

Estuarine Ecosystem Series, 5

Fauna of **Krishna Estuary**



ZOOLOGICAL SURVEY OF INDIA

Estuarine Ecosystem Series, 5

FAUNA OF KRISHNA ESTUARY

Edited by the Director, Zoological Survey of India, Kolkata



सत्यमेव जयते

**Zoological Survey of India
Kolkata**

CITATION

Editor—Director. 2009. *Fauna of Krishna Estuary, Estuarine Ecosystem Series, 5* : 1-298.
(Published by the Director, Zool. Surv. India, Kolkata)

Published – February, 2009

ISBN 978-81-8171-213-4

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PRICE

India : Rs. 400.00

Foreign : \$ 30; £ 25

Published at the Publication Division by the Director, Zoological Survey of India, 234/4, A J C Bose Road, 2nd MSO Building, (13th Floor), Nizam Palace, Kolkata-700 020 and printed at East India Photo Composing Centre, Kolkata-700 006.

Fauna of Krishna Estuary Estuarine Ecosystem Series

No. 5

2008

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KRISHNA ESTUARY — AN OVERVIEW

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INTRODUCTION

Estuarine environment is very significant among various ecosystems due to its ever dynamic nature and of great economic values due to its sustainable fishery resources, both capture and brackish water aquaculture. India with a vast coast line is interspersed with estuaries of about 113 major and minor rivers and small rivulets opening into the Bay of Bengal and Arabian sea forming about 7000 Sq km of estuarine habitat (mixed water) including the large lagoons viz. Chilika and Pulicat.

Among the estuaries of India, major estuarine areas are on east coast in comparison to west coast since several major rivers viz. Ganges, Brahmaputra, Mahanadi, Godavari, Krishna and Cauveri flows west to east and opening into Bay of Bengal forming vast deltaic and estuarine habitat with associated mangrove forests among which mangroves of Ganges, Mahanadi, Krishna, Godavari and Cauvery are extensive and rich in floral and its faunal assemblages.

Estuarine ecosystems has attracted the attention of biologists during the last several decades for exploration of their faunal resources, fishery potential and ecology etc.; as evident from literature available on Gangetic delta, Chilika lagoon, estuaries of Mahanadi, Godavari, Vellar, Mandovi-Zuari, and Kerala back waters (Rao *et al.*, 2002). It is irony that very little studies have been made on Krishna estuary, a major estuary forming a big delta and mangrove forests spread over 200 Sq Km, except those of Ramanadham & Varadarajulu (1975) on Hydrography, Radhakrishna & Janakiram (1975) on mangrove molluscs and of Ravindranath (1980, 1982) on prawn fishery. However the bioresource studies of Krishna river (Jayaram 1994) gave a detailed account on ecology and biodiversity all along the course of the river from its origin to mouth though information on estuarine fauna is limited.

KRISHNA RIVER

The river raises near Mahabaleswar (Maharashtra) at an elevation of 1373 mts in Western Ghats. After flowing about 1400 kms in Maharashtra, Karnataka and Andhra Pradesh joins

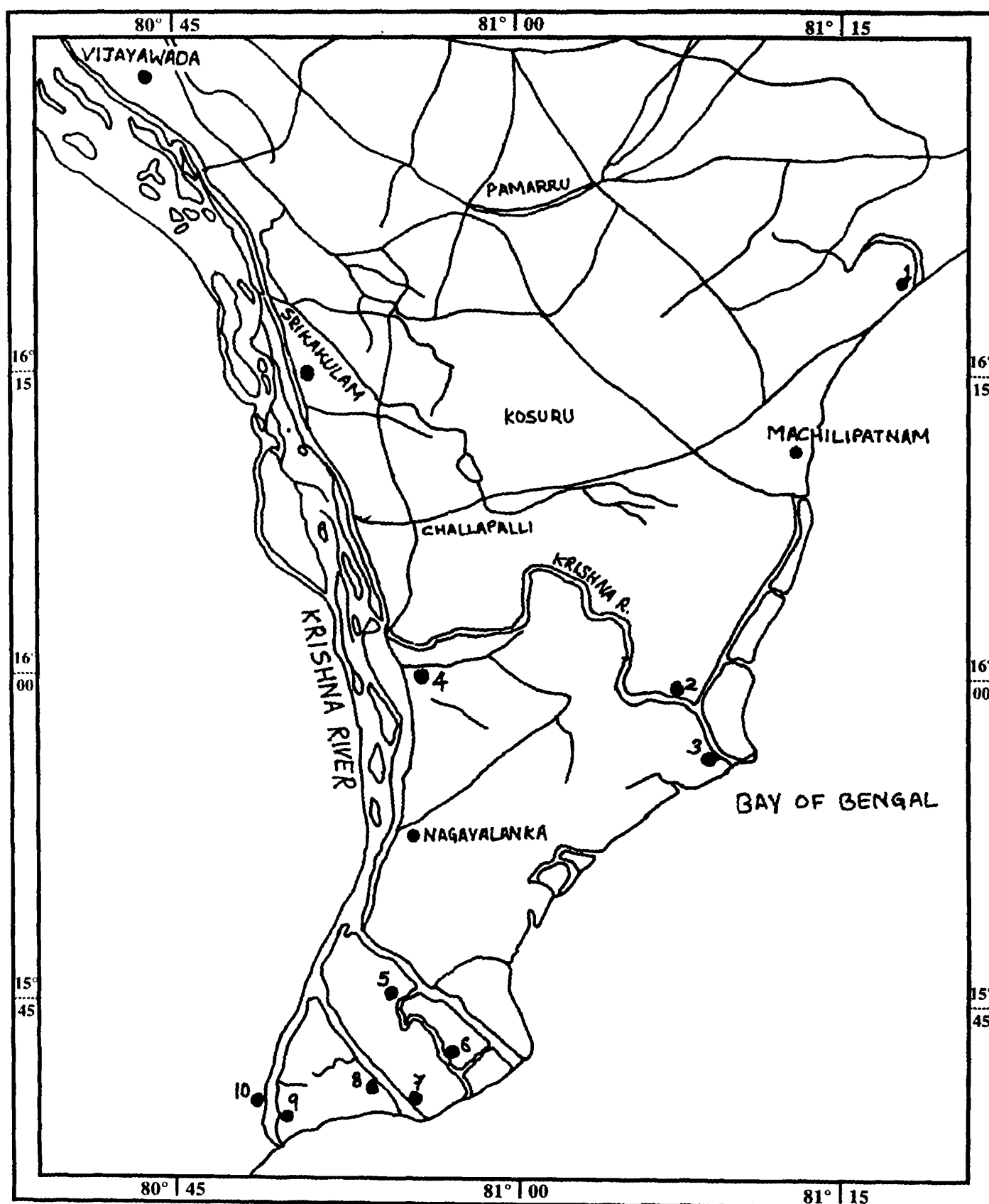


Fig. 1. Map of Krishna River showing Estuarine areas of collection localities : 1. Kanur Creak; 2. Pallethummala Palem; 3. Palakayatippa (Hamsaladivi); 4. Avanigadda (Kothapeta); 5. Edurumondi; 6. Gullalamoda (Sorlagandi/Light House); 7. Gollamanda; 8. Eelachetladibba; 9. Nachugunta; 10. Lankevenitippa.

Bay of Bengal at four different points near Avanigadda and Nagayalanka towns, south of Machilipatnam town in Krishna district of A.P. Several storage reservoirs for irrigation and Hydel power are constructed during its long course, the largest being Srisailem and Nagarjunasagar in Andhra Pradesh. The last storage reservoir point is Prakasam barrage at Vijayawada which is about 100 km upstream from its mouth. The barrage at Vijayawada stores water and supplied through two main canals and a net work of sub canals in the Krishna and Guntur districts and finally the agricultural drainage also opens into sea at some points closer to mouth areas, thus forming a complex estuarine system. The various dams and reservoirs on Krishna river drastically reduced flow of fresh water down of Vijayawada to mouth area except in monsoon when heavy flows are noticed. At Vijayawada, river is about 1170 mts., wide and it continues as single channel of considerable width for about 64 kms. through rich alluvial delta, and nearly 38 kms. from mouth area up stream a branch by name Pulleru takes off towards east at a place called Puligedda which runs for about 20 kms. and meets sea at Hamsaladeevi-Palakayatippa. The main river flows south-west for 20kms., first divides into two at Edurumondi, beyond Nagayalanka. this eastern branch after a course of 10kms. meets sea at Gullalamoda, which is close to light house, with vast mangroves and swamps around. The main river after flowing a few kms. divides into two branches each opening into sea at Lankevenitippa, the western branch and middle at Eelachetladibba. All three branches are about 300-400 mts wide and 10-15 feet depth, around the course of four branches and 10 km. upstream from mouth, vast mangrove forests and marshy swamps present with large scale aquaculture activities for prawns and crabs.

STUDY AREA & COLLECTION STATIONS

Estuarine area of any river is the extent of river upstream upto which salinity extends during any period of the year. As per local information salinity extends in the river beyond Puligedda for few kms. upstream during post monsoon, however of lower levels i.e. 1-3%, since mixing of water is minimum and tidal influx is difficult beyond this point due to gradient difference. In view of above, area from Puligedda to down stream upto mouth area of main river and its branch Pulleru are taken as study area. At Puligedda, the upstream estuarine point in this study showed salinity of 4‰ in January 2000. Collection points are fixed at different localities in the estuarine area to have complete information on the estuarine area. On either side of the main river and its branches from their mouth area to about 10 kms., upstream, vast areas of marshy swamps and mangrove forests are converted as brackish water aquaculture ponds. Collection of prawn seed from mouth areas as major activity among fisher folk is noticed. Sample collection points are shown in fig. 1 and total of 9 stations in Krishna estuarine area and “Kanur” which is connected to the estuarine complex through an agricultural

drainage stream opening as a creak into sea is also included in this study due to its proximity to the estuarine areas.

1. Kanur creak – This station is north east of Machilipatnam and the collection locality is 1-2 km. from its opening to the sea. A large stream carrying agricultural drainage of Krishna canal net work opens into bay of Bengal through this canal which is about 200 m. wide. Mangrove forest developed on both sides of the creak for about 3km. upstream and brackish water aquaculture is practiced. Tidal influx is high and vast areas are exposed during low tide even in the middle of the creak where large benthic populations are abundant. Muddy coast line and salinity 1-8‰ in Sept.-Oct. and 12-26‰ in Jan.-Feb. are noted.

2. Pallethummalapalem – This point is closer to Machilipatnam. From this point, through a creak with mangrove forests on both sides with muddy shores opens to Pulleru river. This point is about 5 km up stream from its opening and around this point vast areas of marshy swamps are seen which are flooded in monsoon and dries in summer. At this point of river herds of dolphin are noticed. Salinity of 18-30‰ in Jan.-Feb. and 5-14‰ in Sept.-Oct. are recorded.

3. Palakayatippa (Hamsaladeevi) – This point is closer to Avanigadda town, from this place confluence point of Pulleru river into bay of Bengal is close and here also large areas mangrove forests and swamps are seen. River at this point is very deep and wide with high tidal influx. More fishing and prawn seed collection activities are seen. Salinity of 11‰ in October and 35‰ in February recorded.

4. Avanigadda (Kothapeta) – This point is on the southern bank of Pulleru river and also very close branching off point of Krishna river. This point is centre of island (Diviseema) with two rivers on two sides and the other side Bay of Bengal. During monsoon, floods are common feature at this place and mangroves are not developed around. Both rivers are shallow, wide and river bed sandy. Salinity extends through Pulleru river during high tides and 4-5‰ in December recorded. Nagayalanka town about 10 km from this place south is situated on eastern banks of Krishna river. This point is considered gate-way for going to different estuarine areas towards mouth wherein agricultural, fishery and aquaculture activities are observed. Salinity of 3‰ in Feb. and at high tide time are noted.

5. Edurumondi (Yesupuram) – This point is 10 km south of Nagayalanka where the Krishna river divides into two branches, forming a big island. The western point, where a jetty exists and fish landings takes place is Yesupuram and eastern point which is closer to main river bank is Yedurumondi.. This island village is good in agriculture and also an important fishing center due to its central location to estuarine and marine areas. Mangrove vegetation starts appearing from this point and continues till mouth area. Salinity of 6-9‰ in Sept.-Oct. and 15-9‰ in Jan.-Feb. recorded.

6. Gullalamoda (Sorlagondi/Lighthouse) – This point is situated near mouth of western side of first (eastern) branch. On eastern side of this branch and around this place vast tracts of swamps and mangrove forests are seen. Light house is located in this area and a criss-cross net work of creeks opening to river is observed. Tidal influence is profound and large areas are exposed during low tide which are very rich in benthic fauna, as sediment is mixture of fine sand and silt. Salinity of 1-9‰ in Sept.-Oct. and 25-31‰ in Jan.-Feb. recorded.

7. Gollamanda – This place is on the eastern bank of middle branch and closer to mouth area. Collections were made around this place and also near mouth area which is surrounded by thick mangrove forests. Coast line is highly muddy and near mouth area sandy. Salinity of 23-26‰ in Dec.-Jan. and 9‰ in October noted.

8. Eelachetladibba – This place is on western bank of middle branch and about 2-3 km. from mouth area, here river is wide and deep with heavy tidal influence. Thick mangrove forests present and complex net work of creeks. Coastline sandy towards mouth area and large areas exposed in the midst of river during low tide. Prawn seed collection is prevalent. Salinity of 6-15‰ in Sep.-Oct. and 14-19‰ in Dec.-Jan. noted.

9. Nachugunta – This point is eastern bank of the western branch of Krishna river. Confluence point is 2 km. from this location and river is wide, deep and with tidal currents. Shore not very muddy and large shallow areas exposed during low tide which are muddy with good benthic fauna. Mangrove vegetation present. Salinity of 0-8‰ in Sep.-Oct. and 22-24‰ in Jan.-Feb. recorded.

10. Lankevenitippa – This point is western most point of Krishna estuary and is in Guntur district. Meeting point to sea is about 3-4 km from this area. From Edurumondi point onwards mangrove forest habitat developed on western bank of the river with large scale conversion into prawn culture ponds. This point is the main fish landing center for estuarine and marine fisheries. Coast line is muddy with live molluscs and mud skippers seen. Salinity of 0-10‰ in Sep.-Oct. and 24-27‰ in Feb noted.

In addition to the above localities, collections of fishes, molluscs and crustaceans were made from Manginapudi, which is a locality on Machilipatnam coast, Gilakaladindi, a locality at port area of Machilipatnam. At both these localities fresh water sources opens into sea. Manginapudi coast is of fine sand-silt mixture with turbid waters, while at Gilakaladindi it is muddy coast with some mangrove vegetation and at both places fish samples were made from country boats and trawlers. Some marine forms of fishes, molluscs and crustacea have been included inadvertently from collections of above areas.

METHODOLOGY

Faunal exploration of Krishna estuary has been conducted as regular study of the Estuarine Biological Station, Zoological Survey of India since detailed information on faunal diversity of this area is lacking. Faunistic surveys during pre monsoon and post monsoon were conducted from Oct 1996-Dec 2000 to various localities of the estuary by camping at Machilipatnam and Nagayalanka. Faunal samples from various points of the estuarine complex including highly inaccessible mangrove forests and muddy swamps were collected by reaching through country boat and engaging fishermen for netting fishes, prawns and crabs etc. At each collection site salinity, pH are noted. Faunal samples were collected from exposed shallow areas and inter tidal localities during low tide, through nets, forceps and sieving the sediment samples, and from fish landing centers. All the material, collected and reported here are made by Dr. C.A.N. Rao & party except those of Feb. 97 & Feb. 98, which were made by Dr. S. Krishnan & party. Therefore in 'Material examined' Collector name is not given.

FAUNAL COMPOSITION

The present work deals with major macro groups viz. Polychaeta, Brachiopoda, Crustacea, Mollusca, Echinodermata and Fishes.

POLYCHAETA – Report of 45 species of polychaetes from this area forms first report since there is no record of this group till now. Polychaete faunal diversity of this estuary is comparable to Mahanadi, Godavari, and Vellar though lesser number of species being the first survey. Similarities with fauna of Godavari estuary is marked.

BRACHIOPODA – *Lingula* sp. (lamp shell), the only representative of this minor phyla has been occasionally reported from Gujarat coast, Gangetic delta, and Kakinada (Godavary estuary). Its occurrence from Krishna estuary is significant in distribution point of view.

CRUSTACEA-DECAPODA (PRAWNS) – Prawns belonging to 28 species are reported in this work. However, Ravindranath (1982) reported 47 species from Krishna estuarine complex in which several fresh water forms are also included. Prawn fishery is noticed as an important activity in the sustainable exploitation of resources of the estuary.

CRUSTACEA-BRACHYURA (CRABS) – The present report of 35 species of crabs is significant being the first information on diversity of brachyuran crabs and is richer in diversity in comparison to Godavari estuary wherein only 21 species are reported.

CRUSTACEA-HERMIT CRABS – Eight species of Hermit crabs are reported here of which 7 species are reported from Gangetic delta, from where a total of 14 species are reported.

MOLLUSCA – This report forms first comprehensive account on molluscan diversity of Krishna estuary wherein 109 species are reported. Among the species reported here some marine forms are also included as collections are made at mouth area where some dead shells washed ashore. Molluscan diversity noticed here, is comparable with those of Ganges, while only 54 species are reported from Godavari estuary. Janakiram (1975) reported mangrove associated mollusca from Nizampatnam area of Krishna estuary where agricultural drainage of Krishna canals forms brackish waters with mixing of sea waters and this area is not studied during this study.

ECHINODERMATA – Among the two species reported here, *A. bengalensis* is estuarine form while the other a marine form collected from mouth area, washed ashore. About 20 species are reported from Hugli-Matla estuary.

FISHES – A total of 269 species of fishes are reported among which some fresh and several marine forms also got included as specimens were collected from fish landing centers at estuarine areas, comprises catch from sea waters as well. This is also because collections were also made at Manginapudi Beach and Gilakalidindi both being marine points. Fish fauna of this estuary is comparable to that of Godavari estuary while only 43 species are reported from Hugli-Matla estuary, which are purely estuarine inter tidal.

ACKNOWLEDGEMENTS

The author is thankful to the Director, Zoological Survey of India, Kolkata for encouragement and providing necessary facilities in carrying out this work. Thanks are also due to the staff members of Estuarine Biological Station, Zoological Survey of India, Berhampur for their assistance in the field surveys.

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Different views of Krishna Estuary



BRACHIOPODA (LAMP SHELL)

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INTRODUCTION

Members of the minor phylum, Brachiopoda commonly known as Lamp shells, are significant as they are one of the oldest group of animals evolved nearly million years ago with about 260 existing and thousands of extinct species. Brachiopods are exclusively marine and benthic occur in all seas from the inter tidal zone to depths of 5000 metres, however rarely found about low tide levels. Except Linguids, which are burrowing, all other brachiopods live permanently attached to the rocks, shells or other firm objects. It is reported that brachiopods prefer cooler waters and avoidance of fully tropical areas. However, brachiopods are by no means absent although confined to shallow waters. The tropical and subtropical waters of the Indo-West Pacific are relatively poor in brachiopods except in the occurrence of genus, *Lingula* sp. With a dozen existing species is spread through out this area including Indian coasts. Japan which has brachiopod elements in common with the North America and North Europe and tropical West Pacific as well as many endemic sp. With about 34 sp. of which genus *Lingula* is most common with eight species.

Since very few brachiopods live along low tide level and can not endure waters of less than 30 ppt. thereby occurring scarcely in estuarine and brackish waters with only exception of Linguids which live in vertical burrows of sandy shores and mud flats in the vicinities of estuaries and able to withstand lower salinities.

Information on the brachiopods of Indian coasts is meager and fragmentary reporting only three sp. from Indian seas including *Lingula* sp. which has been reported to occur at low tide levels on Indian coasts. Most of the information available on Indian Brachiopods concerns about the reports *Lingula* sp. from different localities of Indian coasts which occurs at low tide levels near river mouth areas. There is no information on the Brachiopods which live at various depths below low tide levels probably as there are less faunal exploration studies in the shelf region along Indian coasts.

DESCRIPTION

Lingula sp.

Material : During the faunal exploration studies of the Krishna estuary (Andhra Pradesh), seven live *Lingula* sp. specimens and one pair of dead shell were collected from two different localities of Krishna estuary. 3 exs. (live) buried in sandy-silty sediment about one foot deep from an island-like land mass exposed during low tide in the middle of the Kanur creak, Machilipatnam on 16-9-98. salinity – 4 ppt.; 3 exs. (live) and 1 ex. Dead shell buried in sand-silt sediment in middle of Kanur creak, Machilipatnam, 4-1-2000, salinity 26 ppt.; 1 ex. (live) buried in muddy sediment at light house, sorlagandhi, Nagayalanka, 19-12-2000, salinity 28 ppt.

Habitat : The Kanur creak is situated at a village Kanur on sea coast 10 km north of Machilipatnam, A.P. The collection locality in the creek is less than half kilometer from its mouth area (opening into the sea) and into it the Krishna delta flood canal opens and thus is subjected to complete tidal influence from the nearby sea. Both the banks of the creek are with Mangrove forests and mud flats highly exposed during low tide. This habitat is a typical estuarine with freshwater discharge from one side and salt water influx and from the sea side. During high tide, the collection locality is about 5–6 feet deep. Salinity at the site of the collection was 26 ppt and 4 ppt. and. sediment is a mixture of fine sands silt. the sediment was found to be rich in benthic fauna as large number of Polychaetes, Bivalves and Crustaceans were collected from this area. This area has been surveyed several times during 1996-2000 and during only two occasions Brachiopods were collected. One specimen was collected from light house area, Sorlagandhi, which is close to mouth area and surrounded by mangroves. Sediment is sand-silt mixture and rich in benthic fauna.

Diagnosis : Each specimen is bivalved, dorso-ventral and slightly thin, the biggest specimen measuring 4.5 cm in length and 2.0 cm in width while the smallest 2.0 cm in length and 1.0 cm in width. The biggest specimen having the lopophore of more than 12 cm in length.

Remarks : The preferred habitat for *Lingula* sp. is mud flats as has been found extensively on Japanese coasts. Since mud flats are found only around river mouths, creeks.etc. *Lingula* is mostly confined in these areas wherein there is a fresh water discharge to the sea. Hitherto *Lingula* sp. has been recorded from different localities on east and west coasts of India and at most of these localities it is reported that there are fresh water discharges to the Sea wherein lower salinities are noticed. Thereby the occurrence of *Lingula* sp. is mostly restricted to the vicinities of estuarine and brackish habitat.

DISCUSSION

Live beds of *Lingula* sp. from Balapur Bay of Beyt island (Gujarat coast) were reported by Hornell (1970). Dry shells from Karwar coast (Karnataka) by Patil (1953) and live specimens from Maharashtra coast were reported by Awati & Kshirsagar (1935 & 1957). On the east coast of India live beds of *Lingula* sp. were noticed from Vellar river mouth to the five fathom line in Porto Novo waters (Tamil Nadu) by Rama Moorthy *et al.* (1973), from mud flats of Kakinada bay, Andhra coast (Radhakrishna & Ganapathi, 1969). Live beds of *Lingula* and dry shells were also collected from Digba and Chandipur, West Bengal – Orissa by Soota & Reddy (1976).

It is evident that *Lingula* sp. prefers the estuarine and brackish water habitats, however very close to the sea, thus withstanding changes in the salinities. Since *Lingula* sp. capable to endure lower salinities and is a burrowing form, mud flats are considered as its suitable habitat.

The material reported herein is mentioned as *Lingula* sp. only in tune with the earlier reports. However 1-2 authors mentioned it as *Lingula anatine* (Lam.). Detailed studies are needed for ascertaining its correct taxonomic as well as its population status.

This report of the occurrence of the brachiopod *Lingula* sp. from this estuarine locality assumes significance since this is the only representative of this phylum occurring on Indian coasts. Further, the reports of occurrence of *Lingula* sp. and its distribution on Indian coasts appears to be discontinuous and sporadic indicating this species as a rare faunal element on Indian coasts. It is also to be noted that wherever *Lingula* sp. has been reported from Indian coasts, in most of the cases very few living specimens were noticed and some times dead shells only which clearly indicates that the population of this sp. are at critical levels as in the present case also, seven specimens could be only collected in spite of several visits to this locality.

Though the estuarine areas with varying salinities and mud flats are the preferred habitat for *Lingula* sp. colonization of this sp. in these areas seems to be disturbed since these areas are prone to heavy freshwater discharges during cyclonic storms which is a common feature in Indian coasts and mass mortality of this species is noticed during these periods (Rama Moorthy, *et al.* 1973). Therefore the *Lingula* sp. is to be considered rare and endangered animal and it requires inclusion in the list of the endangered invertebrate species whenever a red-data book on invertebrates is contemplated.

ACKNOWLEDGEMENTS

The author is grateful to the Director, Zoological Survey of India, Kolkata for encouragement and facilities provided.

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POLYCHAETA (ANNELIDA)

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INTRODUCTION

Coastal and estuarine faunal diversity of Indian coasts has been one of the interesting areas of research since Indian sub-continent is bestowed with vast coast line in thousands of kilometers frequently interspersed with several major and minor rivers including streams opening into marine waters thus forming vast areas of specialized habitat—"estuarine ecosystem" which is continuously dynamic and highly productive due to certain inherent factors. Further, around estuarine areas of many rivers, growth of vast extents of luxuriant mangrove forests with mudflats and salt marshes *etc.*, resulted in development and sustaining of rich faunal diversity with high productivity potential in these areas.

Faunal studies on Indian brackish waters *i.e.*, Lagoons, backwaters and estuaries has been one of the interesting areas of studies and first on this aspect is of Annandale *et. al* (1915-24) on fauna of Chilika lake. studies on fauna of various other estuaries, lagoons and back waters of Indian coasts has been studied for different animal groups viz. fishes, mollusca, crustacea and polychaeta; the important being Gangetic delta, estuaries of Mahanadi, Godavari, Vellar and Mondavi-Zuari rivers of Goa. Studies on the faunal components of Pulicat lake and on kerala back waters are also available. However there are no reports on the fauna of Krishna estuary though it is a major and second biggest river in south India after godavari forming a huge delta and a positive estuary surrounded by rich mangrove forests spread in about 160 sq.km.; except few works on mollusca and prawns and its fishery. The reason for lack of information on fauna of Krishna estuary perhaps might be due to its highly inaccessible nature of the area for collection and related ecological information.

Krishna estuarine system has been taken up as a study area for its detailed faunal resources investigations by the zoological survey of India during 1996-2000 and about 10 nos. of faunistic exploratory surveys were conducted to different estuarine localities of the Krishna river and its branches during different seasons (pre monsoon,, monsoon, and post monsoon). Faunal samples of various groups were collected along with the physico-chemical features (ph., salinity, temp.,) at every sample collection location.

During these surveys large number of faunal samples are collected belonging to macro invertebrates viz., coelenterate, brachiopoda, crustacea, polychaeta, mollusca, echinodermata and fishes along with plankton samples for the study of its faunal diversity.

Polychaetes, one of the major taxonomic group of invertebrates, though mostly are marine inhabitants occurring as benthic forms at inter tidal, littoral and abyssal depths constitutes as one of the important faunal components in mixed water habitats viz. estuaries, lagoons and back waters. These areas are freequently inhabited by sufficiently rich diversity and large populations of polychaetes as several polychaete species are euryhaline, capable of tolerating wide salinity fluctuations. Thus several species of polychaetes established as permanent estuarine animal communities due to less competetion and availability of more food material.

A total of about 170 species of polychaetes are reported to occur in estuarine and brackish water habitats along Indian coasts out of about 500 species polychaetes reported from Indian waters. Polychaeta faunal diversity of Indian estuaries and lagoons has been reported by Southern (1921), Balasubhrhamanyan, (1964) Srikrishnadas *et al.* (1987) Rao (1981, 1995, 1998, 2001) Mishra, (1984, 1995) Sunder Raj & Sanjeeva Raj, (1987) Parulekar, (1969) and Pillai, (2001).

STUDY AREA AND MATERIAL& METHODS

River Krishna arising around Mahabaleswar hills situated in western ghats at 1000 mt. above sea level traverses through states of Maharastra, Karnataka, and Andhra Pradesh thus running around 2000 km and finally opens into bay of Bengal at south of Machilipatnam. At about 100 km upstream from its mouth i.e., at vijayawada a barrage has been constructed to store water for irrigation purposes and supplied through two main canals one on Krishna district side and other on guntur district side. The irrigation canals supply water to agricultural fields through a canal net-work and finally the agricultural drainage also opens into the sea at some points closer to mouth areas of the river thus forming a complex estuarine system. At a point about 38 km. upstream from the mouth of the river Krishna, it splits into two branches at Avanigadda, one called Pulleru passes towards east for about 20 km. and meets sea at a point called Hamsaladeevi-Palakayatippa. The main river traverses south-west and divides into three branches before joining sea at three points namely Lankevenitippa, Eelachetlatippa and Gullalamoda. The three branches are small, about 5-10 km in length and about 150-200 mt. wide. Pulleru branch is also of about same width. Around these four points of river openings into the sea, vast stretches of luxuriant mangrove forests developed in an area of around 160 sq km; also large tracts of mud flats, swamps and salt marshes are seen in these areas. Mangrove forests are seen around Kanur Creek also.

Salinity, the important physico-chemical feature of the estuary determines extent and spread of estuarine environment and distribution of its fauna. In Krishna estuary it is found that salinity extends to about 35-38 km upstream from its main mouth ie. upto its dividing point at puligadda as Pulleru river and krishna. Salinity all along estuarine course of the river has been found varying between 5-35 ppt., during Nov-June; less salinities are noted during July-oct. months due to more fresh water inflows of monsoon rains and salinity of 'o' ppt. was noticed even at mouth areas during this period. At Kanur Creek salinity extends to about 2-3 km during non rainy season and while in rainy season mostly fresh water conditions are noticed.

Polychaetes were collected from different localities of the four branches and at Kanur Creek through hand picking and sieving sediment samples collected from inter-tidal and low depth areas from localities as shown in fig. 1; collections are made at Kanur Creek which is about 10km. north of Machilipatnam; along this Creek which is 200 mt. wide estuarine conditions prevailed for 2-3 km and mangrove forest and mud flats developed on either side; this area has been included during this study as Krishna delta irrigation drainage passes through this creek and its proximity to Krishna estuarine system. Polychaete specimens were also collected found associated with mangroves, living in dead mangrove stems, shells and other substrata. A total of about 850 examples of polychaetes were collected during this study and are studied following Fauvel (1953), Hartman (1959), Day (1967) and other literature. All the polychaete material reported here-in has been collected by the author himself except the collections made during Feb. 97 & Feb. 98. which were collected by Dr. S. Krishnan.

SYSTAMATIC ACCOUNT

Family AMPHINOMIDAE

1. *Eurythoe parvecarunculata* Horst, 1912

Material : 1 ex., Eelachetla tippa, Nagayalanka; 10.1.2000

Description : Body broad and flat measuring 5 cm.in length and rectangular in cross section; 2 pairs of eyes; gills begin from 3rd. setigerous segment; dorsal harpoon shaped bristles and long capillary setae; ventral few capillary setae and several furcated setae.

Distribution : Andamans and Gopalpur (Orissa) coast; also reported from Mahanadi estuary; this is the second report from estuarine locality; the present specimen is collected close to the sea of salinity at 29 ppt.

Family PILARGIIDAE

2. *Talehsapia annandalei* Fauvel, 1932

Material : 2 exs., Gollamanda, Nagayalanka; 18.12.2000.

Description : Long and slender worms of 15 cm.; anterior few segments bulbous with a small prostomium; palps, eyes, antennae and peristomial tentacles absent; parapodia uniramous; a pair of anal cirri; proboscis reversible with a pair of horny jaws and four small cirri.

Distribution : Hugli-Matla estuary, Bytarani, Mahanadi and Godavari estuaries; typical estuarine species, not reported from Chilika and Pulicat lakes, the specimens described here are collected at salinity of 25 ppt.

Family NEREIDAE

3. *Namalycastis indica* (Southern 1932)

Material : 1 ex., Kanur creek, Machilipatnam; 17.9.99. 1 ex., Eelachetlatippa, Nagayalanka; 16.10.96. 1 ex., Kanur creek, Machilipatnam; 5.1.2000. 11 ex., Gullalamoda, Nagayalanka; 19.12.2000. 3 ex., Gullalamoda, Nagayalanka; 18.12.2000. 1 ex., Palleshummalapalem, Machilipatnam; 13.12.2000. 1 ex., Kothapeta, Pulleru river bank, Avanigadda; 16.12.2000. 2 ex., Eelachetlatippa, Nagayalanka; 16.9.97. 1 ex., Gullalamoda, Nagayalanka; 19.2.99.

Description : Narrow and elongated up to 4 cm. in length; knob-like paired antennae, bulbous palps, two pairs of prominent eyes and four pairs of tentacular cirri; parapodia uniramous, notopodia with aciculum and 1-2 setae; dorsal cirri enlarged towards posterior feet; ventral spinigerous setae.

Distribution : Widely distributed in estuarine and brackish water habitats along Indian coasts. The specimens described here are collected at salinity between 5-35 ppt.

4. *Namalycastis fauveli* Rao 1981

Material : 4 ex., Pulleru river bank, Kothapeta, Avanigadda; 16. 12. 2000

Description : Small and narrow specimens of 1-2 cm.; prostomium with paired small antennae, bulbous palps, and two pairs of closely arranged eyes; 4 pairs of tentacular cirri; parapodia uniramous with dorsal aciculum and 1-2 setae in anterior segments; dorsal cirri elongated and triangular towards posterior feet; ventral heterogomph spinigers with one limb of the basal piece elongated.

Distribution : Hughli-Matla estuary, Mahanadi estuary, Chilika lake and Godavari estuary. The specimens are collected from locality recording salinity of 5 ppt.

5. *Tylonereis bogoyawlenskyi* Fauvel 1911

Material : 17 ex., Gullalamoda, Nagayalanka; 24.9.98. 12 ex., Lankevenitippa, Nagayalanka; 25.9.98; 3 ex., Nachugunta, Nagayalanka; 20.12.2000. 1 ex., Gullalamoda, Nagayalanka; 11.1.2000; 1 ex., Lankevenitippa, Nagayalanka; 15.9.97.

Description : About 4-7 cm. in length; prostomium with only soft paragnaths; parapodia biramous; dorsal ligule of notopodia triangular and foliaceous; notopodia bilobed while neuropodia trilobed; only homogomph spinigerous setae.

Distribution : Hughli-Matla estuary, Godavari estuary, Tamilnadu coast, and Vembanad lake (Kerala).the specimens reported here are collected from salinities ranging 0-26 ppt.

6. *Leonnates decipens* Fauvel 1929

Material : 2 ex., Edurumondi, Nagayalanka; 18. 9. 97.

Description : Narrow specimens of about 3-4 cm; chitinous paragnaths on maxillary ring and fleshy papillae on the basal ring; parapodia bilobed with three ligules in each rami; dorsal homogomph spinigers and ventral homogomph spinigers & heterogomph falcigers with their end-pieces enlarged and abruptly truncated tips.

Distribution : Reported from gulf of Mannar; this is the first report from estuarine waters; present specimens were collected at salinity of 6.5 ppt.

7. *Dendronereis arborifera* Peters 1854

Material : 6 ex., Kanur creek, Machilipatnam;10.10.96. 3 ex., Gollamanda, Nagayalanka; 18. 12. 2000. 3 ex., Pillethummalapalem, Machilipatnam, 14.12. 2000. 13 ex., Eelachetlatippa, Nagayalanka, 16. 9. 97. 12 ex., Plakayatippa, Nagayalanka, 20. 2. 99. 29 ex., Kanur creek, Machilipatnam, 19. 2.97. 2 ex., Lankavenitippa, Nagayalanka; 22. 2. 99. 8 ex., Edurumondi, Nagayalanka, 18.9.97.

