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Short Communication

Ichthyofaunal diversity of Panchupada estuary, Odisha, India

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The present paper reports a detailed study on the ichthyofaunal diversity of Panchupada estuary for the first time. A total of 87 fish species belonging to 51 families were collected and examined from randomly selected points inside the estuarine part of the Panchupada river during the survey period. The present study gives first-hand information on the fish diversity of Panchupada estuary on the basis of collection and photographic evidence.

[Keywords: East coast of India, Fish diversity, Odisha, Panchupada estuary]

Introduction

The coastal state of Odisha, lies between 17°48' – 22°94' N latitude and 81°24' – 87°29' E longitude harbour 482 kilometres of coastline adjoining the Bay of Bengal stretching over districts of Balasore, Bhadrak, Kendrapara, Jagatsinghpur, Puri and Ganjam¹. The region exhibits around 17 small to large mixed type estuaries on the coastal belt of Odisha². The marine and estuarine fish diversity of Odisha comprise of 605 species belonging to 138 families and 27 orders¹. Thirty-eight species of fishes out of 605 species are designated as threatened species in Odisha³⁻⁵. Few more species have been recently reported from Odisha state⁶⁻¹¹ and in addition, few species are reported recently from Chilika Lake¹²⁻¹⁸.

The Panchupada river is formed by the combination of Jalaka and Baradia river complex. It flows to Bay of Bengal close to Budhabalanga estuary. The Panchupada estuary lies between 21°51'22.133" N latitude and 86°121'39.33" E longitudes (Fig. 1) and is located in Balasore district. Kasafala and Bahabalpur are two important villages along the banks of the Panchupada river estuary. The habitat vegetation consists of tropical and mangroves forests. Xerophytic plants are also seen on the bank of

Panchupada estuary. During the study, fish samples were collected from the Panchupada estuary along with photographic evidences. First-hand information on the ichthyofaunal diversity is provided in this paper.

Materials and Methods

The fishes were collected from different fish landing centres during the months of March to May, 2018. Fishermen captured these fishes by using different types of gill nets, cast nets, drag nets, scoop nets, bamboo traps, hook with lines and through angling. The fresh specimens were photographed and preserved in 10 % formaldehyde. The morphometric measurements were recorded in mm using dial callipers up to 0.1 mm accuracy. Meristic counts and morphometric measurements were taken following standard methods¹. Following these, identification of the specimens was done following standard literatures¹⁹⁻²². All the specimens are deposited in the Estuarine Biology Regional Centre, Zoological Survey of India, Gopalpur-On-Sea, Odisha with Reg. Nos. EBRC/ZSI/F 10113 to EBRC/ZSI/F10179. The IUCN status of all the species were recorded and is given in this study.

Results

A total of 139 fish samples were collected from randomly selected points belonging to 51 families. Sixty five species were confirmed after examination

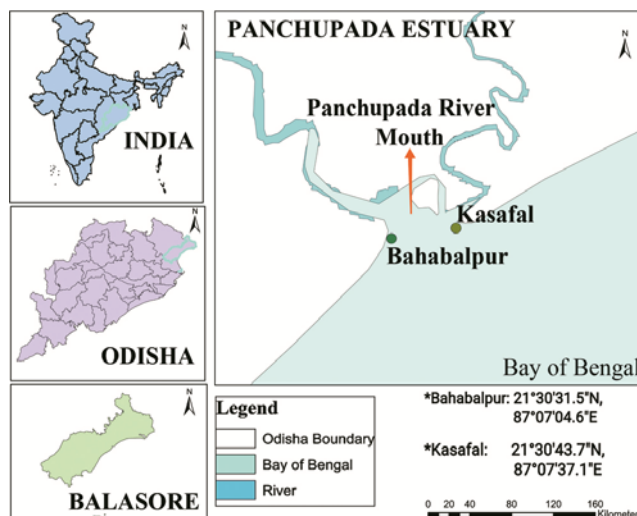


Fig 1 — Study area map of Panchupada estuary

and about 22 species were identified by photographic evidence (Plate 1 & 2). Out of 51 families identified, family Gobiidae represented highest (06) numbers of species followed by Engraulidae with 05 species. The detail list of identified species along with the registration number and IUCN status is presented in Table 1. Out of 87 species that are reported here, majority of the species are under Least Concerned species (37) category of IUCN, followed by Not Assessed (32).

