




A comparative review on freshwater fish fauna between West Bengal and Odisha, two middle-east Indian states

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Abstract

The objective of the present study is the comparative revision of inland freshwater fish faunal diversity between West Bengal and Odisha, two states of middle-east India. Work is mainly based on the available published literature on the freshwater fish faunal diversity, checklist for fish, monograph of the area under study. Result reveals the existence of 345 species of fish belonging to 50 families under 14 orders. Analysis of data shows a slight similarity of freshwater fish faunal diversity between two states is quite expected because both the states differ in their physiography and ecology. The present report may serve as a helpful document for freshwater aquaculturists as well as fishery researchers for their future planning of research work on the subject of the study area.

Keywords: Diversity; fish; freshwater; Odisha; West Bengal

1 | INTRODUCTION

Fish constitutes almost half of the entire number of vertebrates within the planet. A total of 21723 fish species have been recorded out of 39900 species of vertebrates (Jayaram 1999). About 94% of all freshwater fisheries contribute to developing countries (FAO 2007). They supply food and livelihood for several of the world's poorest people and also contribute to the general economic well-being by export commodity trade, tourism, and recreation (Worldfish Center 2002). It has been estimated that freshwater fishes provide about 6% of the world's annual animal protein supplies for humans (FAO 2007). It is the most and sometimes the only real source of animal protein for low-income families (Briones *et al.* 2004). The freshwater fish faunal diversity of India is highly commendable and constituting 1027 species (Gopi *et al.* 2017). West Bengal and Odisha are two middle eastern

states of India. These two states are also much diversified in climatology as well as ecology. The fish fauna of these two states is a very important aquatic component to accelerate the economy of the respective states.

In this review study we determined the fish fauna of these two states. Odisha and West Bengal constitute of about 13.92% (Dutta *et al.* 1993) and 28.34% (Barange *et al.* 2017) to the freshwater fish fauna of India respectively. The terrain of Odisha plays a significant role in fisheries (Dutta *et al.* 1993; Pathak *et al.* 2007) through its 525248 ha of freshwater resources (Panigrahy *et al.* 2011), suitable for both capture and culture fisheries (Dutta *et al.* 1993). The West Bengal is enriched with 0.608 million ha of freshwater fisheries resources including ponds and tanks (0.288 million ha), beels and boar (0.041 million ha), reservoirs (0.027 million ha), 22 river drainage basins (0.172 million ha) and Canals (0.080 million ha) (Bandyo-

padhyay *et al.* 2014). The faunal compositions of freshwater fishes and other aquatic biodiversity are strongly dependent on habitats and many other factors (Chaki *et al.* 2014; Galib *et al.* 2016a; Parvez *et al.* 2017) which in turn affect associated stakeholders like fishermen, fish sellers, and consumers (Flowra *et al.* 2009; Samad *et al.* 2010; Islam *et al.* 2013; Galib *et al.* 2016b). In recent years, riverine ecosystems have been suffering from human intervention resulting in the loss and degradation of habitats and many fish species have become highly endangered, particular in rivers as well as freshwaters including South Asian countries (Galib *et al.* 2010, 2013, 2018; Mohsin *et al.* 2014; Joadder *et al.* 2015; Gopi *et al.* 2017). The main causes are habitat destruction and defragmentation (Fu *et al.* 2003), water abstraction, industrialization (Gibbs 2000; Dawson *et al.* 2003; Szollosi-Nagy 2004), exotic species invention (Copp *et al.* 2005), pollution (Lima-Junior *et al.* 2006), and changes of global climate (Leveque *et al.* 2005; Mas-Marti *et al.* 2010). Freshwater fish are one among the foremost threatened taxonomic groups (Darwall and Vie 2005) of aquatic biota due to their sensitive change in relation to quantitative and qualitative alteration of aquatic habitats (Sarkar *et al.* 2008; Kang *et al.* 2009). As a result, fishes are often used as bio-indicators for the determination of water quality, river network connectivity (Chovance *et al.* 2003). Nowadays the management of fish diversity and associated habitats is considered very important for the sustainability of aquatic ecosystems (Dudgeon *et al.* 2006). Therefore, it is essential to detect the key drivers for aquatic biodiversity loss and to develop a sustainable management technique for both the biota and their habitats (Mohsin *et al.* 2013; Galib 2015). So, the present work was carried out to highlight the diversity, habitat, threats of fish fauna in the study sites and it is believed that the study would be a helpful tool for future researchers, policy makers and other stakeholders in Eastern India.

2 | METHODOLOGY

2.1 Study area

The West Bengal and Odisha states (Figure 1) are stretches from sub-Himalayan Darjeeling to the Bay of Bengal up to the Malkangiri district of Odisha. Geographically West Bengal is more diverse than Odisha because it is the only state in India that stretches from the Himalayas to the Bay of Bengal with the intervention of several important Indian riverine systems like Tista, Bhagirathi, Mayurakshi, Ajoy, Damodar, Rupnaryan, Kansabati etc. Mahanadi is the largest riverine system of Odisha state and its catchment area covers 42% of the state area. Besides Mahanadi, there are several other rivers those flow through the state (e.g. Subarnarekha, Baitarani and Brahmani) which are important for aquatic-fauna of the state. A characteristic coastal belt of the state is made up of deltaic sediments of Mahanadi Subarnarekha, Baitarani, Brahmani

rivers of the Quaternary age.

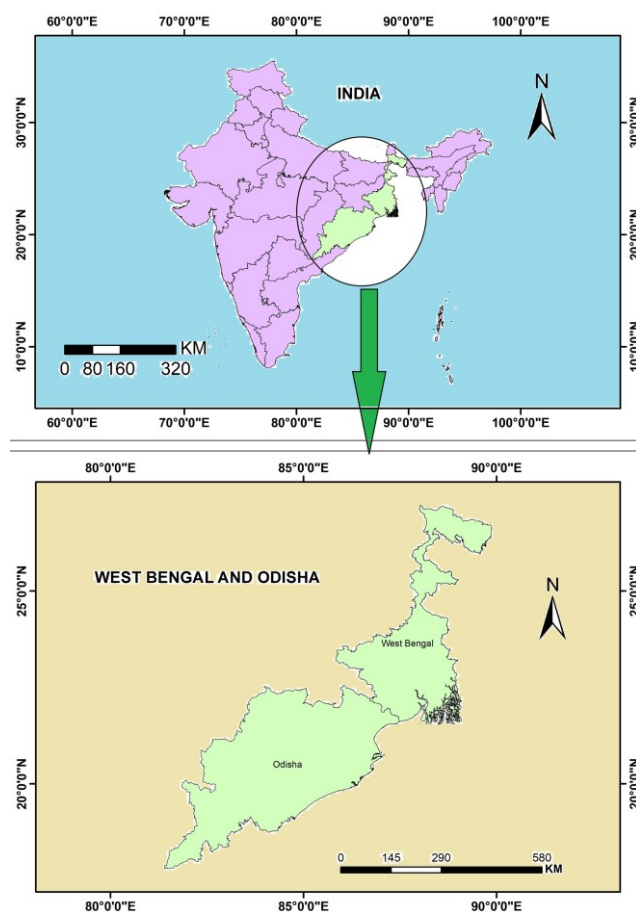


FIGURE 1 Map of the study area.

2.2 Data collection and analysis

The present review is primarily based on the available recent literature (2007 – 2021). The updated checklist of freshwater fishes from different localities of West Bengal and Odisha state was prepared by compiling, reviewing, and analysing. The following important datasets were used; Barman 2007; Pathak *et al.* 2007; Baliarsingh *et al.* 2013; Kumar *et al.* 2013, 2014, 2020; Paul and Chanda 2014; Mohanty *et al.* 2015; Das *et al.* 2016; Samal *et al.* 2016; Chanda 2020; Nandini and Parida 2020; Mogalekar *et al.* 2017; Kar *et al.* 2017; Kisku *et al.* 2017; Paul and Chanda 2017, Das 2018; Mogalekar and Canciyal 2018; Sit *et al.* 2019, 2020a, 2020b; Jana *et al.* 2020a, 2020b, 2021; and Kapuri *et al.* 2020. The literature were retrieved by both online and offline searching. During online searching different databases such as Google Scholar and Web of Science were considered. Classification of fish taxa follows Talwar and Jhingran (1991), Jayaram (2010), and the valid nomenclature of species was adopted as per Eschmeyer's catalog of fishes (Eschmeyer *et al.* 2021). Other information like environment, maximum size and human use of all the fish species were retrieved from FishBase (Froese and Pauly 2021), Talwar and Jhingran (1991) and Jayaram (2010). Orders of fish species in the

present list were treated in an alphabetical sequence of families, genera, and species. Comparison of fish diversity between two states has been studied by using the Sorensen Quotient of similarity index (Sorensen 1948).

