Annotated Check List of IchthyofaunalDiversity in the Freshwater TidalStretch Along the Gosthani Estuary,Bheemunipatnam,EastCoast ofIndia

ABSTRACT

The present study found 60 fish species belonging to 20 orders, 38 families, and 54 genera in theGosthani estuary between May 2023 and April 2024. The fishes were brought to the lab and placedin glass jars before being preserved in a 9-10% formalin solution. The fish were identified at thespecies level using keys specific to the Indian subcontinent fish. Perciformes accounted for 35% ofhighestwasobservedinthetotalpopulation.Therecordedpiscinespecieswasmetbythefollowing orders: Clupeiformes (10%), Siluriformes (83.3%), Beloniformes, Tetraodontiformes, andCypriniformes (each with 5.00%). Anguilliformes, Carangiformes, Mugiliformes, Cichiliformes, andScombriformeseachhad3.33%,whileAnabantiformes,Moroniformes,Acanthuriformes,

Elopiformes, Gonorynchiformes, Synbranchiformes, Gobiiformes, Istiophoriformes,andSpariformes each had 1.66%. According to the IUCN (2024) threatened taxa in the currentinvestigation, 65.00% of the 60 species are least concerned (LC), followed by 23.33% that are notevaluated (NE), 5.00% that are data deficient (DD), and 3.33% that are near threatened (NT) orvulnerable (VU).In the current study, ichthyofaunal diversity reported to habitation environment wasobserved in marine and brackish water fish species (76.66%), while brackish water and freshwaterwereinhabited(55.00%) intheGosthaniestuary.

Keywords:Ichthyofauna;trophiclevel;habitat;threatenedtaxa;IUCN.

1. INTRODUCTION

India's east and west coasts are rich in estuariesandbrackishwater.AccordingtotheGovernment of India (2000), "total brackish waterresourcesareexpectedtoreach1.44millionhectares.AndhraPradeshisdividedintoninedistricts and has a 974-kilometer-long coastlineandacontinentalshelfsizeof33,227square kilometers"."ThemajorityofIndia'slargeestuaries are located along the east coast, withfewerestuarieson the westcoast. The nationhas 14 large, 44 medium, and 162 small riversthat flow into the sea through several estuaries.Major estuaries are mostly found in the Bay ofBengal,wheresomeofthecountry'smostimportantseaportsarelocated.Thestatehasover2.0lakhhectaresofbrackishwaterand27,500 hectaresof mangrove swamps. PulicatLake,whichcovers77,000hectares,isthereg ion's most important brackish water lake. TheGodavariestuarysystemspans330km2.Estuaries support freshwater life forms, marinelife forms, and eventually brackish water speciesthatcanexistinwaterofvariedsalinity.Furthermore,intheupperreaches,thisecosystemwillsupportpurefreshwaterforms,euryhalineformsinthemiddleparts,andstenohalineformsatthemouth".(www.wikipedia.com).

The National Bureau of Fish Genetic Resources(NBFGR) database in Lucknow lists 2,508 nativefinfishspecies,with1,518fromthemarineenvironment, 113 from brackish water, and 877fromfreshwatersettings.Clupeids,mullets,catfish,perches,andprawns.*Mugilcephalus*makesupasubstantialportionoftheestuaryfisheries.Fishing reduces the abundance of adominant consumer (Consumer 4), increases theamount of its prey (Consumer 3), and decreasesthe abundance of Consumer 3's prey. Dependingonthecomplexityofthefoodweb,organismsina feeding chain are divided into three or moretrophiclevels.Atrophiclevelinafoodchaindenotesanorganism'spositioninits environment.Primaryproducers,consumers,and detritivores are all instances of these roles.The most evident relationship between body sizeand food web structure is the trophic interactionhierarchy, which predicts that a predator's trophicrank would increase with size. Georgios Vagenaset al. [1]. investigated "the trophic patterns of theBalkanbiodiversityhotspot'sfreshwaterfishfauna and compared the nutritional requirementsofdifferentspecies.Thetrophicleveloftheanalyzedfishspeciesrangedfrom2.0to4.5,which is within the expected range for freshwaterecosystems, demonstrating the presence of bothtop predators and primary consumers. The fishspeciesinthecurrentstudyareclassedasherbivorous(2.0-2.5),omnivore(2.5-3.5),andcarnivorous(3.5-4.5)accordingtotheirtrophiclevel".

