

# Ichthyofaunal Assessment of Birupa River, Odisha, India

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**Abstract:** The fishes are one of the most important vertebrates, provide rich protein sources for human and several animals and important elements in the economy of many countries. Fish diversity of river essentially represents the ichthyofaunal diversity and their abundance. Rivers conserve a rich variety of fish species which supports the commercial fisheries. Keeping in the view, the diversity of fish fauna of the Birupa River in Choudwar Town, Odisha, India, has been studied from the period January 2018 to March 2018. The aim of the study was to explore the fish fauna of Birupa River in the course of an investigation, 4 sampling sites were selected viz. Birupa Barrage, Birupa Anicut on Birupa river, Jora fishing site, Birupa Fish Market, Choudwar. The total 36 fish species belonging to 25 genera, 16 families and 9 orders were recorded. Cypriniformes constituting 15 species, followed by order Siluriformes constituting 6 species, Perciformes 4 species, Anabantiformes 4 species, Clupeiformes 2 species, Osteoglossiformes 2 species and order Mastacembeliformes, Cichliformes and Tetraodontiformes constituting 1 species each have been recorded. The Cyprinidae family is dominant followed by Channidae. As no attempt had been made in the past to explore the ichthyofaunal diversity of this region. All the species reported in present investigation are reporting first time under mopping survey programme.

**Keywords:** Ichthyofaunal diversity, Birupa Barrage, Birupa River, Choudwar, Odisha

## I. INTRODUCTION

Fish constitutes half of the total number of vertebrates in the world. They live in almost all conceivable aquatic habitats; 21,723 living species of fish have been recorded out of 39,900 species of vertebrates, 8,411 are freshwater species and 11,650 are marine. In India 2,500 species of fishes are present out of which 930 live in freshwater and 1,570 are marine.

India is one of the largest biodiversity countries in the world and occupies ninth position in term of freshwater mega biodiversity. There are about 450 families of freshwater fishes globally. Roughly 65 are represented in India.

Several works have been carried out in different stretches of Mahanadi. Works carried out in Mahanadi river were by Day (1889) and was reported 146 species mainly from the Cuttack region, Hora (1940) reported 43 species, Jayaram and Majumdar (1976) reported 42 fish species, Desai and Shrivastava (2004) reported 48 fish species, Om Prakash (2004) reported 65 fish species, Singh (2004) reported 65 fish species. Other works done in Mahanadi river were, Tamboli & Jha (2010), Choubey & Qureshi (2013), Singh (2014), Sahu (2015) etc. Singh Tarun Kumar (2014) studies the fish diversity of the Mahanadi River and recorded 56 species belonging to 35 genera, 19 families and 7 orders.

The present study was carried out at Birupa, a distributary of Mahanadi is monitored at the downstream of Choudwar town. Wildlife Society of Orissa (WSO) Secretary Biswajit Mohanty warned if no steps are taken within the next couple of decades Birupa river on which lakhs of fishermen survive would fade into history will turn into a dead river.

## II. MATERIALS & METHODS

**Study Area:** State Orissa the Indian subcontinent extends from 17° 49' N to 22° 34' N Latitude and 81° 27' E to 87° 29' Longitude the eastern coast of India. Birupa river is a stream in Odisha, India. It is located at an elevation of 4 meters above sea level. Its coordinates are 20° 37' 0" N and 86° 22' 60" E in DMS. The present study was undertaken to look into the fish diversity of the Birupa River and classify the reported fishes into food fish, ornamental fishes and both food and ornamental fishes. As no attempt had been made in the past to explore the ichthyofaunal diversity of this region. All the species reported in present investigation are reporting first time under mopping survey programme.

