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Ichthyofauna of Ponnani estuary, Kerala

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Abstract

The paper forms the first report on the fish fauna of Ponnani Estuary, one of the major estuaries and fishing harbours of Kerala. The ichthyofauna is represented by 112 species belonging of 14 orders, 53 families and 80 genera. The estuary characterised by high saline water almost throughout the year was dominated by marine species. The commercial fisheries was supported mainly by marine and estuarine forms, and clupeids, anchovies, carangids, leiognathids, croakers, mullets, gobiids and tongue-soles were the major groups collected.

Estuarine ecosystems are one of the most important coastal life support systems and an ideal rendezvous of various economically important marine and freshwater organisms, particularly fishes. In Kerala, there are nearly 30 brackishwater perennial/temporary estuaries, roughly parallel to the Arabian Sea, covering an area of 2,42,600 ha (Abdul Aziz and Nair, 1978).

The extensive estuarine systems along the Kerala coast support a very good fishery. A perfect understanding of the ichthyofaunal diversity of an estuarine system is an essential prerequisite for successful implementation of fisheries development, sustainable utilization of fishery resources and for adopting suitable conservation measures. Fish fauna of some of the major estuarine systems of the State has been documented (John, 1958; Shetty, 1965; Abdul Aziz and Nair, 1978; Nair *et al.*, 1983, a, b; Kurup and Samuel, 1985; Nair and Abdul Aziz, 1987; Natarajan, 1998).

This account forms a first report on the fish fauna of the Ponnani estuary, a relatively unexplored but one of the most important estuaries in Kerala.

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Material and methods

Ponnani estuary, located between 10°46 and 10°48' N and 75°54' to 75°56' E is an open estuary and a major fishing harbour in the Malappuram district of Kerala (Figure 1). The Bharathapuzha river, the longest river in Kerala, originating from the Western Ghats, after draining 256 km through the Coimbatore district of Tamil Nadu and Palakkad, Thrissur and Malappuram districts of Kerala joins

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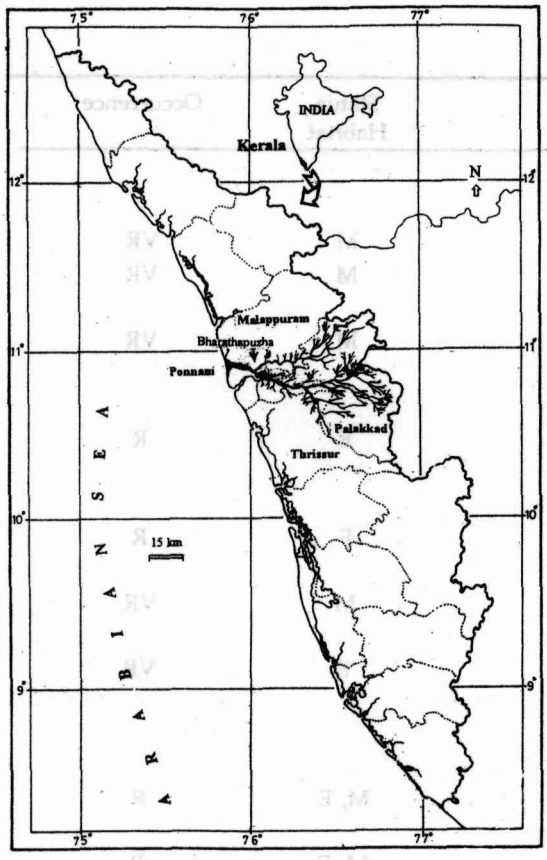

Fig. 1. *Map of Kerala showing the position of Ponnani estuary*

Arabian Sea at this estuary. The estuarine system is exposed to tides from the Arabian Sea and hence water is brackish almost throughout the year.

Fish samples were collected from March 1997 to February 1999 from different locations of the Ponnani estuary with the help of local fishermen. Cast net, siene net, dragnet and gillnet of varying mesh size were used for fish collection. The collected fish specimens were fixed in 5% formalin after recording the pigmentation in individual fishes. The works of Day (1865, 1878), Munro (1955), Fischer and Bianchi (1984), Talwar and Jhingran (1991) and Jayaram (1999) were referred for confirmation of identification. The species were categorised into rare, very care and abundant based on the catch data.

Results and discussion

A total of 112 species belonging to 14 orders, 53 families and 80 genera were collected from the Ponnani estuary during the present study. A classified list of species along with their original habitat and status of occurrence is given in Table 1.