3 | RESULTS AND DISCUSSION

The present review reveals the existence of 324 species of freshwater fish belonging to 142 genera, 44 families, and 12 orders. Order Cypriniformes showed the maximum diversity having 160 species belonging to 61 genera under 6 families followed by Siluriformes (89 species), Perciformes (53 species), Symbranchiformes (9 species), Clupeiformes (8 species), Mugiliformes (5 species), Cyprinodontiformes (4 species), Beloniformes (4 species) and Anguilliformes (3 species) (Table 1). Out of 345 species, 136 species were ornamental importance, 87 species were used as both ornamental and human consumption and the remaining 122 species were utilised as human food only (Table 1). The similarities and dissimilarities of species between the two states of West Bengal and Odisha as per the order are included in Figure 2. The majority of the species (251) were primarily freshwater and 94 species were secondarily freshwater species. Fourteen species

were exotic.

As per IUCN (2020), the maximum number of freshwater fishes were under the Least Concern (217 species) category followed by Near Threatened (24 species), Endangered (13 species), Vulnerable (14 species) and 1 Critically Endangered species (*Hypselobarbus pulchellus*). Status of 46 species was not evaluated and 30 species were belonging to Data Deficient category. A comparative statistical analysis on species distribution between West Bengal and Odisha state has been done through Sorensen's Quotient of Similarity (SQ) index, which showed a slight similarity (SQ = 0.57 is < 0.6). The total number of species from West Bengal was 271 whereas in Odisha this was 183 of which 130 species were common in both states. This result was quite expected because the physiographic similarity between two adjacent states was very little and it was restricted between the southwestern part of West Bengal (Purulia, Bankura, West Burdwan, Birbhum, Jhargram, and Paschim Medinipur districts) and Odisha. The physiography of North Bengal was quite different from Odisha.

TABLE 1 Freshwater fishes of West Bengal and Odisha with their environment, maximum size, human use and conservation status.

Order, family and species	West Bengal	Source	Odisha	Source	Max. length (cm) ^a	Environment ^b	Human use ^c	IUCN status ^d
Order: Anguilliformes								
Family: Anguillidae								
<i>Anguilla bengalensis</i> (Gray, 1831)	+	1–3, 16, 18	+	20–23	200	Fr, Br, Mr	Fo	NT
<i>Anguilla bicolor</i> (McClelland, 1844)	-		+	20, 22	123	Fr, Br, Mr	Fo	NT
Family: Ophichthidae								
<i>Pisodonophis boro</i> (Hamilton, 1822)	+	1, 18	-		100	Fr, Br, Mr	Fo	LC
Order: Beloniformes								
Family: Adrianichthyidae								
<i>Oryzias dancena</i> (Hamilton, 1822)	+	2, 5, 17	+	20, 22, 24	4	Fr, Br	Fo, Or	LC
Family: Belonidae								
<i>Strongylura strongylura</i> (van Hasselt, 1823)	-		+	20, 24, 44, 45	40	Fr, Br, Mr	Fo, Or	NE
<i>Xenentodon cancila</i> (Hamilton, 1822)	+	1–5, 7–9, 11–19	+	20–22, 24–27	40	Fr, Br, Mr	Fo, Or	LC
Family: Hemiramphidae								
<i>Hyporhamphus limbatus</i> (Valenciennes, 1847)	-		+	20, 22	35	Fr, Br, Mr	Fo	LC
Order: Clupeiformes								
Family: Clupeidae								
<i>Corica soborna</i> (Hamilton, 1822)	+	1, 2	-		4.1	Fr, Br, Mr	Fo	LC
<i>Gonialosa manmina</i> (Hamilton, 1822)	+	1, 2	+	20–22, 25–27	14.1	Fr, Br	Fo	LC
<i>Gudusia chapra</i> (Hamilton, 1822)	+	1, 2, 5, 8, 11–19, 36	+	20–23, 25–27, 29	20	Fr, Br	Fo	EN
<i>Gudusia variegata</i> (Day, 1870)	+	1	-		16	Fr	Fo	LC
<i>Tenualosa ilisha</i> (Hamilton, 1822)	+	1, 2, 16–18, 36	+	20, 30	60	Fr, Br, Mr	Fo	LC
<i>Tenualosa toil</i> (Valenciennes, 1847)	+	1	-		60	Fr, Br, Mr	Fo	NE

TABLE 1 Continued.

Order, family and species	West Bengal	Source	Odisha	Source	Max. length (cm) ^a	Environment ^b	Human use ^c	IUCN status ^d
Family: Engraulidae								
<i>Setipinna phasa</i> (Hamilton, 1822)	+	1, 5, 16, 17, 36	+	20	40	Fr, Br, Mr	Fo	LC
<i>Setipinna taty</i> (Valenciennes, 1848)	+	1, 17	+	20	15.3	Fr, Br, Mr	Fo	NE
Order: Cypriniformes								
Family: Balitoridae								
<i>Balitora mysorensis</i> Hora 1941	+	1	-		10.5	Fr	Or	NT
Family: Cobitidae								
<i>Botia almorhae</i> (Gray, 1831)	+	1, 4, 5	-		15.5	Fr	Or	EN
<i>Botia birdi</i> (Chaudhuri, 1909)	+	1, 16, 17	-		18.6	Fr	Or	NE
<i>Botia dario</i> (Hamilton, 1822)	+	1, 12	-		15.1	Fr	Fo, Or	LC
<i>Botia lohachata</i> (Chaudhuri, 1912)	+	1, 12, 15, 18	-		11	Fr	Or	EN
<i>Botia histrionic</i> (Blyth, 1860)	+	1	-		11.7	Fr	Or	LC
<i>Botia rostrata</i> (Gunther, 1868)	+	1	-		25.0	Fr	Or	VU
<i>Canthophrys gongota</i> (Hamilton, 1822)	+	1	-		13.0	Fr	Or	LC
<i>Lepidocephalichthys guntea</i> (Hamilton, 1822)	+	1, 3–5, 7, 8, 11–14, 18, 19	+	20–22, 24–27, 31, 45	15	Fr, Br	Fo, Or	LC
<i>Lepidocephalichthys annandalei</i> (Chaudhuri, 1912)	+	12	-		4.3	Fr	Or	LC
<i>Lepidocephalichthys arunachalensis</i> (Dutta and Barman, 1984)	+	1	-		8	Fr	Or	EN
<i>Lepidocephalichthys berdmorei</i> (Blyth, 1860)	+	1	-		8	Fr	Or	LC
<i>Lepidocephalichthys goalparensis</i> (Pillai and Yazdani, 1976)	+	1	-		4.4	Fr	Or	LC
<i>Lepidocephalichthys irrorata</i> (Hora, 1921)	+	1	-		34	Fr	Or	LC
<i>Lepidocephalichthys manipurensis</i> (Arunkumar, 2000)	+	1, 4	-		56	Fr	Or	LC
<i>Lepidocephalichthys thermalis</i> (Valenciennes, 1846)	+	1, 3, 4, 5, 7, 8, 14, 36	+	20, 24, 31, 45	38	Fr	Fo, Or	LC
<i>Pangio anguillaris</i> (Vaillant, 1902)	+	1, 12	-		6.5	Fr	Or	LC
<i>Somileptes gongota</i> (Hamilton, 1822)	+	1, 3, 12, 18	-		13	Fr	Or	LC
Family: Cyprinidae								
<i>Amblypharyngodon microlepis</i> (Bleeker, 1853)	+	1, 2, 8, 12, 18, 36	+	20	10	Fr	Or	LC
<i>Amblypharyngodon mola</i> (Hamilton, 1822)	+	1–5, 7–9, 11–16, 18	+	20–30, 32, 34	20	Fr	Fo	LC
<i>Aspidoparia jaya</i> (Hamilton, 1822)	+	1, 2, 12, 16, 18	-		15	Fr	Fo	LC
<i>Bangana ariza</i> (Hamilton, 1807)	+	18	+	20–22	30	Fr	Fo	LC
<i>Bangana dero</i> (Hamilton, 1822)	+	1, 18	+	20, 21	75	Fr	Fo	LC
<i>Barilius barila</i> (Hamilton, 1822)	+	1, 12, 18	+	20–21, 25, 27, 33	10	Fr	Fo	LC
<i>Barilius barna</i> (Hamilton, 1822)	+	1, 5, 12, 18	+	20, 21, 25, 27, 33	15	Fr	Fo	LC
<i>Barilius bendelisis</i> (Hamilton, 1807)	+	1, 12, 17, 18	+	20, 21, 25	22.7	Fr	Fo	LC
<i>Barilius shacra</i> (Hamilton, 1822)	+	12, 18	+	20	14	Fr	Fo	LC
<i>Barilius tileo</i> (Hamilton, 1822)	+	1, 12, 18	-		30.5	Fr	Fo	LC
<i>Barilius vagra</i> (Hamilton, 1822)	+	1, 5, 12	+	20, 21, 24, 25, 28	12.8	Fr	Fo	LC
<i>Bengala elanga</i> (Hamilton, 1822)	+	12, 18	+	20	21	Fr	Or	LC
<i>Barbonymus gonionotus</i> (Bleeker, 1849)	+	16, 41	-		40.5	Fr	Fo, Or	LC
<i>Cabdio morar</i> (Hamilton, 1822)	+	1, 4, 8, 14, 18	+	20, 21, 25, 27, 33	20	Fr	Fo, Or	LC

TABLE 1 Continued.