Description : Proboscis with only soft paragnaths; specimens elongated and length 2-6 cm; dorsal cirri with pinnate branchial filaments in 8-25 segments;

Distribution : Mahanadi and Godavari estuaries; widely distributed in Krishna estuary. Present specimens we re collected at salinities 0-27 ppt.

8. *Dendronereis aestuarina* Southern 1921

Material : 1 ex., Kanur creek, Machilipatnam; 12.2.99.

Description : Specimens measuring 2cm.; chitinous paragnaths absent; bipinnate branchial filaments on dorsal cirri from 12th. Segment; posterior segments with out branchiae.

Distribution : Gangetic delta, Mahanadi estuary, Chilika lake, Vellar estuary, and Cochin estuary. The specimen was collected at salinity 12 ppt.

9. *Dendronereides heteropoda* Southern 1921

Material : 2 ex., Pulleru river bank, Kothapeta, Avanigadda; 16.12.2000. 2 ex., Yedurumondi, Nagayalanka; 18.2.98. 1 ex., Gollamanda, Nagayalanka; 18.12.2000

Description : Specimens of 4-8 cm. in length; paragnaths absent; parapodia biramous; numerous gill filaments situated below dorsal cirri from 10-25th segments; notopodia with three ligules and neuropodia with four ligules.

Distribution : Gangetic delta, Mahanadi estuary, Chilika lake and Godavari estuary. The present specimens were collected at salinities ranging 5-19 ppt.

10. *Dendronereides zululadica* Day 1951

Material : 5 ex., Kanur creek, Machilipatnam; 17.9.99. 15 ex., Pulleru river bank, Palleshummalapalem, Machilipatnam; 12.10.96. 5 ex., Pulleru river bank, Palleshummalapalem, Machilipatnam; 13.12.2000.

Description : Specimens about 4-6 cm; paragnaths absent; dorsal ligule of the notopodia in the anterior 10-20th. Segments forms a pinnate four lobed branchia; dorsal cirri normal; parapodia biramous with three lobes in notopodia and single lobe in neuropodia.; posterior feet with single lobe in both ligules.

Distribution : reported from Godavari estuary only till now. The present specimens were collected at salinities ranging 5-28 ppt.

11. *Ceratonereis costae* Grube 1840

Material : 5 ex., Kanur creek, Machilipatnam; 12. 2. 99.

Description : Specimens measuring 3-5 cm; basal ring of proboscis with out chitinous Paragnaths; parapodia biramous and lobes normal; ventral falcigerous bristles present in all feet with a stout yellow shaft and small end piece in the posterior feet.

Distribution : Godavari estuary, Vellar estuary and Gujarat coast. The specimens reported here were collected at salinity 12 ppt.

12. *Ceratonereis burmensis* Monro 1937

Material : 11 ex., Kanur Creek, Machilipatnam, 16.9.98. 26 ex., Pulleru river bank Palleshummalapalem, Machilipatnam, 13.12.2000. 10 ex., Yedurumondi, Nagayalanka, 17. 2. 98. 23 ex., Lankevenitippa, Nagayalanka, 15. 2. 98. 3 ex., Lankevenitippa, Nagayalanka, 15.9. 97. 10 ex., Kanur Creek, Machilipatnam, 8.2.98.

Description : Specimens of 2-5 cm.; oral ring of proboscis with out paragnaths; lobes of feet normal; dorsal and ventral ramus of anterior feet with three ligules; ventral falcigers present in the anterior and middle feet and are absent in posterior feet.

Distribution : Hughli-Matla estuary, Godavari estuary, Goa, Maharastra and Gujarat Coast. The material reported here was collected at salinities 0-28 ppt.

13. *Nereis (Neanthes) chingrighattensis* Fauvel 1932

Material : 2 ex., Kanur Creek, Machilipatnam, 10. 10. 96. 1 ex., Kanur Creek, Machilipatnam, 8.9.97. 1 ex., Eelachetlatippa, Nagayalanka, 16. 9. 97.

Description : specimens measuring 2-4 cm.; all groups of chitinous paragnaths present; vi –several in a single transverse row, vii-viii – many in 2-3 rows deep; three ligules in both rami of anterior feet and only two ligules in neuropodia of posterior feet; only homogomph spinigers; falcigers absent.

Distribution : Hughli-Matla estuary and Mahanadi estuary. The specimens reported here are collected at salinities ranging 1-8 ppt.

14. *Nereis (Neanthes) glandicincta* Southern 1921

Material : 5 ex., Eelachetlatippa, Nagayalanka, 10.1.2000. 15 ex., Gollamanda, Nagayalanka, 18.12.2000. 5 ex., Gullalamoda, Nagayalanka, 18.2.97. 5 ex., Lankevenitippa, Nagayalanka, 15.9.97. 5 ex., Pulleru river, Pallethummalapalem, Machilipatnam, 9.9.97.

Description : specimens measuring 4-8 cm.; maxillary ring of proboscis with many chitinous paragnaths in each group; in the basal ring v-o, vi-one on either side and vii-viii-few in a single line; in several specimens vii-viii are with out any paragnaths and vi-one in a transparent form; notopodial falcigers absent; homogomph neuropodial falcigers with a long knife like terminal piece with cilia; gland like masses at the edge of parapodia.

Distribution : Gangetic delta, Chilika lake, Mahanadi estuary, Godavari estuary, Vellar estuary and Kerala back waters. The material reported here was collected at salinities 0-28 ppt.

15. *Nereis (Neanthes) willeyi* Day 1934

Material : 22 ex., Kanur Creek, Machilipatnam, 12.2.99. 25 ex., Eelachetlatippa, Nagayalanka, 16.9.97.

Description : specimens measuring 3-5 cm.; paragnaths on maxillary ring separate; basal ring with group v-1, vi-a cluster of 5-6 on each side, vii-viii – many in 3-4 rows notopodia with two ligules in anterior feet; notopodial falcigers absent; dorsal spinigers and ventral spinigers & falcigers.

Distribution : Only reported from Orissa coast till now. The specimens reported here were collected at salinities between 4-12 ppt.

16. *Perinereis aibuhitensis* (Grube 1878)

Material : 5 ex., Lankevenitippa, Nagayalanka, 21.2.99. 13 ex., Kanur Creek, Machilipatnam, 15.9.98. 21 ex., Pulleru river bank, Pallethummalapalem, Machilipatnam, 9.10.96. 4 ex., Kanur Creek, Machilipatnam, 4.1.2000. 5 ex., Eelachetlatippa, Nagayalanka, 10.1.2000. 4 ex., Gullalamoda, Nagayalanka, 19.2.99.

Description : Specimens measuring 7-10 cm.; proboscis with conical and transverse paragnaths; i-2 in a line, ii, iii, iv, -several in clusters, v-3 in a triangle, vi-two transverse paragnaths on each side, vii & viii-several in two rows deep; tentacular cirri reaching 4-5th segment; dorsal lobe of posterior feet enlarged; notopodia bilobed and neuropodia trilobed; dorsal spinigers and ventral falcigers.

Distribution : Mahanadi estuary and estuaries of Goa. The specimens reported here were collected at salinities ranging 0-33 ppt.

17. *Perinereis cultrifera* (Grube 1840)

Material : 2 ex., Pulleru river bank, Pallethummalapalem, Machilipatnam, 7.1.2000;

Description : Very long specimens of 15 cm.; prostomium with conical and transverse paragnaths v-one, vi-a single transverse paragnath on each side, vii & viii-several in three rows deep; tentacular cirri reaching 6th segment; hetero-gomph spinigers and falcigers present.

Distribution : Gangetic delta, Mahanadi estuary, Portonovo waters, and Vembanad lake (Kerala). The present material has been collected at salinity of 30 ppt.

18. *Perinereis nigropunctata* (Horst 1889)

Material : 4 ex., Gullalamoda, Nagayalanka, 10.1.2000

Description : Very long specimens; v-three in a triangle, vi-a single broad and transverse one on each side, vii&viii-several in two rows deep; dorsal ligule of notopodia enlarged in posterior feet.

Distribution : Gangetic delta, Mahanadi estuary, Chilika lake, estuaries of Goa and Gujarat coast. The specimens reported here collected at salinity of 31 ppt.

19. *Perinereis nuntia* (Savigny 1818)

Material : 2 ex., Kanur Creek, Machilipatnam, 10.10.96.

Description : specimens large, about 10cm. in length; prostomium with paragnaths on group i-2or3, ii, iii, iv-several in clusters, v & vi-several small arranged in single transverse line, vii & viii-three rows deep.

Distribution : Gangetic delta, Mahanadi estuary, Godavari estuary and estuaries of Goa. The specimens reported here were collected at salinity of 8 ppt.

Family NEPHTYIDAE

20. *Nephtys Oligobranchia* Southern 1921

Material : 1 ex., Gullalamoda, Nagayalanka, 19.12.2000. 7 ex., Gullalamoda, Nagayalanka, 18.2.97. 6 ex., Lankevenitippa, Nagayalanka, 16.2.97.

Description : Small, about 3 cm in length; prostomium small and square shaped with four small tentacles; anterior part of body tetragonal in cross section; parapodia biramous; simple setae; gills start from 7th. Setiger and disappear from 22nd segment.

Distribution : Gangetic delta, Mahanadi estuary, Chilika lake, Godavari estuary, and Cochin estuary. The material reported here has been collected at salinities ranging between 7-28 ppt.

Family GLYCERIDAE

21. *Glycera lancadivae* (Schmarda 1861)

Material : 7 ex., Pulleru river bank, Pallethummalapalem, Machilipatnam, 18.9.98. 1 ex., Kanur Creek, Machilipatnam, 12.2.99. 1 ex., Gollamanda, Nagayalanka, 18.12.2000.

Description : Long and slender forms of 7-8 cm, branchiae absent; parapodia with two anterior equal lobes and a single elongated posterior lobe.

Distribution : Hughli-Matla estuary, Orissa coast and Godavari estuary. The material reported here was collected at salinity of 12 ppt.

22. *Glycera alba* (Muller 1788)

Material : 1 ex., Pulleru river bank, Pallethummalapalem, Machilipatnam, 19.9.98. 1 ex., Kanur Creek, Machilipatnam, 12.2.99.

Description : Slender and elongated worms of 4 cm; simple branchiae; parapodia with Two equal anterior lobes and two unequal posterior lobes.

Distribution : Mahanadi estuary, Chilika lake, Godavari estuary, Pulicat lake, Vellar Estuary and Cochin estuary. The material reported here was collected at salinities 12-14 ppt.

23. *Glycera rouxii* Audouin & M. Edwards, 1878

Material : 1 ex., Nachugunta, Nagayalanka, 20.12.2000. 1 ex., Eelachetllatippa, Nagayalanka, 16.10.97. 1 ex., Gullalamoda, Nagayalanka, 17.10.97.

Description : Narrow specimens of 5-8 cm; long branchiae situated on the antero-dorsal side of each feet on all segments; feet with two lobes in each rami; anterior lobes pointed and posterior one round and the other pointed.

Distribution : Gangetic delta, Mahanadi estuary and Godavari estuary. Specimens reported here were collected at salinities ranging 8-11 ppt.

Family EUNICIDAE

24. *Marphysa sanguinea* (Montagu, 1807)

Material : 3 ex., Kanur Creek, Machilipatnam, 4.1.2000. 4 ex., Gullalamoda, Nagayalanka, 19.12.2000.

Description : Large specimens of 10 cm anterior region broad and posterior region circular; prostomium with bulbous palps and five tentacles; gills of 2-5 filaments starts from 25-30 segment and present all through; dorsal capillary setae and ventral compound knife-like, acicular and comb setae present.

Distribution : Gangetic delta, Godavari estuary and Cochin estuary. The specimens reported here are collected at salinities ranging 12-28 ppt.

25. *Diopatra neapolitana* Delle chiaje 1841

Material : 1 ex., Pulleru river bank, Palleshumalapalem, Machilipatnam, 20.9.98. 9 ex., Kanur Creek, Machilipatnam, 4.1.2000. 10 ex., Eelachetlatippa, Nagayalanka 6.10.97. 4 ex., Gollamanda, Nagayalanka, 11.1.2000. 1 ex., Nachugunta, Nagayalanka, 20.12.2000. 4 ex., Gullalamoda, Nagayalanka, 17.10.97. 8 ex., Gullalamoda, Nagayalanka, 11.1.2000. 6 ex., Kanur Creek, Machilipatnam, 12.2.99. 10 ex., Eelachetlatippa, Nagayalanka, 14.2.98.

Description : Specimens in leathery tubes covered with sand/gravel and shells etc., and 3-10 cm in length; a pair of oval frontals and 5 long occipital tentacles; a pair of small tentacular cirri on first achaetous segment; branchia with spirally arranged filaments from 5-6th Segment to 20-30th Segments; winged capillaries, pseudo compound hooks, comb setae and acicular setae.

Distribution : widely distributed in estuarine areas and lagoons. The material reported here was collected at salinities ranging 8-30 ppt.

26. *Lubrinereis tetarura* (Schmarda 1861)

Material : 1 ex., Kanur Creek, Machilipatnam, 5.1.2000. 5 ex., Gullalamoda, Nagayalanka, 19.12.2000.

Description : Long, narrow and cylindrical worms; flesh red in colour; capillary setae and simple hooks in all feet; ligule of the posterior feet not very long and erect.

Distribution : Mahanadi estuary and Porto novo waters. Specimens reported here are collected at salinities of 7-28 ppt.

27. *Lumbrinereis polydesma* (Southern 1921)

Material : 11 ex., Kanur Creek, Machilipatnam, 12.2.99. 10 ex., Gullalamoda, Nagayalanka, 19.12.2000. 1 ex., Nachugunta, Nagayalanka, 20.12.2000.

Description : Narrow and cylindrical worms of 5-10 cm; feet with capillary setae and simple hooks in all segments; dorsal cirri absent; ligule in posterior feet long but not erect.

Distribution : Gangetic delta, Pulicat lake and vellar estuary. Specimens reported here are collected at salinities of 4-28 ppt.

28. *Lumbrinereis heteropoda* (Marenzeller 1879)

Material : 2 ex., Gullalamoda, Nagayalanka, 18.12.2000.

Description : long and rounded worms of 15 cm; prostomium conical; parapodia with two unequal lobes of which one lobe increases in length towards posterior feet forming an erect cirriform ligule; capillary setae and simple hooks.

Distribution : Gangetic delta, Godavari estuary and Cochin estuary. Specimens reported here are collected at salinity of 12 ppt.

29. *Lumbrinereis notocirrata* (Fauvel 1932)

Material : 2 ex., Gullalamoda, Nagayalanka, 17.10.97.

Description : Very long and cylindrical forms in flesh-red in colour while living; prostomium blunt; small knob-like dorsal cirri at edge of the feet and becoming elongated towards posterior side; winged capillaries and simple hooks.

Distribution : Gangetic delta, Rishikulya estuary and Visakhapatnam backwaters. Specimens reported here are collected at salinity of 11 ppt.

Family ORBINIDAE**30. *Haploscoloplos kerguelensis* (Mc Intosh, 1885)**

Material : 7 ex., Lankevenitippa, Nagayalanka, 25.9.98. 4 ex., Gullalamoda, Nagayalanka, 15.10.97. 2 ex., Gullalamoda, Nagayalanka, 19.12.2000.

Description : specimens 6-8 cm in length; prostomium pointed; proboscis multiple sac-like; body divided into flattened thorax of 20-22 segments and rounded abdomen of several segments; branchiae start from 20th. Segment; all setae crenulate capillaries only, no hooks; pair of anal cirri.

Distribution : Visakhapatnam back waters and Mahanadi estuary. Material reported here was collected at Salinities ranging between 0-28 ppt.

Family SPIONIDAE

31. *Polydora kempi* Southern 1921

Material : 1 ex., Kanur Creek, Machilipatnam, 10.10.96.

Description : Small and narrow worm of 3 cm; fifth setigerous segment modified with stout and blunt tipped bristles; gills begin on 7th. Setigerous segment.

Distribution : Gangetic delta, Chilika lake, Godavari estuary, Porto novo waters and Cochin estuary. The specimen was collected at salinity of 8 ppt.

32. *Polydora ciliata* (Johnston 1838)

Material : 1 ex., Pulleru river bank, Palakayatippa, Avanigadda, 17.12.2000

Description : Small specimen enclosed in muddy tube; fifth setigerous segment modified Having stout hooks with a bent tip and lateral teeth; gills start from 7th. Setigerous segment and disappear in posterior segments; bidentate ventral hooks start from 7th Setigerous segment.

Distribution : Baitarani estuary, Pulicat lake and Porto novo waters. Specimen reported here was collected at salinity of 18 ppt.

33. *Scoelepis squamata* (Muller 1806)

Material : 1 ex., Nachugunta, Nagayalanka, 20.12.2000. 3 ex., Kanur Creek, Machilipatnam, 11.12.2000;

Description : Worms up to 5 cm in length; prostomium pointed with occipital keel; body divided into anterior flattened thorax and rounded abdomen; branchiae from 2nd. Setiger and present all over except the last few segments; notopodial lamellae fused to branchiae; thorax with capillary setae on both rami while abdomen with dorsal capillary setae and ventral bidentate hooks.

Distribution : Rishikulya estuary, Godavari estuary, Pulicat lake, Vellar estuary and Porto novo waters. Specimens reported here are collected at salinities of 26-28 ppt.

34. *Malcoceros indicus* (Fauvel 1928)

Material : 2 ex., Gullalamoda, Nagayalanka, 23.9.98. 4 ex., Kanur Creek, Machilipatnam, 12.2.99. 3 ex., Kanur Creek, Machilipatnam, 8.2.98.

Description : Narrow and elongated specimens of 6-8 cm. in length; prostomium with Lateral peaks; gills from 1st setiger and notopodial lamellae fused with branchiae; dorsal

capillary setae and ventral hooded hooks; few neuropodial capillaries small with abruptly pointed tips in posterior feet.

Distribution : Rishikulya estuary and Porto novo waters. Material reported here was collected at salinities ranging 4-31 ppt.

Family CAPITELLIDAE

35. *Pulliella armata* Fauvel 1929

Material : 2 ex., Kanur Creek, Machilipatnam, 17.9.98.

Description : Small and narrow worms of 2 cm; thorax with 9 setigerous segments with only capillary setae; first three abdominal segments with dorsal and ventral hooks arranged in transverse rows; remaining abdominal segments with well marked dorsal tori; Posterior abdominal segments expanded with dorsal acicular setae and ventral hooks.

Distribution : Godavari estuary and Chilika lake. Specimens reported here are collected at salinity of 8 ppt.

36. *Notomastus latericeus* Sars 1851

Material : 10 ex., Pulleru river bank, Pallethummalapalem, Machilipatnam, 9.10.96. 1 ex., Gollamanda, Nagayalanka, 18.12.2000. 2 ex., Gullalamoda, Nagayalanka, 19.12.2000.

Description : Very long and stout specimens of 15 cm; thorax of 11 setigerous segments with only capillary setae; gills simple, small and retractile on both rami; abdomen with hooks on uncinigerous tori.

Distribution : Chilika lagoon and Godavari estuary. Specimens reported here are collected at salinities ranging between 0-28 ppt.

37. *Heteromastus similis* Southern 1921

Material : 18 ex., Kanur Creek, Machilipatnam, 16.9.98. 45 ex., Gullalamoda, Nagayalanka, 16.10.97. 9 ex., Pulleru river bank, Machilipatnam, 14.12.2000. 16 ex., Kanur Creek, Machilipatnam, 12.2.99. 4 ex., Eelachetlatippa, Nagayalanka, 16.10.97. 10 ex., Palakayatippa, Nagayalanka, 21.2.97. 9 ex., Lankevenitippa, Nagayalanka, 15.10.97. 1 ex., Edurumondi, Nagayalanka, 18.2.98.

Description : Narrow and elongated worms of 5-15 cm; first five thoracic segments with capillary setae and next six segments with long hooks; filliform gills on the abdominal segments.

Distribution : Mahanadi estuary, Chilika lake, Godavari estuary, Pulicat lake, vellar estuary and Porto novo waters. Material reported here has been collected at salinities ranging between 0-31 ppt.

38. *Dasybranchus caducus* (Grube 1846)

Material : 1 ex., Lankevenitippa, Nagayalanka, 15.10.97

Description : Long and stout specimen of 12 cm in length and 2 mm in width; thorax of 13 setigerous segments and tessellated with only capillaries; long abdomen of several segments with compound filiform gills (6-10 branches) and short hooks situated on tori.

Distribution : Godavari estuary. This is the second report from coastal waters of India. The specimen was collected at salinity of 0 ppt.

39. *Barantolla sclupta* Southern 1921

Material : 8 ex., Lankevenitippa, Nagayalanka, 15.10.97. 2 ex., Lankevenitippa, Nagayalanka, 15.2.98.

Description : Narrow specimens of 6-8 cm; thorax with first six setigerous segments with capillaries and next five segments with hooks; abdomen of several segments with only hooks; gills begin in the middle region each consisting of 4-6 finger shaped lobes situated near dorsal parapodial lobes.

Distribution : Gangetic delta, Chilika lake and Pulicat lake. Specimens reported here are collected at salinities of 0-24 ppt.

40. *Branchiicapitella singularis* Fauvel 1932

Material : 6 ex., Pulleru river bank, Palakayatippa, Nagayalanka, 12.1.2000

Description : Specimens narrow measuring 6-8 cm; thorax with seven setigerous segments with capillaries only; 8 and 9th segments with ventral hooded hooks and dorsal copulatory organ formed with large, bent acicular spines of 8 nos., two of each ramus; abdomen with dorsal and ventral hooks; finger shaped branchial filaments situated dorsally in the abdominal region.

Distribution : Pulicat lake, Vellar estuary, and Porto novo waters. The present material was collected at salinity of 30 ppt.

41. *Paraheteromastus tenuis* Monro 1937

Material : 15 ex., Pulleru river, Pallethummalapalem, Machilipatnam, 12.10.96; 3 ex., Pulleru river, Avanigadda, 17.12.2000. 6 ex., Kanur Creek, Machilipatnam, 8.10.97. 1 ex., Edurumondi, Nagayalanka, 18.10.97. 1 ex., Lankevenitippa, Nagayalanka, 15.10.97.

Description : Very narrow specimens of 4-6 cm; first four thoracic segments with capillaries; while remaining seven thoracic segments with long hooks; abdomen several segmented with hooks only; no branchiae.

Distribution : Gangetic delta, Godavari estuary, Vellar estuary and Cochin estuary. Specimens reported here are collected at salinities ranging 0-18 ppt.

Family AMPHARETIDAE

42. *Melinna aberrans* Fauvel 1932

Material : 4 ex., Pulleru river bank, Pallethummalapalem, Machilipatnam, 9.10.97

Description : Specimens of 4cm. in length, narrow enclosed in thick muddy tubes; Body more than 50 segments of which thorax with 13 setigerous segments; gills four pairs and subulate; a pair of big post branchial hooks on 5 th. Segment; thorax with dorsal capillaries and ventral uncini; abdomen with uncinigerous pinnules.

Distribution : Mahanadi estuary, Vellar estuary and Porto novo waters. Specimens reported here are collected at salinity of 14 ppt.

43. *Isolda pulchella* Muller 1858

Material : 1 ex., Gullalamoda, Nagayalanka, 17.10.97; 1 ex., Eelachetlatippa, Nagayalanka, 16.10.97.

Description : small and narrow specimens of 2 cm, body divided into thorax and abdomen; buccal tentacles not seen; four pairs of gills of which two pairs subulate and two pairs pinnate; thorax of 13 setigerous segments and abdomen of about 30 segments with uncinigerous pinnules.

Distribution : Hughli-matla estuary, Mahanadi estuary and Godavari estuary. Specimens reported here are collected at salinities of 8-11 ppt.

Family TERESELLIDAE

44. *Loimia medusa* (Savigny 1820)

Material : 2 ex., Eelachetlatippa, Nagayalanka, 10.1.2000. 1 ex., Gollamanda, Nagayalanka, 11.1.2000. 1 ex., Gullalamoda, Nagayalanka, 19.12.2000.

Description : Large and stout specimens in tubes coated with fine sand; several long filliform tentacles with purple coloured bands; three pairs of arborescent gills; thorax of 17 segments;

dorsal capillaries and ventral pectinate uncini; abdomen with uncinigerous pinnules; ventral thick pads.

Distribution : Widely distributed at river mouths on Indian coast. Specimens reported here are collected at Salinities ranging between 26-29 ppt.

45. *Terebellides stroemi* Sars 1835

Material : 1 ex., Pulleru river bank, Palakayatippa, Avanigadda, 12.1.2000

Description : Specimen of 4cm. in length; thoracic region of 18 segments with dorsal capillaries and ventral uncini; single dorsal gill with 4 pectinate divisions;

Distribution : Godavari estuary (Kakinada bay) and Porto novo waters. The specimen reported here was collected at salinity of 30 ppt.

DISCUSSION

The present studies revealed occurrence of 45 species belonging to 30 genera and 11 families. Among different families, Nereidae is found to be dominant in both in diversity and population richness as 17 species of this family are found and among 850 specimens nearly half belong to this family. Families Capitellidae and Eunicidae are next in diversity and in populations as 161 examples belonging to 7 species are capitellids and 129 specimens of 6 species are eunicids. Families Glyceridae, Spionidae, Amharetidae, and Terebellidae are represented by 4-2 species. The families Amphinomidae, Pilargidae, Orbinidae and Nepthydidae are poorly represented with single species.

Among 17 species of Nereidae *N.indica*, *T. bogoyawlenskyi*, *D. arborifera*, *D. zululandica*, *C. burmensis*, *N (N) glandicincta*, *N (N) willeyi*, *P. aibuhitensis* are common occurring in more numbers while species viz., *N. fauveli*, *L. decipens*, *D.aesturina*, *P. nigropunctata* and *P. nuntia* are uncommon and collected from 1-2 localities in 1-2 specimens. Though 3 species in glyceridae each is represented by few specimens, thus it appears this family is uncommon in estuaries and prefers river mouth regions with sandy substratum. The eunicid *D. neapolitana* is wide spread in its occurrence while *Lumbrinereis* and *Marphysa* species are less common in distribution. *H. kerugulensis* of family Orbinidae is moderately distributed while in family Spionidae *P. kempfi*, *P. ciliata*, *S. squamata* and *M.indicus* are reported from 1-2 localities and in few numbers only. Among capitellids *H. similis* and *P. tenuis* are widely distributed particularly the former in comparison to *D. caducus* and *P. armata* which are reported in 1-2 examples from single locality only.

Species viz. *E. parvicarunculata*, *L. decipiens*, and *N(N) willeyi* are being reported first time from estuarine habitat; the three species are reported earlier from marine habitat only viz. Andamans & Orissa coast, Gulf of Mannar, and Orissa coast respectively; this indicates the three species also can withstand wide salinity fluctuations as several other euryhaline polychaete species. Pilargid species *T. annandalei* which was reported first from Indian waters (Rao, 1977) from Baitarani estuary (Orissa) after its discovery by Fauvel (1932) has been since reported from Hughli-Matla, Mahanadi and Godavari estuaries; its record from Krishna estuary indicates its extension to this region. Similarly *D. zululandica* reported from Godavari estuary (Srinivasa Rao, 1978) has been reported from same locality (Rao, 2001). Occurrence of this species from present locality is significant in its distribution. This species has not been reported from anywhere else from Indian coasts. The occurrence of *G. lancadivae*, *G. rouxi*, *L. notocirrata*, *H. kerugulensis*, *P. armata*, *N. latericeus*, *D. caducus* and *I. pulchella* from this estuary shows the extension of its occurrence to this region as these are reported till now only from northern part of east coast up to Godavari estuary. These are not reported from anywhere south of Godavari estuary and West Coast also.

Studies on polychaete diversity and their distribution in Krishna estuary indicate that it is comparable to those of major estuaries viz. Gangetic delta, Mahanadi, Godavari and Vellar estuaries as a total of 70 species are reported from Godavari estuary including Kakinada bay, while 69 species from Hughli-Matla and 40 species from Mahanadi estuaries. Further investigations in this area are likely to reveal more polychaete diversity as species hitherto restricted to northern part of east coast up to Godavari estuary and species of southern part viz. Pulicat lake, Madras back waters, Vellar estuary and Porto Novo waters are found to occur in Krishna estuary.

ACKNOWLEDGEMENTS

The author is thankful to the Director, Zoological Survey of India, Kolkata for encouragement and providing necessary facilities in carrying out this work. Thanks are also due to the staff members of Estuarine Biological Station, Zoological Survey of India, Berhampur for their assistance in the field surveys.

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HERMIT CRABS (CRUSTACEA : DECAPODA)

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INTRODUCTION

Reports on hermit crabs from estuarine areas along the east coast of India are available from Vellar estuary, Porto Novo (Reddi 1935, Khan & Natarajan 1981, 84), Ennur Backwaters, Tamilnadu (Henderson 1893); Chilka Lake (Henderson, 1915, Kemp 1915, Sewell & Annandale, 1922, Reddy, 1995), Mahanadi estuary, Orissa (Reddy, & Murthy, 1998) and from Hugli Matla estuary, West Bengal (Alcock, 1905, Reddy, 1995). From the west coast of India a stray report of one species, *Clibanarius longitarsus* (deHaan) is available from Neendakarai estuary, Quilon, Kerala (Thomas, 1989). But so far, there is no report of any hermit crab from Krishna estuary in the literature published.

Present study of hermit crabs collected from Krishna estuary, Andhra Pradesh by Estuarine Biological Station, Zoological Survey Of India, Berhampur revealed the presence of 8 species belonging to 3 genera and 2 families. All are being reported for the first time from Krishna estuary. One species, *Coenobita cavipes* Stimpson is being reported for the first time from the coast of Andhra Pradesh. Systematic account of the species identified is given below.

LIST OF THE SPECIES REPORTED

Phylum CRUSTACEA

Class MALACOSTRACA

Sub-Class EUMALACOSTRACA

Super Order EUCARIDA

Order DECAPODA

Sub-Order PLEOCYEMATA

Infra Order ANOMURA

Super Family COENOBITOIDEA

Family DIOGENIDAE

1. *Clibanarius longitarsus* (de Haan)
2. *Cl. padavensis* de Man
3. *Cl. olivaceus* Henderson
4. *Diogenes diogenes* (Herbst)
5. *D. affinis* Henderson
6. *D. avarus* Heller
7. *D. sp.*

Family COENOBITIDAE

- *8. *Coenobita cavipes* Stimpson

*Not reported so far from the coast of Andhra Pradesh

SYSTEMATIC ACCOUNT

Key to the species reported from Krishna estuary

- 1 Antennular flagella end in a filament 2
 - Antennular flagella end abruptly and bluntly *Coenobita cavipes*
2. Chelipeds subequal; fingers of chelipeds opening and closing horizontally 3
 - Chelipeds unequal, as the left is vastly larger; fingers of chelipeds opening and closing obliquely 5
3. Hands rough with spinules; coloured stripes present on second and third pereopods 4
 - Hands comparatively smooth with less spinules; coloured stripes absent on pereopods *Clibanarius olivaceus*
4. Red stripes distinct on eyestalks and second and third pereopods *Cl. padavensis*
 - Red stripes absent on eyestalks; a pale blue band bordered with red on second and third pereopods *Cl. longitarsus*
5. The rostrum is a narrow lamina, with the free edge spinose 6
 - The rostrum is a slender, simple (non-serrated) spinule 7
6. Atennal acicle bifurcate, the outer branch longer and reaches just or barely, the base of the terminal joint of the peduncle; outer surface of the left hand with claw-shaped spines *Diogenes diogenes*

- Antennal acicle obscurely bifurcate, the outer branch does not reach the base of the terminal joint of the peduncle; outer surface of left hand closely and finely granulous *D. affinis*
- 7. Fixed finger of left cheliped deflexed *D. avarus*
- Fixed finger of left cheliped not deflexed..... *D. sp.*

Family DIOGENIDAE

1. *Clibanarius longitarsus* (de Haan)

1849. *Pagurus longitarsus* de Haan, *Fauna Japon, Crust.*, p. 211, pl. 1, fig. 3.

1852. *Clibanarius longitarsus* : Dana, *U.S. Expl. Crust.*, pt. 1, p. 464.

1989. *Clibanarius longitarsus* : Thomas, *J. mar. biol. Ass. India*, 31 : 65.

Material : 1 ex., (9.5 mm), Reg. No. 2876, Bhawanipur, near Kammavari Cheruvu, mouth of Pulleru River, 9.x.1996; 2exs., (8.7, 12.2 mm), Reg. No. 2883, Kanur, near Machilipatnam, mouth of a channel of Pulleru River, 10.x.1996; 1 ex., Reg. No. 2902, Lankavani Tippa, near Nagayalanka, mouth of Krishna River, 15.x.1996; 4 exs., (10-13 mm), Reg. No. 2925, Nachukunta, near Nagayalanka, 18.x.1996; 5 exs., (5-14 mm), Reg. No. 2942, Kanur, near Machilipatnam, 11.ii.1997; 1 ex., (15 mm), Reg. No. 2955, Chenta Kalva Mundi, near Machilipatnam, 13.ii.1997; 1 ex., (18 mm), Reg. No. 2966, Kammavari Cheruvu, near Machilipatnam, 14.ii.1997; 4 exs., (6-10 mm), Reg. No. 2976, Lankavani Tippa, near Nagayalanka, 16.ii.1997; 2 exs., (12-13 mm), Reg. No. 2935, Yelachetla Dibba, near Nagayalanka, 17.ii.1997; 2 exs., (7-12.6 mm), Reg. No. 3002, Kanur, mouth of a branch of Krishna River, 7.ix.1997; 1 ex., (10.5 mm), Reg. No. 3010, Kanur, mouth of a branch of Krishna River, 8.ix.1997; 2 exs., (5,10 mm), Reg. No. 3036, Kanur bridge, mouth of a branch of Krishna River, 12.ix.1997; 6 exs., (4-16 mm), Reg. No. 3046, Lankavani Tippa, near Nagayalanka, mouth of 3rd sub-branch of Krishna River, 15.ix.1997; 1 ex., (15 mm), Reg.No.3050, Enkatulu Tippa, near Nagayalanka, mouth of 2nd sub-branch of Krishna River, 16.ix.1997; 5 exs., (5.7-13 mm), Reg. No. 3067, Idrimundi, near Nagayalanka, mouth of 1st sub-branch of Krishna River, 18.ix.1997; 2 exs., (12, 14 mm), Reg. No. 3119, Pedda Kanur, near Machilipatnam, 8.ii.1998; 2 exs., (M-19.5 mm, Ovigerous F-12.5 mm), Reg. No. 3120, Yelachetla Dibba, mouth of Krishna River, 14.ii.1998; 2 exs., (4-10 mm), Reg. No. 3121, Yesupuram, near Nagayalanka, 18.ii.1998; 2 exs., (8, 12.6 mm), Reg. No. 3122, Pedda Kanur, near Machilipatnam, 7.ii.1998; 2 exs., (7.5 mm each), Reg. No. 3146, Kanur bridge, mouth of Krishna River, 15.ix.1998; 3 exs., (12-18.2 mm), Reg. No. 3173, Pathapalle Thummalapalem, mouth of Krishna River, 18.ix.1998; 3 exs., (13-15 mm), Reg. No. 3201, Swaralaganga, Nagayalanka, 23.ix.1998; 7 exs., (12-18 mm), Reg. No. 3217, Lankavani Tippa, near Nagayalanka, 25.ix.1998; 6 exs., (5-12 mm), Reg. No. 3239, Kanur village, near

Machilipatnam, mouth of Pulleru River, 12.ii.1999; 3 exs., (7.5-11 mm), Reg. No. 3263, Pathapalle Thummalapalem, mouth of a branch of Krishna River, 15.ii.1999; 5 exs., (7.2-8.5 mm), Reg. No. 3307, Opposite Hamsala Divi, mouth of a branch of Krishna River, 17.ii.1999;

Diagnostic characters : Eye stalks as long as antennular peduncles, a little longer than anterior border of carapace; ophthalmic scales small with pointed tips. Antennal acicles reaching middle of the last segment of antennal peduncle with serrated inner margins. Chelipeds equal provided with long setae, palm and wrist with dark tipped spines, fingers with one or two rows of spines, carpus with a distinct spine on the inner side of upper distal end, merus with a spinule on the outer side of upper distal end. Dactylus of 3rd legs longer than propodus. Eyestalks without colour bands; 2nd and 3rd pereopods with a blue band bordered with red.