**Data Collection:** Sampling was carried out by collecting fish species from different fishing grounds and fish markets in selected regions with the help of local fishers. The fishes were collected using gill nets, cast nets, drag nets, bag nets, and bait fishing for collecting fish. For the taxonomic study, fish samples were preserved in 5% formaldehyde solution. The taxonomic identification was done by referring Day, Talwar-Jhingran and Jayaram. The scientific names of the identified fishes were also checked by referring the website of fishbase. The status of the available ornamental fishes were determined according to the Threatened freshwater fishes of India, National Bureau of Fish Genetic Resources, 2010 and IUCN Red list of Threatened Species, 2017.3.

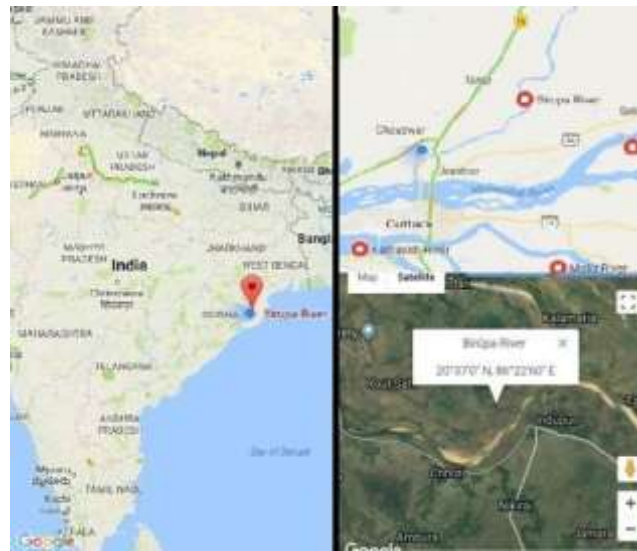


Figure 1: Map showing Birupa River in Odisha, India

**III. RESULT & DISCUSSION**

During the study of fish biodiversity a total of 36 fish species belonging to 25 genera, 16 families and 9 orders were recorded from 4 sampling sites in Choudwar area. Out of 36 species 15 belongs to the order Cypriniformes followed by the order Siluriformes with 6 species), 4 belongs to the order Anabantiformes (3 species of Channidae, 1 species of Anabantidae) , 4 belong to the order Perciformes (2 species of Ambassidae, 1 species of Scatophagidae and 1 species of Terapontidae), , 2 belongs to the order Osteoglossiformes (2 species of Notopteridae), 2 belongs to the order Clupeiformes (1 species of Clupeidae), 1 belong to the order Mastacembeliformes (1 species of Mastacembelidae), , 1 belong to the order Cichliforms (1 species of Cichlidae) and 1 belong to the order Tetraodontiformes (1 species of Tetraodontidae) .

Among the total enlisted species, the dominant ones included family Cyprinidae which was represented by *Labeo rohita*, *Labeo calbasu*, *Labeo bata*, *Catla catla*, *Cirrhinus mrigala*, *Cirrhinus reba*, *Amblypharyngodon melettinus*, *Amblypharyngodon mola*, *Rasbora daniconius*, *Puntius sarana*, *Puntius guganio*, *Puntius gonionotus*, *Barilius bendelisis*, *Salmostoma bacalia*. Cobitidae by *Lepidocephalus guntea*, Siluridae by *Wallago attu*, *Ompok bimaculatus*, Bagridae by *Mystus vittatus*, *Mystus cavasius*, Claridae by *Clarias batrachus*, Heteropneustidae by *Heteropneustes fossilis*, Mastacembelidae by *Macrognathus aculeatus*, Ambassidae by *Parambassis baculis*, *Parambassis lala*, Scatophagidae by *Scatophagus argus*, Terapontidae by *Terapon jarbua*, Channidae by *Channa striatus*, *Channa marulius*, *Channa punctatus*, Anabantidae by *Anabas testudineus*, Notopteridae by *Notopterus notopterus*, *Notopterus chitala*, Cichlidae by *Epiplatys suratensis*, Clupeidae by *Gudusia chapra*, *Gonialosa manmina*, Tetraodontidae by *Tetraodon cutcutia*.