Order, family and species	West Bengal	Source	Odisha	Source	Max. length (cm) ^a	Environment ^b	Human use ^c	IUCN status ^d
<i>Carassius auratus</i> (Linnaeus, 1758) ^{ex}	+	1, 2	-		48	Fr	Fo, Or	LC
<i>Catla catla</i> (Hamilton, 1822)	+	1, 2, 11–13, 18	+	20–28, 30–31, 34, 44	182	Fr	Fo	LC
<i>Chela cachius</i> (Hamilton, 1822)	+	1, 17	+	20–22, 35, 44	6	Fr, Br	Fo, Or	LC
<i>Chela laubuca</i> (Hamilton, 1822)	+	1, 12	-		7	Fr, Br	Fo, Or	LC
<i>Chagunius chagunio</i> (Hamilton, 1822)	+	1, 17, 18, 36	+	20	50	Fr	Fo, Or	DD
<i>Cirrhinus fulungee</i> (Sykes, 1839)	-		+	20, 24	30	Fr	Fo	LC
<i>Cirrhinus mrigala</i> (Hamilton, 1822)	+	1, 2, 7, 8, 11, 13	+	20–28, 30–31, 34, 44	99	Fr	Fo	LC
<i>Cirrhinus reba</i> (Hamilton, 1822)	+	1, 2	+	20–22, 25–27, 29, 30, 33, 44, 45	30	Fr	Fo	LC
<i>Cirrhinus cirrhosus</i> (Bloch, 1795)	+	18	-		100	Fr, Br	Fo	VU
<i>Crossocheilus latius</i> (Hamilton, 1822)	+	1, 2, 16, 18	+	20–22, 24, 27, 28, 33	15.2	Fr, Br	Fo	LC
<i>Ctenopharyngodon idellus</i> (Valenciennes, 1844) ^{ex}	+	1, 2, 36	+	23, 25, 26	150	Fr	Fo	NE
<i>Cyprinion semiplotum</i> (McClelland, 1839)	+	1, 2, 18	-		60	Fr	Fo	VU
<i>Cyprinus carpio</i> (Linnaeus, 1758) ^{ex}	+	1, 2	+	20, 21, 24–26, 31	120	Fr, Br	Fo	VU
<i>Danio dangila</i> (Hamilton, 1822)	+	1, 2	+	20	15	Fr	Or	LC
<i>Danio rerio</i> (Hamilton, 1822)	+	1, 2, 12, 18	+	20–22, 24–26, 31, 44	3.8	Fr	Or	NT
<i>Danionella priapus</i> (Britz, 2009)	+	1	-		1.6	Fr	Or	DD
<i>Dawkinsia filamentosa</i> (Valenciennes, 1844)	-		+	20	18	Fr, Br	Or	LC
<i>Devario aequipinnatus</i> (McClelland, 1839)	+	1, 2, 12, 17	+	20, 21, 24, 25, 44, 45	15	Fr	Or	LC
<i>Devario assamensis</i> (Barman, 1984)	+	1	-		9	Fr	Or	VU
<i>Devario devario</i> (Hamilton, 1822)	+	1–3, 18	+	20, 21, 25–27, 38	10	Fr	Or	LC
<i>Devario malabaricus</i> (Jerdon, 1849)	-		+	20, 21, 24, 25	12	Fr	Or	LC
<i>Devario regina</i> (Fowler, 1934)	+	1	-		7.8	Fr	Or	LC
<i>Semiplotus semiplotus</i> (Hamilton, 1822)	+	1, 2, 12	+	20–22, 24, 25, 30, 31, 34	13	Fr, Br	Or, Fo	LC
<i>Garra annandalei</i> (Hora, 1921)	+	1, 2, 12	+	20, 25	23	Fr	Or, Fo	LC
<i>Garra arupi</i> (Nebeshwar, Vishwanath and Das, 2009)	+	1	-		7.2	Fr	Fo	NE
<i>Garra gotyla</i> (Gray, 1830)	+	1, 2, 12	+	20, 21, 24, 25	18	Fr	Fo	VU
<i>Garra kempfi</i> (Hora, 1921)	+	1	-		11.3	Fr	Fo	LC
<i>Garra lamta</i> (Hamilton, 1822)	+	1, 2, 12	+	20	20.4	Fr	Fo	LC
<i>Garra lissorhynchus</i> (McClelland, 1842)	+	1	-		9.1	Fr	Or	LC
<i>Garra nasuta</i> (McClelland, 1838)	+	1	-		20	Fr	Or	LC
<i>Garra mullya</i> (Sykes, 1839)	+	1, 2, 17	+	20, 21, 24, 25, 28, 31	17	Fr	Fo, Or	LC
<i>Garra platycephala</i> Narayan Rao 1920	+	18	-		10.4	Fr	Fo	NE
<i>Haludaria melanampyx</i> (Day, 1865)	-		+	20	7.5	Fr	Or	DD
<i>Hypophthalmichthys molitrix</i> (Valenciennes, 1844) ^{ex}	+	1, 36	+	20, 25, 26	105	Fr	Fo	NT

TABLE 1 Continued.

Order, family and species	West Bengal	Source	Odisha	Source	Max. length (cm) ^a	Environment ^b	Human use ^c	IUCN status ^d
<i>Hypophthalmichthys nobilis</i> (Richardson, 1845) ^{ex}	+	1, 2, 16	-		146	Fr	Fo	DD
<i>Hypselobarbus dobsoni</i> (Day, 1876)	-		+	20	120	Fr	Fo	DD
<i>Hypselobarbus kolus</i> (Sykes, 1839)	-		+	20, 25	30	Fr	Fo	VU
<i>Hypselobarbus mussullah</i> (Sykes, 1839)	-		+	20	150	Fr	Fo	EN
<i>Hypselobarbus pulchellus</i> (Day, 1870)	-		+	20, 28	40	Fr	Fo	CR
<i>Labeo angra</i> (Hamilton, 1822)	+	1, 2	+	20, 25, 33	22	Fr	Fo	LC
<i>Labeo bata</i> (Hamilton, 1822)	+	1, 2, 5, 16, 36	+	20, 21, 24–26, 28, 30, 31, 34, 44	61	Fr	Fo	LC
<i>Labeo boga</i> (Hamilton, 1822)	+	1, 2	+	20–22, 25, 35, 44	30	Fr	Fo, Or	LC
<i>Labeo boggut</i> (Sykes, 1839)	-		+	20, 21, 25, 29, 44		Fr	Fo	LC
<i>Labeo calbasu</i> (Hamilton, 1822)	+	1, 2, 5, 16, 18	+	20–22, 24, 32, 34, 35, 44, 45	90	Fr, Br	Fo, Or	LC
<i>Labeo dero</i> (Hamilton, 1822)	+	16, 18	+	44, 45	75	Fr	Or	LC
<i>Labeo dyocheilus</i> (McClelland, 1839)	+	1, 2, 18	+	20, 21, 28	90	Fr	Fo	VU
<i>Labeo fimbriatus</i> (Bloch, 1795)	+	1, 2, 16	+	20, 21, 25–27, 45	91	Fr	Fo	LC
<i>Labeo gonius</i> (Hamilton, 1822)	+	1, 2, 16, 18	+	20–22, 25–27	150	Fr	Fo	LC
<i>Labeo nandina</i> (Hamilton, 1822)	+	1, 2, 16	-		81.2	Fr	Fo	NT
<i>Labeo pangusia</i> (Hamilton, 1822)	+	1, 2	+	20–21	90	Fr	Fo	NT
<i>Labeo rohita</i> (Hamilton, 1822)	+	1, 2, 5, 16, 18, 36	+	20–23, 24–28, 30–32, 34	200	Fr	Fo	LC
<i>Gymnostomus ariza</i> (Hamilton 1807)	+	16	-		30	Fr	Fo	LC
<i>Laubuka dadiburjori</i> (Menon, 1952)	-		+	20–21	2.5	Fr	Or	LC
<i>Laubuka fasciata</i> (Silas, 1958)	-		+	20–21, 31, 45	6	Fr	Or	VU
<i>Laubuka laubuca</i> (Hamilton, 1822)	+	1, 5	+	20–22, 25, 45	7.0	Fr, Br	Or	LC
<i>Megarasbora elanga</i> (Hamilton, 1822)	+	1	-		21	Fr	Fo, Or	LC
<i>Neolissochilus hexagonolepis</i> (McClelland, 1839)	+	1, 18	-		120	Fr	Fo	NT
<i>Neolissochilus hexastichus</i> (McClelland, 1839)	+	1	-			Fr	Or	NT
<i>Oreichthys cosuatis</i> (Hamilton, 1822)	+	1, 12, 18	+	20, 21, 25	8.0	Fr	Fo, Or	LC
<i>Oreichthys crenuchooides</i> (Schafer, 2009)	+	1, 18	-		3.1	Fr	Fo, Or	DD
<i>Osteobrama belangeri</i> (Valenciennes, 1844)	+	1	-		38	Fr	Fo, Or	NT
<i>Osteobrama cunma</i> (Day 1888)	-		+	20, 25	15	Fr	Or	LC
<i>Osteobrama cotio</i> (Hamilton, 1822)	+	1, 2, 5, 12, 18	+	20–21, 23, 25–27	15	Fr	Fo, Or	LC
<i>Osteobrama peninsularis</i> (Silas, 1952)	-		+	20, 22	15	Fr	Fo	DD
<i>Osteobrama vigorsii</i> (Sykes, 1839)	-		+	20–22, 24–26, 31	30	Fr, Br	Fo	LC
<i>Osteochilus nashii</i> (Day, 1869)	-		+	20	18	Fr	Or	LC
<i>Osteochilichthys thomassi</i> (Day, 1877)	+	5, 6	-		8.0	Fr	Fo	LC
<i>Pethia aurea</i> (Knight, 2013)	+	1	-		2.4	Fr	Or	NE
<i>Pethia conchonius</i> (Hamilton, 1822)	+	1, 2, 9, 12, 18	+	20–21, 24, 27, 28	14	Fr	Fo, Or	VU