The ichthyofaunal diversity of Ponnani estuary is found to be very high as reported from estuaries elsewhere in tropical and subtropical regions. The fish fauna of Ponnani estuary was derived mainly from the sea; there were 53 marine species and 41 marine and estuarine species. Typically estuarine and freshwater forms were represented by 9 species each. It is apparant that marine elements dominate the fish diversity in Ponnani estuary which could be justified by the fact that backwater is permanently connected to the sea and salinity is high almost throughout the year (Sushama, unpublished data). It has been observed in other estuaries of India that marine fishes migrate into the estuarine system when the hydrobiological conditions are favourable (Sinha *et al.*, 1996). According to Jhingran (1991) temperature and salinity are the major factors determining the distribution of fishes in estuaries.

Most of the typical marine species were very rare in occurrence and were probably the adventitious visitors in the estua-

Table 1

List of fish species collected from the Ponnani estuary

Sl. No.	Species	Status Habitat	Occurrence
	Order : CARCHARHINIFORMES		
	Family : CARCHARHINIDAE		
1.	*Carcharhinus limbatus* (Valenciennes)	M	VR
2.	*Scoliodon laticaudus* (Muller & Henle)	M	VR
	Family : SPHYRNIDAE		
3.	*Sphyrna lewini* (Griffith & Smith)	M	VR
	Order : ELOPIFORMES		
	Family : MEGALOPIDAE		
4.	*Megalops cyprinoides* (Broussonet)	E	R
	Order : ANGUILLIFORMES		
	Family : ANGUILLIDAE		
5.	*Anguilla bengalensis bengalensis* (Gray)	F	R
	Family : MURAENESOCIDAE		
6.	*Muraenesox cinereus* (Forsskal)	M	VR
	Family : MURAENIDAE		
7.	*Lycodontis tile* (Hamilton-Buchanan)	E	VR
	Order : CLUPEIFORMES		
	Family : CLUPEIDAE		
	Subfamily : ALOSINAE		
8.	*Hilsa ilisha* (Hamilton-Buchanan)	M, E	R
	Subfamily : CLUPEINAE		
9.	*Escualosa thoracata* (Valenciennes)	M, E	R
10.	*Herklotsichthys quadrimaculatus* (Ruppell)	M,E	R
11.	*Sardinella dayi* Regan	M	R
12.	*Sardinella longiceps* Valenciennes	M	R
	Subfamily : DOROSOMATINAE		
13.	*Anodontostoma chacunda* (Hamilton-Buchanan)	M,E	R
14.	*Nematalosa nausus* (Bloch)	M, E	R
	Subfamily : PELLONULINAE		
15.	*Corica soborna* Hamilton-Buchanan	F, E	A
	Family : PRISTIGASTERIDAE		
16.	*Ilisha melastoma* (Schneider)	M, E	A
	Family : ENGRAULIDAE		
17.	*Stolephorus commersoni* Lacepede	M	R
18.	*Stolephorus indicus* (van Hasselt)	M	R
19.	*Thryssa dussumieri* (Valenciennes)	M, E	R
20.	*Thryssa malabarica* (Bloch)	M	R
21.	*Thryssa mystax* (Schneider)	M	R
22.	*Thryssa vitrirostris* (Gilchrist & Thompson)	M	R
	Order : GONORHYNCHIFORMES		
	Family : CHANIDAE		