Distribution : India – It is reported on West coast from Neendakarai estuary, Quilon (Kerala) and on East coast from Gulf of Mannar in the South to Chilka Lake in the North and Andaman & Nicobar Islands.

Elsewhere : It is reported from different coasts from East coast of Africa, Red Sea, Singapore, Vietnam, Indonesia, China, and North Pacific Islands to Japan.

Remarks : It is interesting to note that it has not been reported so far from Hugli Matla estuary on East coast of India.

2. *Clibanarius padavensis* de Man

1888. *Clibanarius padavensis* de Man, *J. Linn. Soc. (Zool.)*, **22** : 242.

1899. *Clibanarius padavensis* : Thomas, *J. mar. biol. Ass. India*, **31**(1&2) : 63.

Material : 3 exs., (12-16 mm), Reg. No. 2942, Kanur, mouth of Krishna River, 11.ii.1997; 1 ex., (10 mm), Reg. No. 2976, Lankavani Tippa, near Nagayalanka, 16.ii.1997; 2 exs., (12, 13 mm), Reg.No. 2985, Yelachetla Dibba, near Nagayalanka, 17.ii.1997; 4 exs., (8-13 mm), Reg. No. 3002, Kanur, mouth of Krishna River, 7.ix.1997; 1 ex., (9 mm), Reg. No. 3036, Kanur bridge, mouth of a branch of Krishna River, 12.ix.1997; 3 exs., (8-13 mm), Reg. No. 3060, Lighthouse, Nagayalanka, mouth of 1st sub-branch of Krishna River, 17.ix.1997; 1 ex., (14 mm), Reg. No. 3067, Idrimundi, near Nagayalanka, mouth of 1st sub-branch of Krishna River, 18.ix.1997; 1 ex., (10.5 mm), Reg. No. 3076, Palkaya Tippa, Nagayalanka, mouth of a branch of Krishna River, 19.ix.1997; 1 ex., (15 mm), Reg. No. 3119, Pedda Kanur, near Machilipatnam, 8.ii.1998; 2 exs., (7.4-8.3 mm), Reg. No. 3120, Yelachetla Dibba, mouth of Krishna River, 14.ii.1998; 5 exs., (7-15 mm), Reg. No. 3122, Pedda Kanur, near Machilipatnam, 7.ii.1998; 2 exs., (7, 10 mm), Reg. No. 3146, Kanur bridge, mouth of Krishna River, 15.ix.1998; 3 exs., (13 mm each), Reg. No. 3156, Kanur village, mouth of Krishna River, 16.ix.1998; 14 exs., (10-13 mm), Reg. No. 3201, Swaralaganga, Nagayalanka, mouth of Krishna River,

23.ix.1998; 1 ex., (9 mm), Reg. No. 3209, near Lighthouse, Nagayalanka, 24.ix.1998; 3 exs., (6-12 mm), Reg. No. 3239, Kanur village, mouth of Pulleru River, 12.ii.1989; 2 exs., (12.5 mm each), Reg. No.3307, Hamsala Divi, mouth of a branch of Krishna River, 17.ii.1999.

Diagnostic characters : Eye stalks as long as the antennular peduncles but about one-sixth longer than the anterior border of the carapace. Chelipeds equal and similar; merus with 1 of 2 spinules at the distal end of the outer lower border; carpus with a distinct spine at the distal end of the dorsal inner border. Distinct red longitudinal stripes on eyestalks and walking legs.

Distribution : India-It is reported all along East coast from Rameswaram and Athankarai estuary (Palk Bay) in the South to Hugli Matla estuary in the North.

Elsewhere : It is reported at different coasts from East coast of Africa to Australia.

3. *Clibanarius olivaceus* Henderson

1915. *Clibanarius olivaceus* Henderson, *Rec. Indian Mus.*, **11** : 26.

1972. *Clibanarius olivaceus* Sarojini & Nagabhushanam, *Rec. zool. Surv. India*, **66** : 253.

Material : 1 ex., (5.4 mm), Reg. No. 2883, Kanur, near Machilipatnam, mouth of a channel of Pulleru River, 10.x.1996; 3 exs., Reg. No. 2902, Lankavani Tippa, near Nagayalanka, mouth of Krishna River, 15.x.1996; 2 exs., (7 mm each), Reg. No. 3002, Kanur, mouth of a branch of Krishna River, 7.ix.1997; 4 exs., (5-7.5 mm), Reg. No. 3050, Enketulu Tippa, near Nagayalanka, mouth of Krishna River, 16.ix.1997; 1 ex., (7.2 mm), Reg. No. 3067, Idrimundi, near Nagayalanka, mouth of 1st sub-branch of Krishna River, 18.ix.1997; 1 ex., (5 mm), Reg. No. 3076, Palkaya Tippa, Nagayalanka, mouth of a branch of Krishna River, 19.ix.1997; 2 exs., (4.5, 6 mm), Reg. No. 3121, Yesupuram, near Nagayalanka, 18.ii.1998; 1 ex., (9 mm), Reg. No. 3209, near Light house, Nagayalanka, 24.ix.1998; 1 ex., (11 mm), Reg. No. 3217, Lankavani Tippa, near Nagayalanka, 25.ix.1998; 1 ex., (6 mm), Reg. No. 3239, Kanur village, mouth of Pulleru River, 12.ii.1999.

Diagnostic characters : Eyestalks as long as the antennular peduncles but distinctly longer than the anterior border of the carapace. Chelipeds subequal and similar. The hand with a few scattered granular tubercles and setae. No spines on the entire palmar surface. The fingers rougher becoming spinous towards the tips and more setose than the palm. The length of the hand including the fingers is almost twice its breadth.

Distribution : India – It is reported on East coast from Vellar estuary, Porto Novo in the South to Hugli Matla estuary in the North and also from Andaman Islands.

Elsewhere : Not reported.

4. *Diogenes diogenes* (Herbst)

1791. *Cancer diogenes* Herbst, *Krabben*, 2 (1) : 17, pl. 22, fig. 5.

1905. *Diogenes diogenes* : Alcock, *Cat. Indian Decapod Crust.*, pt. 2 (1) : 62, pl. 15, fig. 3.

1989. *Diogenes diogenes* : Thomas, *J. mar. biol. Ass. India*, 31 (1 & 2) : 71.

Material : 1 ex., (25 mm), Reg. No. 2955, Chenta Kalva Mundi, near Machilipatnam, 13.ii.1997; 1 ex., (15 mm), Reg. No. 3187, Mangenapudi, mouth of Krishna River, 20.ix.1988; 1 ex., (12.5 mm), Reg. No. 3194, Bhawanipur, near Kammavari Cheruvu, mouth of Krishna River, 21.ix.1998.

Diagnostic characters : Rostrum long, about one-third the length of the eyestalks, with its distal half spinose. Antennular peduncle exceeds the length of antennal peduncle by about half of its terminal joint. Antennal acicle bifurcate, the opposed edges of the fork spinulose; the outer prong barely reaches the base of the terminal joint, the inner prong reaches about midway along the penultimate joint of the peduncle. Chelipeds bear claw-shaped spines on the outer surface of the palm, edges of their joints spinose and setose, fingers of the smaller cheliped and the dactyli of 2nd and 3rd legs thickly plumose.

Distribution : India – It is reported all along East coast from Tuticorin (Gulf of Mannar) in the South to Hugli Matla estuary in the North. From West coast it is reported from Mangalore (Karnataka), Calicut & Azhicode (Kerala).

Elsewhere : It is reported from Sri Lanka's coast in Gulf of Mannar.

5. *Diogenes affinis* Henderson

1893. *Diogenes affinis* Henderson, *Tr. Linn. Soc. Zool.*, (2) 5 : 415, pl. 39, fig. 1, 2.

1905. *Diogenes custos* var. *affinis* : Alcock, *Cat. Indian Decapod Crust.*, pt. 2(1) : 65, pl. 6, fig. 2.

1972. *Diogenes affinis* : Sarojini & Nagabhushanam, *Rec. Zool. Surv. India*, 66(1-4) : 259-261, fig. 3.

Material : 33 exs., (5-8 mm), Reg. No. 2955, Chenta Kalva Mundi, near Machilipatnam, 13.ii.1997.

Diagnostic characters : Rostrum shorter, but slightly longer than ophthalmic scales. Antennular peduncle shorter than the antennal peduncle. Antennal acicle indistinctly bifurcate and the outer prong does not reach the base of the terminal joint of the peduncle. Antennal flagellum thickly setose. In the left cheliped, the palm is broader than long.

Distribution : India – It is reported on East coast from Chennai in the South to Hugli Matla estuary in the North.

Elsewhere : It is reported from East coast of Africa and the coast of Myanmar.

6. *Diogenes avarus* Heller

1865. *Diogenes avarus* Heller, *Novara Crust.*, p. 183, Pl. 7, fig. 2.

1905. *Diogenes avarus* : Alcock, *Cat. Indian Decapod Crust.*, pt. 2(1) : 68.

1989. *Diogenes avarus* : Thomas, *J. mar. biol. Ass. India*, 31 : 74.

Material : 1 ex., (5 mm), Reg. No. 2883, Kanur, near Machilipatnam, mouth of a channel of Pulleru River, 10.x.1996; 7 exs., (7 mm each), Reg. No. 3002, Kanur, mouth of a branch of Krishna River, 7.ix.1997; 2 exs., (4, 4.5 mm), Reg. No. 3067, Idrimundi, near Nagayalanka, mouth of 1st sub-branch of Krishna River, 18.ix.1997; 1 ex., (6 mm), Reg. No. 3209, near Lighthouse, Nagayalanka, 24.ix.1998; 13 exs., (5-6.5 mm), Reg. No. 3217, Lankavani Tippa, near Nagayalanka, 25.ix.1998; 3 exs., (5-7 mm), Reg. No. 3224, Sangameswara, Nagayalanka, mouth of Krishna River, 26.ix.1998;

Diagnostic characters : Eyestalks reaching to the middle third of the last segment of the antennular peduncles. Rostrum slender, shorter than ophthalmic scales. Antennal peduncles slightly shorter than antennular peduncles. Antennal acicle straight, barely reaching the base of the terminal joint of the peduncle.

Left cheliped stouter and vastly larger than the right, about two and a half times the length of the carapace; segments granules, more finely on hand. Carpus longer than merus as well as palm. Palm nearly twice as long as broad, its outer surface longitudinally carinated near the middle line, the carina gradually fading away before it reached the finger cleft. The fixed finger deflexed, dactylus less than half the length of palm.

Distribution : India – It is reported all along East coast from Rameswaram in the South to Hugli Matla estuary in the North.

Elsewhere : It is reported from the coasts of Persian Gulf, Mergui (Myanmar), Philippines and Queensland (Australia).

7. *Diogenes* sp. (approx *investigatoris* Alcock)

Material : 3 exs., (5-7 mm), Reg. No. 3050, Enketulu Tippa, near Nagayalanka, mouth of 2nd sub-branch of Krishna River, 16.ix.1997; 1 ex., (4 mm), Reg. No. 3076, Palkaya Tippa, Nagayalanka, mouth of a branch of Krishna River, 19.ix.1997; 1 ex., (4.5 mm), Reg. No. 3239, Kanur village, mouth of Pulleru River, 12.ii.1999.

Diagnostic characters : Eyestalks reach to the middle third of the terminal joint of the antennular peduncle. Antennal and antennular peduncles are of equal length. Ophthalmic Scales have the free edge spinose throughout. Antennal acicle does not reach the base of the last joint of the peduncle.

Edges of all the segments of the left cheliped are setose and non-serrulate, merus as long as carpus, palm shorter than carpus and is higher than long. Fixed finger not deflexed and the fingers when closed do not leave any gap.

A specimen collected from Kanur village has the distinct sharp spine at the proximal end of the inner lower border of merus of left cheliped, which is a character of *D. investigatoris*. Specimens collected from the other two localities at Nagayalanka do not show the spine.

All the specimens have an obliquely longitudinal crest on the outer surface of palm of left cheliped starting from carpal joint, which fades away before reaching finger cleft. A carina is seen between this crest and upper border of the palm. Whole outer surface of hand is granulous. No serration on the lower edge of hand or fixed finger and no spines on the outer surface of palm.

Confirmation of these specimens will be taken out at a later date, after consulting the recent literature, which is not available to the authors at present.

Family COENOBITIDAE

8. *Coenobita cavipes* Stimpson

1859. *Coenobita cavipes* Stimpson, *Proc. Acad. Nat. Sci. Philad.*, p. 245.

1905. *Coenobita cavipes* : Alcock, *Cat. Indian Decapod Crust.*, pt. 2 (1) : 146, pl. xiv, fig. 1.

1950. *Coenobita cavipes* : Barnard, *Ann. South African Mus.*, 38 : 470.

Material : 1 ex., (33.2 mm), Gollalamoda (Lighthouse area near Nagayalanka, mouth of Krishna River, 17.x.1996;

Diagnostic characters : Eyestalks compressed, dorsally punctate, reaching the base of the terminal joint of the antennular peduncle and nearly to the middle of the last joint of the antennal peduncle. Antennal acicle fused with the second joint of the peduncle.

Chelipeds and legs relatively smooth. Upper part of the outer surface of the left palm without any oblique file of upright laminar teeth (stridulating mechanism, a characteristic feature of *C. rugosus*) but studded with vesicular granules with corneous tips; the lower part quite smooth. A thick brush of long hairs on the upper part of the inner surface of both the palms.

Distribution : India – It is reported on East coast from Krusadai Island (Gulf of Mannar) in the South to Hugli Matla estuary in the North and Andaman & Nicobar Islands.

Elsewhere : It is reported from East coast of Africa, Red Sea, Indo-Pacific to West coast of America.

Remarks : Species of the genus, *Coenobita* are adapted to terrestrial conditions and seen on coastal forest land. It is being reported for the first time from the coast of Andhra Pradesh.

ACKNOWLEDGEMENTS

The authors are grateful to Dr. C.A. Nageswara Rao, the then Officer-in-Charge, Estuarine Biological Station, Berhampur, for sending the material to them for identification and to the Director, Zoological Survey Of India, Calcutta, for providing the laboratory facilities.

SUMMARY

Study of hermit crabs (210 exs) collected from Krishna estuary, Andhra Pradesh revealed the presence of 8 species belonging to 3 genera and 2 families. All have been reported for the first time from this estuary. One species of land hermit crab, *Coenobita cavipes* has been reported for the first time from the coast of Andhra Pradesh. Confirmation of one species of the genus *Diogenes* has been kept pending and will be taken up in a subsequent paper.

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BRACHYURAN CRABS (CRUSTACEA : DECAPODA : BRACHYURA)

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INTRODUCTION

Krishna river originates from Western Ghat ranges of Mahabaleswar in Pune District, Maharashtra. It is the second largest riverine and estuarine system after Godavari in Andhra Pradesh which has a complex channel system mainly in the districts Krishna and Guntur. The estuarine tracts of Krishna river are rich in estuarine and mangrove inhabiting crabs. But, even though a considerable information is available on the brachyuran fauna of Godavari estuary (Alcock, 1896, 1898, 1899, 1900; Wood-Mason and Alcock, 1891; Dev Roy and Bhadra, 2001; Dev Roy and Nandi, in press) practically nothing is known from Krishna estuary and hence this communication. The present account is based on intensive collections mainly made by the Estuarine Biological Station, Zoological Survey of India, Berhampur during 1996-2000.

MATERIAL METHODS

All materials for the present study were collected around Machilipatnam and Nagayalanka mainly covering Krishna district and few areas of Guntur district. As the mangrove ecosystem is well developed near the confluence of Krishna river, a good variety of mangrove inhabiting crabs were collected from this region. Crabs were mainly collected by hand picking or netting and also by means of shovel from the burrows. Ocypodid crabs were collected by chasing them into water. Sometimes strong formaldehyde solution was poured inside their hole to irritate them to come out. Before final preservation, crabs were killed one by one by putting them in 40% formaldehyde solution. Many specimens are put together at a time as they fight with each other and loose their chelipeds and limbs. Crabs were finally preserved in 70% alcohol.

In the present communication more than 850 examples of crabs were examined and studied. These were found to belong to 35 species under 22 genera and 9 families. Diagnosis of each

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species dealt herein is mainly based on Alcock (1895-1900), Deb (1995, 1998), Dev Roy and Das (2000) and Dev Roy and Bhadra (2001, 2005).

In the present paper, measurements of crabs were taken on their median line for width at their widest part. The abbreviations L and W are used here to indicate carapace length and carapace width respectively.

SYSTEMATIC LIST

Phylum, Sub-Phylum or Superclass CRUSTACEA Pennant, 1777

Class MALACOSTRACA Latreille, 1806

Subclass EUMALACOSTRACA Grobben, 1892

Superorder EUCARIDA Calman, 1904

Order DECAPODA Latreille, 1803

Suborder PLEOCYEMATA Burkenroad, 1963

Infraorder BRACHYURA Latreille, 1803

Section OXYSTOMATA H. Milne Edwards, 1834

Family DORIPPIDAE MacLeay, 1838

Subfamily DORIPPINAE MacLeay, 1838

1. *Neodorippe callida* Fabricius, 1798

Family CALAPPIDAE de Haan, 1833

Subfamily MATUTINAE de Haan, 1835

2. *Ashtoret lunaris* (Forskål, 1775)

3. *Matuta planipes* Fabricius, 1798

Superfamily LEUCOSOIDEA Samouelle 1819

Family LEUCOSIIDAE Samouelle 1819

Subfamily LEUCOSIINAE Samouelle 1819

4. *Philyra sexangula* Alcock, 1896

5. *Philyra globulosa* H. Milne Edwards, 1837

Section BRACHYRHYNCHA Borradaile, 1907

Super family PORTUNOIDEA Rafinesque, 1815

Family PORTUNIDAE Rafinesque, 1815

Subfamily PORTUNINAE Rafinesque, 1815

6. *Scylla serrata* (Forskål, 1775)

7. *Portunus pelagicus* (Linnaeus, 1758)

8. *Portunus sanguinolentus* (Herbst, 1783)
9. *Charybdis (Charybdis) helleri* A. Milne Edwards, 1873
10. *Charybdis (Charybdis) callianassa* (Herbst, 1790)
11. *Charybdis (Charybdis) feriatus* (Linnaeus, 1758)
12. *Charybdis (Charybdis) rostrata* (A. Milne Edwards, 1861)
13. *Charybdis (Goniohellenus) hoplites* Wood-Mason, 1877
14. *Thalamita crenata* (A. Milne Edwards, 1829)

Family PILUMNIDAE Samouelle, 1819

Subfamily PILUMNINAE Samouelle, 1819

15. *Eurycarcinus orientalis* A. Milne Edwards, 1867

Family ERIPHIIDAE MacLeay, 1838

Subfamily MENIPPINAE Ortmann, 1893

16. *Myomenippe hardwickii* (Gray, 1831)

Superfamily GRAPSIDOIDEA MacLeay, 1838

Family GECARCINIDAE MacLeay, 1838

17. *Cardisoma carnifex* (Herbst, 1794)

Family GRAPSIDAE MacLeay, 1838

Subfamily GRAPSINAE Dana, 1851

18. *Metopograpsus* sp.

Subfamily SESARMINAE Dana, 1852

19. *Parasesarma plicatum* (Latreille, 1803)
20. *Chiromantes bidens* (de Haan, 1835)
21. *Episesarma taeniolata* (White, 1847)
22. *Episesarma tetragonum* (Fabricius, 1798)
23. *Metaplax distincta* (H. Milne Edwards, 1852)
24. *Metaplax intermedia* de Man, 1888
25. *Metaplax indica* H. Milne Edwards, 1852
26. *Metaplax crenulata* (Gerstaecker, 1856)
27. *Metaplax elegans* de Man, 1888
28. *Varuna litterata* (Fabricius, 1798)

Superfamily OCYPODOIDEA Rafinesque, 1815

Family OCYPODIDAE Rafinesque, 1815

Subfamily OCYPODINAE Rafinesque, 1815

29. *Ocypode macrocera* A. Milne Edwards, 183730. *Ocypode platytarsis* H. Milne Edwards, 185231. *Uca lactea* (de Haan, 1835)32. *Uca triangularis* A. Milne Edwards, 1873

Subfamily DOTILLINAE Stimpson, 1858.

33. *Dotilla myctiroides* (A. Milne Edwards, 1852)34. *Dotilla intermedia* de Man, 188835. *Scopimera globosa* Kemp, 1919

SYSTEMATIC ACCOUNT

Family DORIPPIDAE MacLeay, 1838

1838. Dorippina MacLeay, In : Smith, *Illustr. Zool. S. Afr. (Invert.)* : 69.2005. Dorippidae Dev Roy and Bhadra, *Zool. Surv. India. Fauna of Andhra Pradesh, State Fauna Series, 5* (Part 5) : 372.

Diagnosis : Carapace depressed, subquadrangular or subcircular in outline, first 2-3 abdominal segments uncovered usually visible in dorsal view. First two pair of legs long and strong, last two pairs markedly short, slender and dorsal in position, dactylus hook-like.

Remarks : The family Dorippidae is divided in to two subfamilies namely, Dorippinae MacLeay, 1838 and Ethusinae Guinot, 1977. Only the first subfamily is represented in the present collection.

Subfamily DORIPPINAE MacLeay, 1838

Remarks : The subfamily contains four genera namely, *Dorippe* Weber, 1795, *Dorippoides* Serène and Romimohtarto, 1969, *Paradorippe* Serène and Romimohtarto, 1969 and *Neodorippe* Serène and Romimohtarto, 1969 from Indian waters, of which, only the last one is represented in the present collection.

Genus *Neodorippe* Serène and Romimohtarto, 19691969. *Neodorippe* Serène and Romimohtarto, *Mar. Res. Indonesia*, **9** : 3, 4, 11.1990. *Neodorippe*, Holthuis and Manning, *Researches on Crustacea, Special Number*, **3** : 93.2005. *Neodorippe*, Dev Roy and Bhadra, *Zool. Surv. India. Fauna of Andhra Pradesh, State Fauna Series, 5* (Part 5) : 375.

Diagnosis : Carapace depressed, length and width subequal. Grooves distinct and shallow, lateral borders granular bearing 2 tringular teeth directed anteriorly. Chelipeds equal in juveniles and female but markedly unequal in adult male, margin of palm and dactylus with hairs. Leg joints flattened, unarmed; third pair longest.

1. *Neodorippe callida* Fabricius, 1798

(Pl. 1, Fig. 1)

1798. *Dorippe astuta* Fabricius, *Ent.Syst.Suppl.*, p : 361

1896. *Dorippe astute*, Alcock, *J. Asiat. Soc. Bengal* **65** : 280.

1981. *Neodorippe callida*, Manning and Holthuis, *Smithson. Contrib. Zool.*, **306** : 37.

2005. *Neodorippe callida*, Dev Roy and Bhadra, *Zool. Surv. India. Fauna of Andhra Pradesh, State Fauna Series, 5 (Part 5)* : 376.

Material Examined : 1 ex., Kanur, 11-02-97, CR-4989; 1 ex., Kanur, 11-12-2000, CR-4988.

Mesurements : L-11.0-13.0 W-10.0-12.5

Diagnosis : Body and appendages pubescent. Carapace smooth, flat slightly longer than broad. The spine at inner canthus of orbit rudimentary. Last pair of legs exceeding half the length of second. Anterior male appendage tip tin opener shaped with one crescentic tip. Lateral margins of carapace smooth.

Distribution : INDIA : Orissa, Andhra Pradesh, Tamil Nadu and Maharashtra.

Out side India : Red Sea, Pakistan, Myanmar, Thailand, Philippines, China and Indonesia.

Remarks : First time reported from Krishna Estuary.

Family CALAPPIDAE de Haan, 1833

1833. Calappidea de Haan, In : Siebold, *Fauna japon. (Crust.)* (1) : xiii and 67 (1837), 119, 124 (1841).

2005. Calappidae, Dev Roy and Bhadra, *Zool. Surv. India. Fauna of Andhra Pradesh, State Fauna Series, 5 (Part 5)* : 377.

Diagnosis : Carapace oval or circular, lateral borders either with a small tooth or a strong spine at the junction of antero-lateral and postero-lateral borders. Chelipeds massive, palm enormous. Male abdomen five-segmented, female abdomen consisting of seven distinct segments.

Remarks : The family Calappidae is divided in to two subfamilies namely, Calappinae de Haan, 1833 and Matutinae de Haan, 1833. Only the last one is represented in the present collection.

Subfamily MATUTINAE de Haan, 1833

Remarks : The subfamily contains four genera but only two are represented in the present collection. Both the genera can be distinguished by the following key.

Key to the genera of the sub family MATUTINAE

Mid-palmar ridge granular, dactylar ridge smooth, carpus of penultimate periopod bicarinate *Ashtoret*.
 Mid-palmar ridge smooth, dactylar ridge milled, carpus of last pair of leg unicarinate *Matuta*.

Genus *Ashtoret* Galil and Clark, 1994

1994. *Ashtoret* Galil and Clark, *Zool. Verh. Leiden*, **294** : 4.

2005. *Ashtoret*, Dev Roy and Bhadra, *Zool. Surv. India. Fauna of Andhra Pradesh, State Fauna Series*, **5** (Part 5) : 381.

Diagnosis : Carapace sub-circular and strongly convex bearing tubercles centrally. Front trilobed, middle one prominent and broad. Anterolateral margin acute and tuberculate. Posterolateral border convergent having a spine at the junction of antero and postero lateral borders. Pterygostomial region bearing several rows of ellipsoid tubercles. Eye stalks strong, elongate. Chelipeds massive, subequal; palm compressed. Legs adapted for swimming and burrowing.

Remarks : The genus is represented by two species in Andhra Pradesh (Dev Roy and Bhadra *op.cit.*), of which only one species occurs in Krishna Estuary.

2. *Ashtoret lunaris* (Forskål, 1775)

(Pl. 1, Fig. 3)

1775. *Cancer lunaris* Forskål, *Desc. Anim.* : 91.

1896. *Matuta banski*, Alcock, *J. Asiat. Soc. Bengal* **65** (2) : 158.

1994. *Ashtoret lunaris*, Galil and Clark, *Zool. Verh. Leiden*, **294** : 5, figs a-b, pl. 1a-b.

2005. *Ashtoret lunaris*, Dev Roy and Bhadra, *Zool. Surv. India. Fauna of Andhra Pradesh, State Fauna Series*, **5** (Part 5) : 382 : pl.1, fig. 2.

Material Examined : 2 ex., Palleshthummapalem, 10-09-97, CR-4780; 1 ex., Kamavericheruvu, 11-09-97, CR-4787; 1 ex., Kanur, 12-02-99, CR-4782; 9 ex., Gullalamoda, 19-02-99, CR-4783; 1 ex., Palakayattippa, 20-02-99, CR-4781; 1 ex., Kanur, 04-01-2000, CR-4789; 1 ex., Kanur, 05-01-2000, CR-4792; 1 ex., Palleshthummapalem, 06-01-2000, CR-4790; 1 ex., Palleshthummapalem, 07-01-2000, CR-4786; 8 ex., Gollamanda, 11-01-2000, CR-4791; 1 ex., Kanur, 11-12-2000, CR-4784.

Mesurements : L-19.0-39.0 W-21.0-41.0

Diagnosis : Carapace convex and sub-circular bearing 6 tubercles present on its surface, anterior two on the middle of carapace obsolete. Postero-lateral border of carapace with an obscurely defined tubercle. Postero-lateral sides strongly convergent with a very long and strong horizontal epibranchial spine. Front distinctly bilobed. Outer surface of arm smooth, upper border crenulated; a strong tooth like spine present at the angle between palm and arm; cutting edge of both the fingers strongly dentate.

Distribution : INDIA : Orissa, Andhra Pradesh.

Out side India : Aden, Red Sea, Singapore, Malaysia. Philippines, Indonesia, New Guinea and Australia.

Remarks : This is the most ornamental specimen of the genus. The ornamentation is best developed in adult stage which varies with age. This crab occurs abundantly in Krishna estuary.

Genus *Matuta* Weber, 1795

1817. *Matuta* Weber, *Nomencl. ent. Syst Fabr.* : 92.

1896. *Matuta*, Alcock, *J. Asiat. Soc. Bengal*, **65** (2) : 139, 153.

2005. *Matuta*, Dev Roy and Bhadra *Zool. Surv. India. Fauna of Andhra Pradesh, State Fauna Series*, **5** (Part 5) : 383.

Diagnosis : Carapace sub-circular, flat. Front trilobed, middle one prominent and broad. Posterolateral borders convergent having a spine at the junction of antero and postero lateral borders. Eye stalks strong, elongate. Chelipeds massive, equal; palm compressed. Legs adapted for swimming and burrowing.

Remarks : The genus is represented by two species in Andhra Pradesh (Dev Roy and Bhadra, (op.cit), of which, only one species occurs in Krishna Estuary.

3. *Matuta planipes* Fabricius, 1798.

1798. *Matuta planipes* Fabricius, *Entom. Syst. Suppl.* : 369.

1994. *Matuta planipes*, Galil and Clark, *Zool. Verh. Leiden*, **294** : 5, figs a-b, pl. 1a-b.

1998. *Matuta planipes*, Deb, *Zool. Surv. India. Fauna of West Bengal, State Fauna Series*, **3** (part, 10) : 365.

Material examined : 1 ex., Gullalamoda, 19-02-99, CR-4788; 1 ex., Palleshummapalem, 04-01-2000, CR-4785; 2 ex., Kanur, 05-01-2000, CR-4775.

Mesurements : L-13.0-23.5 W-13.0-24.0

Diagnosis : Carapace with reddish colored spots or minute dots, rings and elongated vermicular lines. Front straight having horizontal lobes laterally; rostrum emarginated medially.

Distribution : INDIA :Andhra Pradesh, Orissa, Tamil Nadu, West Bengal, Maharashtra.

Out side India : Pakistan, Myanmar, Thailand, Java, China, Japan and Australia.

Remarks : Compared to the preceding species, this crab is less common in Krishna estuary.

Family LEUCOSIIDAE Samouelle, 1819

1819. Leucosiidae Samouelle, *Entom. Useful Compend.* : 91.

2005. Leucosiidae, Dev Roy and Bhadra, *Zool. Surv. India. Fauna of Andhra Pradesh, State Fauna Series, 5* (Part 5) : 386.

Diagnosis : Carapace oval, subcircular or polygonal in outline. Front narrow, much wider than orbit. Abdominal segments seldom separate distinctly, third to fifth terga intimately fused with or without obliteration of sutures in both sexes.

Remarks : The family Leucosiidae is divided into four subfamilies, of which, only the subfamily Leucosiinae is represented in the present collection.

Subfamily LEUCOSIINAE Samouelle, 1819

Remarks : The subfamily is represented by two genera namely, *Leucosia* Weber, 1795 and *Philyra* Leach, 1817 in Andhra Pradesh. Only the last genus has been recorded from Krishna estuary.

Genus *Philyra* Leach, 1817

1817. *Philyra* Leach, *Zool. Mescell.*, 3 : 18, 22.

1896. *Philyra*, Alcock, *J. Asiat. Soc. Bengal*, 65 (2) : 237.

2005. *Philyra*, Dev Roy and Bhadra, *Zool. Surv. India. Fauna of Andhra Pradesh, State Fauna Series, 5* (Part 5) : 396.

Diagnosis : Carapace circular, depressed, margins continuously bounded by beads. Front quadridentate. Edges of pterygostomian ridges and tip of buccal cavity projected beyond front. Epistome small. Chelipeds symmetrical, massive. True legs small.

Remarks : This genus is represented by 2 species in Krishna Estuary both of which can be distinguished by the following key.

Key to the species of the genus *Philyra*

- Carapace hexagonal, upper surface of chelipeds carinated from base of arm to finger cleft *P. sexangula*
 Carapace circular, upper surface of chelipeds never carinated *P. globulosa*

1900. *Philyra sexangula* Alcock, *J. Asiat. Soc. Bengal* **65** (2) : 241, pl.7, fig. 2.

2005. *Philyra sexangula*, Dev Roy and Bhadra, *Zool. Surv. India. Fauna of Andhra Pradesh, State Fauna Series*, **5** (Part 5) : 398.

Material examined : 1 ex., Kanur, 04-01-2000, CR-4990.

Measurements : L-9.0 W-10.0

Diagnosis : Carapace hexagonal almost as long as broad. A sharp median carina running from front to back. Posterior margin straight, outer angle strongly dentiform. Epistome project beyond the front. Front bilobed with straight edges. Chelipeds nearly 2 ½ times as long as carapace. Legs slender and compressed.

Distribution : INDIA :Andhra Pradesh, Tamil Nadu.

Out side India : Persian Gulf.

Remarks : First time reported from Krishna, earlier recorded from Godavari coast by Alcock (1895). So far, the crab is known only from the east coast.

5. *Philyra globulosa* H.Milne Edwards, 1837

(Pl. 1, Fig. 2)

1837. *Philyra globulosa* H. Milne Edwards, *Hist. Nat. Crust.*, **2** : 132 and In : Cuvier's, *Régne Anim. Crust.* : **2**, pl. 24, fig. 4..

1896. *Philyra globulosa*, Alcock, *J. Asiat. Soc. Bengal*, **65**(2) : 245.

2005. *Philyra globulosa*, Dev Roy and Bhadra, *Zool. Surv. India. Fauna of Andhra Pradesh, State Fauna Series*, **5** (Part 5) : 399, pl. 1, fig. 5.

Material examined : 1 ex, Gilakaladindi, 10-12-2000, CR-5267; 1 ex, Manginapudi, 20-09-98, CR-5268.

Measurements : L-12.0-15.0 W-11.0-14.0

Diagnosis : Carapace circular, slightly depressed, surface covered with vesicular granules, its margins bordered with continous beaded line, some of the beads enlarged to form blunt stout tubercles. Front furry, little emerginate at middle. Chelipeds unequal, palm shorter than dactylus, cutting edge of fingers strongly deantate.

Distribution : INDIA :West Bengal, Orissa, Andhra Pradesh, Tamil Nadu, Kerala, Andamans.

***Out side India* : South Africa, Persian Gulf, Pakistan, Gulf of Thailand and Indonesia.**

Remarks : Uneven denticles at carapace border separate this species from its nearest allied species, *P. globosa*. This crab is widely distributed in the Indian Ocean.

Family PORTUNIDAE Rafinesque, 1815

1815. Portunidia Rafinesque, *Analyse Nature* : 97.

2005. Portunidae, Dev Roy and Bhadra, *Zool. Surv. India. Fauna of Andhra Pradesh, State Fauna Series, 5* (Part 5) : 418.

Diagnosis : Carapace flattened or convex, hexagonal, subquadrate, elongate ovate or subcircular, generally broader than long, regions usually not well outlined. Front broad, horizontal and cut in to 2-6 teeth or lobes. Antero-lateral borders cut in to 4-9 teeth or lobes. Last pair of legs usually modified for swimming.

Remarks : The family is divided in to six subfamilies. All specimens dealt herein have been found to belong to the subfamily Portuninae only.

Subfamily PORTUNINAE Rafinesque, 1815

Remarks : It is represented by four genera namely, *Scylla*, *Portunus*, *Charybdis*, and *Thalamita* in Krishna estuary.