Out of 36 species, 34 species were recorded in the site-I i.e. Birupa Barrage, 13 species were recorded in the site- II i.e. Birupa Anicut, 10 species were recorded in the site-III i.e. Jora and 18 species were recorded in the site-IV i.e. Birupa fish market are shown in the table.

Out of the 36 species, 4 species are near threatened, 29 species are the least concern, 1 species vulnerable, 1 species data deficient and 1 species not evaluated categories are shown in the table. As no attempt had been made in the past to explore the ichthyofaunal diversity of this region. All the species reported in present investigation are reporting first time under mopping survey programme.

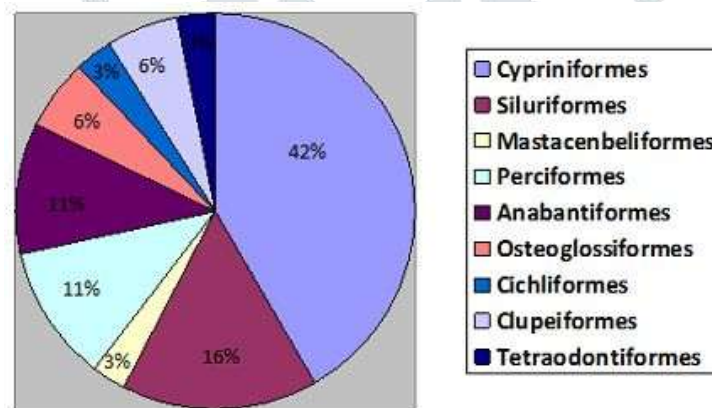


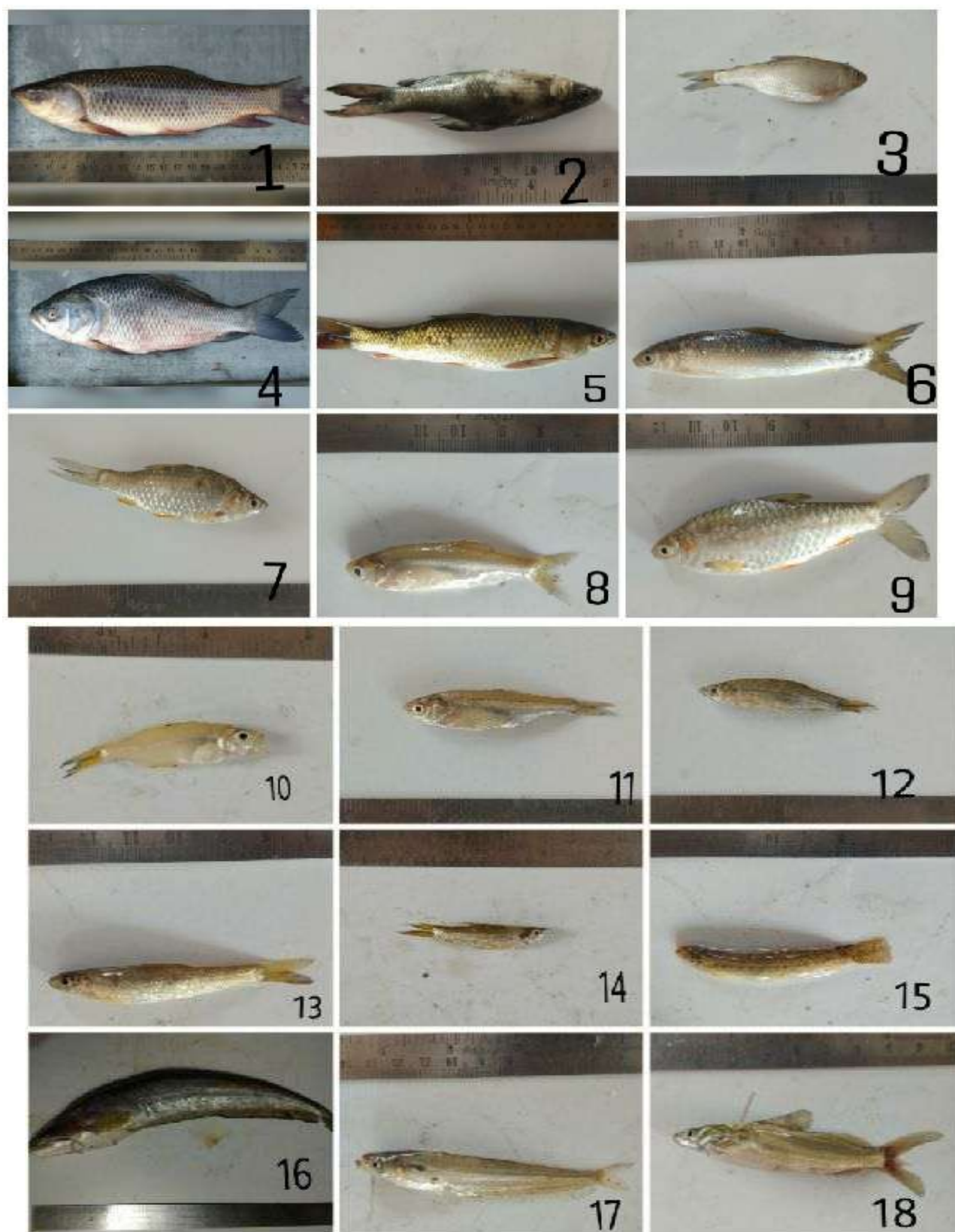
Figure 2: Order wise fish percentage of Birupa river