"Thedifferentcontributionsofdominantspeciesineachhabitatresultedinvariancesinassemblage structures. The fish assemblage inthe freshwater zone was dominated by commonfreshwaterspecies,whereasmarinejuvenileswerecloselylinkedtotheestuarineecology.Estuaryweirshaveauniqueimpactonfishassemblagesbecausetheydisturbthelinkbetweenfreshwaterandestuarinefishpopulations, as well as the migratory success ofregional fish fauna". JooMyun et al. [2]."Theestuarymaybeclassifiedintothreehydrogeomorphic zones based on the period ofyear in which it is inundated by tidal fluctuations:subtidal,intertidal,andsupratidal.Tidalfreshwaterenvironmentsvaryfromriverineregionslargelyduetotidallyinducedphysicalphenomena such as extended water residencedurations,variablewaterlevels,andalteringcurrent velocities and directions. variations in amixohalinesettingaremostlyinducedbyvariationsinsalinityandparticlesuspendedmatterconcentration.Tidalfreshwaterreachesareimportantlocationsforphysical,chemical,and biological processes that can drastically alterriverine intake before it reaches the freshwater-seawaterinterface"[3].Thepresentstudy

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thoroughly investigated the entire number of fishthatarebiologicallysynonymouswiththeGosthani estuary. This report provides firsthandinformation onichthyofaunaldiversity.

2. METHODOLOGY

FishsamplesweretakenfromtheGosthaniestuary (17.8961° N, 83.4545° E) between April2023andMarch2024(Fig.1).Thesampleswere obtained by fishermen using a seine net,bag net, cast net, gill net, scoop net, drag net,stake net, trap net of varied mesh size, hooks,and line while fishing. Freshly caught fish wereproperly cleaned and photographed. These fishwere transported to the laboratory and placed inglassjarsbeforebeingpreservedina9-10%formalin solution [4]. The fish were identified atthespecieslevelusingkeysforIndiansubcontinent fish.Thespecieswereidentifiedlargelyusingmorphometricandmeristematicfeatures.Talwar,P.K.&Kacker,R.[5]Barman, R.P.[6]Day,F[7]JayaramK.C.[8]Munro,I.S.R [9] Nath, P. and Dey, S.C [10] Talwar P.K. andJhingran A.G. [11] Froese, R. and D. Pauly [12].Fischer, W. and G. Bianchi [13]. The IUCN [14]conservation status of the fish species has beenlisted.