TABLE 1 Continued.

Order, family and species	West Bengal	Source	Odisha	Source	Max. length (cm) ^a	Environment ^b	Human use ^c	IUCN status ^d
<i>Pethia gelius</i> (Hamilton, 1822)	+	1, 2, 9, 12, 18	+	20, 21, 25, 28	5.1	Fr	Fo, Or	LC
<i>Pethia guganio</i> (Hamilton, 1822)	+	1, 2, 9	+	20, 21, 25	8.0	Fr	Or	LC
<i>Pethia phutunio</i> (Hamilton, 1822)	+	1, 5, 9, 12, 18	+	20, 21, 25	3.5	Fr	Fo, Or	LC
<i>Pethia punctata</i> (Day 1865)	-		+	20, 31	7.5	Fr	Or	LC
<i>Pethia shalynius</i> (Yazdani and Talukdar, 1975)	+	1	-		6.0	Fr	Fo, Or	VU
<i>Pethia ticto</i> (Hamilton, 1822)	+	1, 2, 5, 9, 12, 18	+	20–22, 24–28, 31, 33	10	Fr	Fo, Or	LC
<i>Puntius ambassis</i> (Day, 1869)	-		+	20, 34	7.5	Fr	Or	DD
<i>Puntius amphibius</i> (Valenciennes, 1842)	-		+	20, 21, 24, 28, 31	20	Fr, Br	Fo	DD
<i>Puntius chola</i> (Hamilton, 1822)	+	1, 2, 5, 9	+	20–22, 25, 29, 35	15	Fr	Fo, Or	LC
<i>Puntius dorsalis</i> (Jerdon, 1849)	-		+	20, 21, 25	25	Fr	Fo, Or	LC
<i>Puntius puntio</i> (Hamilton, 1822)	+	1, 2	-		7.5	Fr	Fo, Or	NE
<i>Puntius sophore</i> (Hamilton, 1822)	+	1, 2, 5, 9, 36	+	20–31, 35	20	Fr	Fo, Or	LC
<i>Puntius terio</i> (Hamilton, 1822)	+	1, 2, 5, 9	+	20	10	Fr	Fo, Or	LC
<i>Puntius vittatus</i> (Day, 1865)	+	1	+	20, 22	5.0	Fr	Fo, Or	LC
<i>Puntius stigma</i> (Valenciennes, 1844)	+	12	-		8.6	Fr	Fo	NE
<i>Raiamas bola</i> (Hamilton, 1822)	+	1, 2, 18	+	20	35	Fr	Fo, Or	LC
<i>Rasbora daniconius</i> (Hamilton, 1822)	+	1, 2, 16, 18	+	20–26, 28, 29, 31, 45	15	Fr	Or	LC
<i>Rasbora rasbora</i> (Hamilton, 1822)	+	1, 2	+	20, 22	13	Fr	Or	LC
<i>Salmostoma bacaila</i> (Hamilton, 1822)	+	1, 2	+	20–22, 24–28, 33, 45	18	Fr	Fo	LC
<i>Salmostoma horai</i> (Silas, 1951)	+	1	-		10	Fr, Br	Fo	VU
<i>Salmostoma phulo</i> (Hamilton, 1822)	+	1, 2, 36	+	20, 21, 28	12	Fr	Or	LC
<i>Salmostoma sardinella</i> (Valenciennes, 1844)	+	1, 2	-		15	Fr	Or	LC
<i>Salmostoma acinacas</i> (Valenciennes, 1844)	-		+	20, 34	15	Fr	Or	LC
<i>Salmostoma balookee</i> (Sykes, 1839)	-		+	20, 21	15	Fr	Fo	LC
<i>Salmostoma boopis</i> (Day, 1874)	-		+	20, 21	12	Fr	Or	LC
<i>Salmostoma untrahi</i> (Day, 1869)	-		+	20, 21	20	Fr	Or	LC
<i>Schizothorax richardsonii</i> (Gray, 1832)	+	1, 2	-		60	Fr	Fo	VU
<i>Securicula gora</i> (Hamilton, 1822)	+	1, 2, 16–18	+	20, 21, 27	24.5	Fr	Fo, Or	LC
<i>Systemus charysopoma</i> (Valenciennes, 1842)	-		+	20	15	Fr	Fo, Or	NE
<i>Systemus clavatus</i> (McClelland, 1845)	+	1	-		24	Fr	Fo	NT
<i>Systemus sarana</i> (Hamilton, 1822)	+	1, 18	+	20–22, 24–27, 29–31, 34	42	Fr	Fo, Or	LC
<i>Systemus gracilus</i> Palmoottil & Maji, 2020	+	39	-		15.1	Fr	Fo	NE
<i>Tor khudree</i> (Sykes, 1839)	+	16	+	20, 21, 29	50	Fr	Fo	EN
<i>Tor putitora</i> (Hamilton, 1822)	+	1, 2, 18	+	20, 21, 24, 25, 31	275	Fr	Fo	EN
<i>Tor tor</i> (Hamilton, 1822)	+	1, 2, 18	+	20, 21, 24, 31, 44	200	Fr	Fo	EN

TABLE 1 Continued.