Key to the genera of the subfamily PORTUNINAE

1. Carapace oval, antero-lateral borders cut into 9 teeth 2
 - Carapace hexagonal, antero-lateral teeth less than 9 3
2. Carapace smooth, regions ill defined, propodus of chelipeds smooth and inflated *Scylla*
 - Carapace not smooth, regions well defined, propodus of chelipeds prismatic and costate *Portunus*
3. Antero-lateral border of carapace cut into 6 teeth *Charybdis*
 - Antero-lateral border of carapace cut into 5 teeth, 4th tooth often small or rudimentary *Thalamita*

Genus *Scylla* de Haan, 1833

1833. *Scylla* de Haan, In : Siebold, *Fauna Japon. (Crust.)* : 11.

1899. *Scylla*, Alcock, *J. Asiat. Soc. Bengal*, 68(2) : 27.

2005. *Scylla*, Dev Roy and Bhadra, *Zool. Surv. India. Fauna of Andhra Pradesh, State Fauna Series, 5* (Part 5) : 419.

Diagnosis : Carapace broad, convex. Front cut into 4 equal teeth. Antero-lateral borders cut into 9 subequal teeth, including outer orbital tooth. Epistome not produced, buccal cavity squarish. Chelipeds massive. Legs stout.

6. *Scylla serrata* (Forskål, 1775)

(Pl. 1, Fig. 5)

1775. *Cancer serratus* Forskål. *Desc. Anim.* : 901998. *Scylla serrata*, Dev.Roy and Das, *Rec. Zool. Surv. India Occ. Paper No. 185* : 26.2005. *Scylla serrata*, Dev Roy and Bhadra, *Zool. Surv. India. Fauna of Andhra Pradesh, State Fauna Series, 5 (Part 5)* : 420.

Material examined : 3 ex., Kamavericheruvu, 09-10-96, CR-4938; 1 ex., Lankevenitippa, 15-10-96, CR-4947; 1 ex., Lankevenitippa, 15-10-96, CR-2192; 2 ex., Edurumondi, 18-02-96, CR-4950; 4 ex., Gilakaladindi, 10-02-97, CR-4954; 12 ex., Palleshummalapalem, 12-02-97, CR-4937; 1 ex., Palleshummalapalem, 12-02-97, CR-4953; 2 ex., Palleshummalapalem, 12-02-97, CR-4967; 2 ex., Lankevenitippa, 16-02-97, CR-4957; 1 ex., Eelachetladibba, 17-02-97, CR-4973; 1 ex., Lankevenitippa, 18-02-97, CR-4956; 2 ex., Yedurumundi, 18-02-97, CR-4948; 3 ex., Kanur, 07-09-97, CR-4881; 8 ex., Palleshummalapalem, 09-09-97, CR-4939; 1 ex., Palleshummalapalem, 10-09-97, CR-4946; 1 ex., Kamavericheruvu, 11-09-97, CR-4944; 1 ex., Gullalamoda, 17-09-97, CR-4942; 1 ex., Palakayatippa, 19-09-97, CR-4972; 5 ex., Peddakanur, 07-02-98, CR-4941; 2 ex., Peddakanur, 08-02-98, CR-4940; 1 ex., Palakayatippa, 13-02-98, CR-4943; 1 ex., Lankevenitippa, 15-02-98, CR-4971; 1 ex., Kanur, 15-09-98, CR-4961; 3 ex., Kanur, 16-09-98, CR-4966; 5 ex., Palleshummalapalem, 18-09-98, CR-4949; 7 ex., Palleshummalapalem, 19-09-98, CR-4882; 2 ex., Swaralaganj, 23-09-98, CR-4952; 2 ex., Swaralaganj, 24-09-98, CR-4955; 4 ex., Sangameswara, 26-09-98, CR-4962; 1 ex., Kanur, 12-02-99, CR-4979; 1 ex., Kanur, 15-02-99, CR-4964; 1 ex., Palleshummalapalem, 15-02-99, CR-4977; 1 ex., Palakayatippa, 17-02-99, CR-4979; 1 ex., Gullalamoda, 19-02-99, CR-4978; 1 ex., Lankevenitippa, 21-02-99, CR-4977; 3 ex., Kanur, 05-01-2000, CR-4968; 1 ex., Palleshummalapalem, 06-01-2000, CR-4970; 2 ex., Palleshummalapalem, 07-01-2000, CR-4971; 2 ex., Gullalamoda, 10-01-2000, CR-4959; 5 ex., Gollalmoda, 11-01-2000, CR-4960; 2 ex., Gollalmoda, 11-01-2000, CR-4976; 2 ex., Palleshummalapalem, 13-12-2000, CR-4958.

Mesurements : L-14.0-68.0

W-20.0-94.0

Diagnosis : Front broad and cut into four blunt subequal teeth. Antero-lateral border of carapace cut into 9 sharp teeth of almost equal size (including the outer orbital angle). Carapace oval, smooth, regions almost indistinct. Anterior male abdominal appendages elegantly bent bearing hairs along one border and spines on other, tip sharp. Arm of cheliped adorned with 3 spines on anterior border and 2 on posterior border. Male abdomen broadly triangular.

Distribution : INDIA : Andhra Pradesh, Orissa, Tamil Nadu, West Bengal, Goa, Maharashtra, Karnataka, Gujarat and Andaman and Nicobar Islands.

Out side India : Africa, Red Sea, Pakistan, Mergui, Mynmar, Formosa, Japan, Australia, Tahiti, Auckland.

Remarks : This crab inhabits muddy bottoms along estuarine waters of Krishna river. It is the most important edible crab of the region which is exploited in large quantities especially from the mangrove areas.

Genus *Portunus* Weber, 1795

1795. *Portunus* Weber, *Nomencl. ent. Syst. Fabr.*, : 93.

1899. *Neptunus*, Alcock, *J. Asiat. Soc. Bengal*, 68 (2) : 28.

2005. *Portunus*, Dev Roy and Bhadra, *Zool. Surv. India. Fauna of Andhra Pradesh, State Fauna Series, 5* (Part 5) : 422.

Diagnosis : Carapace transversely broad, depressed or convex. Front broad and cut into 3-6 teeth. Anterolateral border cut into 9 teeth including outer orbital tooth, last tooth enlarged. Epistome linear and prolonged to form a spine. Chelipeds long and stout. Legs flattened.

Key to species of the genus *Portunus*

- Carapace marked with three large blood red spots, posterior border of merus of chelipeds devoid of any spine *P. sanguinolentus*
- No such spots on carapace, but surface studded with miliary granules, posterior border of merus of chelipeds armed with a spine at its distal end *P. pelagicus*

7. *Portunus pelagicus* (Linnaeus, 1758)

(Pl. 1, Fig. 4)

1758. *Cancer pelagicus* Linnaeus, *Syst. Nat.* 10th ed., 1 : 626.

1899. *Neptunus pelagicus*, Alcock, *J. Asiat. Soc. Bengal*, 68 (2) : 34.

2000. *Portunus pelagicus*, Dev Roy and Das, *Rec. zool. Surv. India, Occ. Paper No. 185* : 41.

Material examined : 1 ex., Kanur, 16-09-98, CR-4896; 1 ex., Kamvericheruvu, 21-09-98, CR-4888; 1 ex., Gullalamoda, 23-09-98, CR-4890; 5 ex., Palakayatippa, 07-02-99, CR-4885; 1 ex., Kanur, 12-02-99, CR-4894; 2 ex., Kanur, 13-02-99, CR-4895; 3 ex., Palleshummalapalem, 07-01-2000, CR-4884; 2 ex., Swralagandhi, 10-01-2000, CR-4891; 1 ex., Gullalamoda, 19-12-2000, CR-4886.

Mesurements : L-11.0-55.0

W-15.5-103.0

Diagnosis : Carapace broad, little convex, surface covered with miliary granules. Front cut into four teeth (excluding inner angle of the orbit), of which, middle two small and prominent. Antero-lateral border cut in to 9 teeth, last one remarkably long and spiniform, tip

white. Chelipeds strong, massive unequal; arm with three large acute spines on the anterior and one on the posterior border.

Distribution : INDIA : Andhra Pradesh, Orissa, Tamil Nadu, West Bengal, Gujarat, Karnataka, Kerala, Maharashtra, Andamans.

Out side India : East and South coasts of Africa, Red Sea, Persian Gulf, Karachi, Mergui Archipelago, Singapore, Philippines, Hong Kong, China, Japan, Australia, New Zealand and Tahiti as far as Hawaiian Islands.

Remarks : In Krishna estuary, this crab occurs in moderate abundance and are caught by fisherman for commercial purposes.

8. *Portunus sanguinolentus* (Herbst, 1796)

(Pl. 1, Fig. 6)

1796. *Cancer sanguinolentus* Herbst, *Krabben und Krebse*, 1 (2) : 161. pl. 8 figs. 56.57.

1899. *Neptunus sanguinolentus*, Alock, *J. Asiat. Soc. Bengal*, 68 (2) : 32.

2000. *Portunus sanguinolentus*, Dev Roy and Das, *Rec. zool Surv. India, Occ. Paper No.*, 185 : 33, pl. 2, fig. 2.

Material examined : 4 ex., Kanur, 25-09-98, CR-4974; 1 ex., Kanur, 17-09-98, CR-4883; 4 ex., Kamvericheruvu, 21-09-98, CR-4889; 1 ex., Lankevenitippa, 25-09-98, CR-4893; 1 ex., Gullalamoda, 19-02-99, CR-4892; 1 ex., Manginapudi, 08-01-2000, CR-4887.

Mesurements : L-16.0-45.0 W-27.0-77.0

Diagnosis : Carapace very broad and little convex, posterior part of carapace marked with three blood-red spots. Antero lateral teeth 9, their tips whitish. No spine on posterior border of arm of chelipeds.

Distribution : INDIA : Andhra Pradesh, Orissa, Tamil Nadu, West Bengal,

Karnataka, Kerala, Nicobars. **Out side India** : East coast of Africa, Red Sea, Persian Gulf, Pakistan, Sri Lanka, Hongkong, Phillippine, Taiwan, Japan, Australia, New Zealand and Hawaii.

Remarks : This crab is landed in appreciable quantities in Krishna estuary.

Genus *Charybdis* de Haan, 1833

1833. *Charybdis* and *Oceanus* de Haan, In : Siebold, *Fauna Japon. (Crust.)* : 9,10.

1899. *Charybdis*, Alcock, *J. Asiat. Soc. Bengal*, 68 (2) : 47.

2005. *Charybdis*, Dev Roy and Bhadra, *Zool. Surv. India. State Fauna Series*, 5 : *Fauna of Andhra Pradesh* (Part 5) : 428.

Diagnosis : Carapace hexagonal, depressed or convex, with distinct transverse granular ridges in anterior half. Front cut in to 6 lobes or teeth. Anterolateral border commonly cut in to 6 teeth. Epistome long. Cheliped stout, legs flattened.

Remarks : The genus *Charybdis* is divided in to 5 subgenera. The present collections from Krishna estuary, however, contains representatives of two subgenera namely, *Charybdis* de Haan and *Goniohellenus* Alcock, both of which can be separated by the following key.

Key to subgenera of the genus *Charybdis*.

- No spine on posterior border of arm of cheliped, antennal flagellum not excluded from orbital hiatus *Charybdis*
- A spine present on posterior border of arm of cheliped, antennal flagellum completely excluded from orbital hiatus *Goniohellenus*

Subgenus *Charybdis* de Haan, 1833

1833. *Charybdis* de Haan, In : Siebold, *Fauna japon.*, (Crust.) : 9, 10.

1899. *Goniosoma*, Alcock, *J. Asiat. Soc. Bengal*, 68(2) : 48, 49.

Remarks : It is represented by four species in Krishna estuary.

Key to species of the subgenus *Charybdis*

1. A transverse granular ridge on the cardiac region 3
 - No transverse granular ridge on the cardiac region 2
2. First anterolateral tooth truncated, carpus of last pair of legs unarmed, a brown cross mark on carapace *C. (C.) feriatius*
 - First anterolateral tooth acute, posterior border of last pair of legs with an acute spine at its distal end, no cross mark on carapace *C. (C.) helleri*
3. First anterolateral tooth notched, last one largest *C. (C.) callianassa*
 - First anterolateral tooth acute and largest *C. (C.) rostrata*

9. *Charybdis (Charybdis) callianassa* (Herbst, 1790)

(Pl. 2, Fig. 1)

1790. *Cancer callianassa* Herbst, *Versuch. Naturgesch. Krabben Krebse*, 3(2) : 45, pl. 54, fig. 7.

1961. *Charybdis (Charybdis) callianassa*, Stephenson, *Aust. J. mar. Freshwater Res.*, : 12(1) 116.

2005. *Charybdis (Charybdis) callianassa*, Dev Roy and Bhadra, *Zool. Surv. India. Fauna of Andhra Pradesh, State Fauna Series*, 5 (Part 5) : 431.

Material examined : 3 ex., Manginapudi, 20-09-98, CR-4993; 2 ex., Kamvericheruvu, 21-09-98, CR-4994; 1 ex., Gullalamoda, 19-02-99, CR-4760; 3 ex., Kanur, 04-01-2000, CR-4793;

1 ex., Kanur, 05-01-2000, CR-4773; 3 ex., Pallethummalapalem, 06-01-2000, CR-4774; 18 ex., Manginapudi, 08-01-2000, CR-4761; 1 ex., Gollalmoda, 11-01-2000, CR-4771.

Mesurements : L-10.0-18.0 W-14.0-28.0

Diagnosis : Carapace nearly convex especially in its posterior half, its length about $2/3^{\text{rd}}$ the extreme breadth. Front cut into six teeth, of which, middle two very prominent, third tooth narrow and acute. Antero-lateral borders cut into six teeth (including the outer-orbital angles)-first tooth notched anteriorly, last one spiniform.

Distribution : INDIA : Andhra Pradesh, Orissa, Tamil Nadu, West Bengal, Maharashtra, Gujarat.

Out side India : South Africa, Pakistan, Gulf of Thailand, Malaya Archipelago, Singapore, Indonesia, Philippines, Hongkong, China, Japan and Australia.

Remarks : A common crab of Krishna estuary.

10. *Charybdis (Charybdis) feriatus* (Linnaeus, 1758)

(Pl. 2, Fig. 2)

1758. *Cancer feritus* Linnaeus, *Syst. Nat.* (10th ed.), 1 : 627.

1852. *Charybdis cruciata*, Dana, *Proc. Ac. nat. Sci. Philad.*, : 39

1995. *Charybdis (Charybdis) cruciata*, Bhadra, *Estuarine Ecosystem Series*, Part-2 : 257-258.

2005. *Charybdis (Charybdis) callianassa*, Dev Roy and Bhadra, *Zool. Surv. India. Fauna of Andhra Pradesh, State Fauna Series*, 5 (Part 5) : 432.

Material examined : 2 ex., Manginapudi, 20-09-2000, CR-4777; 1 ex., Gilakaladindi, 10-12-2000, CR-4769; 1 ex., Kanur, 20-09-2000, CR-4775.

Mesurements : L-12.5 -19.0 W-18.5-30.0

Diagnosis : First spine of the antero-lateral sides of carapace truncated and notched anteriorly, last one spine-like, other four broad anteriorly-acuminate lobes. Dorsal surface of carapace with six longitudinal bands arranged in the form of a cross, extending over three quarters of its length. Lobule at antero-external angle of basal antenna joint with a ridge but not a tooth.

Distribution : INDIA : Andhra Pradesh, Orissa, Tamil Nadu, West Bengal, Gujarat, Kerala, Maharashtra and Andaman and Nicobar Islands.

Out side India : East coast of Africa, Madagascar, Pakistan, Singapore, Hongkong, Formosa, Nagasaki and Australia.

Remarks : This crab is landed in negligible quantities in the commercial catches of this estuary.

(Pl. 2, Fig. 3)

- Material examined :** 1 ex., Kamvericheruvu, 21-09-98, CR-4763; 3 ex., Gollalmoda, 11-01-2000, CR-4768

Measurements : L-15.0 W-24.0

Distribution : INDIA : Andhra Pradesh, Orissa, Tamil Nadu, West Bengal, Kerala and Andaman Islands.

***Out side India* : Red Sea, Persian Gulf, Mediteranean, Sri Lanka, Mergui Archipelago, Malaya Peninsula, Singapore, Indonesia, Thailand, Hong Kong, Australia, China and Hawaii.**

Remarks : This crab occurs in both the coasts of India. It is extensively distributed in the Indo-Pacific region.

(Pl. 2, Fig. 4)

1861. *Goniosoma rostratum* A Milne Edwards, *Archs. Hist. nat. Paris, sér.1*, **10** : 379, 385 pl. 35,fig. 2.
1899. *Charybdis (Goniosoma) rostrata*, Alcock, *J. Asiat. Soc. Bengal*, **68** (2) : 59.
2005. *Charybdis (Cherybdis) rostrata*, Dev Roy and Bhadra, *Zool. Surv. India. Fauna of Andhra Pradesh, State Fauna Series*, **5** (Part 5) : 435.

Material examined : 4 ex., Manginapudi, 20-09-98, CR-4766; 2 ex., Kamvericheruvu, 21-09-98, CR-4767; 2 ex., Kanur, 04-01-2000, CR-4778; 2 ex., Pallethummalapalem, 06-01-2000, CR-4770; 1 ex., Manginapudi, 08-01-2000, CR-4772; 10 ex., Kanur, 05-09-2000, CR-4759; 1 ex., Kanur, 11-12-2000, CR-4776.

Measurements : L-11.0-20.0 W-13.0-28.0

Diagnosis : Front cut into 6 teeth, of which, the middle two bluntly pointed and projected far beyond the others. Antero-lateral border cut into 6 acute teeth, last one almost straight and spine like. Palm of larger cheliped with two spines. 6th tergum of male abdomen broader than long and with curved and gradually convergent sides.

Distribution : INDIA : Andhra Pradesh, Orissa, Tamil Nadu, West Bengal and Andamans.

Out side India : Sri Lanka, Myanmar, Thailand and Indonesia.

Remarks : This species is not yet recorded from the west coast.

Subgenus *Goniohellenus* Alcock, 1899

1899. *Goniohellenus* Alcock, *J. Asiat. Soc. Bengal*, **68**(2) : 48.

2005. *Goniohellenus*, Dev Roy and Bhadra, *Zool. Surv. India. State Fauna Series*, **5** : *Fauna of Andhra Pradesh* (Part 5) : 436.

Remarks : The subgenus is represented by a single species in Krishna estuary.

13. *Charybdis (Goniohellenus) hoplites* (Wood Mason, 1877)

1877. *Goniosoma hoplites* Wood Mason, *Ann. Mag. nat. Hist.*, ser. 4, **19** : 422.

1899. *Charybdis (Goniohellenus) hoplites*, Alcock, *J. Asiat. Soc. Bengal*, **68** (2) : 66.

2005. *Charybdis (Goniohellenus) hoplites*, Dev Roy and Bhadra, *Zool. Surv. India. Fauna of Andhra Pradesh, State Fauna Series*, **5** (Part 5) : 436.

Material examined : 3 ex., Gollalmoda, 11-01-2000, CR-4768.

Mesurements : L-15.0 W-23.0

Diagnosis : Carapace thick, regions well marked and prominent; transverse ridges distinct. Front cut into 8 lobes median lobes large, squarish and projected beyond others. Anterior lateral angle cut into 6 teeth, last one large projecting outwardly. Chelipeds unequal; Anterior border of arm of cheliped bearing two large spines, posterior border with a single spine.

Distribution : INDIA : Andhra Pradesh, Orissa, Tamil Nadu, West Bengal and Gujarat.

Out side India : Persian Gulf, Gulf of Oman, Myanmar and Hong Kong.

Remarks : This crab occurs in both the coasts of India.

Genus *Thalamita* Latreille, 1829

1829. *Thalamita* Latreille, In : Cuvier's, *Règne Anim. Crust.*, (ed 2), **4** : 33.

1899. *Thalamita*, Alcock, *J. Asiat. Soc. Bengal*, **68** (2) : 11, 72.

2005. *Thalamita*, Dev Roy and Bhadra, *Zool. Surv. India. Fauna of Andhra Pradesh, State Fauna Series*, **5** (Part 5) : 439.

Diagnosis : Carapace almost hexagonal, depressed or convex and marked with transverse ridges. Front cut in to 2-6 rounded lobes. Antero lateral borders cut in to 5 teeth, fourth one often small or rudimentary. Epistome long. Chelipeds stout and legs compressed.

14. *Thalamita erenata* (Latreille 1829)

(Pl. 2, Fig. 5)

1829. *Portunus crenatus* Latreille, *Collection du Museum* : 33.

1899. *Thalamita crenata*, Alcock, *J. Asiat. Soc. Bangal*, 68 (2) : 76.

2005. *Thalamita crenata*, Dev Roy and Bhadra, *Zool. Surv. India. Fauna of Andhra Pradesh, State Fauna Series, 5* (Part 5) : 440, pl. 2, fig. 6.

Material examined : 2 ex., Lankevenitippa, 15-09-97, CR-4813; 1 ex., Gullalamoda, 01-01-2000, CR-4812; 1 ex., Kanur, 11-12-2000, CR-4811; 1 ex., Kanur, 12-12-2000, CR-4810.

Mesurements : L-17.0-43.0 W-22.0-62.0

Diagnosis : Carapace smooth, convex, distinctly broader than long; surface crossed by fine transverse granular ridges. Front cut in to six subequal lobes. Antero lateral margins of carapace cut in to five claw-shaped subequal teeth, of which, first tooth the largest, 4th and 5th smaller. Chelipeds unequal, palm armed with four spines in two rows and one near apex of wrist-joint.

Distribution : INDIA : Andhra Pradesh, Orissa, Tamil Nadu, Pondicherry, Maharashtra, Andaman and Nicobar islands.

Out side India : East Coast of Africa, Red Sea, Pakistan, Sri Lanka, Mergui, Archipelago, Singapore, Phillipines, Japan, Indonesia, Australia, New Zealand, Samoa, Hawaii and Society Islands..

Remarks : The specimens examined correspond well with the description of Alcock(*op. cit.*). This species has been found to occur mostly at the confluence area.

Family PILUMNIDAE Samouelle, 1819

1819. Pilumnidae Samouelle, *Entom. Useful Compend.* : 86.

2005. Pilumnidae, Dev Roy and Bhadra, *Zool. Surv. India. Fauna of Andhra Pradesh, State Fauna Series, 5* (Part 5) : 458.

Diagnosis : Carapace thin or thick, surface sharply or plainly granular. Antero-lateral borders shorter than postero-laterals, generally armed with spines or teeth. Front bilobed, separated from supraorbital angle by a notch or groove. Abdomen narrow, elongated, covering most of sternite 4 and with a locking mechanism.

Remarks : The family Pilumnidae is currently splitted into 10 subfamilies. However, in Krishna estuary it includes representatives of the subfamily Pilumninae only.

Subfamily PILUMNINAE Samouelle, 1819

Remarks : The subfamily is represented by a single genus in Krishna estuary.

Genus *Eurycarcinus* A. Milne Edwards, 1867

1867. *Eurycarcinus* A. Milne Edwards, *Annls. Soc. ent. Fr.*, sér. 4, 7 : 276.

1898. *Eurycarcinus*, Alcock, *J. Asiat. Soc. Bengal*, 67 (2) : 209.

2005. *Eurycarcinus*, Dev Roy and Bhadra, *Zool. Surv. India. Fauna of Andhra Pradesh, State Fauna Series*, 5 (Part 5) : 462.

Diagnosis : Carapace oval, convex, smooth. Front broad, straight, squarish. Anterolateral margins with 3 notches. Chelipeds unequal. Finger tips pointed.

15. *Eurycarcinus orientalis* A. Milne Edwards, 1867

(Pl. 3, Fig. 1)

1867. *Eurycarcinus orientalis* A. Milne Edwards, *Annls. Soc. ent. Fr.* sér. 4, 7 : 277.

1898. *Eurycarcinus orientalis*, Alcock, *J. Asiat. Soc. Bangal*, 67(2) : 210.

2005. *Eurycarcinus orentalis*, Dev Roy and Bhadra, *Zool. Surv. India. Fauna of Andhra Pradesh, State Fauna Series*, 5 (Part 5) : 462.

Material examined : 54 ex., Gullalamoda, 10-01-2000,,CR-4813; 1 ex., Palakayatippa, 17-02-99,,CR-4273; 1 ex., Lankevenitippa, 15-10-96,,CR-5274.

Mesurements : L-4.0-8.0 W-6.0-12.0

Diagnosis : Carapace broad, transversely oval. Antero-lateral borders less than 2/3rd the length of postero lateral borders. Front straight, squarish, obscurely sinuous at the middle. Antero-lateral border cut in to 3 thin notches, first two lobes gently rounded, last two anteriorly acuminate. Supra orbital margin entire. Chelipeds unequal, outer surface of wrist and palm granular; thumb of the larger cheliped with an enlarged tooth at its base.

Distribution : INDIA : Andhra Pradesh, Kerala, Maharastra and Andaman Islands.

Out side India : Pakistan and Thailand.

Remarks : This crab was collected from a rotten wooden log in the sea shore.

Family ERIPHIIDAE MacLeay, 1838

Diagnosis : Carapace xanthoid-shaped, thick and narrow. Antero-lateral borders spinose. Front very broad, exceeding half or more the greatest breadth of carapace. Chelipeds unequal, smaller cheliped without noticeably elongated fingers.

Subfamily MENIPPINAE Ortmann, 1894

Remarks : So far, it is represented by a single genus in Krishna estuary.

Genus *Myomenippe* Hilgendorf, 1879

1879. *Myomenippe* Hilgendorf, *MB. AK. Berl.* : 795.

1898. *Myomenippe*, Alcock, *J. Asiat. Soc. Bengal*, **67** (2) : 179.

2005. *Myomenippe*, Dev Roy and Bhadra, *Zool. Surv. India. Fauna of Andhra Pradesh, State Fauna Series*, **5** (Part 5) : 471.

Diagnosis : Carapace rough, granular, regions prominent. Front bilobed, each lobe consisting of 3 teeth, lobes square-cut. Anterolateral lobes more prominent, margins granular.

16. *Myomenippe hardwickii* (Gray, 1831)

(Pl. 3, Fig. 2)

1829. *Myomenippe hardwickii* Gray, *Zool. Miscell., London* : 39-41.

1898. *Menippe* (*Myomenippe*) *granulosa*, Alcock, *J. Asiat. Soc. Bengal*, **67**(2) : 179.

2005. *Myomenippe hardwickii*, Dev Roy and Bhadra, *Zool. Surv. India. Fauna of Andhra Pradesh, State Fauna Series*, **5** (Part 5) : 472, pl. 3, fig. 2.

Material Examined : 1 ex., Palakayatippa, 17-02-99, CR-5263; 2 ex., Eelachetladibba, 10-01-2000, CR-5264.

Mesurements : L-11.0-35.0 W-8.0-26.0

Diagnosis : Carapace broad and rather convex, elevated areas of epibranchial region covered with large vesiculous granules. Front cut into 2 lobes having 3 teeth in each lobe, median two being most prominent. Anterolateral teeth four, of which, three broad. Chelipeds unequal. Carapace, chelipeds and legs brick red in colour in live and fresh condition.

Distribution : INDIA : Andhra Pradesh, Tamil Nadu, West Bengal, Gujarat and Maharashtra.

Out side India : East coast of Africa, Bangladesh, Myanmar, Singapore and Indonesia.

Remarks : During our present study, it was noted that the frontal teeth of the juvenile specimen was much broader than the adult specimens.

Family GECARCINIDAE MacLeay, 1838

1838. Gecarcinidae MacLeay, In : Smith, *Illustr. Zool. S. Afr. (Invert.)* : 63, 65.

1900. Gecarcinidae, Alcock, *J. Asiat. Soc. Bengal*, **69**(2) : 289, 440.

2000. Gecarcinidae, Dev Roy and Das, *Rec. zool. Surv. India, Occ. Paper No.* **185** : 78.

Diagnosis : Carapace thick, transversely oval. Front broad, strongly deflexed. Antero-lateral margins strongly arcuate anteriorly. Inter-antennular septum very broad. Orbits large. Chelipeds massive. Legs strong, dactylus long, usually thorny.

Genus *Cardisoma* Latreille, 1828

1828. *Cardisoma* Latreille, *Encycl. Méthod.*, **10** : 685.

1869. *Cardiosoma*, Smith, *Trans. Conn. Acad. Arts. Sci.*, **2** : 16, 36.

1900. *Cardiosoma*, Alcock, *J. Asiat. Soc. Bengal*, **69**(2) : 441.

2000. *Cardisoma*, Dev Roy and Das, *Rec. zool. Surv. India, Occ. Paper No. 185* : 79.

Diagnosis : Carapace thick, oval and convex. Fronto-orbital width exceeding more than half of the greatest breadth of carapace. Front broad, nearly straight and deflexed. Lateral borders tumid and strongly curved. Epistome short but prominent. Chelipeds massive, equal or unequal. Legs stout, dactyli spinose.

17. *Cardisoma carnifex* (Herbst, 1794)

(Pl. 7, Fig. 4)

1794. *Cancer carnifex* Herbst, *Versuch. Naturgesch. Krabben. Krebse.*, **2** : 163, pl. 41, fig. 1.

1900. *Cardiosoma carnifex*, Alcock, *J. Asiat. Soc. Bengal*, **69**(2) : 445.

2000. *Cardisoma carnifex*, Dev Roy and Das, *Rec. Zool. Surv. India, Occ. Paper No. 185* : 79, pl. 7, fig. 8 and pl. 21, figs. 1, 2.

Material Examined : 1 ex., Lankevenitippa, 25-09-98, CR-4805; 1 ex., Lankevenitippa, 15-10-96, CR-4806; 1 ex., Palleshummapalem, 19-09-98, CR-4807; 1 ex., Gullalamoda, 23-09-98, CR-4808; 1 ex., Kanur, 08-09-97, CR-4809.

Mesurements : L-52.0-62.0 W-62.0-70.0

Diagnosis : Carapace deep, transversely oval and strongly convex from front to back, surface smooth. Front thick, broad and deflexed. Anterolateral borders of carapace defined by a fine ridge. Chelipeds stout, unequal, fingers stout. Leg joints broad, stout and fringed with thickly set of stiff bristles especially on the upper margins of carpus and propodus, dactylus spiny.

Distribution : INDIA : Andhra Pradesh, Tamil Nadu, Andaman and Nicobar Islands.

Out side India : South Africa, Madagascar, Mauritius, Thailand, Formosa, Japan, Indonesia, Tahiti, Tuamotu.

Remarks : In Krishna estuary, this crab has been found to occur in muddy areas of landward fringe of mangroves. This crab is a new record to Andhra Pradesh.

Family GRAPSIDAE MacLeay, 1838

1838. Grapsidae MacLeay, In : Smith, *Illustr. Zool. S. Afr. (Invert.)* : 63, 65.

2005. Grapsidae, Dev Roy and Bhadra, *Zool. Surv. India. Fauna of Andhra Pradesh, State Fauna Series, 5* (Part 5) : 473.

Diagnosis : Carapace thick or flat, quadrilateral, lateral borders straight or convex. Front very broad. Buccal cavern square-cut, a rhomboidal gap left between the external maxillipeds. Chelipeds massive.

Remarks : The family is divided into four subfamilies, of which, representatives of only two subfamilies are recorded from Krishna estuary.

Key to subfamilies of the family GRAPSIDAE

- An oblique hairy ridge on the exposed surface of external maxillipeds, exognath concealed either partly or almost completely SESARMINAE
- No such ridge on the exposed surface of external maxillipeds, exognath remaining exposed throughout GRAPSINAE

Subfamily GRAPSINAE MacLeay, 1838

Remarks : The subfamily is represented by a single genus in Krishna estuary.

Genus *Metopograpsus* H. Milne Edwards, 1853

1853. *Metopograpsus* H. Milne Edwards, *Annls. Sci. nat. (Zool.)*, ser. 3, 20 : 164.

1900. *Metopograpsus*, Alcock, *J. Asiat. Soc. Bengal*, 69(2) : 389,396.

2005. *Metopograpsus*, Dev Roy and Bhadra, *Marine and Estuarine Crabs. Zool. Surv. India. Fauna of Andhra Pradesh, State Fauna Series, 5* (Part 5) : 476.

Diagnosis : Carapace depressed, quadrangular, little broader than long, regions inconspicuous, branchial grooves distinct. Front broad, more than half of the greatest breadth of carapace; post frontal lobes four. Epistome well defined, Chelipeds subequal or unequal. Legs broad and compressed.

18. *Metopograpsus* sp.

(Pl. 3, Fig. 3)

Material Examined : 1 ex., Palakayattippa, 19-09-97, CR-5261; 1 ex., Kanur, 07-09-97, CR-5262.

Mesurements : L-8.0-10.0 W-10.0-12.0

Remarks : The specimen examined was very small and partially damaged. It had a very close resemblance with *M. messor* (Forskål). The exact identity of the species, however, could not be determined due to lack of adult specimen.

Subfamily SESARMINAE Dana, 1852

Remarks : Earlier Dev Roy and Bhadra (2005) recorded only four genera namely, *Parasesarma*, *Episesarma*, *Metasesaema* and *Metaplax* from Andhra coast. During the present study, one more genus namely, *Chiromantes* is recorded for the first time from Krishna estuary vis-à-vis Andhra Pradesh. The four genera under the subfamily known as a result of present investigation from Krishna estuary can be distinguished by the following key.

Key to the genera of the subfamily SESARMINAE

1. Carapace broader than long, pterygostomian regions and side walls reticulated, lower border of orbit not abnormally prominent 2
 - Carapace much broader than long, pterygostomian regions and side walls not reticulated, lower border of orbit prominent *Metaplax*
2. Palm of chelipeds with a longitudinal pectinated crest on its upper part ... *Episesarma*
 - Palm of chelipeds with 2-3 transverse pectinated crest on its upper part 3
3. Lateral border entire *Parasesarma*
 - Lateral border with a tooth behind outer orbital angle *Chiromantes*

Genus *Parasesarma* de Man, 1895

1895. *Parasesarma* de Man, *Zool. Jb. (Syst.)*, **9** : 181.

2005. *Parasesarma*, Dev Roy and Bhadra, *Marine and Estuarine Crabs. Zool. Surv. India. Fauna of Andhra Pradesh, State Fauna Series*, **5** (Part-5) : 482.

Diagnosis : Lateral border of carapace entire and not toothed behind outer orbital angle, otherwise it resemble with the genus *Sesarma*.

19. *Parasesarma plicatum* (Latreille, 1803)

(Pl. 4, Fig. 3)

1803. *Ocypoda plicata* Latreille, *Hist. Nat. Crust.*, : 47.

1899. *Sesarma quadrata*, Alcock, *J. Asiat. Soc. Bengal*, **69**(2) : 413.

1957. *Sesarma (Sesarma) quadrata*, Chhapgar, *J. Bombay nat. Hist. Soc.*, **54**(3) : 520, pl. 16, fig. a-c.

2000. *Sesarma (Parasesarma) plicatum*, Dev Roy and Das, *Rec. zool. Surv. India., Occ. Paper No.* **185** : 91.

2005. *Parasesarma plicatum*, Dev Roy and Bhadra, *Zool. Surv. India. Fauna of Andhra Pradesh, State Fauna Series*, **5** (Part 5) : 483.

Material examined : 4 ex., Lankevenitippa, 15-02-98, CR-4841.

Mesurements : L-9.5-20.0 W-12.0-16.0

Diagnosis : Carapace deep, convex, surface very rough. Front exceeding more than half the greatest breadth of carapace, frontal lobes 4, middle two broad. No tooth behind the outer

orbital angle. Cheliped strong, unequal. Anterior border of cheliped of dactylus elegantly milled with 10-20 lamellae. Outer surface of arm, wrist and palm granular.