3. RESULTSANDDISCUSSIONS

The current study identified the presence of 60fish species belonging to 20 orders, 38 families,and54generacollectedfromtheGosthanie stuary from April 2023 to March 2024. A list offisheswerecompiledinthecurrentstudy,includingtheirorder,family,genus,species,environment, trophic level, and IUCN status. Thespecies that have been listed are displayed inTable1,togetherwiththenumberandpercentage composition of families, genera, andspecies in each order under consideration in thecurrentstudy.TheorderPerciformesrepresentedthemajorityoftheobservedspecies, with 35%. This was complied with by thefollowingorders:Clupeiformes(10%),Siluriformes (83.3%), Beloniformes,Tetraodontiformes, and Cypriniformes (each with5.00%).Anguilliformes,Carangiformes,Mugiliformes,Cichiliformes,Scombriformeseachwith3.33%,andAnabantiformes,Moroniformes,Acanthuriformes,Elopiformes,Gonorynchiformes, Synbranchiformes,Gobiiformes, Istiophoriformes, Spariformes eachwith 1.66%.In the present investigation recordedgeneraoutof54,thepercentagewasobservedofPerciformeswashighestwith33.33%, followedbyClupeiformes9.25%,Siluriformes7.40%,Beloniformes,Tetraodontiformes,Cypriniformeswith5.55%,Carangiformes,Mugiliformes, Cichiliformes, Scombriformes with3.70%andAnguilliformes,Anabantiformes,Moroniformes,Acanthuriformes,Elopiformes,Gonorynchiformes, Synbranchiformes,Gobiiformes, Istiophoriformes, Spariformes eachwith1.85%.Therecorded38families,Perciformes was highest with 26.31%, followedby the homogeneous percentage wasrecordedin Siluriformes and Tetraodontiformes each with7.89%,ClupeiformesandBeloniformeswith5.26%,Anguilliformes,Anabantiformes,Acanthuriformes,Carangiformes,Elopiformes,Gonorynchiformes, Mugiliformes, Cypriniformes,Synbranchiformes,Cichiliformes,Gobiiformes,Istiophoriformes, Scombriformes andSpariformes each with 2.63% Table 2, Fig. 2, 3and 4. The similar study was observed by HaratiandRamaRao[15]conducted"adetailedanalysis of piscine diversity revealed a total of 97species of fresh water, estuary and marine fishbelongingto26orders,53families,and85genera, collected three landing locations for thefirst time. In the present investigation, recordedgenera out of 85, the homogeneous percentagewasobservedofPerciformesandSiluriformeshadthehighestwith11.76%,followedbyAcanthuriformes,Cypriniformes".Abhisheketal., [16]adetailedstudy"analysedofpiscinediversity revealed a total of 63 species of freshwater, estuaryandmarine fish belonging to 13ordersand37familiesinSasihithluEstuary".Fullonton a et al., [17] recorded "a total of 87fishspeciesbelongingto51familiesinsidetheestuarinepartofthe Panchupada Riverduringthe survey period". Bassoucalingam et al., [18]identified36species,withActinopterygiidominating in this estuary. Clupeiformes was thehighest-rankingofthefiveordersfoundatGiriyampetaEstuary.Ghoshetal.,[19]constituted the percentage of Perciformes weremore than 45% of the total fish species recorded,while the contributions ofCypriniformes,Clupeiformes,SiluriformesandPleuronectiforinSubarnarekhaEstuary. Bijukumar,andSushama.[20]recorded112ichthyofaunal species belonging of 14 orders, 53familiesand80genera.Theestuarycharacterised byhighsalinewateralmostthroughout the year was dominated by marinespecies. The commercial fisheries was supportedmainlybymarineandestuarineforms.The reportedfamilyandgenusunderorderPerciformes ofichthyofaunal diversity is

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Comment [H5]: Should be written as Results and Discussion

Comment [H6]: The order Perciformes recorded the highest number of species (35%) followed by Clueiformes (10%), Siluriformes (8.33%), Beloniformes,Tetraodontiformes, Cypriniformes (each with5.00%), Anguilliformes,Carangiformes,Mugiliformes,Cichiliformes,Scombriformes (eachwith3.33%) and Anabantiformes,Moroniformes,Acanthuriformes, Elopiformes,Gonorynchiformes,Synbranchiformes,Gobiiformes, Istiophoriformes, Spariformes (eachwith 1.66%).

highesttaxonomicnumberandpercentagesrecord
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fromtheGosthaniestuary.Ramanujametal., [21] studied ichthyofaunaldiversityof the AdyarWetlandcomplex,TamilNadu,southernIndia. Mukherjee et al. [22] a total of 64 fish speciesbelongingto11orders,38familiesand53gen erawereiden-tifiedinestuarineRiverofIndian Sundarbans.

Inthecurrentstudyichthyofaunaldiversityreportedto thehabitationlocationswereobservedinmarineand brackishwaterfishspecies(76.66%),andbrackishw aterandfreshwateroccupied(55.00%)intheGostha niestuary Table 3, Fig. 5.The similar study wasobservedbyHaratiandRamaRao(2023)inmari ne and brackish water, and brackish waterandfreshwateroccupiedequalnumbers(34.0 2%)andmarine,brackishwater,andfreshwater(30.9 2%)itisdeviatedtopresentobservation. In the present study ichthyofaunaldiversity are classified as herbivorous (2.0-2.5),omnivore(2.5-3.5),andcarnivorous(3.5-4.5)based on their trophic level. The omnivores haveahighestpercentageof33(55.00%),followed by thecarnivorous 23 (38.33%), and the herbivorous 4 (6.66%) Table 3, Fig. 6. A similarstudywasobservedbyHaratiandRamaRao [15] reported the highest number of omnivoresare 50.51%, followed by the carnivorous 39.17%,and the herbivorous 10.30% at Kalingapatnamestuary.Inthecurrentstudy,themost documentedconsumptionoffishspecieswascomm ercial(66.6%),followedbyminorcommercial(28.3%),aquariumandgamefish(18.3%),highlycommercia l(16.6%),publicaquarium (8.3%), and bait fish (6.6%) Rama Raoet al., [23] reported the omnivores have a highestpercentageof22(46.81%),followedbytheca rnivorous 16 (34.04%), and the herbivorous 09(19.14%) in Gosthani River. Chicharo et al. [24]investigated the increased salinity in the upperestuary,whichallowedmarinespeciestocolon ize a region that was formerly freshwater,further reducing habitat for indigenous freshwaterspeciesintheGuadianaRiver'sdownstre ambasin. During the low-inflow year, planktivorousand omnivorous fish populations decreased whilecarnivorousfishpopulationsincreased.