Order, family and species	West Bengal	Source	Odisha	Source	Max. length (cm) ^a	Environment ^b	Human use ^c	IUCN status ^d
Family: Danionidae								
<i>Esomus danrica</i> (Hamilton, 1822)	+	4, 5, 13,14, 18, + 19,		20–22, 24, 13 25, 30, 31, 34, 44, 45		Fr, Br	Fo, Or	LC
Family: Nemacheilidae								
<i>Indoreonectes evazardi</i> (Day, 1872)	-		+	20	4.0	F	Or	LC
<i>Paracanthocobitis urophthalma</i> (Günther, 1868)	+	1, 2, 12, 18	+	20, 21, 24, 11 25, 28, 29, 44		F	Or	LC
<i>Paracanthocobitis moreh</i> (Sykes, 1839)	-		+	20, 21	4.5	F	Or	LC
<i>Paracanthocobitis aurea</i> (Day, 1872)	-		+	20	5.0	F	Or	NE
<i>Schistura denisoni</i> (Day, 1867)	-		+	20, 25	5.0	F	Or	LC
<i>Schistura beavani</i> (Gumther, 1868)	+	1, 2, 18	+	20	8.0	F	Or	LC
<i>Schistura dayi</i> (Hora,1935)	-		+	20	7.5	F	Or	LC
<i>Schistura rupecula</i> (McClelland,1838)	+	2, 12, 18	+	20	7.0	F	Or	LC
<i>Schistura striata</i> (Day, 1867)	-		+	20	5.0	F	Or	EN
<i>Schistura fasciata</i> (Lokeshwor and vishwanath, 2011)	+	1	-		6.8	Fr	Or	NE
<i>Schistura multifasciata</i> (Day,1878)	+	1, 18	-		9.8	Fr	Or	LC
<i>Schistura savona</i> (Hamilton, 1822)	+	1, 2, 12, 18	-		2.4	Fr	Or	LC
<i>Schistura scaturigina</i> (McClelland, 1839)	+	1, 2	-		10	Fr	Or	LC
<i>Schistura tirapensis</i> Kottelat, 1990	+	1	-		5.6	Fr	Or	LC
<i>Aborichthys elongatus</i> Hora, 1921	+	1, 2, 12	-		7.4	Fr	Or	LC
<i>Aborichthys kempfi</i> (Chaudhuri, 1913)	+	1	-		8.1	Fr	Or	NT
<i>Neonoemacheilus assamensis</i> (Menon, 1987)	+	1	-		4.3	Fr	Or	NT
<i>Nemacheilus corica</i> (Hamilton, 1822)	+	1, 2, 12, 16, 18	-		4.2	Fr	Or	LC
Family: Psilorhynchidae								
<i>Psilorhynchus arunachalensis</i> (Nebeshwar, Bagra and Das, 2007)	+	1	-			Fr	Or	DD
<i>Psilorhynchus balitora</i> (Hamilton, 1822)	+	1, 12, 18	-		7.0	Fr, Br	Or	LC
<i>Psilorhynchus nudithoracicus</i> (Tilak and Husain, 1980)	+	1	-		5.8	Fr	Or	LC
<i>Psilorhynchus homaloptera</i> (Hora and Mukerji, 1935)	+	1	-		9.4	Fr	Fo	LC
<i>Psilorhynchus sucatio</i> (Hamilton, 1822)	+	1, 12, 18	-		8.2	Fr	Or	LC
Order: Cyprinodontiformes								
Family: Aplocheilidae								
<i>Aplocheilus lineatus</i> (Valenciennes, 1846)	-		+	20	10	Fr, Br	Or	LC
<i>Aplocheilus panchax</i> (Hamilton, 1822)	+	1, 3, 5, 8, 12, 18, 19	+	20–22, 44	9.0	Fr, Br	Fo, Or	LC
Family: Poeciliidae								
<i>Gambusia affinis</i> (Baird and Girard, 1853) ^{ex}	+	1, 5	-		5.0	Fr	Or	LC
<i>Phalloceros caudimaculatus</i> (Hensel, 1868) ^{ex}	+	1, 5	-		3.5	Fr	Or	NE
Order: Characiformes								
Family: Serrasalminidae								
<i>Colossoma macropomum</i> (Cuvier, 1816) ^{ex}	+	16	-		108	Fr	Fo	NE
<i>Piaractus brachypomus</i> (Cuvier, 1818)	+	5, 8	-		88	Fr	Fo, Or	NE

TABLE 1 Continued.

Order, family and species	West Bengal	Source	Odisha	Source	Max. length (cm) ^a	Environment ^b	Human use ^c	IUCN status ^d
Order: Mugiliformes								
Family: Mugilidae								
<i>Planiliza parsia</i> (Hamilton, 1822)	+	5, 16, 17	+	20	16	Fr, Br, Mr	Fo	NE
<i>Planiliza tade</i> (Fabricius, 1775)	+	17	+	44, 45	19.7	Fr, Br	Fo	NE
<i>Rhinomugil corsula</i> (Hamilton, 1822)	+	1, 16–18	+	20, 21, 25, 27, 30	45	Fr	Fo, Or	LC
<i>Sicamugil cascasia</i> (Hamilton, 1822)	+	1, 18	-		10	Fr	Or	LC
<i>Mugil cephalus</i> Linnaeus 1758	+	16	-		100	Fr, Br	Fo	LC
Order: Osteoglossiformes								
Family: Notopteridae								
<i>Chitala chitala</i> (Hamilton, 1822)	+	1, 5, 16, 18, 36	+	20, 21, 24–28, 30, 31, 34, 35, 44	122	Fr	Fo, Or	NT
<i>Notopterus notopterus</i> (Pallas, 1769)	+	1, 5, 16, 18, 36	+	20–28, 44, 45	60	Fr	Fo, Or	NE
Order: Perciformes								
Family: Ambassidae								
<i>Ambassis ambassis</i> (Lacepede, 1802)	-		+	20, 22	15	Br, Fr	Fo, Or	LC
<i>Ambassis gymnocephalus</i> (Lacepede, 1802)	-		+	20, 22, 44, 45	16	Br, Fr	Fo	LC
<i>Chanda nama</i> (Hamilton, 1822)	+	1, 5, 14	+	20–23, 25–28	11	Fr	Fo, Or	LC
<i>Parambassis baculis</i> (Hamilton, 1822)	+	1, 5, 14	+	20	5.0	Fr	Or	LC
<i>Parambassis lala</i> (Hamilton, 1822)	+	1, 5, 14	+	20, 26, 27	3.9	Fr, Br	Or	NT
<i>Parambassis ranga</i> (Hamilton, 1822)	+	1, 5, 14	+	20–23, 25–27, 33, 35	8.0	Fr	Fo, Or	LC
Family: Anabantidae								
<i>Anabas cobojius</i> (Hamilton, 1822)	+	1, 5, 8	+	20, 22, 24, 25, 28, 33, 44, 45	30	Fr	Fo	DD
<i>Anabas testudineus</i> (Bloch, 1792)	+	1, 5, 7, 11, 12, 14, 19	+	20–22, 24–26, 28, 31–34, 44, 45	25	Fr, Br	Fo	DD
Family: Badidae								
<i>Badis andrewraoi</i> (Valdesalici and van der Voort, 2015)	+	1	-		3.9	Fr	Or	NE
<i>Badis assamensis</i> (Ahl, 1937)	+	1	-		6.8	Fr	Or, Fo	DD
<i>Badis autumnum</i> (Valdesalici and van der Voort, 2015)	+	1	-		3.6	Fr	Or	NE
<i>Badis badis</i> (Hamilton, 1822)	+	1, 5, 11, 12, 14	+	20, 21, 24, 25, 27, 44	5.0	Fr	Or, Fo	LC
<i>Badis kyanos</i> (Valdesalici and van der Voort, 2015)	+	1	-		3.5	Fr	Or	NE
<i>Badis kanabos</i> Kullander & Britz 2002	+	12	-		3.6	Fr	Or	DD
<i>Badis laspiophilus</i> (Valdesalici and van der Voort, 2015)	+	1	-		2.1	Fr	Or	NE
<i>Badis soraya</i> (Valdesalici and van der Voort, 2015)	+	1	-		3.2	Fr	Or	NE
<i>Badis singenensis</i> (Geetakumari and Kadu, 2011)	+	1	-		3.7	Fr	Or	NE
Family: Channidae								
<i>Channa andrao</i> (Britz, 2013)	+	1	-			Fr	Or	NE

TABLE 1 Continued.

Order, family and species	West Bengal	Source	Odisha	Source	Max. length (cm) ^a	Environment ^b	Human use ^c	IUCN status ^d
<i>Channa aurantimaculata</i> (Musikasinthorn, 2000)	+	1	-		19	Fr	Or, Fo	DD
<i>Channa bleheri</i> (Vierke, 1991)	+	1	-		13.5	Fr	Or, Fo	NT
<i>Channa gachua</i> (Hamilton, 1822)	+	1, 5, 8, 14, 16	+	20–23, 25, 26, 29, 30, 34, 35	20	Fr	Or, Fo	LC
<i>Channa marulius</i> (Hamilton, 1822)	+	1, 5, 8, 13, 16, 18	+	20–23, 24–31, 44, 45	183	Fr	Or, Fo	LC
<i>Channa orientalis</i> (Bloch and Schneider, 1801)	+	1, 5, 8, 13, 14, 16, 18	+	20, 25, 31, 44, 45	33	Fr, Br	Or, Fo	NE
<i>Channa punctata</i> (Bloch, 1793)	+	1, 5, 8, 13, 14, 16, 18	+	20, 32, 34, 35, 44, 45	31	Fr, Br	Or, Fo	LC
<i>Channa stewartii</i> (Playfair, 1867)	+	1, 16	-		25	Fr	Or, Fo	LC
<i>Channa striata</i> (Bloch, 1793)	+	1, 5, 8, 13, 14, 16, 18	+	20–22, 24–29, 31, 34, 44, 45	100	Fr, Br	Or, Fo	LC
Family: Chichlidae								
<i>Etroplus suratensis</i> (Bloch, 1790)	-		+	22, 35, 44	40	Fr, Br	Or, Fo	LC
<i>Oreochromis mossambicus</i> (Peters, 1852) ^{ex}	+	1, 5, 8, 16	+	20–22, 24–26, 35	39	Fr, Br	Fo	NT
<i>Oreochromis niloticus</i> (Linnaeus, 1758) ^{ex}	+	1, 5, 8, 16, 36	+	20, 25, 26	60	Fr, Br	Fo	NE
Family: Datnioididae								
<i>Datnioides polota</i> (Hamilton, 1822)	+	1	-		30	Fr, Br	Fo	LC
Family: Eleotridae								
<i>Eleotris fusca</i> (Forster, 1801)	+	1	-		26	Fr, Br	Fo	LC
Family: Gobiidae								
<i>Apocryptes bato</i> (Hamilton, 1822)	+	1, 5, 10	+	32	26	Fr, Br	Fo	NE
<i>Apocryptes caudalis</i> (Paul and Chanda, 2015)	+	5, 10, 42	-		12	Fr, Br	Fo	NE
<i>Awaous staminus</i> (Eydoux and Souleyt, 1850)	-		+	21		Fr	Fo	NE
<i>Brachyamblyopus brachysoma</i> (Bleeker, 1854)	+	1, 5, 10	-		10.5	Fr, Br	Fo	NE
<i>Glossogobius giuris</i> (Hamilton, 1822)	+	1, 4, 5, 7–8, 10, 14, 19, 43	+	20–23, 25–30, 34, 44, 45	50	Fr, Br	Or, Fo	LC
<i>Glossogobius biocellatus</i> (Valenciennes, 1873)	-		+	44, 45	12	Fr, Br	Or, Fo	NE
<i>Gobiopterus chuno</i> (Hamilton, 1822)	-		+	22, 34	3.0	Fr, Br	Fo	DD
<i>Odontamblyopus rubicundus</i> (Hamilton, 1822)	+	1, 10, 17, 19	-		25.0	Fr, Br	Or, Fo	NE
<i>Pseudapocryptes elongatus</i> (Cuvier, 1816)	+	1, 10, 17	+	22	20	Fr, Br	Fo	LC
<i>Stigmatogobius sadanundio</i> (Hamilton Buchanan, 1822)	+	43	-		6.0	Fr, Br	Fo, Or	LC
Family: Nandidae								
<i>Nandus nandus</i> (Hamilton, 1822)	+	1, 4, 5, 7, 9, 12, 13, 16, 19, 36	+	20, 21, 25–28, 35, 44, 45	20	Fr, Br	Fo, Or	LC
<i>Nandus banshlaii</i> Kaburi, Sinha, Dey, Roy, Bhakat, 2020	+	40	-		6.9	Fr	Fo, Or	NE
<i>Nandus meni</i> Hossain & Sarker 2013	+	5, 36	-		13.5	Fr, Br	Fo, Or	NE
Family: Osphronemidae								
<i>Ctenops nobilis</i> (McClelland, 1845)	+	1	-		10.5	Fr, Br	Fo, Or	NT