Two species reported here are found to be in Vulnerable category according to IUCN Red list status, while 04 species belong to Near Threatened category. The catch quantity of the commercial species was quite good from this estuary. Different types of fishing vessels operate in the area right from big trawlers to non-motorised small boats with various kinds of nets for fishing. Most of the species caught were either of freshwater or brackish water habitats.

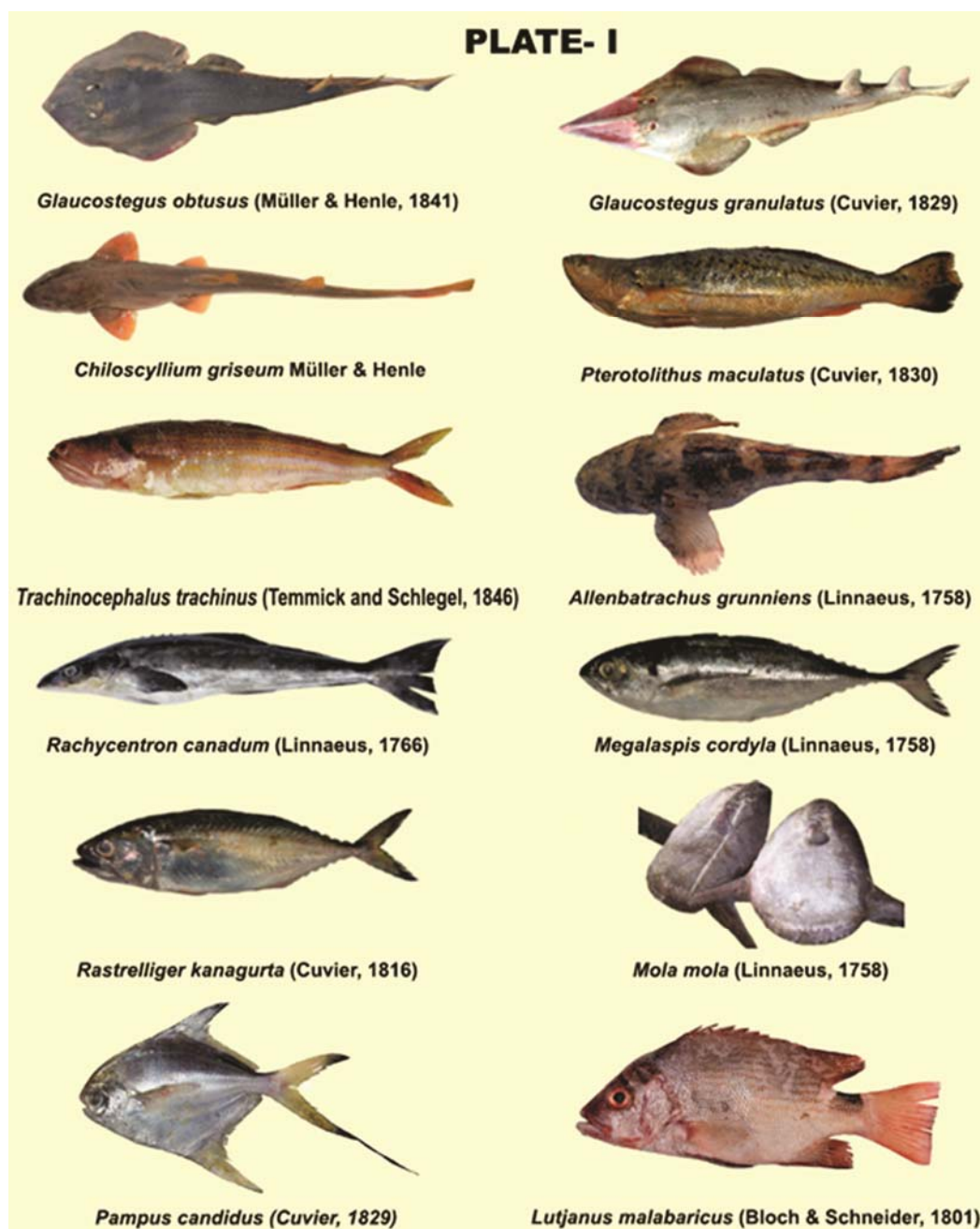


Plate 1 — Photographs of some identified fish species

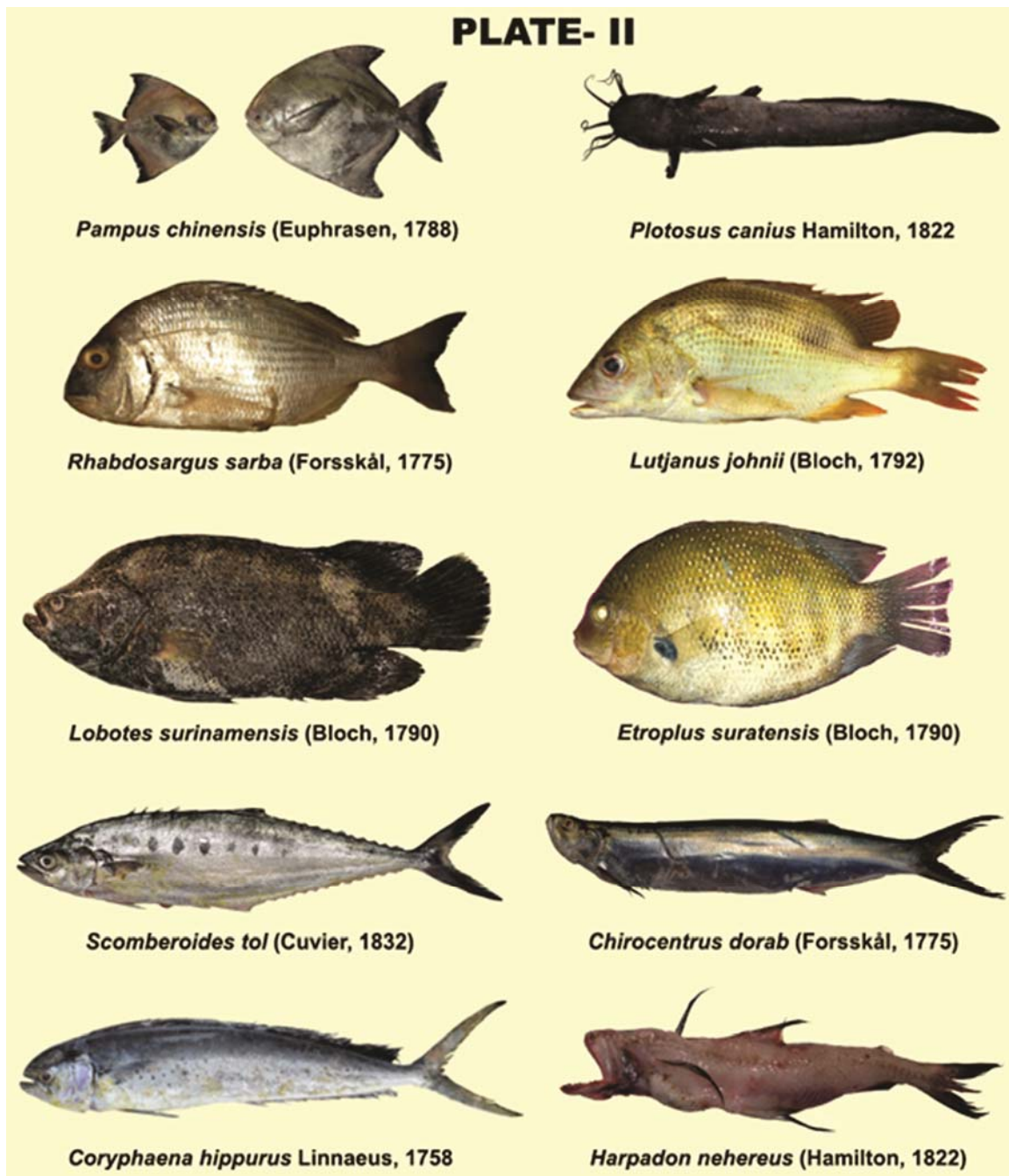


Plate 2 — Photographs of some identified fish species

Discussion

This checklist of estuarine and marine fishes of Panchupada estuary was prepared based on the collections and photographic evidences from two important fish landing centres namely Kasafala and Bahabalpur of Balasore district. The present survey revealed that about 9 types of fishing gears are used in Panchupada estuary. Out of that scoop net, fishing

lines, bamboo traps are fully traditional of which the bamboo traps are eco-friendly fishing gears. Selection of fishing methods and fishing gears are influenced by various factors such as geographical conditions, nature of the fish stock, weather, traditional techniques, seasons etc. Therefore variety of gears can be observed in different parts of Panchupada estuary. The success of these fishing techniques also depends

