona-I, II
		<i>Mystus bleekeri</i> (Day, 1877)		

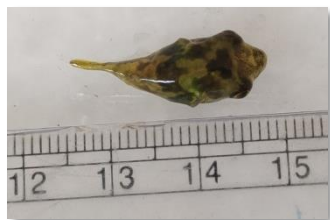
		LC	Paschim Medinipur: Midnapore, Ghatal, Sabang, Garbeta –I, II, Salboni, Keshpur, Khargpur-I and II, Narayangarh, Keshpur, Daspur, Chandrakona-I, II
	<i>Mystus tengara</i> (Hamilton-Buchanan, 1822)		
Claridae		LC	Jhargram: Gopi-I and II Paschim Medinipur: Sabang, Pingla, Ghatal, Midnapore, Ghatal, Sabang, Garbeta –I, II, Salboni, Keshpur, Khargpur-I and II, Narayangarh, Keshpur, Daspur, Chandrakona-I, II
	<i>Clarias batrachus</i> (Linnaeus, 1758)		
Sisoridae		NT	Jhargram: Jhargram Paschim Medinipur: Midnapore
	<i>Bagarius bagarius</i> (Hamilton, 1822)		
		LC	Paschim Medinipur: Ghatal
	<i>Glyptothorax telchitta</i> (Hamilton, 1822)		
Siluridae		NT	Jhargram: Binpur-I and II Paschim Medinipur: Midnapore, Ghatal, Sabang, Garbeta –I, II, Salboni, Keshpur, Khargpur-I and II, Narayangarh, Keshpur, Daspur, Chandrakona-I, II
	<i>Ompok pabo</i> (Hamilton, 1822)		
		NT	Paschim Medinipur: Midnapore, Ghatal, Sabang, Garbeta –I, II, Salboni, Keshpur, Khargpur-I and II, Narayangarh, Keshpur, Daspur, Chandrakona-I, II
	<i>Ompok pabda</i> (Hamilton, 1822)		
		NT	Paschim Medinipur: Midnapore, Ghatal, Garbeta –I, II, Keshpur, Daspur, Chandrakona-I
	<i>Ompok bimaculatus</i> (Bloch, 1794)		

			NT	Jhargram: Gopi-I Paschim Medinipur: Ghatal, Sabang,
		<i>Wallago attu</i> (Bloch and Schneider, 1801)		
	Heteropneustidae		LC	Jhargram: Jamboni, Gopi-I and II Paschim Medinipur: Daspur-I, Sabang, Khargpur-I and II, Salboni, Keshpur, Narayangarh, Midnapore, Ghatal, Sabang, Garbeta –I, II, Salboni, Daspur, Chandrakona-I, II
		<i>Heteropneustes fossilis</i> (Bloch,1794)		
	Amblycipitidae		LC	Paschim Medinipur: Midnapore, Garbeta – I, II, Chandrakona-I, II
		<i>Amblyceps mangois</i> (Hamilton,1822)		
Beloniformes	Belonidae		LC	Jhargram: Gopi-I and II Paschim Medinipur: Ghatal, Midnapore, Sabang, Garbeta –I, II, Salboni, Daspur, Chandrakona-I, II, Keshiary, Dantan-II
		<i>Xenentodon cancila</i> (Hamilton,1822)		
Cyprinodontiformes	Aplocheilidae		LC	Jhargram: Gopi-I, Gopi-II, Sankrail, Binpur-I Paschim Medinipur: Salboni, Keshpur, Daspur-I, Kharagpur-II, Ghatal, Sabang, Pingla, Narayangarh
		<i>Aplocheilus panchax</i> (Hamilton,1822)		
	Oryziatidae		NE	Paschim Medinipur: Sabang, Ghatal.
		<i>Oryzias melastigma</i> (McClelland,1839)		
Synbranchiformes	Mastacembelidae		LC	Jhargram: Gopi-I, Binpur-II, Paschim Medinipur: Midnapore, Sabang, Debra, Salboni, Keshpur, Chandrakona-II, Garbeta-II,III, Keshiary, Daspur-II
		<i>Macrognathus aral</i> (Bloch and Schneider, 1801)		

				Jhargram: Jamboni, Gopi-I and II, Sankarail Paschim Medinipur: Midnapore, Debra, Sabang, Pingla, Salboni, Keshpur, Daspur-I, Khargpur-I and II, Narayangarh, Ghatal Chandrakona-II, Garbeta-II, III, Keshiary, Daspur-II
				Jhargram: Binpur-I, Gopi-I Paschim Medinipur: Daspur-I, Ghatal, Midnapore, Debra, Sabang, Narayangarh Chandrakona-II, Garbeta-II, III, Keshiary, Daspur-II
Branchidae			VU	Jhargram: Binpur-I Paschim Medinipur: Midnapore, Sabang, Pingla Chandrakona-II, Garbeta-II, III, Keshiary, Daspur-II
Perciformes	Ambassidae		LC	Jhargram: Binpur-II, Sankrail Gopi-I and II Paschim Medinipur: Debra, Sabang, Pingla, Salboni, Keshpur, Khargpur-II Chandrakona-II, Garbeta-II, III, Keshiary, Daspur-II
			LC	Jhargram: Binpur-I, Gopi-I Paschim Medinipur: Sabang, Debra, Pingla
			NT	Jhargram: Gopi-I and II, Binpur-II, Sankrail, Nayagram Paschim Medinipur: Ghatal, Midnapore, Sabang, Pingla, Chandrakona-II, Garbeta-II, III, Keshiary, Daspur-II