23.	*Chanos chanos* (Forsskal)	M, E	R
	Order : CYPRINIFORMES		
	Family : CYPRINIDAE		
24.	*Puntius sarana subnasutus* (Valenciennes)	F	A
	Order : SILURIFORMES		
	Family : ARIIDAE		
25.	*Arius arius* (Hamilton-Buchanan)	M	A
26.	*Arius cealatus* Valenciennes	M	R
27.	*Arius maculatus* (Thunberg)	M, E	VR
	Family : BAGRIDAE		
28.	*Mystus gulio* (Hamilton-Buchanan)	E, F	A
29.	*Mystus montanus* (Jerdon)	F	R
30.	*Mystus oculatus* (Valenciennes)	F	R
	Order : GADIFORMES		
	Family : BREGMACEROTIDAE		
31.	*Bregmaceros maclellandi* Thompson	M	VR
	Order : CYPRINODONTIFORMES		
	Family : HEMIRAMPHIDAE		
32.	*Hyporhamphus limbatus* (Valenciennes)	M, E	A
33.	*Hyporhamphus dussumieri* (Valenciennes)	M, E	A
	Family : BELONIDAE		
34.	*Strongylura strongylura* (van Hasselt)	M, E	A
	Order : SYNGNATHIFORMES		
	Family : SYNGNATHIDAE		
35.	*Microphis cuncalus* (Hamilton-Buchanan)	F, E	VR
	Order : SCORPAENIFORMES		
	Family : SCORPAENIDAE		
36.	*Scorpaenopsis leonina* (Richardson)	M	R
	Family : PLATYCEPHALIDAE		
37.	*Grammoplites scaber* (Linnaeus)	M, E	A
38.	*Platycephalus indicus* (Linnaeus)	M, E	A
	Order : PERCIFORMES		
	Family : CENTROPOMIDAE		
39.	*Lates calcarifer* (Bloch)	M,E	R
	Family : AMBASSIDAE		
40.	*Ambassis commersoni* Cuvier	M, E	A
41.	*Ambassis gymnocephalus* (Lacepede)	M, E	A
	Family : SERRANIDAE		
42.	*Epinephelus malabaricus* (Schneider)	M, E	R
43.	*Epinephelus tauvina* (Forsskal)	M, E	R
	Family : TERAPONIDAE		
44.	*Terapon jarbua* (Forsskal)	M, E	A
	Family : SILLAGINIDAE		
45.	*Sillago sihama* (Forsskal)	M, E	A
	Family : LACTARIIDAE		

46.	*Lactarius lactarius* (Schneider)	M, E	R
	Family : CARANGIDAE		
47.	*Alepes djedaba* (Forsskal)	M	VR
48.	*Carangoides ferdau* (Forsskal)	M	R
49.	*Carangoides hedlandensis* (Whitley)	M	R
50.	*Carangoides malabaricus* (Bloch)	M	R
51.	*Carangoides praeustus* (Bennet)	M	VR
52.	*Carangoides sexfasciatus* Quoy & Gaimard	M	R
53.	*Megalopsis cordyla* (Linnaeus)	M	A
54.	*Scomberoides commersonianus* Lacepede	M	VR
	Family : APOLECTIDAE		
55.	*Apolectus niger* (Bloch)	M	R
	Family : MENIDAE		
56.	*Mene maculata* (Bloch)	M	R
	Family : LEIOGNATHIDAE		
57.	*Gazza minuta* (Bloch)	M, E	A
58.	*Leiognathus bindus* (Valenciennes)	M, E	A
59.	*Leiognathus blochii* (Valenciennes)	M, E	A
60.	*Leiognathus brevirostris* (Valenciennes)	M, E	A
61.	*Leiognathus equula* (Forsskal)	M, E	A
62.	*Leiognathus splendens* (Cuvier)	M, E	R
63.	*Secutor insidator* (Bloch)	M, E	A
	Family : LUTJANIDAE		
64.	*Lutjanus argentimaculatus* (Forsskal)	M, E	R
65.	*Lutjanus eherenbergii* (Peters)	M	R
66.	*Lutjanus fulviflamma* (Forsskal)	M	R
	Family : GERRIDAE		
67.	*Gerres filamentosus* Cuvier	M, E	A
	Family : POMADASYIDAE		
68.	*Pomadasys argenteus* (Forsskal)	M, E	R
69.	*Pomadasys maculatus* (Bloch)	M	R
	Family : SCIAENIDAE		
70.	*Daysciaena albida* (Cuvier)	M	A
71.	*Dendrophis russelli* (Cuvier)	M	VR
72.	*Johnius russelli* (Cuvier)	M	VR
73.	*Otolithes ruber* (Schneider)	M	VR
	Family : MONODACTYLIDAE		
74.	*Monodactylus argenteus* (Linnaeus)	M	VR
	Family : EPHIPPIDAE		
75.	*Drepane punctatus* (Linnaeus)	M	VR
	Family : SCATOPHAGIDAE		
76.	*Scatophagus argus* (Linnaeus)	M, E	A
	Family : CICHLIDAE		
77.	*Etroplus maculatus* (Bloch)	E, F	A
78.	*Etroplus suratensis* (Bloch)	E, F	A
79.	*Oreochromis mossambica* (Peters)	F	A
	Family : MUGILIDAE		