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Fig.1. SamplingplacesatGosthaniestuary(17.8961°N, 83.4545° E)

Table1.TaxaofichthyofaunaatGosthaniestuary

Sl. no	Order/Family	Scientificname	Commonname	Habitat	Trophic level	Humanusage	IUCN status
1	Anguillidae/Anguilliformes	*Anguillabengalensis*	Indianmottledeel	Marine;freshwater;brackish;	3.8±0.7	Fisheries: commercial;aquaculture:gamefish	NT
2	Anguillidae/Anguilliformes	*Anguillabicolor*	Indonesian shortfineel	Marine;freshwater;brackish	3.6±0.50	Fisheries:minorcommercial	NT
3	Chanidae/Anabantiformes	*Channapunctata*	Spottedsnakehead	Freshwater;brackish;	3.8±0.70	Fisheries:commercial; aquaculture: commercial;aquarium	LC
4	Belonidae /Beloniformes	*Strongylura strongylura*	Spottailneedlefish	Marine;Brackish;	4.2±0.73	Fisheries:commercial	NE
5	Belonidae/Beloniformes	*Xenentodoncancila*	Freshwatergarfish	Freshwater;Brackish;	3.9±0.62	Fisheries: minor commercial;aquarium	LC
6	Drepaneidae/ Moroniformes	*Drepanelongimana*	Concertinafish	Marine;Brackish	3.7±0.34	Fisheries: minor commercial;aquarium:commercial	NE
7	Hemiramphidae/ Beloniformes	*Hyporhamphus limbatus*	Congaturihalfbeak	Marine;Freshwater;Brackish	3.1±0.1	Fisheries:minorcommercial	LC
8	Leiognathidae/ Perciformes	*Deveximentum insidiator*	Pugnoseponyfish	Marine;Brackish;	2.8±0.27	Fisheries:commercial	NE
9	Leiognathidae/ Perciformes	*Eubleekeria splendens*	Splendidponyfish	Marine;Brackish	2.9±0.38	Fisheries:commercial	LC
10	Leiognathidae/ Perciformes	*Gazzaminuta*	Toothpony	Marine;Brackish	4.2±0.0	Fisheries:commercial	LC
11	Scatophagidae/ Perciformes	*Scatophagusargus*	Spottedscat	Marine;Freshwater;Brackish	3.0±0.35	Fisheries: aquaculture: commercial;aquarium	LC
12	Carangidae/Carangiformes	*Caranxignobilis*	Gianttrevally	Marine;brackish	4.2±0.4	Fisheries: commercial;aquaculture:gamefish	LC
13	Carangidae/Carangiformes	*Trachinotuscarolinus*	Floridapompano	Marine;brackish	3.5±0.6	Fisheries: highly commercial;aquaculture:gamefish:	LC
14	Cichlidae/Cichliformes	*Oreochromis mossambicus*	Mozambique tilapia	Freshwater;brackish	2.2±0.0	Fisheries: highly commercial;aquaculture:gamefish:	VU

15	Cichlidae/Cichliformes	*Etroplussuratensis*	Pearlspot	Freshwater;Brackish	2.9±0.26	Fisheries: commercial;aquaculture:aquarium:	LC
16	Dorosomatidae/ Clupeiformes	*Konosiruspunctatus*	Dotted gizzardshad	Marine;brackish	2.9±0.24	Fisheries:minorcommercial	LC