Distribution : INDIA : Andhra Pradesh, Orissa, Pondicherry, Tamil Nadu, West Bengal, Gujarat, Maharashtra, Karnataka, Kerala, Maharashtra and Andaman and Nicobar Islands.

Out side India : East Coast of Africa, Pakistan, Sri Lanka, Myanmar, China, Korea and Japan.

Remarks : This crab occurs both in brackish & fresh water. It prefers muddy bottom of mangroves.

Genus *Chiromantes* Gistel, 1848

1848. *Chiromantes* Gistel, *Naturgeschichte des Thierreichs fur höhere Schulen* : X

Diagnosis : Carapace squarish, usually deep often depressed. Lateral borders straight and parallel with a tooth behind the external orbital angle. Upper surface of chelipeds with 2-3 transverse pectinated crests.

Remarks : The systematics of *Sesarma* crabs is very puzzling, confusing and still in an unsettled state as already discussed by Dev Roy and Das (2000) and Dev Roy and Bhadra (2005). In the present work, the subgenus *Chiromantes* has been treated as a genus following Ng(1994).

20. *Chiromantes bidens* (de Haan, 1835)

(Pl. 4, Fig. 4)

1835. *Grapsus (Pachysoma) bidens* de Haan, *Fauna Japon. (Crust.)* : 60.

1995. *Sesarma bidens*, Ghosh, *Zool. Surv. India, Estuarine Ecosystem Series, Part1-2, Hugli Matla Estuary* : 243

2000. *Sesarma (Chiromantes) bidens*, Dev Roy & Das., *Rec. Zool. Surv. India, Occ. Paper No. 185* : 90.

2005. *Chiromantes bidens*, Dev Roy and Nandi, *J. Environ. & Sociobiol.*, **2** (1&2) : 123.

Material examined : 1 ex., Kanur, 15-09-98, CR-4838.

Measurements : L-31.5 W-34.5

Diagnosis : Carapace broader than long, little convex, regions well demarcated. A sharp tooth present just behind the orbital angle. Chelipeds strong and equal, upper border of male dactylus elegantly milled with 15-20 coarse transverse lamellae; outer surface of male palm bearing two comb line impressions. In all legs, anterior and posterior borders of propodus and dactylus covered with hairs.

Distribution : INDIA : Andhra Pradesh, Orissa, West Bengal and Andaman and Nicobar Islands. *Out side India* : Sri Lanka, Japan, Thailand, Hong Kong.

Remarks : This crab was found to occur in muddy areas of mangrooves. It is reported for the first time from Andhra Pradesh.

Genus *Episesarma* de Man, 1895

1895. *Episesarma* de Man, *Zool. Jb. (Syst.)*, **9** : 181..

1970. *Neoepisesarma*, Serene and Soh, *Treubia*, **27**(4) : 395, 405.

2005. *Episesarma*, Dev Roy and Bhadra *Zool. Surv. India. Fauna of Andhra Pradesh, State Fauna Series 5* (Part 5) : 484.

Diagnosis : Carapace and front narrow. Antero-lateral tooth strongly marked behind outer orbital angle. Anterior border of male cheliped armed with a sub distal triangular dentate process. A longitudinal pectinated crest on upper part of male cheliped running parallel to its margin.

Key to species of the genus *Episesarma*

1. Upper border of dactylus of larger cheliped in male milled with more than 40 fine lamellae *E. taeniolata*
2. Upper border of dactylus of larger cheliped in male with coarsely crenulated crest
..... *E. tetragonum*

21. *Episesarma taeniolata* White, 1847

(Pl. 4, Fig. 1)

1847. *Sesarma taeniolatum* White, *List of the specimens of Crustacea in the collection of the British Museum London* : 38.

1957. *Sesarma (Sesarma) taeniolata*, Chhapgar, *J. Bombay Nat. Hist. Soc.*, **54**(3) : 521.

2000. *Neoepisesarma (Neoepisesarama) taeniolata*, Dev Roy and Das, *Rec. zool. Surv. India. Occ. Paper No.*, **185** : 95.

2005. *Episesarma taeniolata*, Dev Roy and Bhadra, *Zool. Surv. India. Fauna of Andhra Pradesh, State Fauna Series, 5* (Part 5) : 485.

Material Examined : 2 ex., Kanur, 10-10-97, CR-4850; 1 ex., Kanur, 08-09-97, CR-4847.

Mesurements : L-17.0-32.0 W-20.0-35.0

Diagnosis : Carapace squarish, nearly flat, surface covered with tuft of small hairs. Antero lateral border cut into 2 teeth including outer orbital angle. Outer surface of palm is granular, inner surface with a granular ridge. Upper border of male dactylus elegantly milled with more than 40 fine lamellae-like structures.

Distribution : INDIA : Andhra Pradesh, West Bengal; Maharastra, Andaman Islands.

Out side India : Pakistan, Mergui, Archipelago, Malay, Peninsula, Singapore, Indonesia, China, Japan, Thailand.

Remarks : This species has been found to occur in landward fringe of mangrove thickets.

22. *Episesarma tetragonum* (Fabricius, 1798)

(Pl. 4, Fig. 2)

1798. *Cancer tetragonum* Fabricius, *Ent. Syst. Suppl.*, : 341.

1900. *Sesarma tetragonum*, Alcock, *J. Asiat. Soc. Bangal*, **69** (2) : 355.

1995. *Sesarma tetragonum*, Deb, *Zool. Surv. India. Fauna of Chilka Lake, Wetland Ecosystem Series*, **1** : 362

2000. *Neoepisesarma (Muradium) tetragonum*, Dev Roy and Das, *Rec. zool. Surv. India, Occ. Paper No.*, **185** : 97.

2005. *Episesarma tetragonum*, Dev Roy & Bhadra, *Zool. Surv. India State Fauna Series 5 : Fauna of Andhra Pradesh (Part 5)* : 485.

Material Examined : 1 ex., Kanur, 10-10-96, CR-4845; 1 ex., Kanur, 08-09-97, CR-4855; 2 ex., Palleshummapalem, 09-09-97, CR-4856; 3 ex., Palakayatippa, 19-09-97, CR-4846; 1 ex., Kanur, 17-09-98, CR-4859; 2 ex., Palleshummapalem, 18-09-98, CR-4849; 1 ex., Sangameswara, 26-09-98, CR-4848; 1 ex., Gollalmoda, 11-01-2000, CR-4860.

Mesurements : L-13.0-39.0 W-16.0-43.0

Diagnosis : Carapace more or less square-shaped, little convex, and covered with thick hairs. There is a sharp teeth in antero lateral region behind the outer orbital angle. Cheliped strong and unequal, inner angle of the wrist dentiform. Propodus and dactylus of legs covered with hairs. Dactylus of male bearing 9-10 tubercles.

Distribution : INDIA : Andhra Pradesh, Orissa, Tamil Nadu, West Bengal, Andaman.

Out side India : Sri Lanka.

Remarks : This crab occur in landward fringe of mangrove forests. Compared to the proceeding species, this crab is more common in the study area.

Key to species of the genus *Metaplax*

1. Anterior border of carpus and propodus of legs spiny, male chelipeds three times the length of carapace *M. crenulata*
 – male chelipeds less than 3 times the length of carapace, Legs smooth 2
2. Dactylus of male chelae with a prominent lobe on its dentary edge, male chelipeds unequal 3
 – Dactylus of chela without a prominent lobe on its dentary edge, male chelipeds equal 4

3. All abdominal segments separated in male, lower orbital border continued up to the level of first notch in the lateral border, orbital portion finely and unevenly serrulated *M. indica*
- Third to fifth male abdominal segments fused in male, lower orbital border continued up to the level of second notch in the lateral border, lobules of orbital portions consisting of 9-10 small blunt obscurely bilobulate teeth gradually decreasing in size *M. distincta*
4. Cheliped of male palm longer than high *M. elegans*
- Cheliped of male palm higher than long *M. intermedia*

Genus *Metaplax* H. Milne Edwards, 1852

1852. *Metaplax* H. Milne Edwards, *Annls. Sci. nat. (Zool.)*, sér. 3, **18** : 161.

1900. *Metaplax*, Alcock, *J. Asiatic. Soc. Bangal*, **69** (2) : 431.

2005. *Metaplax*, Dev Roy and Bhadra, *Zool. Surv. India. Fauna of Andhra Pradesh, State Fauna Series, 5* : (Part 5) : 486.

Diagnosis : Carapace quadrilateral, flat broader than long, regions well defined. Front deflexed. Lateral border almost parallel and cut into 4-5 teeth. Epistome short and prominent. Chelipeds short, massive in male and long, slender in female. Legs slender.

23. *Metaplax distincta* H. Milne Edwards, 1852

(Pl. 5, Fig. 2)

1852. *Metaplax distinctus* H. Milne Edwards, *Annls. Sci. nat. (Zool.)*, sér. 3, **18** : 162. pl. 4, fig. 27

1900. *Metaplax distincta*, Alcock, *J. Asiat. Soc. Bengal*, **69**(2) : 432

2005. *Metaplax distincta*, Dev Roy and Bhadra, *Zool. Surv. India. Fauna of Andhra Pradesh, State Fauna Series, 5* (Part 5) : 488.

Material Examined : 3 ex., Kanur, 07-09-97, CR-4875; 1 ex., Kanur, 07-09-97, CR-4872; 3 ex., Kanur, 08-09-97, CR-4873; 1 ex., Palleshummapalem, 09-09-97, CR-4874; 1 ex., Palleshummapalem, 09-02-98, CR-4871; 1 ex., Eelachetladibba, 14-02-98, CR-4869; 2 ex., Kanur, 15-09-98, CR-4995; 1 ex., Kanur, 16-09-98, CR-4868; 3 ex., Kanur, 13-02-99, CR-4865; 2 ex., Palleshummapalem, 15-02-99, CR-4864; 1 ex., Kanur, 05-01-2000, CR-4878; 1 ex., Gullalamoda, 10-01-2000, CR-4870; 1 ex. Gollalmoda, 11-01-2000, CR-4879; 1 ex. Kanur, 13-02-99, CR-5269; 1 ex. Kanur, 10-10-96, CR-5270.

Mesurements : L-10.0-16.0 W-14.0-22.5

Diagnosis : Carapace about $\frac{3}{5}$ th as long as broad, deep, surface finely granular at anterior half. Lower orbital border in male extended up to the level of 2nd notch of lateral border of carapace. The infra orbital ridge consisting of 25-30 lobules, of which, first 9-11 constituting

the orbital portion longer than broad and transeversely sulcate above, the lobules decreasing in size from within outwards. Fixed finger armed with a distinct lobe on its dentary edge. Upper border of merus of first and fourth pair of legs armed with a single subterminal spine, second and third pair with several spines.

Distribution : INDIA : Andhra Pradesh, Tamil Nadu, West Bengal, Karnataka, Maharashtra, Andaman.

Out side India : Mergui, Archipelago, Thailand.

Remarks : This is a mangrove inhabiting species truly estuarine in nature.

24. *Metaplax intermedia* de Man, 1888

(Pl. 5, Fig. 5)

1888. *Metaplax intermedius* de Man, *J. Linn. Soc. Zool.*, **22** : 166, pl. 11, fig. 7-9.

1900. *Metaplax intermedia*, Alcock, *J. Asiat. Soc. Bengal*, **69**(2) : 435.

2005. *Metaplax inermia*, Dev Roy & Bhadra, *Zool. Surv. India. Fauna of Andhra Pradesh, State Fauna Series*, **5** (Part 5) : 491.

Material Examined : 2 ex., Kanur, 08-09-97, CR-4866; 1 ex., Kanur, 08-09-97, CR-4867.

Mesurements : L-13.5-15 W-18.5-23

Diagnosis : Carapace distinctly broader than long. Infraorbital ridge consisting of 40-50 small teeth or granules, first 5-6 of these lobule-like, being longer than broad, the lobuliform teeth decreasing in size from within outwards, and then gradually becoming minutely and regularly pectinate. In male cheliped, palm at least as long as broad (high); dactylus bearing a prominent lobe at its inner margin, upper margin of meropodites of legs armed with a single spine distally. All the abdominal segments separated in male.

Distribution : INDIA : Andhra Pradesh, Orissa, West Bengal.

Out side India : Myammar.

Remarks : This species can easily be differentiated from other species of this genus by the presence of a prominent lobe on the dentary edge of cheliped and also by distinctly unequal chelipeds. It inhabits muddy areas of mangroves in Krishna estuary.

25. *Metaplax indica* H. Milne Edwards, 1852

(Pl. 5, Fig. 4)

1852. *Metaplax indicus* H. Milne Edwards, *Annls. Sci. nat. (Zool.)*, ser. 3, **18** : 161

1900. *Metaplax indica*, Alcock, *J. Asiat. Soc. Bengal*, **69**(2) : 432

2005. *Metaplax indica*, Dev Roy & Bhadra, *Zool. Surv. India. Fauna of Andhra Pradesh, State Fauna Series*, **5** (Part 5) : 490.

Measurements : L-10 W-14

Remarks : This crab can easily be identified from its congeneric species by the presence of fused abdomoinal segments in male. It inhabits muddy areas of mangroves in Krishna estuary.

26. *Metaplex crenulata* (Gerstaecker, 1856)

(Pl. 5, Fig. 1)

1856. *Rhaconotus crenulatus* Gerstaecker, Arch. Naturgesch. Jahrg., 22(1) : 142.

1900. *Metaplex crenulata*, Alcock, *J. Asiat. Soc. Bengal*, **69**(2) : 435.

2005. *Metaplex crenulata*, Dev Roy and Bhadra, *Zool. Surv. India. Fauna of Andhra Pradesh, State Fauna Series*, **5** (Part 5) : 487.

Material Examined : 5 ex., Palakayatippa, 20-02-99, CR-4863.

Measurements : L-9.0 W-11.0

Diagnosis : Carapace almost 3/4th as long as broad, surface pitted, regional areas very distinct and well outlined by deep grooves; lateral border cut into 5 teeth, first 4 prominent, almost equal in size, their edges serrated. In male, the lower border of orbit extended beyond first notch of lateral border. Chelipeds unequal extended about three times the length of carapace, fingers lacking conspicuous lobe on the dentary edges. Muscular crest present near the proximal end of the anterior margin of the upper surface of the arm.

***Distribution* : INDIA : Andhra Pradesh, West Bengal.**

Out side India : Myanmar, Malaysia.

Remarks : This specimen generally larger in size than the other species of the same genus.

27. *Metaplex elegans* de Man, 1888

(Pl. 5, Fig. 3)

1888. *Metaplex elegans* de Man, *J. Linn. Soc. Zool.*, **22** : 164, pl. 11, fig. 4-6.

1900. *Metaplex elegans*, Alcock, *J. Asiat. Soc. Bengal*, **69**(2) : 434.

2005. *Metaplex elegans*, Dev Roy and Bhadra, *Zool. Surv. India. Fauna of Andhra Pradesh, State Fauna Series*, **5** (Part 5) : 489.

Material Examined : 1 ex., Kanur, 05-01-2000, CR-4876; 1 ex., Palleshummapalem, 13-12-2000, CR-4877.

Measurements : L-15.5 W-21.5

Diagnosis : Carapace about 5/7th as long as broad, little convex, surface smooth, regional boundaries faintly indicated. Infra orbital ridge consisting of 45-55 minute teeth or granules in male and about 30 in females, teeth gradually and regularly decreasing in size backwards.. Meropodite of legs armed with a single spine in 1st pair; 3-6 spine in 2nd pair and 7-10 in 3rd pair. Male abdomen with 7 separate broad segments.

Distribution : INDIA : Andhra Pradesh, Tamil Nadu, Andaman.

Out side India : Mergui, Archipelago, Malay Peninsula, Indonesia, Singapore Thailand.

Remarks : In Krishna estuary, this crab inhabits muddy areas of mangroves.

Genus *Varuna* H. Milne Edwards, 1830

1830. *Varuna* H. Milne Edwards, *Dict. Hist. Nat.*, **16** : 511.

1900. *Varuna*, Alcock, *J. Asiat. Soc. Bangal*, **69** (2) : 400.

2005. *Varuna*, Dev Roy and Bhadra, *Zool. Surv. India. Fauna of Andhra Pradesh, State Fauna Series*, **5** (Part 5) : 479.

Diagnosis : Carapace squarish, flattened, regions fairly distinct. Front broad, straight and deflexed. Antero lateral border cut into 3 teeth (including the outer orbital angle). Epistome well defined. Chelipeds equal, massive in male. Legs compressed.

28. *Varuna litterata* (Fabricius, 1798)

(Pl. 3, Fig. 4)

1798. *Cancer litteratus* Fabricius, *Entom. Syst. Suppl.*, : 342.

1899. *Varuna litterata*, Alcock, *J. Asiat. Soc. Bangal*, **69** (2) : 401.

2005. *Varuna litterata*, Dev Roy and Bhadra, *Zool. Surv. India. Fauna of Andhra Pradesh, State Fauna Series*, **5** (Part 5) : 480.

Material Examined : 8 ex., Palleshummapalem, 12-10-96, CR-2190; 1 ex., Lankevenitippa, 15-10-96, CR-4796; 3 ex., Eelachetladibba, 16-10-96, CR-2193; 1 ex., Kanur,

08-09-97, CR-4801; 1 ex., Palleshummapalem, 18-09-98, CR-4794; 1 ex., Gullalamoda, 19-02-99, CR-4795; 1 ex., Kanur, 04-01-2000, CR-4798; 1 ex., Kanur, 04-01-97, CR-4798; 2 ex., Palleshummapalem, 07-01-2000, CR-4799; 1 ex., Gullalamoda, 10-01-2000, CR-4797, 12 ex., Kanur, 11-12-2000, CR-4803; 2 ex., Kanur, 12-12-2000, CR-4804; 15 ex., Palleshummapalem, 13-12-2000, CR-4802.

Mesurements : L-12.0-36.0 W-13.0-39.0

Diagnosis : Carapace smooth, depressed with a H-shaped groove at its middle. Antero-lateral borders arched and cut into 3 teeth including the outer orbital angle. Three terminal joints of legs compressed and adapted for swimming. Inner border of arm denticulate, inner corner of wrist with a large sharp spine.

Distribution : INDIA : Andhra Pradesh, Orissa, Tamil Nadu, West Bengal, Kerala, Maharashtra.

Out side India : Myanmar, Bangladesh, Phillipines, Hongkong, Japan, New Zealand, New Guinea, Singapore, Australia, East Africa.

Remarks : This species is very common in Krishna estuary occurring in both brackish and fresh water.

Family OCYPODIDAE Rafinesque, 1815

1815. Ocypodia Rafinesque, *Analyse de la Nature* : 96.

2005. Ocypodidae, Dev Roy and Bhadra, *Zool. Surv. India. Fauna of Andhra Pradesh, State Fauna Series, 5 (Part 5)* : 497.

Diagnosis : Carapace subquadrangular, subcubical or subglobose, deep or flat, broader than long. Front narrow, deflexed. Orbit occupying almost 90% of carapace border. Eye stalk slender and elongated to form a style. Chelipeds unequal. Legs strong.

Key to subfamilies of the family OCYPODIDAE

Carapace sub-cubical, anteriorly side walls sculptured resembling brain convolutions.
No hairy ridge pouch between bases of 2nd and 3rd pair of legs DOTILLINAE

Carapace sub-quadrilateral, anteriorly side walls without sculpture. A hairy ridge pouch between bases of 2nd and 3rd pair of legs OCYPODINAE

Subfamily OCYPODINAE Rafinesque, 1815

Remarks : The subfamily is represented by two genera.

Key to the genera of the subfamily OCYPODINAE

- Antennular flagella concealed under front. Eyes large occupying major part of eye stalk *Ocypode*
 Antennular flagella small but not concealed. Eyes small, eye stalk long and slender *Uca*

Genus *Ocypode* Weber, 1795

1795. *Ocypode* Weber, *Nomencl. ent. Syst. Fabr.* : 92.
 1900. *Ocypoda*, Alcock, *J. Asiat. Soc. Bengal*, 69(2) : 342.
 2005. *Ocypode*, Dev Roy & Bhadra, *Zool. Surv. India. Fauna of Andhra Pradesh, State Fauna Series, 5* (Part 5) : 499.

Diagnosis : Carapace sub quadrilateral, deep, regions ill defined. Front narrow, deflexed. Lateral border with or without tooth behind the outer orbital angle. Eye stalk prolonged to form a style. Epistome short. Chelipeds unequal. Palm of larger chela short with a stridulating ridge. Legs strong.

Key to species of the genus *Ocypode*

- Carapace and its appendages characteristically red in colour, anterior border of first two pair of legs covered with dense hair, finger of smaller cheliped expanded and flattened at tip *O. macrocera*
- Carapace and its appendages yellow or whitish in colour, anterior border of propodus of leg joints not covered with brushes of hair, finger of smaller chela with a pointed tip *O. platytarsis*

29. *Ocypode macrocera* H.Milne Edwards, 1837

(Pl. 6, Fig. 1)

1837. *Ocypode macrocera* H.Milne Edwards, *Hist. Nat. Crust.*, 2 : 49.
 1900. *Ocypoda macrocera*, Alcock, *J. Asiat. Soc. Bengal*, 69(2) : 432
 2005. *Ocypode macrocera*, Dev Roy & Bhadra, *Zool. Surv. India. Fauna of Andhra Pradesh, State Fauna Series, 5* (Part 5) : 502.

Material Examined : 8 ex., Gullalamoda, 17-10-96, CR-2191; 2 exx., Chetakaluamandi, 13-02-97, CR-4814; 4 ex., Palakayatippa, 21-02-97, CR-4828, 2 ex.; Pallethummapalem, 10-09-97, CR-4821; 4 ex., Lankevenitippa, 15-09-97, CR-4826; 2 ex., Eelachetladibba, 16-09-97, CR-4824; 1 ex., Idurumundi, 18-09-97, CR-4815; 1 ex., Palakayatippa, 13-02-98, CR-4819; 2 ex., Kanur, 17-09-98, CR-4825; 2 ex., Kamavericheruvu, 21-09-98, CR-4823; 1 ex., Gullalamoda, 23-09-98, CR-4822; 2 ex., Gullalamoda, 23-09-98, CR-4830; 4 ex., Gullalamoda,

24-09-98, CR-4820; 4 ex., Kanur, 12-02-99, CR-4817; 1 ex., Gullalamoda, 19-02-99, CR-4816; 3 ex., Lankevenitippa, 21-02-99, CR-4818; 7 ex., Palleshummalapalem, 06-01-2000, CR-4832; 2 ex., Palleshummalapalem, 07-01-2000, CR-4829; 5 ex., Gullalamoda, 10-01-2000, CR-4831.

Measurements : L-7.0-38.0 W-9.0-39.0

Diagnosis : Carapace squarish, granular and convex. Carapace reddish in colour. Stridulatory ridge comprising of striations. Eyes large, style prolonged. Finger tip of smaller chela spatula shaped.

Distribution : INDIA : Andhra Pradesh, Orissa, Tamil Nadu, West Bengal.

Out side India : Myanmar, Gulf of Thailand.

Remarks : The bright red colouration of adult specimen is very characteristic of this species, however the colouration is very dull in juvenile stage.

30. *Ocypode platytarsis* H.Milne Edwards, 1852

(Pl. 6, Fig. 2)

1852. *Ocypode platytarsis* H. Milne Edwards, *Annls. Sci. nat. (Zool.)*, ser. 3, **18** : 141.

1900. *Ocypoda platytarsis*, Alcock, *J. Asiat. Soc. Bengal*, **69**(2) : 432.

2005. *Ocypode platytarsis*, Dev Roy and Bhadra, *Zool. Surv. India. Fauna of Andhra Pradesh, State Fauna Series*, **5** (Part 5) : 504.

Material Examined. 1 ex., Manginapudi, 20-09-98, CR-5265; 1 ex., Puligada, 17-12-2000, CR-5266.

Measurements : L-10.0 W-13.0

Diagnosis : Carapace quadrilateral, deep and convex. Stridulatory ridge without hairs consisting of small tubercles only. Dactyli of legs compressed. Palm of small cheliped pointed.

Distribution : INDIA : Andhra Pradesh, Orissa, Tamil Nadu.

Out side India : Sri Lanka.

Remarks : The granulation of carapace is very prominent even in juvenile specimen.

Genus *Uca* Leach, 1814

1814. *Uca* Leach, In : D. Brewster, *The Edinburgh Encyclopedia*, **7**(2) : 430.

1817. *Uca*, Latreille, *Nouv. Dict. Nat.*, **12** : 517.

1975. *Celuca*, Crane, *Fiddler Crabs of the World. Ocypodidae* : Genus *Uca* : 211.

2005. *Uca*, Dev Roy & Bhadra, *Zool. Surv. India. Fauna of Andhra Pradesh, State Fauna Series*, **5** (Part 5) : 499.

Diagnosis : Carapace subquadrilateral or subhexagonal, deep, regions indistinct, surface smooth, the H form depression distinct. Front narrow, deflexed. Anterolateral border absent. Eyes small, stalk prolonged to form a style. Epistome short. Male chelipeds remarkably unequal. Palm of larger chela short with a stridulating ridge. Legs strong.

Key to species of the genus *Uca*

- Carapace subquadrilateral, major cheliped porcelain white with truncated tip *Uca lactea*
- Carapace hexagonal, major cheliped yellow, finger tips never truncated *Uca tringularis*

31. *Uca lactea* (de Haan 1835)

(Pl. 6, Fig. 3)

1835. *Ocypode (Gelasiums) lacteus* de Haan, *Faun Japon. (Crust.)* : 54.

1900. *Gelasiums lacteus*, Alcock, *J. Asiat. Soc. Bangal*, **69** (2) : 355.

1961. *Uca annulipes*, Sankarankuty, *J. mar. biol. Ass. India*, **3** (1-2) : 113.

1975. *Uca (celuca) lactea lactea*, Crane, *Fiddler Crabs of the world : Ocypodidae : Genus Uca* : 300.

2005. *Uca lactea*, Dev Roy and Bhadra, *Zool. Surv. India. Fauna of Andhra Pradesh, State Fauna Series*, **5** (Part 5) : 508.

Material Examined : 1 ex., Lankevenitippa, 15-10-96, CR-4934; 1 ex., Kanur, 11-02-97, CR-4991; 6 ex., Kanur, 11-02-97, CR-4991; 3 ex., Kamaveicheruvu, 14-02-97, CR-4911; 1 ex., Palakayatippa, 21-02-97, CR-4933; 1 ex., Pallethummapalem, 09-05-97, CR-4936; 4 ex., Kanur, 08-09-97, CR-4932; 2 ex., Kanur, 08-09-97, CR-4919; 4 ex., Kanur, 12-09-97, CR-4922; 8 ex., Lankevenitippa, 15-09-97, CR-4901; 3 ex., Palakayatippa, 19-09-97, CR-4925; 6 ex., Peddakanur, 07-02-98, CR-4918; 2 ex., Palakayatippa, 13-02-98, CR-4926; 6 ex., Palakayatippa, 13-02-98, CR-4915; 5 ex., Lankevenitippa, 15-02-98, CR-4935; 6 ex., Kanur, 15-09-98, CR-4917; 7 ex., Kanur, 16-09-98, CR-4981; 1 ex., Kanur, 16-09-98, CR-4982; 3 ex., Pallethummalapalem, 18-09-98, CR-4983; 3 ex., Gullalamoda, 24-09-98, CR-4916; 3 ex., Gullalamoda, 24-09-98, CR-4908; 1 ex., Sangameswara, 26-09-98, CR-4984; 4 ex., Palakayatippa, 17-02-99, CR-4912; 7 ex., Kanur, 04-01-2000, CR-4928; 4 ex., Kanur, 05-01-2000, CR-4923; 1 ex., Gullalamoda, 10-01-2000, CR-4910; 8 ex., Gullalamoda, 10-01-2000, CR-4908; 3 ex., Gollalamoda, 11-01-2000, CR-4900; 2 ex., Pallethummapalem, 13-12-2000, CR-4921; 2 ex., Palakayatippa, 17-12-2000, CR-4907; 3 ex., Gollalamoda, 18-12-2000, CR-4924.

Mesurements : L-6.0-13.0 W-9.5-22.0

Diagnosis : Carapace more or less quadrilateral in outline the outer orbital angle projecting outwardly in a diagonal manner. Tip of fixed finger of large male cheliped notched or truncated

due to the presence of a enlarged tooth and a ridge also present inside the palm of large cheliped.

Distribution : INDIA : Andhra Pradesh, Tamil Nadu, Orissa, Karnataka, Kerala, Maharashtra, Andaman & Nicobar Islands.

Out side India : Japan, Africa, Madagascar, Mauritius, Red Sea, Persian Gulf, Singapore, Malaya Peninsula, Thailand, Indonesia, Phillipines, China, Australia, New Guinea, Pakistan.

Remarks : The porcelain white major chela of male is the most remarkable feature of this species. It occurs in sandy mud substratum of mangroves in Krishna estuary.

32. *Uca triangularis* A. Milne Edwards, 1837

(Pl. 6, Fig. 4)

1852. *Gelasimus triangularis* A. Milne Edwards, *Nouv. Archs. Mus. nat. Paris (N.S.)*, **9** : 275.

1900. *Gelasimus triangularis*, Alcock, *J. Asiat. Soc. Bangal*, **69** (2) : 356.

1995. *Uca (Celuca) triangularis Bengali*, Bairagi, *Zool. Surv. India, Estuarine Ecosystem Series, Part-2, Hugli Matla Estuary* : 274.

2005. *Uca triangularis*, Dev Roy and Bhadra, *Zool. Surv. India, State Fauna Series 5 : Fauna of Andhra Pradesh (Part 5)* : 508.

Material Examined : 3 ex., Lankevenitippa, 15-10-96, CR-4929; 4 ex., Kanur, 14-02-98, CR-4914; 4 ex., Lankevenitippa, 15-02-98, CR-4913; 3 ex., Gullalamoda, 24-09-98, CR-4920; 7 ex., Gollalmoda, 11-01-2000, CR-4927; 2 ex., Palleshummapalem, 13-12-2000, CR-4931; 1 ex., Palakayatippa, 17-12-2000, CR-4899; 3 ex., Gollalmoda, 18-12-2000, CR-4930.

Mesurements : L-8.5-12.0 W-14.5-21.0

Diagnosis : Carapace hexagonal, although giving it looks triangular outline from a distance. Antero-lateral angles of carapace strongly acute. Cheliped markedly unequal, the manus of larger cheliped yellow in colour. Dactyl with two broad shallow grooves. Front broad about 1/6th the greatest breadth of carapace. Upper border of palm with a double row of tubercles.

Distribution : INDIA : Andhra Pradesh, Tamil Nadu, West Bengal.

Out side India : Myanmar, Australia, Malaysia.

Remarks : The major cheliped is pointed and yellow in colour in fresh condition, the specie larger in size.

Sub-family DOTILLINAE Stimpson, 1858.

Remarks : The subfamily is represented by two genera.

Key to genera of the subfamily DOTILLINAE

Merus of third maxillipeds larger than ischium, fourth abdominal segment of male fringed with bristles distally overlapping the fifth segment *Dotilla*

Merus of third maxillipeds shorter than ischium, fourth abdominal segment normal in male whereas fifth segment constricted in part or all of its extent giving the abdomen a wasp-like appearance *Scopimera*

Genus *Dotilla* Stimpson, 1858

1858. *Dotilla* Stimpson, *Proc. Acad. nat. sci. Philad.*, : 98.

1900. *Dotilla*, Alcock, *J. Asiat. Soc. Bangal*, **69** (2) : 363.

2005. *Dotilla*, Dev Roy & Bhadra, *Zool. Surv. India. State Fauna Series*, **5** : *Fauna of Andhra Pradesh* (Part 5) : 511.

Diagnosis : Carapace subquibical, deep, surface sculptured. Front narrow, deflexed lobe. lateral border with or without teeth. Eyes small, stalk prolonged to form a style and present terminally. Epistome short. Chelipeds equal. Fingers slender acute slightly deflexed. Legs moderate.

Key to species of the genus *Dotilla*

Chelipeds not much longer than carapace and legs, no tympana on sternum
..... *D. intermedia*

Chelipeds 1-4 times the length of carapace and much longer than the legs, tympanum on each segment of sternum *D. myctiroides*

33. *Dotilla myctiroides* (H. Milne Edwards 1852)

(Pl. 7, Fig. 1)

1852. *Doto myctiroides* H.Milne Edwards, *Annls Sci. nat. (Zool).* ser. 3, **18** : 152.

1957. *Dotilla myctiroides*, Chnapgar, *J. Bombay nat. Hist. Soc.*, **54** (3) : 511.

2000. *Dotilla myctiroides*, Dev Roy and Das, *Rec. zool. Surv. India, Occ. Paper No.* **185** : 128.

Material Examined : 1 ex., Eelachetladibba, 17-02-97, CR-5260.

Mesurements : L-11.0-13.0 W-10.0-12.5

Diagnosis : Carapace thick with lateral groove. Chelipeds 3 times length of carapace, and little longer than broad. Antero lateral border granular. Front divided to two grooves each of which meaning with both side lateral margin in a parallel manner.

Distribution : INDIA : Andhra Pradesh, Orissa, Tamil Nadu, Goa, Karnataka, Maharashtra, Andaman.

Out side India : Seychelles, Sri Lanka, Mergui, Archipelago, Malaya Peninsula, Singapore, Indonesia, Philippines.

Remarks : This crab is comparatively rare in Andhra Pradesh.

34. *Dotilla intermedia* de Man, 1888

(Pl. 7, Fig. 2)

1888. *Dotilla intermedia* de Man, *J. Linn. Soc. Zool.*, **22** : 135, pl. 9, figs. 4-6.

1899. *Dotilla clepsydrodactylus*, Alcock, *J. Asiat. Soc. Bangal*, **69** (2) : 365.

1995. *Dotilla intermedia*, Bairagi, *Zool. Surv. India, Estuarine Ecosystem Series, Part-2, Hugli Matla Estuary* : 274.

2005. *Dotilla intermedia*, Dev Roy and Bhadra, *Zool. Surv. India, Fauna of Andhra Pradesh, State Fauna Series*, **5** (Part 5) : 512.

Material Examined : 1 ex., Eelachetladibba, 17-02-97, CR-5257; 2 ex., Kottapetta, 16-12-2000, CR-5259; 3 ex., Eelachetladibba, 17-02-97, CR-5257.

Mesurements : L-5.0-9.0 W-6.0-10.0

Diagnosis : Carapace distinctly broader than long. Frontal grooves reaching up to gastric region. Gastric region bearing 4 minute tubercles.

Distribution : INDIA : Andhra Pradesh, Orissa, Tamil Nadu, West Bengal.

Out side India : Mergui Archipelagi, Tavoy.

Remarks : This species can be differentiated from other species of same genus by its carapace character mainly.

Genus *Scopimera* de Haan, 1835

1835. *Scopimera* de Haan *Faun. Japon. Crust.*, : 24.

1900. *Scopimera*, Alcock, *J. Asiat. Soc. Bangal*, **69** (2) : 369.

1995. *Scopimera*, Bairagi, *Zool. Surv. India, Estuarine Ecosystem Series, Part-2, Hugli Matla Estuary* : 276.

Diagnosis : Carapace cubical, broader than long, sculptured like *Dotilla*. Maxlipped unsculptured. Abdomen of male curious wasp like.

35. *Scopimera globosa* de Haan, 1835

(Pl. 7, Fig. 3)

1835. *Scopimera globosa* de Haan, In : Siebold, *Fauna Japan (Crust.)* : 53, pl.11, fig.3,3 a-b.

1919. *Scopimera globosa*, Kemp, *Rec. Indian Mus.*, 16(5) : 312, fig. 2.

1995. *Scopimera globosa*, Bairagi, *Zool. Surv. India, Estuarine Ecosystem Series, Part-2, Hugli Matla Estuary* : 276.

Material Examined : 1 ex., Nachugunta, 20-12-2000, CR-5271.