80.	*Liza macrolepis* (Smith)	M, E	A
81.	*Liza parsia* (Hamilton-Buchanan)	M, E	A
82.	*Liza tade* (Forsskal)	M, E	A
83.	*Mugil cephalus* Linnaeus	M, E	A
	Family : SPHYRAENIDAE		
84.	*Sphyraena barracuda* (Walbaum)	M	R
	Family : POLYNEMIDAE		
85.	*Eleutheronema tetradactylum* (Shaw)	M	VR
86.	*Polydactylus indicus* (Shaw)	M	VR
	Family : ACANTHURIDAE		
87.	*Acanthurus nigrofuscus* (Forsskal)	M	VR
88.	*Zebrasoma xanthurus* (Blyth)	M	VR
	Family : CALLIONYMIDAE		
89.	*Callionymus fluviatilis* Day	F, E	VR
	Family : GOBIIDAE		
	Subfamily : Gobiinae		
90.	*Awaous gutum* (Hamilton - Buchanan)	F, E	A
91.	*Glossogobius giuris* (Hamilton-Buchanan)	M, E, F	A
92.	*Oligolepis cylindriceps* (Hora)	E	R
93.	*Oxyurichthys tentacularis* (Valenciennes)	E	A
	Subfamily : Apocrypteinae		
94.	*Pseudapocryptes lanceolatus* (Bloch & Schneider)	M	R
	Subfamily : Sicydiaphiinae		
95.	*Sicyopterus griseus* (Day)	E, F	R
	Family : ELEOTRIDIDAE		
96.	*Eleotris fusca* (Schneider)	E, F	R
	Family : TRYPAUCHENIDAE		
97.	*Trypauchen vagina* (Bloch & Schneider)	M	A
	Family : SIGANIDAE		
98.	*Siganus canaliculatus* (Park)	M	R
99.	*Siganus javus* (Linnaeus)	M	R
	Family : TRICHIURIDAE		
100.	*Trichiurus lepturus* Linnaeus	M	R
	Family : SCOMBERIDAE		
101	*Rastrelliger kanagurta* (Cuvier)	M	R
102.	*Scomberomorus guttatus* (Bloch & Schneider)	M	R
	Family : STROMATEIDAE		
103.	*Pampus argenteus* (Euphrasen)	M	VR
104.	*Pampus chinensis* (Euphrasen)	M	VR
	Order : PLEURONECTIFORMES		
	Family : BOTHIDAE		
105.	*Pseudorhombus elevatus* Ogilby		
	Family : CYNOGLOSSIDAE		
106.	*Cynoglossus arel* (Schneider)	M	R
107.	*Cynoglossus cynoglossus* (Hamilton-Buchanan)	M	R
108.	*Cynoglossus lingua* (Hamilton-Buchanan)	M	R

109.	*Cynoglossus puncticeps* (Richardson)	M, E	A
110.	*Paraplagusia bilineata* (Bloch)	M	A
	Family : SOLEIDAE		
111.	*Euryglossa orientalis* (Bloch)	M, E	A
	Order : TETRADONTIFORMES		
	Family : TETRADONTIDAE		
112.	*Chelonodon patoca* (Hamilton-Buchanan)	M, E	A

M = Marine; E = Estuarine; F = Freshwater

V R = Very Rare; R = Rare; A = Abundant

rine system, and among these *Megalapsis cordyla* and *Daysciaena albida* only formed significant fishery in the estuary. Most of the fishery in Ponnani estuary is supported by transient forms inhabiting different habitats such as sea and estuary i.e., marine and estuarine forms.

Among the 112 species of fish collected, over 90 species were found to be commercially important (Talwar and Kacker, 1984; Talwar and Jhingran, 1991). Clupeids (8 species), anchovies (6 species), carangids (8 species), Leiognathids (7 species), croakers or sciaenids (4 species), mullets (4 species), gobiids (6 species) and tonguesoles (5 species) were the major groups supporting the fisheries of Ponnani estuary. Among the freshwater and estuarine species *Etroplus maculatus, E. suratensis* and *Mystus gulio* only contributed significantly to the estuarine fisheries.

Many species used estuaries as the breeding and/or nursery grounds. The young ones of clupeids, milk fish, *Lates calcarifer, Ambassis spp. Gerres filamentosus, Scatophagus argus,* cichlids, gobiids, mullets and flatfishes were collected during the present study.

Migratory forms performing both catadromous and anadromous migrations were found among the ichthyofauna. Adults of *Anguilla bengalensis,* a catadromous species and *Hilsa ilisha,* an anadromous species were collected from the estuary.

Biological wealth of an estuary reflects its health. Ponnani estuary though supports a rich ichthyofaunal diversity, it has been subjected to ecological degradation due to the ever increasing human interventions. The increasing levels of siltation, pollution and over exploitation of resources are the major problems encountered (James, 1987). This necessitates frequent monitoring of fish diversity and estimation of sustainable yield to ensure steady supply of resources to the local people.

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