Sl. no	Order/Family	Scientificname	Commonname	Habitat	Trophic level	Humanusage	IUCN status
17	Dorosomatidae/ Clupeiformes	*Hilsakelee*	Keeleshad	Marine,freshwater,brackish.	2.9±0.33	Fisheries: highly commercial;bait:	LC
18	Dorosomatidae/ Clupeiformes	*Sardinellafimbriata*	Fringescale sardinella	Marine,Brackish	2.7±0.30	Fisheries:commercial	DD
19	Engraulidae/ Clupeiformes	*Stolephorusindicus*	Indiananchovy	Marine,Brackish	3.6±0.0	Fisheries: minor commercial;bait	LC
20	Engraulidae/ Clupeiformes	*Stolephoruscommersonnii*	Devisanchovy	Marine,Brackish	3.1±0.20	Fisheries:commercial	DD
21	Megalopidae/ Elopiforms	*Megalopscyprinoides*	Indo-pecifictarpon	Marine, Freshwater, Brackishwater	3.5±0.1	Fisheries: minor commercial;Aquaculture	LC
22	Gobiidae/ Gobiiforms	*Glossogobiusgiuris*	Tankgobi	Marine, Brackish,Freshwater,	3.7±0.2	Fisheries: minor commercial;aquaculture	LC
23	Chanidae/Gonorynchiformes	*Chanoschanos*	Milk fish	Marine,BrackishFreshwater,	2.4±0.20	Fisheries: highly commercial;aquaculture	LC
24	shyraenidae/Istiophoriforms	*Sphyraenaobtusata*	Obtusebarracuda	Marine,Brackish	4.5±0.4	Fisheries: commercial;gamefish	NE
25	Mugilidae/ Mugiliforms	*Mugilcephalus*	Greymullet	Marine ,fresh water, brackishwater	2.5±0.17	Fisheries: highly commercial;aquaculture	LC
26	Mugilidae/ Mugiliforms	*Planilizamacrolepis*	Largescalemullet	Marine,Brackish,freshwater	2.6±0.26	Fisheries: commercial;aquaculture	LC
27	Mullidae/Perciformes	*Parupeneusindicus*	Indiangoatfish	Marine,Brackish.	3.5±0.37	Fisheries: commercial;gamefish	LC
28	Ambassidae/ Perciformes	*Ambassisnalua*	Scallopedperchlet	Marine,Brackish,freshwater	3.4±0.4	_	LC
29	Ambassidae/ Perciformes	*Parambassisranga*	Indianglassyfish	freshwater,brackish	3.5±0.32	Fisheries:subsistence fisheries; aquarium:commercial	LC
30	Gerreidae/Perciformes	*Gerresfilamentous*	Whip fin silverbiddy	Marine,freshwater,brackish	3.3±0.2	Fisheries:minorcommercial	LC
31	Gerreidae/Perciformes	*Gerressubfasciatus*	Common silverbell	Marine,Brackish	3.3±0.3	Minorcommercial	LC
32	Lutjanidae/ Perciformes	*Lutjanusargentimaculatus*	Mangrove redsnapper	Marine;freshwater;brackish	3.6±0.5	Fisheries:commercial; aquaculture:commercial;gamefish	LC

33	Ambassidae/ Perciformes	*Chandanama*	Elongate glass-perchlet	Freshwater;brackish	3.6±0.54	Fisheries: minor commercial;aquarium:public aquariums	LC
34	Latidae/	*Latescalcarifer*	Barramundi	Marine;freshwater;brackish	3.8±0.60	Fisheries:highlycommercial;	LC