Mesurements : L-9.0 W-9.0

Diagnosis : Carapace covered with tubercles and divergent posteriorly. Front narrow and pointed. Orbits with strong dorsal inclination, upper orbital margins end with an extra orbital tooth. Lateral borders of carapace crenulated. Chelipeds subequal and long. Fourth and fifth abdominal segment of male fused.

Distribution : INDIA : Andhra Pradesh, West Bengal.

Out side India : Malaysia, Hong Kong, Japan, Korea, North China, Formosa.

Remarks : This species is so far recorded from the east coast only.

SUMMARY

35 species of Brachyuran crabs under 22 genera and 9 families have been recorded from Krishna Estuary, Andhra Pradesh which also includes few marine species. Three species namely, *Cardisoma carnifex* (Herbst, 1794), *Chiromantes bidens* (de Haan, 1835) and *Scopimera globosa* de Haan, 1835 hve been recorded for the first time from the State.

ACKNOWLEDGEMENTS

The author is greatful to the Director, Zoological Survey of India, to Dr. C. A. Nageswara Rao the then Officer-in-Charge, Dr. S. Z. Siddiqi present Officer-in-Charge of Estuarine Biological Station and Sri A. K. Singh, Sci-E and Officer-in-Charge, FPS building, Kolkatta for provding literatures, facilities and encouragements. The author is also greatful to Sri B. Dalai of this station for his help in collecting the specimen and Sri.P. Varma of this station for taking digital photograph of specimen.

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PLATE VI

PRAWNS (CRUSTACEA : DECAPODA)

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INTRODUCTION

Prawns and shrimps constitute an important and valuable fishery resource along both the coasts of India. It is one of the most important foreign exchange earners of the country. Although, prawn and shrimp fauna of Indian estuaries has been considerably worked out (Reddy, 1995) and (Deb, 1995, 1998) very little information available about the group from Krishna estuary (Chanda and Roy, 2005). The present work was, therefore, undertaken to fill up this gap. In the present communication, an account of penaeid and non-penaeid prawn fauna of Krishna estuary has been dealt with based on intensive field surveys during 1996-2000. A total of 1500 examples of both penaeid and non-paenid prawns were examined. These belonged to 28 species under 10 genera and 3 families. In the present paper the diagnosis of each species is mainly based on FAO Species Catalogue, Ravindranath (1977), Deb (1995-1998) and Reddy (1995).

MATERIAL METHODS

Prawns are mainly collected with the help of fisherman by using fishing net, some time some small shrimps were collected by digging the mud from the intertidal area of estuaries. Prawns were preserved in 40% formalin.

In the present paper, measurements of prawnss were taken for their length from the tip of the rostrum to end of telson. The abbreviation L is used here to indicate the total length. Other abbreviations used in this text are as under

SYSTEMATIC LIST

Class CRUSTACEA

Order DECAPODA

Family PENAEIDAE

1. *Penaeus (Penaeus) monodon* Fabricius, 1798
2. *Penaeus (Penaeus) semisulactus* De Haan, 1844

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3. *Penaeus (Fenneropenaeus) indicus* (H.Milne Edwards, 1837)
4. *Penaeus (Fenneropenaeus) merguiensis* De Man, 1888
5. *Penaeus (Fenneropenaeus) penicillatus* Alcock, 1905
6. *Penaeus (Marsupenaeus) japonicus* Bate, 1888
7. *Penaeus (Melicertus) canaliculatus* (Olivier, 1811)
8. *Metapenaeus monoceros* (Fabricius, 1798)
9. *Metapenaeus dobsoni* (Miers, 1878)
10. *Metapenaeus lysianassa* (de Man, 1888)
11. *Metapenaeus brevicornis* (H.Milne Edwards, 1837)
12. *Metapenaeus affinis* (H.Milne Edwards, 1837)
13. *Metapenaeus ensis* (De Haan, 1844)
14. *Metapenaeopsis stridulans* (Alcock, 1905)
15. *Metapenaeopsis toloensis* Hall, 1962
16. *Parapenaeus longipes* Alcock, 1905
17. *Parapenaeopsis sculptilis* (Heller, 1862)
18. *Parapenaeopsis coromandelica* Alcock, 1906

Family PALAEMONIDAE

19. *Exopalaemon styliferus* (H.Milne Edwards, 1840)
20. *Nematopalaemon tenuipes* (Henderson, 1893)
21. *Leptocarpus potamiscus* (Kemp, 1917)
22. *Macrobrachium malcolmsonii*. (H.Milne Edwards, 1844)
23. *Macrobrachium rosenbergii* (De man, 1879)
24. *Macrobrachium equidens* (Dana, 1852)
25. *Macrobrachium rude* (Heller, 1862)

Family SOLENOCEIDAE

26. *Solenocera crassicornis* (H.Milne Edwards, 1837)
27. *Solenocera hextii* Wood-Mason & Alcock, 1891
28. *Solenocera choprai* Natraj, 1954

SYSTEMATIC ACCOUNT

1. *Penaeus (Penaeus) monodon* Fabricius, 1798

1798. *Penaeus monodon* Fabricius, *Srpp. Ent. Syst. Ent. Syst.*, P. 408

1969. *Penaeus monodon*, George, *Bull. Cent. Mar. Fish Res. Inst*, 14 : 22

1991. *Penaeus (penaeus) monodon*, Paulpandian & Ramasamy, *Guide to the Prawns of Portonovo*. 36, pt. 29, fig. 4.

Material examined : 3 ex., Lankevenitippa, 15-10-96, CR-5154; 3 ex., Nachugunta, 20-12-2000, CR-5155; 1 ex., Gullalamoda, 17-09-97, CR-5156; 1 ex., Edurumondi, 18-09-97, CR-5157; 1 ex., Nagayalanka, 18-02-97, CR-5158; 2 ex., Kanur, 13-02-99, CR-5159; 2 ex., Palleshummalapalem, 19-09-98, CR-5160; 10 ex., Kanur, 07-09-97, CR-5161; 2 ex., Palleshummalapalem, 18-09-98, CR-5162; 3 ex., Eelachetladibba, 17-02-97, CR-5163; 1 ex., Eelachetladibba, 16-09-97, CR-5164; 4 ex., Palleshummalapalem, 12-02-97, CR-5165; 3 ex., Kamavericheruvu, 09-10-96, CR-5166; 1 ex., Kanur, 16-09-98, CR-5167; 1 ex., Gilakaladindi, 17-02-97, CR-5168; 1 ex., Edurumondi, 17-10-96, CR-5169; 3 ex., Palleshummalapalem, 13-12-2000, CR-5170; 1 ex., Palakayatippa, 17-12-2000, CR-5171; 1 ex., Edurumondi, 18-12-2000, CR-5172; 2 ex., Palleshummalapalem, 14-12-2000, CR-5173.

Measurements : L-48.0-205.0

Diagnosis : Carapace smooth. Rostrum very strong and armed with 7-8 dorsal and 3-4 ventral teeth. Hepatic carina straight. Adrostral crina and groove extending beyond epigastric tooth. Antennal crest prominent. Petasma with distomedian projection reaching distal margin of costae. Thelycum with large lateral plates forming a lip like structure, anterior plate small subcircular (concave) and sub triangular, posterior plate inserted in between lateral plates.

Distribution : INDIA : East and West coasts, Andaman and Nicobar Island and Lakshadwip.

Outside : Pakistan, Sri Lanka, China, Japan, East Africa, Gulf of Aden, Red Sea, West coast of Madagascar, Mauritius, Philippines, New Guinea and Australia.

Remarks : This species is not abundant in commercial catches but has maximum weight and large size over other species.

2. *Penaeus (Penaeus) semisulcatus* De Haan, 1844

1844. *Penaeus semisulcatus* De Haan, *In. Von Siebold, Fauna Japonica, Crustacea* (6/7) : pt.46 fig. 1

1969. *Penaeus semisulcatus*, George, *Bull. Cent. mar. Fish. Res. Inst*. 14 : 23

1991. *Penaeus (Penaeus) semisulcatus*, Paulpandian & Ramasamy, *Guide to the Prawns of Portonovo*. 36 pt. 29, fig. 4

Material examined : 4 ex., Kanur, 12-12-2000, CR-5191; 3 ex., Kanur, 11-12-2000, CR-5192; 1 ex., Palleshummalapalem, 06-01-2000, CR-5193; 1 ex., Palleshummalapalem, 13-12-2000, CR-5194; 4 ex., Kamavericheruvu, 09-10-96, CR-5195; 7 ex., Kanur, 04-01-2000, CR-5196; 2 ex., Kanur, 13-02-99, CR-5197; 1 ex., Edurumondi, 17-10-96, CR-5198; 1 ex., Palleshummalapalem, 12-02-97, CR-5199.

Mesurements : L-69.0-150.0

Diagnosis : Carapace smooth. Rostrum long, strong and straight, dorsally armed with 5-8 teeth and ventrally with 2-4 teeth. Adrostral crest and groove extended beyond epigastric tooth. Gastrofrontal crest absent. Antennal crest prominent. Fifth pereopod with small but distinct exopod. Hepatic carina straight. Petasma with distomedian projections reaching as far as costae. Thelycum with large flap-like lateral plates joining at midpoint and forming a lip-like structure; anterior process semi-circular, concave; posterior process convex and partly inserted between lateral plates.

Distribution : INDIA : East and West coasts.

Outside : Sri Lanka, Japan, East Africa, Red Sea, Western Madagascar, Mauritius, Philippines, New Guinea, Northern Australia, Korea and Eastern Mediterranean.

Remarks : Closely resembles with *P. (P.) monodon*. In size and weight, the female appear to attend larger size than male.

3. *Penaeus (Fenneropenaeus) indicus* (H. Milne Edwards, 1837)

1837. *Penaeus indicus* H. Milne Edwards, *Hist. Nat. Crust.*, Paris, 2 : 415

1906. *Penaeus indicus*, Alcock, *Cat. Indian Decapod Crust.*, pt. 3(1) : 12

1991. *Penacus (fenneropenaeus) indicus*, Paulpandian & Ramasamy, *Guide to the Prawns of Portonovo CAS in Mar. boil, Ann. Univ. Parangipettai. India* : 35, pt. 28, fig. 2.

Material examined : 1 ex., Lankevenitippa, 15-10-96, CR-5077; 1 ex., Kamavericheruvu, 11-09-97, CR-5078; 5 ex., Palleshummalapalem, 12-02-97, CR-5079; 1 ex., Manginapudi, 08-01-2000, CR-5080; 1 ex., Palleshummalapalem, 08-10-96, CR-5081; 3 ex., Avaniguda, 13-02-98, CR-5082; 10 ex., Swaralaganj, 24-09-98, CR-5083; 2 ex., Palleshummalapalem, 07-01-2000, CR-5084; 5 ex., Lankevenitippa, 15-09-97, CR-5085; 8 ex., Palleshummalapalem, 09-09-97, CR-5086; 1 ex., Kanur, 13-02-99, CR-5087; 1 ex., Lankevenitippa, 25-09-98, CR-5088; 1 ex., Pedapatnam, 11-10-96, CR-5089; 1 ex., Gilakaladindi, 12-02-97, CR-5090; 23 ex., Eelachetladibba, 16-09-97, CR-5091; 2 ex., Palleshummalapalem, 12-10-96, CR-5092; 1 ex., Sangameswara, 26-09-98, CR-5093; 3 ex., Palleshummalapalem, 10-09-97, CR-5094; 6 ex., Kanur, 12-09-97, CR-5095; 4 ex., Palleshummalapalem, 15-02-99, CR-5096; 3 ex., Palleshummalapalem, 12-02-97, CR-5097; 1 ex., Eelachetladibba, 16-10-96, CR-5098; 1 ex.,

Nachugunta, 18-10-96, CR-5099; 1 ex., Kanur, 11-12-2000, CR-5100; 3 ex., Pallethummalapalem, 14-12-2000, CR-5101; 17 exx., Swaralaganj, 23-09-98, CR-5102; 10 ex., Kanur, 08-09-97, CR-5103; 9 ex., Nachugunta, 13-01-2000, CR-5104; 1 ex., Gullalamoda, 10-01-2000, CR-5105; 7 ex., Gullalamoda, 19-02-99, CR-5106; 23 ex., Edurumondi, 18-09-97, CR-5107; 5 ex., Gollalmoda, 11-01-2000, CR-5108; 6 ex., Gollalmoda, 11-01-2000, CR-5109; 4 ex., Kanur, 16-09-98, CR-5110; 20 ex., Pallethummalapalem, 19-09-98, CR-5111; 26 ex., Pallethummalapalem, 18-09-98, CR-5112; 3 ex., Kanur, 15-09-98, CR-5113; 17 ex., Kanur, 07-09-97, CR-5114; 8 ex., Gullalamoda, 17-09-97, CR-5115; 10 exx., Pallethummalapalem, 13-12-2000, CR-5116; 4 ex., Edurumondi, 18-09-97, CR-5117; 1 ex., Kanur, 12-12-2000, CR-5118; 12 ex., Palakayatippa, 19-09-97, CR-5119; 15 ex., Palakayatippa, 17-12-2000, CR-5120.

Mesurements : L-47.0-158.0

Diagnosis : Carapace smooth. Rostrum very large and slender having 7-9 teeth dorsally and 4-6 teeth ventrally. Adrostral crest and groove extending to epigastric tooth. Gastrofrontal and hepatic crest absent. Gastro orbital carina occupying the posterior 2/3rd distance between hepatic spine and orbital angle. Petasma with distomedian projections over reaching the distal margin of costae, and ventral costae unarmed. Thelycum with large lateral plates joined to form a lip-like structure; anterior process rounded, posterior process vestigial.

Distribution : INDIA : East and West coasts, Andaman and Nicobar Island, Laksadwip.

Outside : Sri Lanka, China, East African coast, Madagascar, Red Sea, Philippines and Northern Australia.

Remarks : Widely distributed through out the Krishna Estuary.

4. *Penaeus (Fenneropenaeus) merguiensis* De Man, 1888

1888. *Penaeus merguiensis*, De man, J. Linn. Soc. Lond. (zool), **22** : 287

1906. *Penaeus indicus* var. *mergiensis*, Alcock, Cat.IndianDecapod Crast., pt. 3(1) : 13

1991. *Penaeus (fenneropenaeus) merguiensis*, Paulpandian & Ramasamy, Guide to the Prawns of Portonovo CAS in Mar.Biol., Ann.Univ., Parangipettai, India. **35** : pt, 28 fig. 3.

Material examined : 6 ex., Eelachetladibba, 16-09-97, CR-5213; 1 ex., Kanur, 11-02-97, CR-5214; 1 ex., Eelachetladibba, 16-10-96, CR-5215.

Mesurements : L-50.0-125.0

Diagnosis : Carapace smooth, hair less. Rostrum very high forming a crest bearing 6-9 teeth dorsally and 3-6 teeth ventrally. Adrostral crest and groove not reaching epigastric tooth. Gastrofrontal and hepatic crest absent, gastro-orbital carina occupying middle 1/3rd distance

between hepatic spine and orbital angle. Petasma with distomedian projection over-hanging distal margin of costae. Free border of ventral costae serrated. Thelycum with large lateral plates joined to form-lip like structure, anterior process sunk in between lateral plates and not visible.

Distribution : INDIA : East and West coast and Southern India.

Outside : Sri Lanka, Northern eastern coasts of Arabian Sea, Philippines, Gulf of Oman, New Caledonia and Australia.

Remarks : It plays significant role in fishery along east coast of India.

5. *Penaus (Fenneropenacus) penicillatus* Alock, 1905

1905. *Penaeus indicus* var. *penicillatus*, Atcock, *Ann. Mag. nat. Hist.*, (7) **16** : 525

1969. *Penaeus penicillates*, George, *Bull. Cent. mar. Fish. Res. Inst.*, **14** : 24

1991. *Penaeus (fenneropenacus) penicillatus*, Chiaki koizumi (Ed.), *Prawns of Japan and the world* : 18.

Material examined : 1 ex., Kanur, 12-09-97, CR-5241; 2 ex., Lankevenitippa, 25-09-98, CR-5242.

Mesurements : L-82.0-112.0

Diagnosis : Carapace smooth. Rostrum strong, long and directed downwards bearing 7-9 teeth dorsally and 3-5 teeth ventrally. Adrostral crest and groove reaching just beyond epigastric tooth. Gastrofrontal and hepatic crest absent. Petasma with small distomedian projection not reaching the costae. Thelycum with flap-like lateral plate joined to form a lip-like structure. Anterior plate concave, posterior plate completely inserted between lateral plates.

Distribution : INDIA : East and West coast.

Outside : Pakistan, China, North East Arabian Sea, Indonesia and Taiwan.

Remarks : The tail of the species is beautifully colored in fresh condition.

6. *Penaeus (Marsupenaeus) japonicus* Bate, 1888

1888. *Penaeus canaliculatus* var. *japonicus* Bate, *Rep. Sci. Res. "Challenger"* **24** : 245

1969. *Penaeus Japonicus*, George, *Bull. Cent. mar. Fish. Res. Inst.*, **14** : 21

1991. *Penaeus (Marsupenaeus) japonicus*, Paulpandian & Ramasamy, *Guide to the Prawns of Portonovo, CAS in Mar. biol., Ann. Univ., Parangipettai, India* : 36, pt. 29, fig 1.

Material examined : 1 ex., Kanur, 11-12-2000, CR-5185; 5 ex., Gullalāmoda, 19-02-99, CR-5186.

Mesurements : L-113.0-155.0.

Diagnosis : Carapace smooth. Rostrum long, slender, straight and armed with 9-11 teeth dorsally and a single tooth ventrally, an accessory carina on the blade. Telson armed with 3 pair of movable spines; discontinuous crest and groove extended up to posterior margin of carapace. Petasma having long distomedian projections distinctly over-hanging distal margin of costae, tip enlarged. Thelycum lacking specific lateral process but joined to form a big bag/pouch like structure opening anteriorly. Anterior and posterior plates triangular.

Distribution : INDIA : East and West coast.

Outside : South East Africa, Gulf of Madagascar, Red Sea, Mauritius, Korea, Japan, New Guinea and Australia.

Remarks : Very rarely occurred in Krishna Estuary.

7. *Penaeus (Melicertus) canaliculatus* (Olivier, 1811)

1811. *Palaemon canaliculatus*, Olivier, *Encycl. Method. Hist. Nat. (Ins)*, 8 : 660

1969. *Penaeus canaliculatus*, George, *Bull. Cent. Mar. Fish. Res. Inst.* 14 : 21

1991. *Penaeus (Melicertus) canaliculatus*, Paulpandian & Ramasamy, *Guide to the Prawns of Portonovo, CAS, in Mar. biol., Ann Univ., Parangipettai, India* : 35, pt 29, fig. 4.

Material examined : 1 ex., Edurumondi, 18-09-97, CR-5208.

Mesurements : L-72.0.

Diagnosis : Carapace smooth. Rostrum strong and straight, dorsally armed with 9-11 teeth and ventrally with a single tooth. Adrostral crest and groove extending beyond the posterior margin of carapace. Gastrofrontal groove bifurcate posteriorly. Telson unarmed. Band coloration of last abdominal segment continuous. Petasma with short distomedian projections reaching distal margin of costae. Ventral costae broadened apically and having spinules. Thelycum with lateral plates having anteromedian margins diverging then turning in a broad arc continuous with raised to form a depressed area.

Distribution : INDIA : East and West coast.

Outside : Sri Lanka, South East Africa, Red Sea, Taiwan, Polynesia, Mauritius and New Guinea.

Remarks : This species some time confused with *P. (M.) japonicus*.

8. *Metapenaeus monoceros* (Fabricius, 1798)

1798. *Penaeus monoceros* Fabricius, *Entom. Syst. Suppl.*, : 409.

1906. *Metapenaeus monoceros*, Alcock, *Cat. India Decapod Crust.*, pt 3 (1) : 18.

1998. *Metapenaeus monoceros*, Deb, *Zool. Surv. India. Estuarine Ecosystem Series, 3 : Fauna of Mahanadi Estuary*, : 137.

Material examined : 29 ex., Gullalamoda, 12-02-99, CR-4997; 29 ex., Kanur, 16-09-98, CR-4998; 7 ex., Kanur, 07-09-97, CR-4999; 12 ex., Kamavericheruvu, 11-09-97, CR-5000; 13 ex., Kanur, 17-07-98, CR-5001; 4 ex., Manganpudi, 08-01-2000, CR-5002; 4 ex., Pallethummalapalem, 19-09-98, CR-5003; 23 ex., Pallethummalapalem, 18-09-98, CR-5004; 4 ex., Pallethummalapalem, 15-02-99, CR-5005; 01 ex., Eelachetladibba, 17-02-97, CR-5006; 4 ex., Pallethummalapalem, 06-01-2000, CR-5007; 2 ex., Pallethummalapalem, 10-09-97, CR-5008; 01 ex., Kanur, 15-09-98, CR-5009; 13 ex., Kanur, 13-02-99, CR-5010; 03 ex., Pallethummalapalem, 09-02-98, CR-5011; 26 ex., Pallethummalapalem, 12-10-96, CR-5012; 10 ex., Palakayatippa, 17-02-99, CR-5013; 23 ex., Pallethummalapalem, 10-09-97, CR-5014; 7 ex., Lankevenitippa, 25-09-98, CR-5015; 3 ex., Pedakanur, 11-10-96, CR-5016; 01 ex., Nachugunta, 18-10-96, CR-5017, 5 ex., Eelachetladibba, 14-02-98, CR-5018; 1 ex., Kanur, 12-09-97, CR-5019; 4 ex., Kanur, 11-02-97, CR-5020; 2 ex., Pallethummalapalem, 10-09-97, CR-5021; 3 ex., Pallethummalapalem, 08-10-96, CR-5022; 4 ex., Pallethummalapalem, 10-09-97, CR-5023; 75 ex., Pathapaethumalapalem, 08-10-96, CR-5024; 1 ex., Eelachetladibba, 17-02-97, CR-5025; 1 ex., Kanur, 14-02-99, CR-5026; 3 ex., Sangameswara, 26-09-98, CR-5027; 24 ex., Eelachetladibba, 16-10-96, CR-5028; 30 ex., Kanur, 11-12-2000, CR-5029; 17 ex., Kanur, 11-12-2000, CR-5030; 1 ex., Gilakaladindi, 10-12-2000, CR-5031; 24 ex., Kanur, 08-09-97, CR-5032; 15 ex., Gollalmoda, 11-01-2000, CR-5033; 40 ex., Swaralaganj, 23-09-98, CR-5034; 10 ex., Gollalmoda, 11-01-2000, CR-5035; 40 ex., Kanur, 05-01-2000, CR-5036; 10 ex., Pallethummalapalem, 13-12-2000, CR-5037; 4 ex., Nachugunta, 20-12-2000, CR-5038; 1 ex., Palakayatippa, 19-09-97, CR-5039; 8 ex., Kanur, 04-01-2000, CR-5040; 1 ex., Kanur, 12-12-2000, CR-5041; 29 ex., Kanur, 12-12-2000, CR-5042; 4 ex., Pallethummalapalem, 14-12-2000, CR-5043; 1 ex., Edurumondi, 18-09-97, CR-5044.

Mesurements : L-48.0-125.0

Diagnosis : Body pubescent, often small patch/stripe present in larger specimen. Dorsal part of the rostrum armed with 9-12 evenly placed teeth. Adrostral crest extended beyond second rostral tooth, adrostral groove reaching behind epigastric tooth. Telson without spinules. Ischial spine of first walking leg distinct. Distomedian projections of petasma convoluted, swollen and bulbiform hiding the distolateral projection. Anterior plate of thelycum long and deeply grooved having small ball like structure at both end; lateral plates very small, egg shaped surrounded by large raised lateral margins.

Distribution : INDIA : East and West coast.

Outside : Sri Lanka, South Africa, Malay Peninsula, Red Sea, Madagascar, Mauritius and Mediterranean.

Remarks : Closely resemble *M. ensis*. This species is available plenty in Krishna Estuary.

9. *Metapenaeus dobsoni* (Miers, 1878)

1878. *Penaeus dobsoni* Miers, *Proc. Zool. Soc. London* p. 302

1906. *Metapenaeus dobsoni*, Alcock, *Cat. Indian Decapod Crust.*, pt. 3(1) : 21

1995. *Metapenaeus dobsoni*, Reddy, *Zool. Surv. India. Estuarine Ecosystem Series, Part-2 : Hugli, Malla Estuary* : 294.

Material examined : 1 ex., Palleshummalapalem, 08-10-96, CR-5121; 9 ex., Palakayatippa, 19-09-97, CR-5122; 1 ex., Eelachetladibba, 17-02-97, CR-5123; 2 ex., Hamsaladwivi, 17-02-99, CR-5124; 5 ex., Kanur, 12-12-2000, CR-5125; 3 ex., Kanur, 05-01-2000, CR-5126; 5 ex., Palleshummalapalem, 08-10-96, CR-5127; 7 ex., Edurumondi, 18-09-97, CR-5128; 1 ex., Sangameswara, 26-09-98, CR-5129; 1 ex., Kanur, 15-09-98, CR-5130; 1 ex., Avaniguda, 13-02-98, CR-5131; 3 ex., Lankevenitippa, 25-09-98, CR-5132; 1 ex., Kamavericheruvu, 11-09-97, CR-5133; 1 ex., Pedakanur, 07-02-98, CR-5134; 8 ex., Kanur, 16-09-98, CR-5135; 2 ex., Palleshummalapalem, 12-10-96, CR-5136; 5 ex., Palleshummalapalem, 18-09-98, CR-5137; 22 ex., Nachugunta, 18-10-96, CR-5138; 2 ex., Kanur, 10-10-96, CR-5139; 1 ex., Gollalmoda, 11-01-2000, CR-5140; 1 ex., Palleshummalapalem, 12-02-97, CR-5141; 2 ex., Gullalamoda, 19-02-99, CR-5142; 1 ex., Palleshummalapalem, 10-09-97, CR-5142-a; 1 ex., Palleshummalapalem, 06-01-2000, CR-5143; 30 ex., Kanur, 08-09-97, CR-5144; 1 ex., Gollalmoda, 11-01-2000, CR-5145; 3 ex., Kanur, 13-02-99, CR-5146; 1 ex., Palleshummalapalem, 13-12-2000, CR-5147; 19 ex., Gullalamoda, 24-09-98, CR-5148; 3 ex., Edurumondi, 18-09-97, CR-5149; 1 ex., Manginapudi, 08-01-2000, CR-5150; 3 ex., Kanur, 07-09-97, CR-5151; 1 ex., Palleshummalapalem, 14-12-2000, CR-5152; 18 ex., Swaralaganj, 23-09-98, CR-5153.

Mesurements : L-50.0-95.0

Diagnosis : Body pubescent with small patches. Rostrum long, extended beyond antennular peduncle and armed with 7-9 dorsal teeth, almost half of its distal half toothless. Adrostral crest reaching as far as epigastric tooth. Telson armed with spinules. Petasma with each distomedian projections form short filament or tubular structure culminating in a pair of simple distomedian spouts. Distolateral projections directed forward. Thelyum having long tongue shaped anterior plate bearing a groove, lateral plates horse shoe-shaped.

Distribution : INDIA : South-West coast.

Outside : Sri Lanka, Gulf of Thailand, Philippines and Indonesia.

Remarks : In Krishna water the species mostly present in the juvenile stages.

10. *Metapenaeus lysianassa* (de Man, 1888)

1888. *Penaeus lysianassa* de Man, *J. linn. Soc. Lond. (Zool.)*, **22** (140) : 290

1906. *Metapenaeus lysianassa*, Alcock, *Cat. Indian Decapod Crust.* Pt. 3(1) : 23

1995. *Metapenaeus lysianassa*, Reddy, *Zool. Surv. India. Estuarine Ecosystem Series, Part-2, Hugli Matla Estuary* : 295.

Material examined : 2 ex., Swaralaganj, 24-09-98, CR-5228; 1 ex., Nagayalanka, 16-09-97, CR-5229; 6 ex., Palakayatippa, 19-09-97, CR-5230; 1 ex., Kamavericheruvu, 11-09-97, CR-5231; 4 ex., Edurumondi, 18-09-97, CR-5232; 1 ex., Kanur, 15-09-98, CR-5233; 1 ex., Kanur, 16-09-98, CR-5234; 1 ex., Kanur, 04-01-2000, CR-5235; 1 ex., Pedakanur, 07-02-98, CR-5236; 2 ex., Kanur, 12-09-97, CR-5237; 2 ex., Kanur, 08-09-97, CR-5238; 2 ex., Kanur, 13-02-99, CR-5239.

Mesurements : L-36.0-63.0

Diagnosis : Body pubescent. Rostrum very wide high and short reaching almost first antennular article and dorsally armed with 6-7 teeth. Adrostral crest and groove reaching as far as third rostral tooth. Telson armed with spinules. Distolateral projections of petasma bifurcate distally. Small apical filament like structure present at median margin of distomedian projection. Anterior and lateral plates of thelycum sub-equal, middle one small and tongue like.

Distribution : INDIA : East coast.

Outside : Sri Lanka, Gulf of Tonkin, Indonesia, Archipelago and Borneo.

Remarks : This species represents only in small numbers along with the other *Metapenaeus* species in catches.

11. *Metapenaeus brevicornis* (H.Milne Edward, 1837)

1837. *Penaeus brevicornis* H.Milne Edward, *Hist. Nat. Crust. Paris.*, **2** : 417.

1906. *Metapenaeus brevicornis*, Alcock, *Cat. India Decapod Crust.*, Pt. 3 (1) : 22.

1995. *Metapenaeus brevicornis*, Reddy, *Zool. Surv. India. Estuarine Ecosystem Series, Part-2 : Hugli Matla Estuary* : 293.

Material examined : 1 ex., Pallethummalapalem, 09-09-97, CR-5246-a; 1 ex., Kanur, 13-02-99, CR-5247; 1 ex., Gilakaladindi, 10-12-2000, CR-5248; 2 ex., Kanur, 12-12-2000, CR-5249.

Mesurements : L-43.0-102.0

Diagnosis : Proximal half of rostrum armed with 5-7 dorsal teeth, distal half toothless. Adrostral crest and groove extended up to second rostral tooth. Telson armed with 2 pair of spinules, distal pair larger. Distomedian projections of petasma with long slender apical

filament, distolateral projections directed anterolaterally. In thelycum, anterior plate large, square-cut and grooved, lateral plates egg shaped.

Distribution : INDIA : East and west coast, Hooghly, Gangetic delta.

Outside : Pakistan, Vietnam and Indonesia.

Remarks : In Krishna estuary more juveniles are met with. From fishery point of view this species is poorly represented in commercial catches of Andhra Pradesh.

12. *Metapenaeus affinis* (H.Milne Edwards, 1837)

1837. *Penaeus affines* H. Milne Edwards, *Hist. Nat. Crust. Paris*, 2 : 416.

1906. *Metapenaeus affines*, Alcock, *Cat. Indian Decapod Crust* pt. 3 (7) : 20.

1995. *Metapenaeus affinis*, Reddy, *Zool. Surv. India. Estuarine Ecosystem Series, Part-2 : Hugli Matla Estuary* : 293.

Material examined : 5 ex., Pedapatnam, 11-10-96, CR-5178; 1 ex., Sangameswara, 26-09-98, CR-5179; 1 ex., Palleshummalapalem, 09-02-98, CR-5180; 2 ex., Eelachetladibba, 17-02-97, CR-5181; 5 ex., Manginapudi, 08-01-2000, CR-5182; 3 ex., Kanur, 13-02-99, CR-5183; 1 ex., Gilakaladindi, 10-12-2000, CR-5184.

Mesurements : L-54.0-180.0

Diagnosis : Body pubescent and tomentose. Rostrum bearing 9-10 teeth dorsally, reaching almost to third antennular article or more. Telson armed with spinules. Strong spine at all 3 cheliped bases. Distomedian projections of petasma crescent-shaped. Thelycum concave, lateral lobes fairly flat and transversely cut into unequal segments.

Distribution : INDIA : East and West coast.

Outside : Sri Lanka, Gulf of Oman, Arabian Sea, Philippines and Taiwan Island.

Remarks : Although this species is found in small numbers in Krishna Estuary but all are in adult condition.

13. *Metapenaeus ensis* (De Haan, 1844)

1844. *Penaeus ensis* De Haan, *In. von. Siebold, Fauna Japonica Crustacea* (6/7) : Pl. 46, Fig. 2.

1969. *Metapenaeus ensis*, George, *Bull. Cent. mar. Fish. Res. Inst.*, 14 : 15.

2005. *Metapenaeus ensis*, Chanda and Roy, *Zool. Surv. India. State Fauna Series, 5 : Fauna of Andhra Pradesh (Part 5)* : 541.

Material examined : 1 ex., Edurumondi, 19-02-99, CR-5244; 1 ex., Palleshummalapalem, 10-09-97, CR-5245; 1 ex., Nachugunta, 18-10-96, CR-5245-a; 4 ex., Eelachetladibba, 17-02-97, CR-5246.

Measurements : L-57.0-150.0

Diagnosis : Almost the entire body pubescent. Rostrum strong and straight bearing 8-11 teeth dorsally and reaching almost tip of antennular peduncle. Post rostral crest reaching the posterior margin of carapace. Telson armed with spinules only. Petasma with distomedian projection convoluted, swollen. Thelycum with long anterior plate anteriorly, lateral plates triangular, ball-like with raised lateral margins.

Distribution : INDIA : East and West coast.

Outside : Bangladesh, Sri Lanka, Japan, New Guinea and Australia.

Remarks : This species is found in very small numbers.

14. *Metapenaeopsis stridulans* (Alcock, 1905)

1905. *Metapenaeopsis stridulans* Alcock, *Ann. Mag. Nat. Hist.*, (7) 6 : 518, 526.

1969. *Metapenaeopsis stridulans*, George, *Bull. Cent. Mar. Fish. Res. Inst.*, 14 : 25.

2005. *Metapenaeopsis stridulans*, Chanda and Roy, *Zool. Surv. India. Fauna of Andhra Pradesh, State Fauna Series*, 5 (Part 5) : 541.

Material examined : 3 ex., Manginapudi, 08-01-2000, CR-5212.

Measurements : L-83.0-101.0

Diagnosis : Body densely pubescent. Rostrum low, usually straight reaching almost tip of antennular peduncle, and dorsally armed with 7-8 teeth. Stridulating organ consisting of 5-7 very strong and straight ridges. Petasma asymmetrical, right distoventral projection shorter and bearing some small apical processes. Thelycum with broadly trapezoidal intermediate plate with median groove.

Distribution : INDIA : East and West coast, Andaman and Nicobar Island.

Outside : Sri Lanka, Gulf of Oman, Gulf of Thailand, China and Indonesia.

Remarks : This is a marine species.

15. *Metapenaeopsis toloensis* Hall, 1962

1961. *Metapenaeus toloensis* Hall, *Fish. Publ. Colon. Off (U.K.)*, 17 : 33.

Material examined : 7 ex., Manginapudi, 08-01-2000, CR-5209.

Measurements : L-89.0-104.0

Diagnosis : Body densely pubescent. Rostrum little up-curved, reaching end of second antennular segment and bearing 8-9 teeth dorsally. Stridulating organ consisting of 20 weak

ridges. Petasma asymmetrical, right distoventral projection shorter bearing a few small apical processes. Thelycum with intermediate trapezoid plate, lateral margins densely setose and elevated.

Distribution : INDIA : East and West coast, Andaman Island.

Outside : Sri Lanka, China, Andaman, Philippines and Gulf of Thailand.

Remarks : This species is also marine in habit.

16. *Parapenaeus longipes* Alcock, 1905

1905. *Parapenaeus longipes* Alcock, ann. Mag. nat. Hist., (7) 6 : 520-523.

1969. *Parapenaeus longipes*, George, Bull. Cent. Mar. Fish. Res. Inst., 14 : 26

1991. *Parapenaeus longipes*, Paulpandian & Ramasamy, Guide to the Prawns of Portonove. CAS in Mar. biol., Ann. Univ, Parangipettai. India : 18 pt.11.