Table 1: List of fish species of Birupa river at 4 sampling sites and their threat status

Sl. No.	Order	Family	Scientific Name	IUCN Status	Sampling Sites			
					Site-1	Site-2	Site-3	Site-4
1	Cypriniformes	Cyprinidae	<i>Labeo rohita</i>	LC	+	+	-	+
2			<i>Labeo calbasu</i>	LC	+	-	-	-
3			<i>Labeo bata</i>	LC	+	-	-	+

4			<i>Catla catla</i>	LC	+	+	-	+
5			<i>Cirrhinus mrigala</i>	LC	-	+	-	+
6			<i>Cirrhinus reba</i>	LC	-	+	-	+
7			<i>Amblypharyngodon meletinus</i>	LC	+	-	-	-
8			<i>Amblypharyngodon mola</i>	LC	+	-	-	+
9			<i>Rasbora daniconius</i>	LC	+	-	+	-
10			<i>Puntius sarana</i>	LC	+	-	-	+
11			<i>Puntius guganio</i>	LC	+	-	-	+
12			<i>Puntius gonionotus</i>	LC	+	-	-	-
13			<i>Barilius bendelisis</i>	LC	+	+	-	+
14			<i>Salmostoma bacalia</i>	LC	+	-	-	-
15		Cobitidae	<i>Lepidocephalus guntea</i>	LC	+	-	-	-
16	Siluriformes	Siluridae	<i>Wallago attu</i>	NT	+	-	+	-
17			<i>Ompok bimaculatus</i>	NT	+	-	+	-
18		Bagridae	<i>Mystus vittatus</i>	LC	+	+	+	-
19			<i>Mystus cavasius</i>	LC	+	+	+	-
20		Clariidae	<i>Clarias batrachus</i>	LC	+	+	+	+
21		Heteropneustidae	<i>Heteropneustes fossilis</i>	LC	+	+	+	+
22	Mastacembeliformes	Mastacembelidae	<i>Macrognathus aculeatus</i>	NE	+	-	-	-
23	Perciformes	Ambassidae	<i>Parambassis baculis</i>	LC	+	-	-	+
24			<i>Parambassis lala</i>	NT	+	-	-	+
25		Scatophagidae	<i>Scatophagus argus</i>	LC	+	-	-	-
26		Terapontidae	<i>Terapon jarbua</i>	LC	+	-	-	-
27	Anabantiformes	Channidae	<i>Channa striatus</i>	LC	+	+	+	-
28			<i>Channa marulius</i>	LC	+	+	-	-
29			<i>Channa punctatus</i>	LC	+	+	+	-
30		Anabantidae	<i>Anabas testudineus</i>	DD	+	+	+	+
31	Osteoglossiformes	Notopteridae	<i>Notopterus notopterus</i>	V	+	-	-	+
32			<i>Notopterus chitala</i>	NT	+	-	-	+
33	Cichliformes	Cichlidae	<i>Etroplus suratensis</i>	LC	+	-	-	-
34	Clupeiformes	Clupeidae	<i>Gudusia chapra</i>	LC	+	-	-	+
35			<i>Gonialosa manmina</i>	LC	+	-	-	+
36	Tetraodontiformes	Tetraodontidae	<i>Tetraodon cutcutia</i>	LC	+	-	-	-