		LC	Jhargram: Gopi-I, Binpur-II, Sankrail, Nayagram Paschim Medinipur: Ghatal, Daspur-I, Sabang Chandrakona-II, Garbeta-II, III, Keshiary, Daspur-II
	<i>Parambassis ranga</i> (Hamilton, 1822)		
Badidae		LC	Jhargram: Binpur-I, Sankrail, Nayagram Paschim Medinipur: Ghatal, Daspur-I, Sabang Chandrakona-I and II, Garbeta-I, II and III, Keshiary,
	<i>Badis badis</i> (Hamilton, 1822)		
Anabantidae		DD	Jhargram: Gopi-I and II, Jamboni, Binpur-I, Sankrail Paschim Medinipur: Khargpur-I and II, Midnapore, Ghatal, Daspur-I, Sabang, Khargpur-I, Debra, Salboni, Keshpur, Narayangarh Chandrakona-II, Garbeta-II, III, Keshiary, Daspur-II
	<i>Anabas testudineus</i> (Bloch, 1792)		
Osphronemidae		LC	Jhargram: Gopi- I and II, Binpur-I and II, Sankrail, Nayagram Paschim Medinipur: Ghatal, Daspur-I, Midnapore, Debra, Sabang, Pingla, Salboni, Keshpur, Narayangarh Chandrakona-I and II, Garbeta-I, II and III, Keshiary, Daspur-II
	<i>Trichogaster fasciata</i> (Bloch and Schneider, 1801)		
		LC	Jhargram: Gopi-I, Binpur-I Paschim Medinipur: Midnapore, Daspur-I, Debra, Sabang, Pingla, Chandrakona-II, Garbeta-II, III, Keshiary
	<i>Trichogaster lalius</i> (Hamilton, 1822)		
Channidae		LC	Jhargram: Binpur-I and II, Gopiballavpur-I and II, Nayagram, Sankrail, Jamboni, Jhargram Paschim Medinipur: Salboni, Keshpur, Ghatal, Daspur –I, Midnapore, Khargpur-I and II, Pingla, Debra, Narayangarh, Sabang Chandrakona-I and II, Garbeta-II, III, Keshiary, Daspur-II
	<i>Channa punctata</i> (Bloch, 1793)		
		NE	Jhargram: Gopi-I Paschim Medinipur: Midnapore, Daspur-I, Narayangarh, Chandrakona-II

		<i>Channa gachua</i> (Hamilton 1822)			
			LC	Jhargram: Gopi-I and II, Binpur-II, Paschim Medinipur: Khargpur-I and II Midnapore, Debra, Sabang Chandrakona-II, Garbeta-II, III, Keshiary, Daspur-II	
		<i>Channa striata</i> (Bloch, 1793)			
	Gobioidae		LC	Jhargram: Jamboni, Gopi-I, Binpur-II, Nayagram, Sankrail Paschim Medinipur: Daspur-I, Ghatal, Sabang, Kharagpur-I, Narayangarh Chandrakona-I and II, Garbeta-I, II and III, Keshiary, Daspur-II	
	Nandidae		LC	Jhargram: Binpur-I Paschim Medinipur: Daspur-I, Debra, Ghatal, Sabang, Midnapore	
		<i>Nandus nandus</i> (Hamilton, 1822)			
Osteoglossiformes	Notopteridae		LC	Jhargram: Jamboni, Binpur-II, Gopiballavpur-I and II, Sankrail Paschim Medinipur: Ghatal, Debra, Sabang, Pingla, Midnapore, Salboni, Keshpur, Daspur-I, Khargpur-I and II, Narayangarh Chandrakona-II, Garbeta-II, III, Keshiary, Daspur-II	
			NT	Paschim Medinipur: Midnapore, kharagpur-I	
		<i>Chitala chitala</i> (Hamilton, 1822)			
Tetraodontiformes	Tetraodontidae		EN	Paschim Medinipur: Midnapore,	
		<i>Leodon cutcutia</i> (Hamilton, 1822)			



Carinotetraodon travancoricus
(Hora and Nair, 1941)

EN **Paschim Medinipur:** Midnapore, Garbeta-III,

Discussion

The result of the current study depicts the existence of 61 indigenous ornamental freshwater fish species in the area under study (Table-1). It also depicts Cyprinidae is the dominant ornamental fish family in this region (Fig. 3). During last two decades various researchers (Mishra *et al.*, 2003; Jana *et al.*, 2015; Kar *et al.*, 2016; Paul and Chanda 2017a; Paul and Chanda 2017b; Pahari *et al.*, 2017; Kisku *et al.*, 2017; Chanda, 2020; Jana *et al.*, 2020; Jana *et al.*, 2021; Jana *et al.*, 2021a; Jana *et al.*, 2021b Chanda and Jana, 2021) have studied the diversity of indigenous freshwater fish, where they have reported to some fishes as ornamental fish but have not studied indigenous ornamental fish diversity individually in the said study area. Here, only Paul and Chanda (2014), has reported indigenous ornamental fish diversity in the study area and reported 48 species of ornamental fish from the study area. A comparison between observation of Paul and Chanda (2014), and present study reveals that there is a probability to found 67 species of ornamental fish from Paschim Medinipur and Jhargram district as because 43 species are common with the record of Paul and Chanda, and there is a gap of 24 species (10 in record of Paul and Chanda, and 14 in present study) between two reports.

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