Material examined : 1 ex., Kanur, 17-09-98, CR-5174; 11 ex., Manginapudi, 08-01-2000, CR-5175; 11 ex., Kamavericheruvu, 21-09-98, CR-5176; 6 ex., Manginapudi, 20-09-98, CR-5177.

Mesurements : L-69.0-102.0

Diagnosis : Body smooth, glabrous. Rostrum slightly exceeding distal margin of basal antennular segment, dorsally bearing 6-7 teeth; post rostral crest distinct. Branchiostegal spine absent. Longitudinal and transverse sutures present. Distolateral lobes of petasma spout like and of equal length as of distomedian lobe. Thelycum with semicircular anterior plate, posterior plate broad and quadrate.

Distribution : INDIA : Southern india.

Outside : Pakistan, Sri Lanka, China, Tanzania, East Africa, Somalia and Northern and Eastern Arabian Sea.

Remarks : Branchiostegal spine absent in this species while present in other *Parapenaeus* species.

17. *Parapenaeopsis sculptilis* (Heller, 1862)

1862. *Penaeus sculptilis* Heller, Verh. Zool. Bot. Ges. Wien., 12 : 528

1969. *Parapenaeopsis sculptilis*, George, Bull. Cent. mar. Fish. Res. Inst., 14 : 35

1995. *Parapenaeopsis sculptilis*, Reddy, Zool. Surv. India. Estuarine Ecosystem Series, Part-2 : Hugli Matla Estuary, Prawns and Shrimps (Crustacea : Decapoda) : 297.

Material examined : 1 ex., Pallethummalapalem, 13-12-2000, CR-5187; 1 ex., Kanur, 04-01-2000, CR-5188; 3 ex., Gollalmoda, 11-01-2000, CR-5189; 1 ex., Gollalmoda, 11-01-2000, CR-5190.

Mesurements : L-72.0-115.0

Diagnosis : Body smooth. Rostrum strong and a little upwards directed; dorsally armed with 7-9 teeth, distal half toothless. Antennal spine large, carina reaching half the distance between spine and hepatic spine. Epipodites on first and second pereopod. Petasma with lateral plates compressed forming a tube-like structure with paired apical spout directed antero-laterally. Thelycum with anterior plate distally rounded and broadly articulated with posterior plate.

Distribution : INDIA : South-East India.

Outside : Pakistan, China, Japan, Indonesia, Philippines and New Guinea.

Remarks : One of the ornamental species found in Krishna Estuary.

18. *Parapenaeopsis coromandelica* Alcock, 1906

1906. *Parapenaeopsis stylifera coromandelica* Alcock, *Cat. Indian Decap. Crust.*, 3(1) : 37.

2005. *Parapenaeopsis coromandelica*, Chanda and Roy, *Zool. Surv. India, State Fauna Series, 5 : Fauna of Andhra Pradesh (Part 5)* : 541.

Material examined : 2 ex., Gilakaladindi, 10-12-2000, CR-5252.

Mesurements : L-105.0

Diagnosis : Body smooth. Rostrum sigmoidal, sharply bent upward, distal half toothless rest part armed with 6-8 dorsal teeth. Epigastric tooth present. Telson armed with 1-2 pair of fixed spines. Distolateral projections of petasma slender, horn like and straight. Thelycum square-cut concave with a slender stem like posterior process.

Distribution : INDIA : Southern part of India (Andhra Pradesh, Tamil Nadu and Kerala).

Outside : Sri Lanka, Gulf of Thailand, Indonesian Archipelago and Borneo.

Remarks : In this species telson armed with 1-2 sub-apical fixed spine where as in other species except *P. stylifera* either telson is un-armed or armed with mobile spinules

19. *Palaemon (Exopalaemon) styliferus* (H. Milne Edwards, 1840)

1840. *Palaemon styliferus* H. Milne Edwards, *Hist. nat. Crust.*, 3 : 638

1925. *Leander styliferus*, Kemp, *Rec. Indian Mus.*, 27 : 289

1950. *Palaemon (Exapalaemon) styliferus*, Holthuis, *Siboga. Exped.*, pt. x, 39 : 46

1998. *Palaemon (Exopalaemon) styliferus*, Maya Deb, *Zool. Surv. India, Estuarine Ecosystem Series, 3 : Mahanadi Estuary* : 132.

Material examined : 1 ex., Swaralaganj, 23-09-98, CR-5202; 1 ex., Eelachetladibba, 16-09-97, CR-5203; 1 ex., Kanur, 16-09-98, CR-5204; 1 ex., Lankevenitippa, 15-09-97, CR-5205; 1 ex., Eelachetladibba, 16-10-96, CR-5206; 2 ex., Kanur, 12-12-2000, CR-5207.

Mesurements : L-50.0-90.0

Diagnosis : Body transparent. Rostrum very long, elevated outwards and having an elevated basal crest, dorsally armed with 5-7 teeth, distal part almost toothless bearing only 1-2 subdistal teeth; ventral margin with 6-10 teeth. Telson bearing 2 pair of minute spine-like structure. Branchiostegal spine and crest present. Fifth abdominal segment rounded dorsally. Dactyles of fifth pair of pereopods about 1/3rd as long as propodus.

Distribution : INDIA : Southern India.

Outside : Pakistan, Arabian Sea, Thailand, Borneo and Indonesia

Remarks : This species closely resembles *N. tenuipes* but can be differentiated by the presence of branchiostegal groove.

20. *Nematopalaemon tenuipes* (Henderson, 1893)

1891. *Leander tenuipes*, Henderson, *Trans. Linn. Soc. Lond., (Zool.)*, (2)5 : 440.

2001. *Nematopalaemon tenuipes*, Jayachandran, *Palaemonid Prawns Biodiversity, Taxonomy, Biology and Management* : 194.

Material examined : 1 ex., Kanur, 13-02-99, CR-5250; 2 ex., Eelachetladibba, 14-02-98, CR-5251.

Mesurements : L-53.0-77.0

Diagnosis : Rostrum elongated, slender extended beyond apex of antennal scale, dorsally armed with 5-8 teeth, of which, 5-7 teeth present in the highly elevated crest, tip of rostrum bearing a single tooth strongly bent upward; ventral margin armed with 4-6 teeth. Antennal and branchiostegal spine present on carapace, branchiostegal groove lacking. Abdomen little compressed laterally.

Distribution : INDIA : East and West coast.

Outside : Pakistan, Africa. Somalia, Arabian Sea, VietNam, Philippines and New Guinea.

Remarks : This species has interesting long thread like dactyls of the last 3 pereopods which gives spider like appearance.

21. *Leptocarpus potamiscus* (Kemp, 1917)

1917. *Leander potamiscus* Kemp, *Rec. Indian Mus.*, **13** : 225

2001. *Leptocarpus potamiscus*, Jayachandran, *Palaemonid Prawns Biodiversity, Taxonomy, Biology and Management* : 43.

Material examined : 3 ex., Kanur, 16-09-98, CR-5253.

Mesurements : L-72.0

Diagnosis : Rostrum very long extending beyond antennal scale, top of which strongly upcurved; dorsal surface bearing 7-11 teeth, 1 post orbital, 1-2 sub distal and 6-8 teeth on a raised basal crest; lower margin with 6-10 equidistant teeth. Only carapace having antennal spine. Branchiostegal groove distinct. Telson slender having 2 pair of dorsal spine, distal end also with 2 pair of spines, first pair small but the second pair extended beyond telson tip. Antero-lateral spine sharp.

Distribution : INDIA : Bombay, Goa, Cochin of west coast, Krishna, Godavari in the central part of east coast and Middle Andaman.

Outside : Pakistan, East Africa, Arabian Sea and Somalia.

Remarks : This species very commonly found in Bombay coast and having commercial importance (Rai, 1933) hence the common name is Bombay prawn.

22. *Macrobrachium malcolmsonii*. (H. Milne Edwards, 1844)

1844. *Palaemon malcolmsonii* H. Milne Edwards, *Voy inde Jacquemont*, **4**(2) : 8

1950. *Macrobrachium malcolmsonii*, Holthuis, *Siboga Exped*, **39** a(9) : 121

1995. *Macrobrachium malcolmsonii*, Reddy, *Wetland Ecosystem Series*, **1** : *Fauna of Chilika Lake* : 380.

Material examined : 2 ex., Kanur, 16-09-98, CR-5075; 1 ex., Avaniguda, 13-02-98, CR-5076.

Mesurements : L-100.0-115.0

Diagnosis : Body symmetrical. Rostrum strong and long reaching end of antennal scale; dorsally armed with 7-11 teeth, of which, 3 placed behind orbital margin, 1-2 sub-distal and rest evenly placed teeth. Hepatic spine situated at a level lower than antennal spine. Telson tip sharp, over-reaching the postero lateral spines.

Distribution : INDIA : Southern India.

Outside : Pakistan, Sri Lanka and Bangladesh.

Remarks : This species is both estuarine and fresh water in habit.

23. *Macrobrachium rosenbergii* (De Man, 1879)

1878. *Palaemon rosenbergii* De man, *Notes Leyden Mus.*, **1** : 167

1950. *Macrobrachium rosenbergii*, Holthuis, *Siboga Expd.*, **39** : 111

1998. *Macrobrachium rosenbergii*, Deb, *Zool. Surv. India : Estuarine Ecosystem Series*, **3** : Mahanadi Estuary : 134.

Material examined : 1 ex., Pedakanur, 07-02-98, CR-5240.

Mesurements : L-75.0

Diagnosis : Large adult size more than 5 inches long, bulky and swollen anteriorly. Rostrum long and slender extending beyond the antennal scale, dorsally with 12-14 teeth, posterior 3 teeth placed behind orbital margin; ventral margin with 8-14 teeth at regular interval. Tip of the telson over-reaching two sets of postero-lateral spine.

Distribution : INDIA : Indian ocean, Eastern part of India.

Outside : Pakistan, Sri Lanka, China, Philippines, New Guinea and Mauritius.

Remarks : This species occurred very rarely. Although this is a fresh water species, it has also been found in brackish water having low salinity.

24. *Macrobrachium equidens* (Dana, 1852)

1852. *Palaemon equidens* Dana, *Proc. Acad. nat. Sci. Philad.*, **6** : 26

1950. *Macrobrachium equidens*, Holthuis, *Siboga Exped.* **39** : 162

1995. *Macrobrachium equidens*, Reddy, *Zool. Surv. India, Estuarine Ecosystem series, Part-2, Hugli Matla Estuary Prawns & shrimps (Crustacea : Decapoda)* : 310.

Material examined : 3 ex., Kanur, 11-12-2000, CR-5045; 7 ex., Kanur, 15-09-98, CR-5046; 50 ex., Lankevenitippa, 15-09-97, CR-5047; 11 ex., Kanur, 16-09-98, CR-5048; 24 ex., Edurumondi, 18-09-97, CR-5049; 22 ex., Gullalamoda, 17-09-97, CR-5050; 1 ex., Gullalamoda, 13-12-2000, CR-5051; 1 ex., Kanur, 08-09-97, CR-5052; 1 ex., Pallethummalapalem, 18-09-98, CR-5053; 5 ex., Pallethummalapalem, 12-10-96, CR-5054; 5 ex., Kanur, 04-01-2000, CR-5055; 13 ex., Edurumondi, 16-09-97, CR-5056; 2 ex., Gollalmoda, 11-01-2000, CR-5057; 1 ex., Gullalamoda, 10-01-2000, CR-5058; 2 ex., Nachugunta, 18-10-96, CR-5059; 4 ex., Gilakaladindi, 10-02-97, CR-5060, 1 ex., Gullalamoda, 23-09-98, CR-5061, 1 ex., Kanur, 11-02-97, CR-5062; 1 ex., Pedakanur, 07-02-98, CR-5063; 1 ex., Nachugunta, 20-12-2000, CR-5064; 6 ex., Gollalmoda, 11-01-2000, CR-5065; 1 ex., Gilakaladindi, 10-02-97, CR-5066, 8 ex., Kanur, 14-02-99, CR-5067, 1 ex., Edurumondi, 17-10-96, CR-5068; 2 ex., Edurumondi, 18-09-97, CR-5069; 1 ex., Palakayatippa, 19-09-97, CR-5070; 16 ex., Kanur, 05-01-2000, CR-5071; 14 ex., Kanur, 12-12-2000,

CR-5072; 2 ex., Palleshummalapalem, 14-12-2000, CR-5073; 7 ex., Palleshummalapalem, 13-12-2000, CR-5074.

Mesurements : L-45.0-108.0

Diagnosis : Body robust. Rostrum strong and long reaching at end of antennal scale; dorsal margin armed with 10-11 teeth placed at a regular interval; ventral margin armed with 4-7 teeth. Ridge of antennal spine extending in the direction of hepatic spine. Out of 2 postero-lateral spines of telson, lower one over-reaching the telson tip.

Distribution : INDIA : South-West coast, Kerala.

Outside : Pakistan, Sri Lanka, China, East coast of Africa, Madagascar, Philippines and New Caledonia.

Remarks : This species is found in large number.

25. *Macrobrachium rude* (Heller, 1862)

1862. *Palaemon rudis* Heller, *Verh. Zool. Bot. Ges. Wien*, 12 : 525

1950. *Macrobrachium rude*, Holthuis, *Siboga Exped.*, pt. X, 39 : 150.

1998. *Macrobrachium rude*, Deb, *Zool. Surv India, Estuarine Ecosystem Series*, 3 : Mahanadi Estuary : 133.

Material examined : 2 ex., Lankevenitippa, 13-12-2000, CR-3523; 1 ex., Eelachetladibba, 14-02-98, CR-3524; 1 ex., Gullalamoda, 23-09-98, CR-3525; 1 ex., Palleshummalapalem, 12-02-97, CR-3526; 2 ex., Gollalmoda, 11-01-2000, CR-3527; 3 ex., Kanur, 10-10-96, CR-3528; 4 ex., Edurumondi, 17-10-96, CR-3529; 6 ex., Lankevenitippa, 15-09-97, CR-3530; 2 ex., Edurumondi, 18-09-97, CR-3531; 1 ex., Palleshummalapalem, 14-12-2000, CR-3532; 2 ex., Pedakanur, 07-02-98, CR-3533; 2 ex., Avaniguda, 13-02-98, CR-3534; 2 ex., Gollalmoda, 11-01-2000, CR-3535; 1 ex., Eelachetladibba, 16-10-96, CR-3536; 1 ex., Palleshummalapalem, 15-02-99, CR-3537; 2 ex., Kanur, 16-09-98, CR-3538.

Mesurements : L-68.0-96.0

Diagnosis : Body bulky, carapace swollen with very large head. Rostrum almost straight reaching the antennal scale, dorsally bearing with 10-15 teeth; a small gap after 2-3 teeth from distal end followed by other teeth placed at a regular interval, posterior two teeth placed behind orbital margin; ventral margin bearing 3-6 teeth. Telson armed with 2 pair of spines dorsally. Apex of fingers acute and hooked. Hepatic spine situated at lower level than antennal spine.

Distribution : INDIA : East coast.

Outside : Sri Lanka, Bangladesh, Natal East coast Africa, Madagascar and South Somalia.

Remarks : This species is both riverine and estuarine in habit.

26. *Solenocera crassicornis* (H. Milne Edwards, 1837)

1837. *Penaeus crassicornis* H.Milne Edwards, *Hist.nat.Crust.*, 2 : 418

1991. *Solenocera crassicornis*, Paulpandian & Ramasamy, *Guide to the Prawns of Portonovo*, : 31 pt.24.

Material examined : 4 ex., Managanapudi, 20-09-98, CR-5200; 9 ex., Managanapudi, 08-01-2000, CR-5201.

Mesurements : L-81.0-130.0

Diagnosis : Body smooth, hairless. Rostrum reaching or slightly extending distal margin of eyes, dorsally armed with 8-12 dorsal teeth, ventral margin slightly convex; post rostral crest low and rounded. Post orbital spine present. Supra hepatic and branchiostegal spine absent. Telson plain, unarmed.

Distribution : INDIA : South coast.

Outside : Pakistan, Bangladesh, China, Japan, New Guinea and North East coasts of Arabian Sea.

Remarks : This species is marine in habitat. However found at the confluence area.

27. *Solenocera hextii* Wood-Mason & Alcock, 1891

1891. *Solenocera hextii* Wood Mason & Alcock, *Ann. Mag. Nat. Hist.* (6) 7 : 188

1969. *Solenocera hextii*, George, *Bull. Cent. mar. fish. Res. Inst.*, 14 : 18.

Material examined : 1 ex., Manginapudi, 08-01-2000, CR-5243.

Mesurements : L-115.0

Diagnosis : Body smooth. Rostrum sparsely hairy, dorsal margin armed with 6-8 teeth, ventral margin straight; postrostral crest elevated, reaching up to posterior margin of carapace. Cervical groove deep. Post orbital and suprahepatic spines present. Branchiostegal and pterygostomial spines absent. L-shaped branchiocardine crest present. Telson trifurcate.

Distribution : INDIA : South coast.

Outside : Gulf of Aden and Arabian Sea.

Remarks : Purely marine in habit.

28. *Solenocera choprai* Natraj, 1954

1945. *Solenocera choprai* Natraj, *J. Asiat. Soc. Bengal*, 11(2) : 91

1969. *Solenocera choprai*, George, *Bull. Cent. mar. Fish. Res. Inst.*, 14 : 18.

Material examined : 2 ex., Kamavericheruvu, 21-09-98, CR-5210.

Mesurements : L-100.0-117.0

Diagnosis : Body smooth and glabrous. Rostrum pubescent at its base and extended more than half of the eye, convex ventrally giving 6-9 dorsal teeth. Suprahepatic and branchiostegal spine absent. Pterygostomian angle broadly rounded. Hepatic crest curved and forming rounded loop downwardly behind front margin of carapace. Telson trifurcate.

Distribution : INDIA : South coast.

Outside : Pakistan, China, Japan, East Africa, Red Sea, East coasts of Arabian Sea, Mozambique and Kenya.

Remarks : This species is collected from the confluence area.

SUMMARY

28 species of prawns under 10 genera and 3 families have been recorded from Krishna Estuary, Andhra Pradesh which includes a few marine species.

ACKNOWLEDGEMENTS

The author is grateful to the Director, Zoological Survey of India, to Dr. C.A. Nageswara Rao previous Officer-in-Charge, Dr. S.Z. Siddiqi now Officer-in-Charge of Estuarine Biological Station for providing literatures, facilities and encouragements. The author is also grateful to Sri B. Dalai of this station for his help in collecting the specimen.

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MOLLUSCA

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INTRODUCTION

Phylum Mollusca is the second largest group comprising of more than 1, 00,000 species and majority of which inhabit marine biotopes. Molluscs are more abundant in littoral zone of tropical seas. The South-East Indian region, the Bay of Bengal including Andaman and Nicobar Island are falling under Indo-Malayan region or West-Central sub-area of Indo-West Pacific Region, West coast of India and Lakshadweep falls under Western Indian Ocean sub-area.

From India, a total of 3271 species of molluscs have been reported belonging to 220 families and 591 genera of which 1900 are gastropods, 1100 bivalves, 210 Cephalopods, 41 polyplacophors and 20 scaphopods. (Apte, 1998, Subba Rao, 1989, Subba Rao *et al.*, 1991, Subba Rao, *et al.* 1995, Surya Rao, and Mitra, S. 1998, Mitra *et al.*, 2005, Ramakrishna *et al.*, 2007 Ramakrishna and Dey 2007). Out of the 7 classes of Phylum Mollusca, only 5 major classes viz. Polyplacophora, Gastropoda; Scaphopoda, Bivalvia and Cephalopoda are represented in the Indian Region. Along the Indian coast Mollusca is a well represented group. "Check list of molluscs of Indian estuaries" (Subba Rao and Surya Rao, 1985). Includes a total of 245 species (120 of Gastropoda and 125 of Bivalvia excluding 14 fresh water species).

There are 14 major, 44 medium and 162 minor rivers in India. Majority of these rivers forms estuaries at their meeting places with the sea along east and west coast. Detailed studies on malaco fauna of Indian Estuaries, along East Coast have been undertaken by few workers. They are Rushikulya Estuary (Rama Rao *et al.*, 1992) Mahanadi Estuary (Surya Rao and Maitra, 1998), Hugli-Matla Estuary (Subba Rao, *et al.*, 1995), Godavari Estuary (Mahapatra, 2001).

Information available on the molluscs in Krishna estuarine system refers to Radhakrishna and Janakiram (1975) in relation to mangrove areas. River Krishna, the second largest river of South India opens into Bay of Bengals at Hamsaladivi near Nagayalanka of Andhra Pradesh along the East Coast after flowing a distance of nearly 1,120 kms. It originates from Western Ghat ranges of Mahabaleswar, South of Pune (Maharashtra).

The present studies are based on the collections of several surveys conducted by the scientists of Estuarine Biological station, ZSI, during 1996-2000.

Samples have been collected from 23 stations viz. Pallethummalapalem, Karawaka, Pedapatnam, Gilakaladindi, Kanur, PedaKanur, Kammavaricheruvu, Manginapudi, Bhavanipuram, Edurumundi, Eelachetladibba, Lankavenithippa, Gollalamoda, Palakayatippa, Yesupuram, Estuarine area near Light House, Kothapeta, Sorlagondi, Sangameswaram, Jhinkapalem, Opposite side of Hamsaldivi, Opposite side of Gollalamoda.

Collections have been preserved and deposited with Estuarine Biological station, ZSI, Gopalpur-on-sea. Classification followed is as given in Vaught (1989). Genus and Species allocation are in alphabetical order. Measurements of shells is expressed in millimeters. Details of Material examined have been provided serially as number of examples examined, Date of collection of Material, Name of the collection site, name of the collector and Identification registration No. Diagnostic characters, Distribution pattern and additional information as Remarks have been provided for easy identification.

ABBREVIATIONS USED

L = Length; Ht = Height; D = Diameter; W = Width; nr. Near; ex. = Example; no. = Number; ZSI = Zoological Survey of India; Pl = Plate; Fig. = Figure.

MATERIAL AND METHOD

Specimens were collected from different regions of the estuary (Mouth area, Upper reaches and connecting channels) during Premonsoon, monsoon and Postmonsoon period. Gastropods, bivalves were hand picked on the exposed mud flats (during low tide), sandy and muddy shores which includes both dead and live specimens. Few cephalopods have been collected from the fisherman's nets. Most of the collections are dry collections. Wet collections have been kept either preserved in 4% formaldehyde solution or 70% alcohol (for soft bodies).

SYSTEMATIC LIST OF MOLLUSCS

Class GASTROPODA
Sub class PROSOBRANCHIA
Order ARCHAEOGASTROPODA
Super family TROCHOIDEA
Family TROCHIDAE
Sub family UMBONIINAE

Genus *Umbonium* Link, 1807

1. *Umbonium vestiarius* (Linnaeus, 1758)

Super Family NERITOIDEA

Family NERITIDAE

Sub Family NERITINAE

Genus *Neritina* Lamarck, 1816

Sub Genus *Dostia* Gray, 1847

2. *Neritina (Dostia) violacea* (Gmelin, 1791)

Genus *Theodoxus* Montfort, 1810

Sub Genus *Clithon* Montfort, 1810

3. *Theodoxus (Clithon) oualaniensis* (Lesson, 1831)

4. *Theodoxus (Clithon) bicolor* (Recluz, 1842)

Order MESOGASTROPODA

Super Family LITTORINOIDEA

Family LITTORINIDAE

Sub Family LITTORININAE

Genus *Littorina* Ferussac, 1822

5. *Littorina* sp.

Sub Genus *Littorinopsis* Moerch, 1876

6. *Littorina (Littorinopsis) melanostoma* Gray, 1839

7. *Littorina (Littorinopsis) scabra scabra* (Linnaeus, 1758)

Genus *Littoraria*

8. *Littoraria undulata* Gray, 1839

Super Family RISSOIDEA

Family ASSIMINEIDAE

Sub Family ASSIMINEINAE

Genus *Assiminea* Fleming, 1828

9. *Assiminea brevicula* (Pfeiffer, 1854)

Super Family CERITHIOIDEA

Family POTAMIDIDAE

Sub Family POTAMIDINAE

Genus *Cerithidea* Swainson, 1840

Sub Genus *Cerithideopsilla* S.Str.

10. *Cerithidea (Cerithideopsilla) cingulata* (Gmelin, 1791)

Sub Genus *Cerithidea* S. Str.

- 11.
- Cerithidea (cerithidea) obtusa*
- (Lamarck, 1822)

Genus *Telescopium* Montfort, 1810

- 12.
- Telescopium telescopium*
- (Linnaeus, 1758)

Family TURRITELLIDAE

Sub Family TURRITELLINAE

Genus *Turritella* Lamarck, 1799.

- 13.
- Turritella acutangula*
- (Linnaeus, 1758)

- 14.
- Turritella attenuata*
- Reeve, 1869

Super Family NATICOIDEA

Family NATICIDAE

Sub Family NATICINAE

Genus *Natica* Scopoli, 1777.

- 15.
- Natica tigrina*
- (Roeding, 1798)

Sub Family POLINICINAE

Genus *Polinices* Mont fort, 1810Sub Genus *Glossaulax* Pilsbry, 1929

- 16.
- Polinices (Glossaulax) didyma*
- (Roeding, 1798)

Sub Genus *Polinices* S. Str.

- 17.
- Polinices (Polinices) mammilla*
- (Linnaeus, 1758)

Super Family Tonnoidea

Family Tonnidae

Genus *Tonna* Bruennich, 1772

- 18.
- Tonna dolium*
- (Linnaeus, 1758)

Family FICIDAE

Genus *Ficus* Roeding, 1798

- 19.
- Ficus gracilis*
- (Sowerby, 1825)

Family Bursidae

Genus *Bursa* Roeding, 1798

- 20.
- Bursa rana*
- (Linnaeus, 1758)

- 21.
- Bursa echinata*
- (Lamarck, 1843)

Order NEOGASTROPODA

Sub order MURICOIDEA

Family MURICIDAE

Sub Family MURICINAE

Genus *Murex* Linnaeus, 1758

22. *Murex tribulus* Linnaeus, 1758

23. *Murex trapa* Roeding, 1798

Sub Family ERGALATAXINAE

Genus *Cronia* H and A. Adams, 1853

24. *Cronia subnodulosa* (Melvill, 1893)

Sub Family Thaidinae

Genus *Thais* Roeding, 1798

25. *Thais lacera* (Born, 1778)

26. *Thais tissoti* (Petit, 1852)

Sub Family RAPANINAE

Genus *Rapana* Schumacher, 1817

27. *Rapana rapiformis* (Born, 1778)

Family NASSARIIDAE

Sub Family NASSARIINAE

Genus *Nassarius* Dumeril, 1806

Sub Genus *Hima* Gray, 1852

28. *Nassarius (Hima) stolatus* (Gmelin, 1791)

Sub Genus *Plicarcularia* Thiele, 1929

29. *Nassarius (Plicarcularia) pullus* (Linnaeus, 1758)

Sub Genus *Zeuxis* H. and A. Adams, 1953

30. *Nassarius (Zeuxis) foveolatus* (Reeve, 1847)

Genus *Bullia* Gray in Griffith and Pidgeon, 1834.

31. *Bullia vittata* (Linnaeus, 1767)

Family MELONGENIDAE

Genus *Pugilina* Schumacher, 1817

Subgenus *Hemifusus* Swainson, 1840

32. *Pugilina (Hemifusus) cochlidium* (Linnaeus, 1758)

Family OLIVIDAE

Genus *Olivancillaria* d' Orbigny, 1840

33. *Olivancillaria gibbosa* (Born, 1778)

Super Family CONOIDEA

Family TURRIDAE

Sub Family TURRICULINAE

Genus *Turricula* Schumacher, 1817.

34. *Turricula javana* (Linnaeus, 1767)

Family TEREBRIDAE

Genus *Hastula* H and A. Adams 1853

35. *Hastula bacillum* (Deshayes, 1859)

Sub class OPISTHOBRANCHIA

Order CEPHALASPIDEA

Super Family PHILINOIDEA

Family HAMINEIDAE

Sub Family HAMINEINAE

Genus *Haminoea* (Leach) Gray, 1847.

36. *Haminoea crocata* (Reeve, 1860)

Sub class GYMNOMORPHA

Order SYSTELLOMMATOPHORA

Superfamily ONCHIDIDOIDEA

Family ONCHIDIIDAE

Genus *Onchidium* Buchanan, 1800

37. *Onchidium* sp.

Subclass PULMONATA

Order BASOMMATOPHORA

Super Family ELLOBIOIDEA

Family ELLOBIIDAE

Genus *Ellobium* Roeding, 1798.

38. *Ellobium aurisjudae* (Linnaeus, 1758)

39. *Ellobium gangeticum* (Pfeiffer, 1855)

40. *Ellobium* sp.

Genus *Cassidula* Ferussac, 1821

41. *Cassidula nucleus* Martyn, 1791

Genus *Pythia* Roeding, 1798.

42. *Pythia plicata* (Gray, 1826)

Sub Family MELAMPINAE

Genus *Melampus* Montfort, 1810

43. *Melampus pulchella* (Petit, 1842)

44. *Melampus* sp.

Class CEPHALOPODA

Sub class NAUTILOIDEA

Order Nautilida

Family NAUTILIDAE

Genus *Nautilus* Linnaeus, 1758

45. *Nautilus pompilius* (Linnaeus, 1758)

Sub class COLEOIDEA

Order SEPIIDA

Family SEPIIDAE

Genus *Sepiella* Gray, 1849

46. *Sepiella inermis* (Ferussac and d' Orbigny, 1848)

Order TEUTHIDA

Sub order MYOPSIDA

Family LOLIGINIDAE

Genus *Loliolopsis* Berry, 1929

47. *Loliolopsis* sp.

Order OCTOPODA

Sub order INCIRRATA

Family OCTOPODIDAE

Sub Family OCTOPODINAE

Genus *Octopus* Lamarck, 1798

48. *Octopus* sp.

Class BIVALVIA
Order ARCOIDA
Super Family ARCACEA
Family ARCIDAE
Genus *Arca* Linnaeus, 1758

49. *Arca ventricosa* Lamarck, 1819

Genus *Trisidos* Roeding, 1798

50. *Trisidos tortuosa* (Linnaeus, 1758)

Sub Family ANADARINAE
Genus *Anadara* Gray, 1847

51. *Anadara granosa* (Linnaeus, 1758)

52. *Anadara rhombea* (Born, 1780)

Genus *Scapharca* Gray, 1847

53. *Scapharca deyrollei* (Jausseume, 1893)

54. *Scapharca inequivalvis* (Burguiere, 1789)

Genus *Trisidos* Roeding, 1798

Family NOETIIDAE

Genus *Striarca* Concord, 1862

55. *Striarca lactea* (Linnaeus, 1858)

Order MYTILOIDA
Super Family MYTILODEA
Family MYTILIDAE
Sub Family MYTILINAE
Genus *Perna* Philipsson, 1788

56. *Perna viridis* (Linnaeus, 1758)

Sub Family MODIOLINAE
Genus *Modiolus* Lamarck, 1799

57. *Modiolus striatulus* (Hanley, 1844)

Order OSTREOIDA
Super Family ANOMIODEA
Family ANOMIIDAE
Genus *Anomia* Linnaeus, 1758

58. *Anomia achaeus* (Gray, 1849)

59. *Anomia* sp.

Family PLACUNIDAE

Genus *Placuna* Lightfoot, 1786.

60. *Placuna placenta* Linnaeus, 1758

Super Family OSTRACEA

Family OSTREIDAE

Genus *Crassostrea* Sacco, 1897

61. *Crassostrea cuttackensis* (Newton and Smith, 1912)

Genus *Saccostrea* Dollfus and Dautzenberg, 1920

62. *Saccostrea cucullata* (Born, 1778)

Subclass HETERODONTA

Order VENEROIDA

Super Family CARDIACEA

Family CARDIIDAE

Genus *Acanthocardia* Gray, 1851

63. *Acanthocardia coronata* (Schroeter, 1787)

Genus *Trachycardium* Moerch, 1853

64. *Trachycardium asiaticum* (Bruguere, 1792)

Super Family MACTRACEA

Family MACTRIDAE

Genus *Mactra* Linnaeus, 1767

65. *Mactra cuneata* Gmelin, 1791

66. *Mactra luzonica* Dunker, 1854

67. *Mactra symmetrica* Deshayes, 1853

Sub Genus *Mactrinula* Gray, 1953

68. *Mactra (Mactrinula) plicataria* (Linnaeus, 1767)

Subgenus *Coelomactra* Dall, 1895

69. *Mactra (Coelomactra) turgida* Gmelin, 1791

70. *Mactra (Coelomactra) violacea* Gmelin, 1791

Super Family SOLENACEA

Family SOLENIDAE

Genus *Solen* Linnaeus, 1758

71. *Solen brevis* Gray, 1842

72. *Solen gravelyi* (Ghosh, 1920)

73. *Solen kempi* (Preston, 1916)

74. *Solen truncatus* (Wood, 1815)

Family CULTELLIDAE

Genus *Neosolen* Ghosh, 1920

75. *Neosolen aquaedulcioris* Ghosh, 1916

Genus *Pharella* Gray, 1854

76. *Pharella javanicus* (Lamarck, 1818)

Genus *Siliqua* Megerle Von Muehlfeld, 1811

77. *Siliqua radiata* (Linnaeus, 1758)

Super Family TELLINACEA

Family TELLINIDAE

Genus *Tellina* Linnaeus, 1754

Sub Genus *Angulus* Megerle Von Muehlfeld, 1811

78. *Tellina (Angulus) philippinarum* (Hanley, 1844)

Sub Family MACOMINAE

Genus *Macoma* Leach, 1819

Sub Genus *Psammacoma* Dall 1900

79. *Macoma (Psammacoma) birmanica* (Philippi, 1949)

80. *Macoma (Psammacoma) truncata* (Jonas, 1844)

Family DONACIDAE

Genus *Donax* Linnaeus, 1758

Sub Genus *Hecuba* Schumacher, 1817.

81. *Donax (Hecuba) scortum* (Linnaeus, 1758)

Sub Genus *Latona* Schumacher, 1817

82. *Donax (Latona) incarnatus* Gmelin, 1817

83. *Donax (Latona) faba* Schroeter, 1788

Family PSAMMOBIIDAE

Genus *Sanguinolaria* Lamarck, 1799.

Sub Genus *Soletellina* Blainville, 1824

84. *Sanguinolaria (Soletellina) acuminata* (Deshayes, 1857)

Family CORBICULIDAE

Genus *Geloina* Gray, 1842.

85. *Geloina erosa* (Solander, 1786)

Super Family VENERACEA

Family VENERIDAE

Subfamily MERETRICINAE

Genus *Meretrix* Lamarck, 1799.86. *Meretrix casta* (Gmelin, 1791)87. *Meretrix mererix* (Linnaeus, 1758)

Subfamily PITARINAE

Genus *Pelecypora* Dall, 190288. *Pelecypora trigona* (Reeve, 1850)

Subfamily TAPETINAE

Genus *Marcia* H. and A. Adams, 185789. *Marcia pinguis* Schroeter, 1788Genus *Paphia* Roeding, 179890. *Paphia textrix* Schroeter, 1798

Sub Family CHIONINAE

Genus *Timoclea* Brown, 182791. *Timoclea imbricata* (Sowerby, 1853)

Family GLAUCONOMIDAE

Genus *Glaucanome* Gray, 182892. *Glaucanome sculpta* (Sowerby, 1894)

Order MYOIDA

Sub Order PHOLADINA

Super Family PHOLADACEA

Family PHOLADIDAE

Sub Family PHOLADINAE

Genus *Pholas* Linnaeus, 175893. *Pholas orientalis* Gmelin, 1791Genus *Barnea* Risso, 187694. *Barnea candida* (Linnaeus, 1758)

Sub Family MARTESIINAE

Genus *Martesia* Sowerby, 182495. *Martesia fragilis* (Verill and Bush, 1873)

SYSTEMATIC ACCOUNT

Class GASTROPODA

Sub class PROSOBRANCHIA

Order ARCHAEOGASTROPODA

Super Family TROCHOIDEA

Family TROCHIDAE

Sub Family UMBONIINAE

Genus *Umbonium* Link, 18071. *Umbonium vestiarius* (Linnaeus)

1758. *Trochus vestiarius* Linnaeus, Syst. Nat., ed. 10 : 758, sp. 515 (Type locality : "M. Mediterranes, Asiatico, Chinensis").