1: Site- 1 Birupa Barrage; 2: Site- 2 Birupa Anicut; 3: Site- 3 Jora; 4: Site- 4 Birupa fish market, IUCN status; LC = Least Concern; NT = Near Threatened; VU = Vulnerable; EN = Endangered; DD = Data Deficient; NE = Not Evaluated.



**Figure 3: Fish Fauna Of Birupa River.** 1- *Labeo rohita*, 2-*Labeo calbasu*, 3-*Labeo bata*, 4-*Catla catla*, 5-*Cirrhinus mrigala*, 6-*Cirrhinus reba*, 7- *Puntius sarana*, 8- *Puntius guganio*, 9- *Puntius gonionotus*, 10-*Amblypharyngodon melettinus*, 11-*Amblypharyngodon mola*, 12- *Rasbora daniconius*, 13-*Barilius bendelisis*, 14-*Salmostoma bacalia*. 15-*Lepidocephalus guntea*, 16- *Wallago attu*, 17-*Ompok bimaculatus*, 18- *Mystus vittatus*



**Figure 4: Fish Fauna Of Birupa River.** 19- *Mystus cavasius*, 20- *Clarias batrachus*, 21- *Heteropneustes fossilis*, 22- *Macrogathus aculeatus*, 23- *Parambassis baculis*, 24- *Parambassis lala*, 25- *Scatophagus argus*, 26- *Terapon jarbua*, 27- *Channa striatus*, 28- *Channa marulius*, 29- *Channa punctatus*, 30- *Anabas testudineus*, 31- *Notopterus notopterus*, 32- *Notopterus chitala*, 33- *Etrophus suratensis*, 34- *Gudusia chapra*, 35- *Gonialosa mannina*, 36- *Tetraodon cutcutia*.

#### IV. CONCLUSIONS:

During the entire study period different fish varieties were observed in the water resources of Birupa River and the results show that the area is rich and diversified with ichthyofauna. Out of the 36 species, 4 species are near threatened, 29 species are the least concern, 1 species vulnerable, 1 species data deficient and 1 species not evaluated categories. The study revealed that many species in the study area are being threatened by various human activities, invasive alien species and destructive fishing. Moreover, removal of sewage runoff into the river causes severe threats to fish diversity. Special attention is to be given for conservation of these fish diversity. The observations recorded in the present study may prove valuable as a reference for assessing the changes due to the environmental conditions in the locality, in future. The findings of the present study underline the importance of Birupa River in providing the preferred abode for fishes. Initiating and encouraging the conservation movement among fisherman are some of the urgent steps to be taken by N. G. O's and fisheries department of government.

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## VI. CONTRIBUTION OF AUTHORS

The work is a product of the intellectual environment of the whole team that all members have contributed in various degrees of research work. Aradhana Khuntia, Trilochan Swain design the study, developed the methodology, performed the analysis & wrote the manuscript. Aradhana Khuntia performed the experiment, collected the data. Trilochan Swain, Gurudatta Pattnaik provided direction & guidance.

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