TABLE 1 Continued.

Order, family and species	West Bengal	Source	Odisha	Source	Max. length (cm) ^a	Environment ^b	Human use ^c	IUCN status ^d
<i>Osphronemus goramy</i> (Lacepede, 1801) ^{ex}	+	1	-		70	Fr, Br	Fo, Or	LC
<i>Trichogaster fasciata</i> (Bloch and Schneider, 1801)	+	1, 5, 7, 8, 16, 43	+	20–23, 24–26, 44, 45	12.5	Fr	Fo	LC
<i>Trichogaster chuna</i> (Hamilton, 1822)	+	1, 5, 8, 12, 16, 18	-		7.0	Fr	Or	LC
<i>Trichogaster lalius</i> (Hamilton, 1822)	+	1, 5, 7, 8, 16, 43	+	20–22, 24, 27, 44, 45	8.8	Fr	Or	LC
<i>Trichogaster labiosa</i> (Day, 1877)	+	1, 12	-		9.0	Fr	Or	LC
Family: Teraponidae								
<i>Terapon jarbua</i> (Forsskal, 1775)	+	17	+	44, 45	25	Fr, Br	Or	NE
Family: Scatophagidae								
<i>Scatophagus argus</i> (Linnaeus, 1766)	+	5, 36	+	44, 45	20	Fr, Br	Fo, Or	LC
Family: Latidae								
<i>Lates calcarifer</i> (Bloch 1790)	+	5, 16	-		200	Fr, Br	Fo	LC
Order: Siluriformes								
Family: Amblycipitidae								
<i>Amblyceps apangi</i> (Nath and Dey, 1989)	+	1, 12	-		7.3	Fr	Fo	LC
<i>Amblyceps arunchalensis</i> (Nath and Dey, 1989)	+	1	-		8.1	Fr	Fo	EN
<i>Amblyceps cerinum</i> (Ng and Wright, 2010)	+	1	-		9.7	Fr	Fo	NE
<i>Amblyceps mangois</i> (Hamilton, 1822)	+	1, 5, 12, 16	+	20, 21, 24, 25, 31	12.5	Fr	Fo, Or	LC
<i>Amblyceps tuberculatum</i> (Linthoingambi and Vishwanath, 2008)	+	1	-		9.7	Fr	Or	DD
Family: Arridae								
<i>Arius gogora</i> (Hamilton, 1822)	+	1, 17	+	20, 27	91.4	Fr, Br, Mr	Fo	NT
<i>Hexanematichthys sagor</i> (Hamilton, 1822)	-		+	20	45	Fr, Br, Mr	Fo	NE
<i>Nemapteryx nenga</i> (Hamilton, 1822)	-		+	20	45	Fr, Br, Mr	Fo	NE
Family: Bagridae								
<i>Batasio batasio</i> (Hamilton, 1822)	+	1, 16	-		10	Fr	Or, Fo	LC
<i>Batasio fasciolatus</i> (Ng, 2006)	+	1	-		7.1	Fr	Or	LC
<i>Batasio merianiensis</i> (Chaudhuri, 1913)	+	1	-		6.6	Fr	Or	DD
<i>Batasio spilurus</i> (Ng, 2006)	+	1	-		4.2	Fr	Or	DD
<i>Batasio tengana</i> (Hamilton, 1822)	+	1, 18	+	20, 21	9.0	Fr	Or, Fo	LC
<i>Chandramara chandramara</i> (Hamilton, 1822)	+	1	-		5.0	Fr	Or	LC
<i>Hemibagrus menoda</i> (Hamilton, 1822)	+	1, 18	+	20, 44, 45	45	Fr	Or, Fo	LC
<i>Mystus bleekeri</i> (Day, 1877)	+	1, 18	+	20, 21, 24, 25, 27–29, 44	15.5	Fr	Or, Fo	LC
<i>Mystus carcio</i> (Hamilton, 1822)	+	1	-		5.0	Fr	Or	LC
<i>Mystus cavasius</i> (Hamilton, 1822)	+	1	+	20–22, 27–29, 34, 44	40	Fr, Br, Mr	Fo	LC
<i>Mystus dibrugarensis</i> (Chaudhuri, 1913)	+	1	-			Fr	Or	LC
<i>Mystus gulio</i> (Hamilton, 1822)	+	1	+	20, 22, 24, 30, 35	46	Fr, Br	Fo	LC
<i>Mystus tengara</i> (Hamilton, 1822)	+	1, 5, 14, 18	+	20, 21, 25, 26, 28	18	Fr	Or, Fo	LC
<i>Mystus vittatus</i> (Bloch, 1794)	+	1, 4, 5, 8, 13, 18	+	20–22, 24–28, 30, 35, 44	21	Fr, Br	Or, Fo	LC

TABLE 1 Continued.