Table 1 — Checklist of ichthyofauna recorded from Panchupada Estuary

Sl. No.	Family	Name of Species	Ex.	Regd. No.	SL (mm)	IUCN Status
1	Ambassidae	<i>Ambassis ambassis</i> (Lacepède, 1802)	2	EBRC/ZSI/F 10158	70.7	LC
2		<i>Ambassis gymnocephalus</i> (Lacepède, 1802)	7	EBRC/ZSI/F 10159	40.6	LC
3	Ariidae	<i>Arius arius</i> (Hamilton, 1822)	1	EBRC/ZSI/F 10155	90.7	LC
4	Bagridae	<i>Hemibagrus microphthalmus</i> (Day, 1877)	1	EBRC/ZSI/F 10178	60.9	LC
5	Batrachoididae	<i>Allenbatrachus grunniens</i> (Linnaeus, 1758)	NA	Photographic evidence	NA	NE
6	Belonidae	<i>Strongylura leiura</i> (Bleeker, 1850)	1	EBRC/ZSI/F 10169	330.7	NA
7		<i>Strongylura strongylura</i> (van Hasselt, 1823)	1	EBRC/ZSI/F 10130	330.1	NA
8	Carangidae	<i>Alepes djedaba</i> (Forsskål, 1775)	9	EBRC/ZSI/F 10156	90.8	LC
9		<i>Caranx sexfasciatus</i> Quoy & Gaimard, 1825	3	EBRC/ZSI/F 10154	50.4	LC
10		<i>Megalaspis cordyla</i> (Linnaeus, 1758)	NA	Photographic evidence	NA	LC
11		<i>Parastromateus niger</i> (Bloch, 1795)	1	EBRC/ZSI/F 10136	60.9	NA
12		<i>Scomberoides lysan</i> (Forsskål, 1775)	1	EBRC/ZSI/F 10160	120.8	LC
13		<i>Scomberoides tol</i> (Cuvier, 1832)	NA	Photographic evidence	NA	LC
14	Chirocentridae	<i>Chirocentrus dorab</i> (Forsskål, 1775)	NA	Photographic evidence	NA	NE
15	Cichlidae	<i>Etroplus suratensis</i> (Bloch, 1790)	NA	Photographic evidence	NA	LC
16	Clupeidae	<i>Anodontostoma chacunda</i> (Hamilton, 1822)	3	EBRC/ZSI/F 10147	80.6	LC
17		<i>Hilsa kelee</i> (Cuvier, 1829)	5	EBRC/ZSI/F 10120	100.3	NA
18		<i>Tenualosa toli</i> (Valenciennes, 1847)	6	EBRC/ZSI/F 10149	120.4	NA
19	Coryphaenidae	<i>Coryphaena hippurus</i> Linnaeus, 1758	NA	Photographic evidence	NA	LC
20	Cynoglossidae	<i>Cynoglossus dubius</i> Day, 1873	1	EBRC/ZSI/F 10114	210.1	NA
21		<i>Cynoglossus lingua</i> Hamilton, 1822	1	EBRC/ZSI/F 10139	140.1	NA
22		<i>Cynoglossus puncticeps</i> (Richardson, 1846)	1	EBRC/ZSI/F 10126	80.1	NA
23	Dasyatidae	<i>Brevitrygon walga</i> (Müller & Henle, 1841)	1	EBRC/ZSI/F 10170	280.3	NT
24	Drepaneidae	<i>Drepane longimana</i> (Bloch & Schneider, 1801)	1	EBRC/ZSI/F 10132	50.4	NA
25	Engraulidae	<i>Coilia neglecta</i> Whitehead, 1967	2	EBRC/ZSI/F 10148	140.5	LC
26		<i>Stolephorus dubiosus</i> Wongratana, 1983	1	EBRC/ZSI/F 10163	60.7	LC
27		<i>Thryssa gautamiensis</i> BabuRao, 1971	1	EBRC/ZSI/F 10151	80.7	DD
28		<i>Thryssa hamiltonii</i> Gray, 1835	1	EBRC/ZSI/F 10152	80.3	NA
29		<i>Thryssa kammalenoides</i> Wongratana, 1983	2	EBRC/ZSI/F 10150	90.3	NA
30	Gerreidae	<i>Gerres filamentosus</i> Cuvier, 1829	2	EBRC/ZSI/F 10134	80.6	LC
31	Gobiidae	<i>Boleophthalmus boddarti</i> (Pallas, 1770)	1	EBRC/ZSI/F 10140	110.3	LC
32		<i>Odontamblyopus rubicundus</i> (Hamilton, 1822)	2	EBRC/ZSI/F 10144	170.6	NA
33		<i>Oxudercus dentatus</i> Eydoux & Souleyet, 1850	1	EBRC/ZSI/F 10164	60.7	NA
34		<i>Parachaeturichthys polynema</i> (Bleeker, 1853)	1	EBRC/ZSI/F 10127	50.2	NA
35		<i>Pseudapocryptes elongatus</i> (Cuvier, 1816)	3	EBRC/ZSI/F 10141	150.3	LC
36		<i>Trypauchen vagina</i> (Bloch & Schneider, 1801)	2	EBRC/ZSI/F 10123	110.4	NA
37	Glaucostegidae	<i>Glaucostegus granulatus</i> (Cuvier, 1829)	NA	Photographic evidence	NA	VU
38		<i>Glaucostegus obtusus</i> (Müller & Henle, 1841)	NA	Photographic evidence	NA	NE
39	Haemulidae	<i>Pomadasys kaakan</i> (Cuvier, 1830)	2	EBRC/ZSI/F 10125	70.6	NA
40	Hemiramphidae	<i>Hyporhamphus limbatus</i> (Valenciennes, 1847)	1	EBRC/ZSI/F 10167	160.4	LC
41		<i>Rhynchorhamphus georgii</i> (Valenciennes, 1847)	1	EBRC/ZSI/F 10168	260	NA
42	Hemiscylliidae	<i>Chiloscyllium griseum</i> Müller & Henle, 1838	NA	Photographic evidence	NA	NT
43	Leiognathidae	<i>Deveximentum insidiator</i> (Bloch, 1787)	5	EBRC/ZSI/F 10173	50.7	NA
44		<i>Leiognathus equulus</i> (Forsskål, 1775)	7	EBRC/ZSI/F 10175	53.7	LC
45		<i>Nuchequula blochii</i> (Valenciennes, 1835)	8	EBRC/ZSI/F 10177	50.6	NA
46	Lobotidae	<i>Lobotes surinamensis</i> (Bloch, 1790)	NA	Photographic evidence	NA	LC
47	Lutjanidae	<i>Lutjanus fulvus</i> (Forster, 1801)	1	EBRC/ZSI/F 10174	122.4	LC