Sl. no	Order/Family	Scientificname	Commonname	Habitat	Trophic level	Humanusage	IUCN status
	Perciformes					aquaculture: game fish;aquarium	
35	Lutjanidae/ Perciformes	*Lutjanusindicus*	Stripedsnapper	Marine;freshwater;brackish	3.8 ±0.6	_	NE
36	polynemidae/ Perciformes	*Eleutheronema tetradactylum*	Fourfinger threadfin	Marine;freshwater;brackish	4.1 ±0.5	Fisheries: highly commercial;aquaculture:	NE
37	polynemidae/ Perciformes	*Leptomelanosoma indicus*	Indianthreadfin	Marine;brackish	3.9 ±0.67	Fisheries: commercial; gamefish	NE
38	Leiognathidae/ Perciformes	*Karalladussumieri*	Dussumieri ponyfish	Marine,Brackish	3.2±0.38	Fisheries:commercial	NE
39	Leiognathidae/ Perciformes	*Leiognathusequulus*	commonponyfish	Marine, Freshwater, BrackishWater	3.0±0.40	Fisheries: minor commercial;aquaculture:commercial	LC
40	Leiognathidae/ Perciformes	*Nuchequulanuchalis*	Spotanape ponyfish	Marine,Brackish	3.0±0.25	Gamefish:yes	NE
41	Terapontidae/ Perciformes	*Teraponjarbua*	Jarabuaterapon	Marine, Freshwater, BrackishWater	3.9±0.5	Fisheries: minor commercial;aquaculture:	LC
42	Muliidae/Perciformes	*Upeneusvitlatus*	yellow strippedgoatfish	Marine,Brackish	3.6±0.0	Fisheries:minorcommercial	LC
43	Sciaenidae/ Perciformes	*Johniuscoitor*	coitercrocker	Marine,Brackish,Freshwater	3.4 ±0.4	Fisheries:commercial	LC
44	Trachiuridae/Scombriformes	*Trichiuruslepturus*	Largeheadhairtail	Marine;brackish	4.4 ±0.4	Fisheries: highly commercial;gamefish	LC
45	Ariidae/siluriformes	*Ariusarius*	Threadfin seacatfish	Marine;brackish	3.5 ±0.37	Fisheries:commercial	NE
46	Ariidae/siluriformes	*Ariusmaculatus*	Spottedcatfish	Marine; freshwater; brackish;demersal;	3.4 ±0.46	Fisheries:commercial	NE
47	Heteropneustidae/Siluriformes	*Heteropneustes fossilis*	signingcatfish	Freshwater,Brackishwater	3.6 ±0.3	highly commercial;aquaculture: commercial	LC
48	sparidae/spariformes	*Acanthopagruslatus*	Yellowfins eabream	Marine;freshwater;brackish	3.8 ±0.43	Aquaculture:commercial	DD
49	Terapontidae/Tetradontiformes	*Chelonodonpatoca*	Milkspottedpuffer	Marine;freshwater;brackish	3.1 ±0.40	Fisheries:minorcommercial	LC
50	Tetradontidae/Tetradontiformes	*Leiodoncutcutia*	Ocellated pufferfish	Freshwater;brackish	3.3 ±0.2	Fisheries:ofnointerest	LC

51	Tricanthidae/Tetradontiformes	*Triacanthus biaculeatus*	Short-nosedtripodfish Tripodfish	Marine,Brackish	2.8 ±0.29	Fisheries:minorcommercial	NE

Sl. no	Order/Family	Scientificname	Commonname	Habitat	Trophic level	Humanusage	IUCN status
52	Sciaenidae/Acanthuriformes	*Leiostomusxanthurus*	Spotcrocker	Marine,Brackish	3.2±0.1	Fisheries: commercial; bait:occasionally	LC
53	Cyprinidae/Cypriniformes	*Cyprinuscarpio*	commoncarp	Freshwater,Brackish	3.1±0.0	Fisheries: highly commercial;aquaculture:commercial;	VU
54	Cyprinidae/Cypriniformes	*Puntiussophore*	poolbarb	Freshwater,Brackish	2.6±0.1	Aquarium:publicaquariums	LC
55	Cyprinidae/Cypriniformes	*Systomussarana*	olivebarb	Freshwater,Brackish	2.9±0.2	Fisheries: commercial;aquarium	LC
56	Trichiuridae/Scombriformes	*Lepturacanthus savala*	Savalaiheirtail	Marine,Brackish	4.3±0.76	Fisheries:commercial	NE
57	Aridae/siluriformes	*Ariusjella*	Blockfin sea catfish	Marine,Brackish	3.5±0.37	Fisheries:commercial	NE
58	Bagridae/siluriformes	*Mystuscavasius*	Gangeticmystus	Freshwater,Brackish	3.4±0.4	Fisheries:commercial	LC
59	Dorosomatidae/Clupeiformes	*Tenualosailisha*	Hilsashad	Marine, Freshwater, Brackishwater	2.9±0.29	Fisheries: minor commercial;aquaculture:experimental	LC
60	Mastacembelidae/Synbranchiformes	*Mastacembelus armatus*	Zig-zageel	Freshwater,Brackishwater	2.8±0.27	Fisheries: commercial;aquarium	LC

Table2.Taxapercentagecompositionoffamilies,generaandspeciesoffishesundervariousorders