Order, family and species	West Bengal	Source	Odisha	Source	Max. length (cm) ^a	Environment ^b	Human use ^c	IUCN status ^d
<i>Olyra longicaudata</i> (McClelland, 1842)	+	1, 12	-		11.	Fr	Or	LC
<i>Rita chrysea</i> (Day, 1877)	-		+	20, 21, 25, 45	19.5	Fr	Fo	LC
<i>Rita kuturnee</i> (Sykes, 1839)	-		+	20	30	Fr	Fo	LC
<i>Rita gogra</i> (Sykes, 1839)	+	1	-		26.0 cm	Fr	Or, Fo	LC
<i>Rita rita</i> (Hamilton, 1822)	+	1, 16, 18	+	20, 25, 28	150	Fr, Br	Or	LC
<i>Sperata aor</i> (Hamilton, 1822)	+	1, 18	+	20, 21, 24–28, 31	180	Fr	Fo	LC
<i>Sperata seenghala</i> (Sykes, 1839)	+	1, 16, 18	+	20–22, 24–28, 30, 31	150	Fr, Br	Fo	LC
Family: Chacidae								
<i>Chaca chaca</i> (Hamilton, 1822)	+	1, 18	+	44, 45	20	Fr	Or	LC
Family: Clariidae								
<i>Clarias batrachus</i> (Linnaeus, 1758)	+	1	+	20, 21, 25, 26, 28, 31, 32, 34	47	Fr, Br	Or, Fo	LC
<i>Clarias gariepinus</i> (Burchell, 1822) ^{ex}	+	1, 8, 16	+	25	170	Fr	Fo	LC
<i>Clarias magur</i> (Hamilton, 1822)	+	1	+	20, 22	21.5	Fr	Fo	EN
Family: Heteropneustidae								
<i>Heteropneustes fossilis</i> (Bloch, 1794)	+	1	+	20–23, 24–26, 29, 31–34	30	Fr, Br	Or, Fo	LC
Family: Horabagridae								
<i>Pachypterus atherinoides</i> (Bloch, 1794)	+	1, 17	+	21, 25, 27, 44, 45	15	Fr, Br	Fo, Or	LC
Family: Loricariidae								
<i>Pterygoplichthys multiradiatus</i> (Hancock, 1828) ^{ex}	+	1, 16	-		50	Fr	Fo, Or	NE
Family: Pangasidae								
<i>Pangasius pangasius</i> (Hamilton, 1822)	+	1, 16	+	20–22, 25, 27, 30	90	Fr, Br	Fo, Or	LC
<i>Pangasius bocourti</i> Sauvage, 1880	-		+	37	120	Fr	Fo	LC
<i>Pangasianodon hypophthalmus</i> (Sauvage, 1878) ^{ex}	+	1	-		130	Fr	Fo	EN
Family: Plotosidae								
<i>Plotosus canius</i> (Hamilton, 1822)	+	1	-		150	Fr, Br, Mr	Fo	NE
Family: Ailiidae								
<i>Ailia coila</i> (Hamilton, 1822)	+	1, 16, 18	+	20–22, 24–27, 31, 34, 45	30	Fr, Br	Fo	NT
<i>Ailiichthys punctata</i> (Day, 1872)	+	1	+	33	10	Fr	Or	DD
<i>Clupisoma garua</i> (Hamilton, 1822)	+	1, 16, 18	+	20, 21, 25–27, 33, 45	60.9	Fr, Br	Fo	LC
<i>Clupisoma montana</i> (Hora, 1937)	+	1	-		29	Fr	Fo	LC
<i>Clupisoma bastari</i> Datta and Karmakar, 1980	-		+	20, 25	18	Fr	Fo	DD
<i>Eutropiichthys murius</i> (Hamilton, 1822)	+	1	+	20, 27, 45	28	Fr	Fo	LC
<i>Eutropiichthys vacha</i> (Hamilton, 1822)	+	1, 18	+	20–22, 26–28, 30, 31, 45	34	Fr, Br	Fo	LC
<i>Silonia silondia</i> (Hamilton, 1822)	+	1	+	20–22, 27, 34	183	Fr, Br	Fo	LC

TABLE 1 Continued.

Order, family and species	West Bengal	Source	Odisha	Source	Max. length (cm) ^a	Environment ^b	Human use ^c	IUCN status ^d
Family: Siluridae								
<i>Ompok bimaculatus</i> (Bloch, 1794)	+	1, 5, 8	+	20–22, 24–45, 28, 30, 44, 45		Fr, Br	Fo, Or	NT
<i>Ompok pabda</i> (Hamilton, 1822)	+	1, 5, 8, 18	+	20–22, 25–30, 27, 30		Fr	Fo, Or	
<i>Ompok pabo</i> (Hamilton, 1822)	+	1, 5, 14, 18	+	20, 21, 25, 26, 45		Fr	Fo, Or	NT
<i>Pterocryptis berdmorei</i> (Blyth, 1860)	+	1, 18	-		21.4	Fr	Fo, Or	NT
<i>Wallago attu</i> (Bloch and Schneider, 1801)	+	1, 5, 13, 19	+	20–22, 24–31	240	Fr, Br	Fo	LC
Family: Sisoridae								
<i>Bagarius bagarius</i> (Hamilton, 1822)	+	1, 16–18	+	20–22, 25, 27	200	Fr, Br	Fo	NT
<i>Bagarius yarrelli</i> (Sykes, 1839)	+	1	+	22	200	Fr	Fo	NT
<i>Conta pectinata</i> (Ng, 2005)	+	1, 18	-		4.9	Fr	Or	DD
<i>Erethistes pusillus</i> (Muller and Troschel, 1849)	+	1, 18	+	27	4.2	Fr	Or	LC
<i>Erethistoides infuscatus</i> (Ng, 2006)	+	1	-		4.5	Fr	Or	DD
<i>Erethistoides montana</i> (Hora, 1950)	+	1	-		4.8	Fr	Or	DD
<i>Erethistes hora</i> (Hamilton, 1822)	-		+	20, 21, 25	13	Fr	Or	LC
<i>Gagata cenia</i> (Hamilton, 1822)	+	1, 12, 16, 17	+	25, 33	15	Fr, Br	Fo	LC
<i>Gagata gagata</i> (Hamilton, 1822)	+	1	+	20–21	31	Fr, Br	Fo	LC
<i>Gagata sexualis</i> (Tilak, 1970)	+	1	-		6.0	Fr	Or	LC
<i>Gagata dolichonema</i> (He, 1996)	+	1	-		13	Fr	Or	LC
<i>Glyptothorax cavia</i> (Hamilton, 1822)	+	1, 12	-		28	Fr	Or	LC
<i>Glyptothorax dikrongensis</i> (Tamang and Chaudhry, 2011)	+	1	-		9.4	Fr	Or	NE
<i>Glyptothorax gracilis</i> (Gunther, 1864)	+	1	-		12.7	Fr	Or	DD
<i>Glyptothorax indicus</i> (Talwar, 1991)	+	1, 12, 18	-		11	Fr	Or	LC
<i>Glyptothorax lonah</i> (Sykes, 1839)	-		+	20, 21	15	Fr	Or	LC
<i>Glyptothorax radiolus</i> (Ng and Lalramliana, 2013)	+	1	-		11.9	Fr	Fo	NE
<i>Glyptothorax striatus</i> (McClelland, 1842)	+	1	-		21.5	Fr	Fo	NT
<i>Glyptothorax telchitta</i> (Hamilton, 1822)	+	1, 12, 18	-		10	Fr	Or	LC
<i>Glyptothorax pectinopterus</i> (McClelland 1842)	+	12	-		17.8	Fr	Or	LC
<i>Glyptothorax schmidtii</i> (Volz 1904)	+	16	-		8.5	Fr	Or	LC
<i>Gogangra viridescens</i> (Hamilton, 1822)	+	1, 12, 16–18	+	20, 21	8.5	Fr	Or	LC
<i>Hara hara</i> (Hamilton, 1822)	+	1	+	44, 45	13	Fr	Or	LC
<i>Hara horai</i> (Misra, 1976)	+	1	-		8.0	Fr	Or	LC
<i>Hara jerdoni</i> (Day, 1870)	+	1	-		4.0	Fr	Or	LC
<i>Hara koladynensis</i> (Anganthoibi and Vishwanath, 2009)	+	1	-		6.6	Fr	Or	DD
<i>Nangra assamensis</i> (Sen and Biswas, 1994)	+	1	-		9.2	Fr	Or	LC
<i>Nangra nangra</i> (Hamilton, 1822)	+	1	-		5.5	Fr	Or	LC
<i>Pseudolaguvia ferula</i> (Ng, 2006)	+	1	-		2.5	Fr	Or	DD
<i>Pseudolaguvia ferruginea</i> (Ng, 2009)	+	1	-		2.9	Fr	Or	DD
<i>Pseudolaguvia flavida</i> (Ng, 2009)	+	1	-		2.5	Fr	Or	DD
<i>Pseudolaguvia foveolata</i> (Ng, 2005)	+	1	-		3.0	Fr	Or	DD
<i>Pseudolaguvia ribeiroi</i> (Hora, 1921)	+	1	-		10.0	Fr	Or	LC
<i>Pseudolaguvia shawi</i> (Hora, 1921)	+	1, 18	-		3.0	Fr	Or	LC

TABLE 1 Continued.