(contd.)

Table 1 — Checklist of ichthyofauna recorded from Panchupada Estuary (contd.)

Sl. No.	Family	Name of Species	Ex.	Regd. No.	SL (mm)	IUCN Status
48		<i>Lutjanus indicus</i> Allen, White & Erdmann, 2013	2	EBRC/ZSI/F 10138	40.8	NA
49		<i>Lutjanus johnii</i> (Bloch, 1792)	NA	Photographic evidence	NA	LC
50		<i>Lutjanus malabaricus</i> (Bloch & Schneider, 1801)	NA	Photographic evidence	NA	NE
51	Molidae	<i>Mola mola</i> (Linnaeus, 1758)	NA	Photographic evidence	NA	VU
52	Mugilidae	<i>Osteomugil speigleri</i> (Bleeker, 1858)	2	EBRC/ZSI/F 10172	60.8	NA
53	Mullidae	<i>Upeneus sulphureus</i> Cuvier, 1829	1	EBRC/ZSI/F 10171	60.4	LC
54	Muraenesocidae	<i>Muraenesox bagio</i> (Hamilton, 1822)	1	EBRC/ZSI/F 10146	330.3	NA
55	Muraenidae	<i>Strophidon sathete</i> (Hamilton, 1822)	1	EBRC/ZSI/F 10116	340.7	NA
56	Ophichthidae	<i>Pisodonophis boro</i> (Hamilton, 1822)	1	EBRC/ZSI/F 10117	520.7	LC
57	Paralichthyidae	<i>Pseudorhombus arsius</i> (Hamilton, 1822)	1	EBRC/ZSI/F 10133	130.8	NA
58	Platycephalidae	<i>Platycephalus indicus</i> (Linnaeus, 1758)	3	EBRC/ZSI/F 10129	130.4	DD
59	Plotosidae	<i>Plotosus canius</i> Hamilton, 1822	NA	Photographic evidence	NA	NE
60	Polynemidae	<i>Eleutheronema tetradactylum</i> (Shaw, 1804)	2	EBRC/ZSI/F 10137	130.7	NA
61	Rachycentridae	<i>Rachycentron canadum</i> (Linnaeus, 1766)	NA	Photographic evidence	NA	LC
62	Scatophagidae	<i>Scatophagus argus</i> (Linnaeus, 1766)	1	EBRC/ZSI/F 10119	80.1	LC
63	Sciaenidae	<i>Johnius belangerii</i> (Cuvier, 1830)	1	EBRC/ZSI/F 10176	74	NA
64		<i>Otolithes ruber</i> (Bloch & Schneider, 1801)	3	EBRC/ZSI/F 10143	90.6	NA
65		<i>Pterolithus maculatus</i> (Cuvier, 1830)	NA	Photographic evidence	NA	LC
66	Scombridae	<i>Rastrelliger kanagurta</i> (Cuvier, 1816)	NA	Photographic evidence	NA	DD
67		<i>Scomberomorus guttatus</i> (Bloch & Schneider, 1801)	1	EBRC/ZSI/F 10165	120.6	DD
68	Serranidae	<i>Epinephelus coioides</i> (Hamilton, 1822)	4	EBRC/ZSI/F 10128	40.7	NT
69		<i>Epinephelus malabaricus</i> (Bloch & Schneider, 1801)	1	EBRC/ZSI/F 10179	134	NT
70	Siganidae	<i>Siganus canaliculatus</i> (Park, 1797)	1	EBRC/ZSI/F 10153	30.88	LC
71	Sillaginidae	<i>Sillaginopsis domina</i> (Cuvier, 1829)	2	EBRC/ZSI/F 10162	130.6	NA
72		<i>Sillago sihama</i> (Forsskål, 1775)	2	EBRC/ZSI/F 10157	70.6	LC
73	Soleidae	<i>Synaptura commersonnii</i> (Lacepede, 1802)	1	EBRC/ZSI/F 10113	210.4	NA
74	Sparidae	<i>Acanthopagrus berda</i> (Forsskål, 1775)	1	EBRC/ZSI/F 10145	50.3	LC