S.No	Orders	%offamiliesinanorder	%ofgenerainanorder	%ofspeciesinanorder
1	Anguilliformes	2.63	1.85	3.33
2	Anabantiformes	2.63	1.85	1.66
3	Beloniformes	5.26	5.55	5.00
4	Moroniformes	2.63	1.85	1.66
5	Perciformes	26.31	33.33	35.00
6	Acanthuriformes	2.63	1.85	1.66
7	Carangiformes	2.63	3.70	3.33
8	Elopiformes	2.63	1.85	1.66
9	Gonorynchiformes	2.63	1.85	1.66
10	Mugiliformes	2.63	3.70	3.33
11	Siluriformes	7.89	7.40	8.33
12	Tetraodontiformes	7.89	5.55	5.00
13	Cypriniformes	2.63	5.55	5.00
14	Synbranchiformes	2.63	1.85	1.66
15	Cichiliformes	2.63	3.70	3.33
6	Clupeiformes	5.26	9.25	10.00
17	Gobiiformes	2.63	1.85	1.66
8	Istiophoriformes	2.63	1.85	1.66
19	Scombriformes	2.63	3.70	3.33
20	Spariformes	2.63	1.85	1.66

Table3.TrophiclevelsandhabitatofichthyofaunalspeciesatGosthaniestuary

Trophiclevel			Habitat	
Herbivorous(2.0–2.5)	Omnivorous(2.6–3.5)	Carnivorous(3.6–4.50	Brackish water &Marine	Brackish water&Freshwater
6.66	55.00	38.33	76.66	55.00

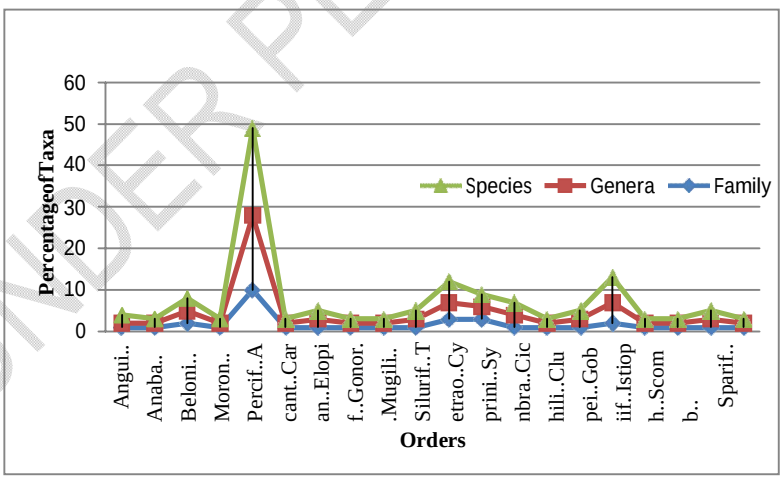

Fig.2.Taxaof variousorders

AccordingtoIUCN[14]statusinthepresentinvestigation,outof60speciescontributedto65.00%areleastconcern(LC),followedby 23.33%notevaluated(NE),5.00%aredatadeficient(DD), 3.33% are near threaten (NT) andvulnerable(VU)Table4.Fig7.HaratiandRama

Comment [H12]: The IUCN conservation status of the fish species recorded in the present investigation revealed the presence of 65% least concern species followed by……..

Rao [15] reported to majority of the species areunder Least Concerned species IUCN [14] statusthe ichthyofaunal diversity were recorded in thecurrent investigation at Kalingapatnam estuary.Abhisheketal.[16]reported48speciesbelonged to Least Concern (LC) category, twospecies be -longed Data Deficient (DD) and 10speciesbelongedtoNotEvaluated(NE)categoryinSasihithluEstuary.Mohantyetal., [25] accounted of faunal characteristics for 129commercially important species is provided. Thechecklist also documents 48 threatened speciesand103speciesunderdifferentcategoriesof conservationstatusinChilikaLake,Odisha.Fullonto na et al. [17] Out of 87 species that arereportedtoLeastConcernedspecies(37)category,followedbyNotAssessed(32).Twospeciesreportedherearefoundtobein Vulnerable,while04species belongtoNearThreatened category, according to IUCN Red liststatusatPanchupadaestuary,Odisha.Thethreatenedpiscinespeciespositionwerementioned by Rama Rao [26] Gotta Barrage atHiramandalam,RamaRao,andRamachandraRao.[27]NarayanapuramAnicutatNagavaliRiver[28].

Comment [H13]: Rewrite with proper sentence structure and corrected grammar.