Order, family and species	West Bengal	Source	Odisha	Source	Max. length (cm) ^a	Environment ^b	Human use ^c	IUCN status ^d
<i>Sisor barakensis</i> (Vishwanath and Darshan, 2005)	+	1	-			Fr	Or	VU
<i>Sisor raddophorus</i> (Hamilton, 1822)	+	1	-		18	Fr	Or	LC
Order: Synbranchiformes								
Family: Chaudhuriidae								
<i>Pillaia indica</i> (Yazdani, 1972)	+	1	-		7.7	Fr	Or	EN
Family: Mastacembelidae								
<i>Macrognathus aculeatus</i> (Bloch, 1786)	+	1, 18	+	20, 21, 24, 38, 25, 28, 31, 32, 44, 45		Fr, Br	Fo, Or	LC
<i>Macrognathus aral</i> (Bloch and Schneider, 1801)	+	1, 5, 8, 14	+	22, 26, 30	63.5	Fr, Br	Fo	LC
<i>Macrognathus morehensis</i> (Arunkumar and Tombi Singh, 2000)	+	1	-			Fr	Fo, Or	LC
<i>Macrognathus pancalus</i> (Hamilton, 1822)	+	1, 4, 5, 8, 13, 14, 18	+	20–28, 44, 18, 45		Fr, Br	Fo, Or	LC
<i>Mastacembelus armatus</i> (Lacepede, 1800)	+	1, 5, 8, 14, 18	+	20–23, 25–29, 44, 45	90	Fr, Br	Fo	LC
Family: Synbranchidae								
<i>Monopterus albus</i> (Zuiew, 1793)	+	1	-		100	Fr, Br	Fo	LC
<i>Monopterusuchia</i> (Hamilton, 1822)	+	1, 16, 19	+	20, 21, 24, 26, 28, 31, 44, 45	70	Fr, Br	Or	LC
<i>Ophisternon bengalense</i> (McClelland, 1844)	+	1	+	20, 22	100	Fr, Br	Fo	LC
Order: Syngnathiformes								
Family: Syngnathidae								
<i>Microphis cunocalus</i> (Hamilton, 1822)	+	1	-		17.5	Fr, Br	Or	LC
<i>Microphis deocata</i> (Hamilton, 1822)	+	1, 18	-		15	Fr	Or	NT
Order: Tetradontiformes								
Family: Tetraodontidae								
<i>Leiodon cutcutia</i> (Hamilton, 1822)	+	1, 5, 13, 16, 18	+	20, 44	15	Fr, Br	Or	LC
<i>Tetraodon fluviatilis</i> (Hamilton, 1822)	+	1	+	37	17	Fr, Br	Or	NE
Order: Pleuronectiformes								
Family: Cynoglossidae								
<i>Cynoglossus puncticeps</i> (Richardson, 1846)	+	17	+	44	16	Fr, Br	Or	LC
<i>Cynoglossus lingua</i> Hamilton, 1822	+	17	-		45	Fr, Br	Or	LC

ex, exotic species. Sources: 1, Moglekar *et al.* (2017); 2, Barman (2007); 3, Basu *et al.* (2012); 4, Paul and Chanda (2014); 5, Chanda (2020); 6, Jana *et al.* (2020a); 7, Jana *et al.* (2021); 8, Kisku *et al.* (2017); 9, Sit *et al.* (2020a); 10, Sit *et al.* (2019); 11, Saha and Patra (2013); 12, Sarkar (2018); 13, Kar *et al.* (2017); 14, Paul and Chanda (2017); 15, Jana *et al.* (2020b); 16, Ganguly *et al.* (2018); 17, Mishra *et al.* (2003); 18, Das (2015); 19, Jana *et al.* (2015); 20, Mogalekar and Canciyal (2018); 21, Pathak *et al.* (2007); 22, Mohanty *et al.* (2015); 23, Sarkar *et al.* (2015); 24, Baliarsingh *et al.* (2013); 25, Singh *et al.* (2013); 26, Singh (2014); 27, Das *et al.* (2016); 28, Samal *et al.* (2016); 29, Satapathy and Mishra (2014); 30, Mishra *et al.* (2013); 31, Ramakrishna *et al.* (2006); 32, Dandapat (2015); 33, Karmakar *et al.* (2008); 34, Das (2008); 35, Behera and Nayak (2014); 36, Pahari *et al.* (2017); 37, Nandini and Parida (2020); 38, Kumar *et al.* (2020); 39, Mathews and Debarghya (2020); 40, Kapuri *et al.* (2020); 41, Das (2018); 42, Paul and Chanda (2015); 43, Sit *et al.* (2020b); 44, Baliarsingh *et al.* (2020a); 45, Baliarsingh *et al.* (2020b). ^a according to Talwar and Jhingran (1991), Jayaram (2010), Froese and Pauly (2021). ^b according to Talwar and Jhingran (1991), Jayaram (2010), Froese and Pauly (2021). Fr, freshwater; Br, brackish water; Mr, marine water. ^c according to Talwar and Jhingran (1991), Jayaram (2010), Froese and Pauly (2021). Fo, food; Or, ornamental. ^d IUCN (2020). CR, Critically Endangered; NT, Near Threatened; EN, Endangered; VU, Vulnerable; LC, Least Concern; NE, Not Evaluated; DD, Data Deficient.

The present work reveals that the study area is rich in fish faunal diversity. Mongalekar and Canciyal (2018) have reported 186 species of freshwater fishes belonging to 96 genera, 33 families of 11 orders but in the present work included 12 more species, reported in the recent literature (e.g. Nandini and Parida 2020; Kumar *et al.* 2020, Baliarsingh *et al.* 2020a, 2020b), which resulted in a total of 198 valid species from Odisha state (Table 1). Similarly, the major work of Mongalekar *et al.* (2017) on freshwater fish of West Bengal included 267 species belonging to 123 genera, 40 families of 12 orders which was recorded as 297 species in the present study, based on the recent literature (e.g. Barman 2007; Chanda 2018, 2020; Kisku *et al.* 2017; Jana *et al.* 2020a, 2021; Ganguly *et al.* 2018; Sarkar 2018; Mathews and Debarghya 2020; Kapuri *et al.* 2020) (Table 1).

There is no previous work similar to the present study. The present study has enlisted 345 freshwater fish species from the study area which is the first report of the freshwater fish fauna of middle-east India. As West Bengal and Odisha are two very closely located states of eastern India some similarities in the fish fauna between two states is expected. The similarities were as follows, 33.33% Anguilliformes, 50% Beloniformes, 62.50% Clupeiformes, 41.87% Cypriniformes, 60.0% Mugiliformes, 41.50% Perciformes, 42.69% Siluriformes, 66.66% Synbranchiformes, 25.0% Cyprinodontiformes, 50% of Pleu-

ronectiformes, 100% Osteoglossiformes and 100% Tetraodontiformes (Figure 2). The species of Syngnathiformes and Characiformes were not reported in the state of Odisha. The Sorensen's similarity index of the freshwater fish fauna of these two states resulted in a slight similarity (QS = 0.60). This may be due to the eco-climatic similarity between the south-western part of West Bengal and the north-eastern part of Odisha states.

4 | CONCLUSIONS

Varied freshwater fish resources of the study area are the natural blessing for the livelihood of rural poor. Both Bengali and Odia people prefer freshwater fish to marine ones and cultivable freshwater fish is very limited in both states. The introduction of new species in freshwater aquaculture systems will certainly improve the economy of a country and for this purpose listing and investigation of fish for culture is a prime requisite for furthering the economy of a country from aqua-resources. A huge number of freshwater fish fauna indicates the rich biodiversity of the aquatic ecosystem of the area. The present study area constitutes 33.59% of the freshwater fish population of India. The present findings would be very helpful for future planning, management, and conservation of fishery resources of middle-east India.

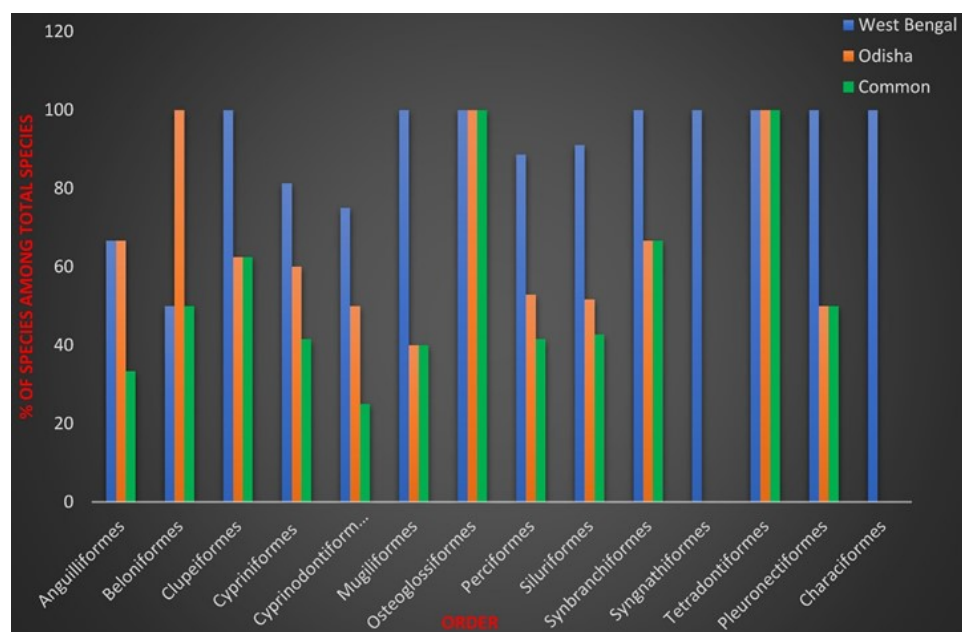


FIGURE 2 Order wise fish species distribution in West Bengal and Odisha with common species.

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CONFLICT OF INTEREST

The authors declare no conflict of interest.

AUTHORS' CONTRIBUTION

AJ Secondary data collection, checklist preparation, manuscript writing, data analysis; **AC** Secondary data collection, validation of species names, manuscript editing,

formatting and data evaluation.

DATA AVAILABILITY STATEMENT

Data sharing is not applicable to this article as no new data were created or analysed in this study.

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