75		<i>Rhabdosargus sarba</i> (Forsskål, 1775)	NA	Photographic evidence	NA	LC
76	Sphyraenidae	<i>Sphyraena putnamae</i> Jordan & Seale, 1905	1	EBRC/ZSI/F 10161	120.6	NA
77	Stromateidae	<i>Pampus candidus</i> (Cuvier, 1829)	NA	Photographic evidence	NA	NE
78		<i>Pampus chinensis</i> (Euphrasen, 1788)	NA	Photographic evidence	NA	NE
79	Synodontidae	<i>Harpadon nehereus</i> (Hamilton, 1822)	NA	Photographic evidence	NA	NE
80		<i>Trachinocephalus trachinus</i> (Temmick and Schlegel, 1846)	NA	Photographic evidence	NA	LC
81	Terapontidae	<i>Terapon jarbua</i> (Forsskål, 1775)	1	EBRC/ZSI/F 10121	100.7	LC
82	Tetraodontidae	<i>Lagocephalus lunaris</i> (Bloch & Schneider, 1801)	2	EBRC/ZSI/F 10131	160.1	LC
83		<i>Takifugu oblongus</i> (Bloch, 1786)	3	EBRC/ZSI/F 10124	50.9	LC
84	Tetrarogidae	<i>Tetraroge niger</i> (Cuvier, 1829)	1	EBRC/ZSI/F 10142	85.4	LC
85	Triacanthidae	<i>Triacanthus nieuhofii</i> Bleeker, 1852	5	EBRC/ZSI/F 10122	40.9	NA
86	Trichiuridae	<i>Trichiurus lepturus</i> Linnaeus, 1758	3	EBRC/ZSI/F 10166	220.6	LC
87	Uranoscopidae	<i>Ichthyoscopus lebeck</i> (Bloch & Schneider, 1801)	1	EBRC/ZSI/F 10118	101.3	NA

SL= Standard Length; DD= Data Deficient; LC= Least Concern; NA= Not Assessed; NE= Not Evaluated; NT= Near Threatened and VU= Vulnerable

on various factors like selection of fishing gear and method. From the survey it is revealed that the cast nets, gill nets, seine nets, drag net, and trammel net are mostly used by the fishermen. Of all the nets used,

cast net is most common and used throughout the year in the Panchupada estuary. In total 87 fish species were examined from two randomly selected points belonging to 51 families during the survey period.

The unique mangrove and marine habitats of this estuary provides a suitable breeding ground for various faunal species and thus more surveys should be conducted on a regular basis to get the complete picture of the species diversity of fish fauna inhabiting this important estuary of North Odisha.

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Conflict of Interest

There is no conflict of interest.

Author Contributions

SF, SR, and SRM: Data collection, specimen collection, preliminary sorting and identification; SR and RKM: Concept designing of the work; and AM: Concept designing, identification and critical analysis.

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