Table4.PercentagecompositionofIUCN(2024)threatened speciesstatus

IUCN(2024)	NT	LC	DD	NE	VU
No.ofspecies	2	39	3	14	2
%contribution	3.33	65.00	5.00	23.33	3.33

Table5.Thepercentage compositionoffisheryusageatvariouslevels

Humanusage	commercial	minorcommercial	highlycommercial	aquarium	bait	game fish	publicaquarium
%composition	66.6	28.3	16.6	18.3	6.6	18.3	8.3

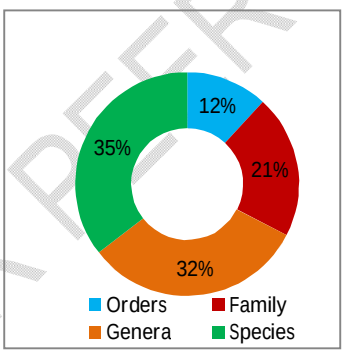

Fig.3.Taxacomposition

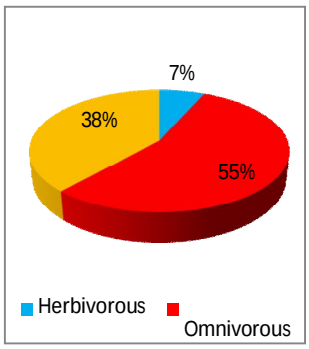

Fig.4.Trophiclevels

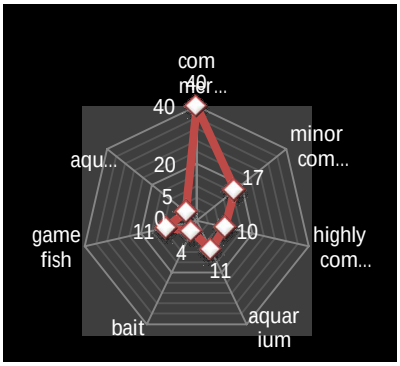

Fig.5.Fisheryusage

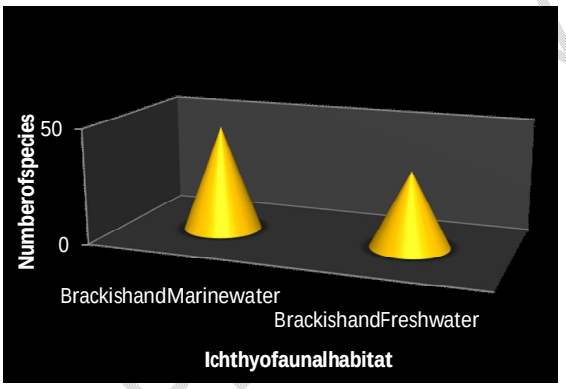

Fig.6.Habitat

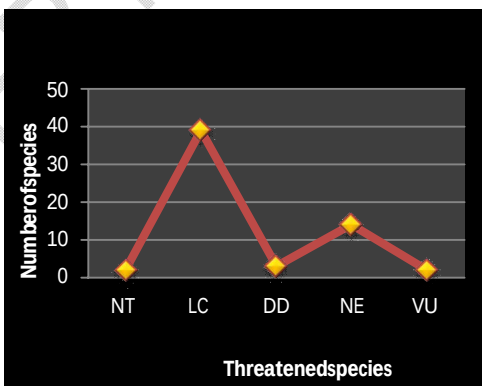

Fig.7.IUCNstatus(2024)

4. CONCLUSION

Thestudythoroughlyinvestigatedtheentirenumber offishthatarebiologicallysynonymous withtheGosthaniestuary.Thisreportprovidesfirstha ndinformationonichthyofaunaldiversity. The different contributions of dominant species ineachhabitatresultedinvariancesinassemblage

Comment [H14]: The present study recorded the fish species present in Gosthani estuary and prepared an inventory incorporating their trophic level and IUCN conservation status.

structures. The fish assemblage in the freshwaterzonewasdominatedbycommonfreshwaterspecies, whereas marine juveniles were closelylinkedtothe estuarineecology.

DECLARATION

Themethodologywascollaborationbetweenboth authors, KRR and VH, who contributed tothe completion of this work and also carried outthemorphometric,meristic,trophiclevel,andIUCN status analyses of the wild fish. The finalmanuscriptwasreadandapprovedbybothwriters.

ETHICALAPPROVAL

Thisstudywasconductedaccordingtointernational ethicalstandardssetbytheInstitutionalAnimal CareandUseCommittee.

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