2003. *Umbonium vestiarius* : Subba Rao, Rec. zool. Surv. India. Occ. Paper, **192** : 80, pl. 6, fig. 1a-f.

Material examined : 3 ex., 13-2-1997, Kaluamundi, m-4025; 2 ex., 15-9-1997, Lankavenithippa m-4111; 3 ex., 19-9-1997, Nagayalanka, m-4117; 1 ex., 23-9-1998, Sorlagondi, m-4312; 2 ex., 24-9-1998, Sorlagondi m-4270; 7 ex., 12-2-1999, Kanur, m-4429; 33 ex., 19-2-1999, Light House (Northern side) m-4466; 4 ex., 4-1-2000, Kanur, m-4590; 3 ex., 10-1-2000, Sorlagondi, m-4584; 9 ex., 11-01-2000, Gollalamoda, m-4596.

Measurements (in mm) : L = 5-9; D = 9-14

Diagnostic character : Shell brightly coloured, polished; spire depressed; Umbilicus with large subcircular callous pad; Shows polymorphism.

Distribution : INDIA : Andhra Pradesh : Godavari Estuary, Pulicat lake; Gujarat; Goa; Kerala : Cochin; Maharashtra : Bassei, Bombay; Orissa : Chilika lagoon, Gopalpur Mahanadi Estuary; Pondichery : Karaikal; Tamil Nadu : Madras, Porto Novo, Mandapam, Krusadai Island, Tuticorin; West Bengal : Digha coast.

Elsewhere : Japan; Java; New Zealand; Pakistan; Persian Gulf; Philippines; Indonesia; Sri Lanka.

Remarks : Commonly known as button shell and is used as ornament and household decorative items. Occur in subtidal region of shallow beaches on sandy coast near back waters and estuary. Seen on both the coasts of India.

Super Family NERITOIDEA

Family NERITIDAE

Sub Family NERITINAE

Genus *Neritina* Lamarck, 1816Sub Genus *Dostia* Gray, 18402. *Neritina (Dostia) violacea* (Gmelin)

1791. *Nerita violacea* Gmelin, *Syst. Nat.* ed. 13 : 3686, sp. 68 (Type locality : Not given).

1989. *Neritina (Dostia) violacea* : Subba Rao. Hand Book : *Freshwater molluscs of India*, Zool. Surv. India : 37, figs. 30 and 31.

Material examined : 9 ex., 9-10-1996, Bhavanipuram, m-3948; 1 ex., 9-10-1996, Bhavanipuram, m-3983; 3 ex., 12-10-1996, Pallethummalapalem (Karwaka), m-3935; 8 ex., 15-10-1996, Lankavenithippa, m-3858; 1 ex., 16-10-1996, Eelachetladibba, m-3926; 4 ex., 7-9-1997, Kanur m-4099; 14 ex., 8-9-1997, Kanur, m-4171; 2 ex., 10-2-1997, Gilakaladindi, m-4018; 6 ex., 11-2-1997, Kanur, m-4068; 2 ex., 16-2-1997, Lankavenithippa, m-4059; 3 ex., 18-2-1997, Edurumundi, m-4065; 3 ex., 18-2-1997, Yesupuram, m-4218; 3 ex., 12-2-1998, Kothapeta, m-4197; 3 ex., 15-2-1998, Lankavenithippa, m-4207; 1 ex., 18-2-1998, Yesupuram, m-4218; 2 ex., 12.2.1999, Kanur (Channel) m-4428; 6 ex., 14-2-1999, Kanur (Bridge), m-4454; 11 ex., 20-2-1999, Palakayatippa, m-4488; 1 ex., 21-2-1999, Lankavenithippa, m-4481; 2 ex., 5-1-2000, Kanur, m-4614; 2 ex., 17-12-2000, Palakayatippa, m-4673.

Measurements : L = 7-22; W = 6-14

Diagnostic characters : Shell elongately ovate, thick; Spire obsolete; aperture semicircular; Columellar plate porcellaneous with 7-10 dentitions; radula with central having a little broader cusp.

Distribution : INDIA : Andhra Pradesh : Kakinada, Godavri Estuary; Andaman and Nicobar Islands; Goa; Karnataka : Netravati Estuary nr. Manglore, Kumta, Kodibag nr. Manglore, Kumta, Kodibag nr. Karwar; Kerala : Cochin backwater; Maharashtra : Ratnagiri; Orissa : Mahanadi Estuary nr., Paradeep; Tamil Nadu : Porto Novo, Killai Estuary; West Bengal : Sagar Island, Digha Coast, Hugli-malta Estuary, Port Canning, Calcutta.

Elsewhere : Myanmar : Mergui Archipelago; Philippines; China; Japan; SriLanka; Australia; Thailand; Indonesia; New Calendonia.

Remarks : A fresh water species. Also found in Indian estuaries and backwaters. Found mainly on the upper mud flat, Euryhaline in nature (tolerate a wide range of salinity).

Genus *Theodoxus* Mont fort, 1810

Sub Genus *Clithon* Mont fort, 1910

3. *Theodoxus (Clithon) oualaniensis* (Lesson)

1831. *Neritina oualaniensis* lesson, Voy. Coquille. Zool., 3(1) : 379 (Type locality : Qulan, fiji).

1978. *Clithon oualaniensis* : Rajgopal and Mookherjee, *Rec. zool. Sury. India, Occ. Pap.*, 12 : 43.

Material examined : 1 ex., 16-10-1996, Eelachetladibba, m-3931; 3 ex., 12-2-1998, Kothapeta, m-4196; 18 ex., 15-2-1998, Lankavenithippa, m-4208; 11 ex., 18-2-1998, Yesupuram, m-4215; 34 ex., 18-12-2000, Gollalamoda, m-4708; 7 ex., 20-12-2000, Nachugunta, m-4689.

Measurements : L = 5-16; W = 5-11

Diagnostic character : Shell globose; Columella finely dentate brightly coloured.

Distribution : INDIA : Andhra Pradesh : Godavari Estuary, Bhimilipatnam; Andaman and Nicobar Island; Karnataka : Netravati Estuary nr. Mangalore, Murdeswar, Kodibag; Kerala : Quilon; Orissa : Kushabhadra Estuary near Konark, Arakakuda nr. Chilika mouth, Brahmagiri at Chilika, Gopalpur Mahanadi Estuary; Tamil Nadu : Vellar Estuary nr. Porto Novo Mandapam, Rameswaram, Kundugal point.

Elsewhere : Indonesia : Java, Sumatra; Srilanka; Thailand.

Remarks : Found on mud flats or on sand patches near Estuary, smaller in size, exhibit polymorphism.

4. *Theodoxus (Clithon) bicolor* (Recluz)

1842. *Nerita bicolor* Recluz, *Proc. Zool. Soc. Lond.*, P. 172. Type locality : Agoo (in a mountain stream), Philippines.

1947. *Theodoxus (Clithon) bicolor* : Ray, *Rec. Indian Mus.*, 45(4) : 308.

Material examined : 28 ex., 16-12-2000, Kothapeta, m-3732; 15 ex., 17-12-2000, Puligadda, m-4739.

Measurement (in mm) : L = 6-12; W = 5-15.

Diagnostic character : Shell coarsely striated; Spire distinct; inner columellar margin with more than 12 denticulations; Colour olive-green with dark squares; Shell never with spirus; outer margin of per stome not thickened.

Distribution : INDIA : Andaman Island.

Elsewhere : Indonesia; Moluccas; Philippines; Formosa.

Remarks : Generally fluviatile (riverine), also seen in fresh water, prefer streams with clear water and stony bottom.

Order MESOGASTROPODA
Super Family LITTORINOIDEA
Family LITTORINIDAE
Sub Family LITTORININAE
Genus *Littorina* Ferussac, 1822.

5. *Littorina* Sp.

Material examined : 1 ex., 17-9-1998, Kanur, m-4255; 5 ex., 17-2-1999, opposite side of Hamsaldivi, m-4463; 8 ex., 20-2-99, Palakayatippa, m-4494; 3 ex., 10-1-2000, Sorlagondi, m-4636.

Measurement : L = 7-22; D = 5-16

Description : Shell turbate, Solid without horny epidermis, Columella not black.

Sub Genus *Littorinopsis* Moerch, 1876.

6. *Littorina (Littorinopsis) melanostoma* Gray

1839. *Littorina melanostoma* Gray, Zoology of Captain Beechys 'Voyage H. m. S. blossom, Mollusks : 140 (Type locality : Indian Ocean, Panang Malaysia).

1970. *Littorina (Littorinopsis) melanostoma* : Rosewater, Indo-Pacific. *Mollusca*, 2 (11) : 462, pl. 325, figs. 28, 29; pl. 355, figs. 1-4.

Material examined : 3 ex., 9-10-1996, Bhavanipuram, m-3953; 1 ex., 12-10-1996, Pallemthumalapalem (Karwaka), m-3939; 1 ex., 16-10-1996, Eelachetladibba, m-3924; 4 ex., 17-10-1996, Gollalamoda, m-3867; 1 ex., 18-10-1996, Nachugunta, m-3842; 2 ex., 23-9-1998, Sorlagondi, m-4314; 3 ex., 24-9-1998, Sorlagondi, m-4274; 1 ex., 14-2-1999, Kanur (Bridge), m-4456; 1 ex., 19-2-1999, Light House, m-4475; 1 ex., 20-2-1999, Palakayatippa, m-4491; 1 ex., 10-1-2000, Sorlagondi, m-4625; 2 ex., 11-12-2000, Kanur, m-4721; 1 ex., 14-12-2000, Kanur, m-4721.

Measurements : L = 11-25; D = 5-12.

Diagnostic character : Yellowish white in colour with brown longitudinal markings between spiral striae arranged axially; body flattened; Columella black (tip).

Distribution : INDIA : Andhra Pradesh : Godavari Estuary; Orissa : Hukitola; Tamil Nadu : Mandapam, Pulli Island; West Bengal : Hugli Matla Estuary, Port Canning, Ganga Sagar, Bhuriganga Estuary in Sunderban.

Elsewhere : Myanmar : Murgui Archipelago, Akyab; Philipines; Singapore, Sri Lanka.

Remarks : Usually found clinging to the branches and leaves of mangrove plants in estuaries.

7. *Littorina (Littorinopsis) scabra scabra* (Linnaeus)

1758. *Helix scabra* Linnaeus, *Syst. Nat. ed.* 10 : 770 (Type locality, Amboinamoluccas, Lectotype designated by Rosewater, 1970).

2003. *Littorina (Littorinopsis) scabra scabra* : Subba Rao, *Rec. zool. Surv. India, Occ. Paper*, **192** : 120, pl. 19, fig. 8.

Material examined : 7 ex., 10-1-2000, Light House (Opposite to Eelachetladibba), m-4637.

Measurement : L = 7-9, D = 5-6

Diagnostic character : Shell solid, with variable colour pattern, Generally dark, violet gray to reddish brown, nodules white, columella reddish brown; sculptured with spiral cords and row of small nodules on the penultimate whorl and two rows on the last whorl; presence of spiral cords and axial growth lines; inside and outside of aperture with fine lines and brown spots.

Distribution : INDIA : Andhra Pradesh : Godavari Estuary; Andamans; Goa; Karnataka; mangalore; Kerala : Cochin; Maharashtra : Bombay; Orissa : Hukitiola, Chatrapur nr. Gopalpur; Tamil Nadu : Madras, Gulf of mannar, Tuticorin; West Bengal : Port Canning, Hugli-malta Estuary.

Elsewhere : Common throughout Indo-pacific (From South African coast to Philippines Islands).

Remarks : Found in the mangrove area attached to stems and leaves of mangrove trees. Also occurs in the crevices in intertidal region.

Genus *Littoraria*

8. *Littoraria undulata* Gray

1839. *Littorina undulata* Gray, *Zool. Beechery's Voy.*, P.140.

1982. *Littorina (Littoraria) undulata* : Raja Gopal and Mookherjee, *Rec. zool. Surv. India, Occ. Paper*, **28** : 6.

Material examined : 10 ex., 14-2-1999, Kanur (Bridge), m-4456.

Measurement : L = 9-10, D = 6-7.

Diagnostic character : Shell yellowish or cream coloured, ornamented with brown undulating axial marks; columella violet-grey colour or white with brown bands;

Distribution : INDIA : Andaman and Nicobar Islands; Goa; Karnataka; Kerala; Gujarat; Lakshadweep; Orissa; Tamil Nadu; West Bengal : Hugli-malta Estuary Medinipur, North and South 24 Parganas.

Elsewhere : Indo-pacific, Madagascar to Philippines.

Super Family RISSOIDEA

Family ASSIMINEIDAE

Sub Family ASSIMINEINAE

Genus *Assiminea* Fleming, 18289. *Assiminea brevicula* (Pfeiffer)

1854. *Hydrocena brevicula* Pfeiffer, *Proc.Zool.Soc.Lond*, P. 306.

1995. *Assiminea brevicula* : Subba Rao. *et al.*, *Estuarine Ecosystem Series, 2 : Mollusca in Hugli Matla Estuary*, *Zool. Surv. India* : 57.

Material examined : 11 ex., 9-10-1996, Bhavanipuram, m-3958; 5 ex., 10-10-1996, Palleshumulupalem, m-3976; 20 ex., 11-10-1996, Pedapatnam, m-3977; 17 ex., 8-9-1997, Kanur, m-4175; 10 ex., 7-2-1998, Kanur, m-4195; 7 ex., 12-9-1998, Kanur, m-4333; 8 ex., 15-9-1998, Kanur, m-4334; 3 ex., 20-2-1999, Palakayatippa, m-4495; 3 ex., 10-1-2000, Light House, m-4628; 19 ex., 10-1-2000, Opp. to Gollalamoda, m-4629; 2 ex., 13-12-2000, Palleshumulapalem, m-4727; 4 ex., 16-12-2000, Kothapeta, m-4737; 6 ex., 18-12-2000, Gollalamoda, m-4706.

Measurement : L = 2-8, D = 3-9.

Diagnostic character : Shell small, globose, thick, bright brickred or Yellowish coloured, 6-7 whorls, collumellar pillar whitish; Spire elevated.

Distribution : INDIA : Andhra Pradesh : Godavari Estuary; Andaman and Nicobar Islands; Tamilnadu; West Bengal : Hugli malta Estuary.

Elsewhere : Borneo; Cebu; Malacca; Philippines and Singapore.

Remarks : Usually found either crawling on the mud or remains attached to grasses in muddy localities near to Estuary and back waters.

Super Family CERITHIOIDEA

Family POTAMIDIDAE

Sub Family POTAMIDINAE

Genus *Cerithidea* Swainson, 1840Subgenus *Cerithideopsilla*10. *Cerithidea (Cerithideopsilla) cingulata* (Gmelin)

1791. *Murex cingulatus* Gmelin, *Syst.Nat. ed.* 13 (6) : 3561, sp. 138 (Type locality : Tranquebar).

2003. *Cerithidea (Cerithideopsilla) cingulata* : Subba Rao, *Rec. zool. Surv. India. Occ. Paper No.*, **192** : 136 pl. 22, fig. 2.

Material examined : 27 ex., 8-10-1996, Pallethumulapalem, m-3888, 3889, (22ex); 14 ex., 9-10-1996, Bhavanipuram, m-3957; 2 ex., 10-10-1996, Pallethumulapalem, m-3969; 43 ex., 12-10-1996, Pallethumulapalem (Karwaka), m-3932; 19 ex., 15-10-1996, Lankavenithippa, m-3852, 3853 (12ex); 8 ex., 17-10-1996, Gollalamoda, m-3870; 3 ex., 18-10-1996, Nachukunta, m-3840; 9 ex., 10-2-1997, Gilakaladindi, m-4017; 10 ex., 17-2-1997, Eelachetladibba, m-4052; 11 ex., 18-2-1997, Edurumundi, m-4062; 15 ex., 18-2-1997, Nagayalanka, m-4075; 1 ex., 21-2-1997, Palakayatippa, S K and P m-4000; 4 ex., 8-9-1997, Kanur, m-4172; 2 ex., 9-9-1997, Pallethumulapalem, m-4162; 2 ex., 10-9-1997, Pallethumulapalem, m-4106; 31 ex., 15-9-1997, Lankavenithippa, m-4112; 8 ex., 18-9-1997, Edurumundi, m-4134; 4 ex., 13-2-1998, Lankavenithippa, m-4244; 4 ex., 15-2-1998, Lankavenithippa, m-4206; 9 ex., 15-2-1998, Yesupuram, m-4214; 18 ex., 16-9-1998, Kanur, m-4337; 6 ex., 18-9-1998, Sangameswar, m-4308; 6 ex., 19-9-1998, Pallethumulapalem, m-4262; 5 ex., 24-9-1998, Sorlagondi, m-4271; 19 ex., 26-9-1998, Sangameswar, m-4303; 1 ex., 12-2-1999, Kanur, m-4426; 4 ex., 12-2-1999, Kanur, m-4440; 1 ex., 14-2-1999, Kanur, m-4453; 4 ex., 20-2-1999, Palakayatippa, m-4487; 8 ex., 21-2-1999, Lankavenithippa, m-4483; 6 ex., 22-2-1999, Lankavenithippa, m-4478; 3 ex., 4-1-2000, Kanur, m-4594; 1 ex., 6-1-2000, Pallethumulapalem, m-4539; 1 ex., 11-1-2000, Gollalamoda, m-4602; 4 ex., 12-1-2000, Palakayatippa, m-4567; 7 ex., 14-12-2000, Pallethumulapalem, m-4630; 1 ex., 20-12-2000, Nachukunta, m-4688; 1 ex., 12-12-2000, Kanur, m-4710; 2 ex., 11-12-2000, Kanur, m-4713.

Measurements : L = 18-31, D = 6-12

Diagnostic characters : Shell narrow, elongate; Whorls with spiral and axial ribs; Columella not twisted; body whorl with varix; Dark brown in colour.

Distribution : INDIA : Andhra Pradesh; Goa; Gujarat; Karnataka; Kerala; Maharashtra; Pondichery; Tamil Nadu; West Bengal.

Elsewhere : Pakistan, Sri Lanka, Myanmar, Indonesia, Japan.

Remarks : Common in the estuaries, back water and mangrove swamps along East and West coast of India. Widely used as raw material for manufacture of lime.

Sub Genus *Cerithidea* S. Str.

11. *Cerithidea (Cerithidea) obtusa* (Lamarck)

1822. *Cerithium obtusum* Lamarck, *Hist. Nat. Anim. Sanr, Vert.*, 7 : 71.

2003. *Cerithidea (Cerithidea) obtusa* : Subba Rao, *Rec. zool. Surv. India. Occ. Paper*, 192 : 136, pl. 22, fig. 5, 6.

Material examined : 6 ex., 8.10.1996, Pallethumulapalem, m-3891; 2 ex., 9-10-1996, Bhavanipuram, m-3960; 2 ex., 12-10-1996, Pallethumulapalem (Karwaka), m-3934; 1 ex., 12-

10-1996, Pallethumulapalem (Karwaka), m-3826; 7 ex., 15-10-1996, Lankavenithippa, m-3851; 6 ex., 15-10-1996, Lankavenithippa, m-3866; 2 ex., 16-10-1996, Eelachetladibba, m-3923; 1 ex., 17-10-1996, Gollalamoda, m-3869; 2 ex., 18-10-1996, Nachukunta, m-3844; 2 ex., 21-2-1997, Palakayatippa, m-3999; 2 ex., 9-9-1997, Pallethumulapalem, m-4166; 1 ex., 11-9-1997, Kammavaricheruvu, m-4133; 2 ex., 19-9-1997, Nagayalanka, m-4119; 1 ex., 13-2-1998, Palakayatippa, m-4191; 2 ex., 15-9-1998, Kanur, m-4230; 1 ex., 18-9-1998, Sangameswar, m-4370; 2 ex., 19-9-1998, Pallethumulapalem m-4263; 2 ex., 12-2-1999, Kanur, m-4438; 4 ex., 15-2-1999, Pallethumulapalem, m-4357; 1 ex., 17-2-1999, Opp. Hansaldivi, m-4460; 3 ex., 20-2-1999, Palkaithipa, m-4486; 1 ex., 21-2-1999, Lankavenithippa, m-4482; 1 ex., 10-1-2000, Sorlagondi, m-4582; 1 ex., 10-1-2000, Light House, m-4545; 2 ex., 11-1-2000, Jinkapalem, m-4557; 1 ex., 12-1-2000, Palakayatippa, m-4566.

Measurements : L = 36-47, D = 19-25.

Diagnostic character : Shell broadly elongate and round, yellowish in colour; apex blunt; sculpture with spiral threads and prominent transpiral ridges; aperture broadly rounded; outer lip thick and flattened.

Distribution : INDIA : Andhra Pradesh : Godavari Estuary; Andaman and Nicobar Islands; Orissa; Kasaphala, ChandipurMahanadi Estuary, False point, Gopalpur back waters; West Bengal : Medinipur, North and South 24 Parganas, Sunderban, Hugli-malta Estuary.

Elsewhere : Indian Ocean to Western Pacific.

Remarks : Found in mangrove area or in back waters. Seen crawling on the mud or on plants which are wet with spring tides.

Genus *Telescopium* Montfort, 1810

12. *Telescopium telescopium* (Linnaeus)

1758. *Trochus telescopium* Linnaeus, *Syst.Nat.* ed. 10 : 760 sp.521 (type locality : Not given)

2003. *Telescopium telescopium* : Subba Rao, *Rec. zool. Surv. India. Occ. Paper No.*, 192 : 136, pl. 22, fig. 3.

Material examined : 10 ex., 8-10-1996, Pallethumulapalem, m-3887; 3 ex., 9-10-1996, Bhavanipuram, m-3945; 2 ex., 10-10-1996, Pallethumulapalem m-3968; 7 ex., 12-10-1996, Pallethumulapalem (Karwaka), m-3933; 3 ex., 15-10-1996, Lankavenithippa, m-3854; 1 ex., 17-10-1996, Gollalamoda, m-3874; 1 ex., 10-2-1997, Gilakaladindi, m-4015; 1 ex., 11-2-1997, Kanur, m-4067; 5 ex., 12-2-1997, Pallethumulapalem, m-4014; 1 ex., 13-2-1997, Kaluamundi, m-4024; 1 ex., 17-2-1997, Eelachetladibba, m-4053; 1 ex., 18-2-1997, Edurumundi, m-4066; 7 ex., 18-2-1997, Nagayalanka, m-4074; 1 ex., 7-9-1997, Kanur, m-4100; 1 ex., 8-9-1997, Kanur, m-4173; 1 ex., 10-9-1997, Pallethumulapalem, m-4107; 1 ex.,

11-9-1997, Kammavaricheruvu, m-4129; 2 ex., 13-2-1998, Palakayatippa, m-4188; 2 ex., 15-2-1998, Lankavenithippa, m-4205; 1 ex., 18-2-1998, Yesupuram, 4213; 1 ex., 19-9-1998, Pallethumulapalem m-4264; 1 ex., 26-9-1998, Sangameswar, m-4304; 1 ex., 12-2-1999, Kanur, m-4425; 1 ex., 12-2-1999, Kanur, m-4441; 1 ex., 17-2-1999, Opp. Hamsaladiwi, m-4459; 1 ex., 19-2-1999, Light House area, m-4467; 3 ex., 20-2-1999, Palakayatippa, m-4485; 3 ex., 21-2-1999, Lankavenithippa, m-4480; 2 ex., 10-1-2000, Sorlagondi, m-4580; 1 ex., 11-1-2000, Gollalamoda, m-4601; 1 ex., 12-1-2000, Palakayatippa, m-4568.

Diagnostic character : Shell broadly elongate; Whorls sculptured with spiral ribs; body whorl without varix; Collumella twisted and channeled; Labial lip acutely curved.

Distribution : INDIA : Andhra Pradesh : Bhimilipatnam, Godavari Estuaries; Andaman and Nicobar Islands; Gujarat : Gulf of Kutch, Kandla Port, Salya beach, Murdeswar; Kerala : Cochin; Pondichery : Karaikal; Orissa : Chandipur, Mahanadi Estuary, Paradeep, Chilika lagoon, Gopalpur, Konark; West Bengal : Hugli-Matla Estuary.

Elsewhere : Myanmar; Indonesia; Malaya Peninsula; Madagaskar; North Australia; Philippines; Singapore; Sri Lanka.

Remarks : Commonly known as Horn shell, used in manufacture of lime. Extensively used as food in the Philippines (Talavera and Faustino : 1933). A common species found partly buried in the mud on mud flats, in small ditches or canals.

Family TURRITELLIDAE

Sub Family TURRITELLINAE

Genus *Turritella* Lamarck, 1799

13. *Turritella acutangula* (Linnaeus)

1758. *Turbo acutangulus* Linnaeus, Syst. Nat., ed. 10 : 776, sp. 599 (Type locality; not given).

1982. *Turritella acutangula* : Rajagopal and Mookherjee, Rec. zool. Surv. India, Occ. Pap. No., 28 : 15.

Material examined : 1 ex., 20-9-1998 Manginapudi, m-4319.

Measurement : L = 87, D = 28

Diagnostic characters : Shell large, elongate; whorls Keeled in middle, with strong spiral ridges, sutures more deep.

Distribution : INDIA : Andhra Pradesh : Godavari Estuary, Kakinada; Gujarat : Gulf of Kutch; Maharashtra : Bombay, Devgarh; Pondichery : Karaikal; Orissa : Chandipur, Chandrabhaga nr. Konark, Ganjam CoastMahanadi Estuary, Paradeep; Tamilnadu : Madras, Mandapam, Rameswaram, Point Calimere, Tranquebar.

Elsewhere : Myanmar : Maungamagon; Indonesia; Madagascar; Philippines; Sri Lanka.

Remarks : Commonly known as screw shell or turret shells. Generally occurs buried in the sandy bottom of marine littoral region.

14. *Turritella attenuata* Reeve

1869. *Turritella attenuata* Reeve, *Conch. Icon.*, 5, Turritella, sp. No. 4, pl. 1. fig. 4.

2003. *Turritella attenuata* : Subba Rao, *Rec. zool. Surv. India Occ. Paper No.*, 192 : 140, pl. 23, fig. 1.

Material examined : 1 ex., 17-9-1998, Kanur, m-4258.

Measurements : L = 44-64, D = 10-14.

Diagnostic characters : Shell elongate, attenuate; whorls strongly and singly keeled, with spirally raised striations. Upper part of whorls sloping where as curved and constricted at lower part.

Distribution : INDIA : Orissa; Tamil Nadu; West Bengal : Medinipur.

Elsewhere : Eastern Sea.

Remarks : Generally found in marine littoral region.

Super Family NATICOIDEA

Family NATICIDAE

Sub Family NATICINAE

Genus *Natica* Scopoli, 1777.

15. *Natica tigrina* (Roeding)

1798. *Cochlis tigrina* Roeding *Museum Boltenianum* : 147, sp. 1843 (Type locality : Not given)

1952. *Natica tigrina* : Satyamurti, *Bull. Madras Govt. mus. New. Ser.* 1 (2) pt. 6 : 108, pl. 8, fig. 2.

Material examined : 1 ex., 9-10-1996, Bhavanipuramam, m-3955; 1 ex., 15-9-1997, Lankavenithippa, m-4078; 3 ex., 15-9-1997, Lankavenithippa, m-4116; 1 ex., 15-2-1998, Lankavenithippa, m-4209; 2 ex., 23-9-1998, Sorlagondi, m-4315; 3 ex., 19-2-1999, Light House (North side), m-4365; 6 ex., 19-2-1999, Light House (North) m-4473; 1 ex., 22-2-1999, Lankavenithippa, m-4391; 1 ex., 10-1-2000, Light House (Opp. Eelachetladibba), m-4547; 1 ex., 10-1-2000, Sorlagondi, m-4586; 3 ex., 10-1-2000, Sorlagondi, m-4623; 3 ex., 11-1-2000, Jinkapalem, m-4558; 1 ex., 11-1-2000, Gollalamoda, m-4603; 1 ex., 20-12-2000, Nachugunta, m-4687.

Measurements : L = 23-31, D = 18-26.

Diagnostic characters : Shell globose, white or cream coloured with rows of chocolate brown spots, spire reduces and almost on the same level; Body whorl inflated and globular; Aperture semicircular; Umbilicus present and completed, filled by a callous; Columella not flattened; Collumellar callous very thick especially at its base.

Distribution : INDIA : Andhra Pradesh : Godavari Estuary; Andaman and Nicobar Island; Gujarat : Pirotan Island (Gulf of Kutch); Kerala : Cochin; Maharashtra : Bombay; Orissa : Mahanadi Estuary, Baleswar, Chandipur, Cuttack Coast; Tamil Nadu; West Bengal : Digah. Muriganga Estuary, Ganga Sagar in Sundarban, Medinipur, North and South 24 Parganas.

Elsewhere : Australia; China; Fiji; Pakistan; Phillipines; Japan; Persian Gulf; Sri Lanka; Malaysia : Penag; Myanmar : Akyab; Singapore; Hongkong; Indonesia : Java.

Remarks : Occurs in estuarine areas/sandy mud in shallow coastal areas.

Sub Family POLINICINAE

Genus *Polinices* Mont fort, 1810

Sub Genus *Glossaulax* Pilsbry, 1929

16. *Polinices (Glossaulax) didyma* (Roeding)

1798. *Albula didyma* Roeding *Museum Boltenianum* : 29, sp. 145 (refers chemnitz, 1781, pl. 186, figs. 1856.

1985. *Polinices (Glossaulax) didyma* : Mookherjee, *Rec. zool. Surv. India, Occ. Paper No.*, 75 : 54, pl. 9, fig. 37.

Material examined : 2 ex., 8-10-1996, Palleshumulapalem, m-3899; 3 ex., 13-2-1997, Kaluamundi, m-4027; 1 ex., 10-9-1997, Palleshumulapalem, m-4110; 1 ex., 23-9-1998, Sorlagondi, m-4317; 11 ex., 12-2-1999, Kanur, m-4434; 1 ex., 19-2-1999, Light House, m-4472; 1 ex., 4-1-2000, Kanur, m-4595; 6 ex., 5-1-2000, Kanur, m-4613; 1 ex., 10-1-2000, Sorlagondi, m-4588; 8 ex., 11-1-2000, Gollalamoda, m-4597.

Measurements : L = 15-25, W = 15-17

Diagnostic characters : Shell large, thick, globose, slightly laterally compressed; whorl rounded with oblique growth; aperture semioval; parietal callous dark brown with a deep groove.

Distribution : INDIA : Andhra Pradesh : Godavari Estuary; Gujarat : Pirotan Island in Gulf of Kutch; Maharashtra : Bombay; Orissa : Chandipur, Mahanandi Estuary nr. Paradeep, Puri; Tamil Nadu : Madras, Krusadai Island, Kundugal point; West Bengal : Digah, Medinipur, South 24 Parganas.

Elsewhere : Hawaii; Japan to Natal; Common in Fiji; Queensland; Australia to Indian Ocean.

Remarks : In young shells width is more than lengths. But in shell above 50 mm, length is more than width.

Sub Genus *Polinices* S. St.

17. *Polinices (Polinices) mammilla* (Linnaeus)

1758. *Natica mamilla*, Linnaeus, *Syst.Nat. Ed.* 10.

2003. *Polinices (Polinices) mammila* : Subba Rao, *Rec. zool. Surv. India, Occ. Paper No.*, **192** : 190, pl.38, fig. 3,4.

Material examined : 3 ex., 13-2-1997, Kaluamundi, m-4028; 1 ex., 20-9-1998, Sorlagondi, m-4317; 1 ex., 23-9-1998, Sorlagondi, m-4316; 12 ex., 12-2-1999, Kanur, m-4435; 1 ex., 12-2-1999, Kanur, m-4444; 1 ex., 19-2-1999, Light House, m-4366; 1 ex., 17-9-1998, Kanur, m-4257; 1 ex., 21-9-1998, Kammavaricheruvu, m-4260; 3 ex., 1 ex., 10-1-2000, Light House area, m-4587.

Measurements : L = 12-32, W = 11-22.

Diagnostic characters : Shell pyriformly ovate; Ivory white in colour; spire reduced; body whorl inflated; aperture semicircular; Umbelicus closed; Length more than breadth.

Distribution : INDIA : Andaman and Nicobar Islands; Goa; Kerala; Lakshadweep; Maharashtra; Orissa : Chandipur, Paradeep, Puri Coast; Tamil Nadu : Madras, Krusadai Island, Kundugal point, shingle Island, Rameswaram, Tuticorin, Tranquebar, Tiruchendur.

Elsewhere : Indo-West Pacific.

Remarks : Common in shallow waters.

Synonym : *Natica mamilla* (Linnaeus), *Polinices tumidus* (Swainson).

Super Family TONNOIDEA

Family TONNIDAE

Genus *Tonna* Bruennich, 1772

18. *Tonna dolium* (Linnaeus)

1758. *Buccinum dolium* Linnaeus, *Syst.Nat., ed.* 10 : 735 (Type locality : m. siculo).

2003. *Tonna dolium* : Subba Rao, *Rec. zool. Surv. India, Occ. Paper No.*, **192** : 194, pl. 41, fig.7.

Material examined : 1 ex., 18-10-1996, Nachugunta, m- 3843, 1 ex., 21-2-1997, Palakayatippa, m-4002; 1 ex., 7-9-1997, Kanur, m-4103; 2 ex., 25-9-1998, Lankavenithippa,

m-4237; 1 ex., 19-2-1999, Light House (Northern side), m-4363; 1 ex., 6-1-2000, Palleshumulapalem, m-4544; 2 ex., 7-1-2000, Palleshumulapalem, m-4576; 1 ex., 10-1-2000, Sorlagondi, m-4581; 1 ex., 10-12-2000, Gilakaladindi, m-4699.

Measurements : L = 65-83, D = 29-55.

Diagnostic characters : Shell ovately ventricose; body whorl globular; Spire conical, depressed; aperture wide; sculpture of broad, flat spiral ridges alternating with spiral threads; ridges maculated with brown spots on white back ground.

Distribution : Andhra Pradesh : Godavary Estuary; Andaman and Nicobars : Nicobar Islands; Maharashtra : Bombay; Orissa : Chandipur, Paradeep, Mahanadi Estuary; Tamil Nadu : Madras, Pamban, Krusadai and Shingle Islands : West Bengal : Medinipur, North and South 24 Parganas.

Elsewhere : Sri Lanka; China; Philippines; Fiji; New Zealand.

Remark : Commonly known as Tun shell; prefers deeper, waters; occasionally found washed into intertidal region or collected in fishing nets.

Family FICIDAE

Genus *Ficus* Roeding, 1798

19. *Ficus gracilis* (Sowerby)

1825. *Pyrula gracilis* Sowerby, *Cat. Tank.*, pl. 17.

2003. *Ficus gracilis* : Subba Rao, *Rec. zool. Surv. India, Occ. Paper No.*, **192** : 199, pl.42, fig.1-4.

Material examined : 1 ex., 11-9-1997, Kammavaricheruvu, m-4130; 1 ex., 11-1-2000, Gollalamoda, m-4604.

Measurements : L = 36, D = 21

Diagnosis : Shell pyriform; Length width ratio less than $\frac{1}{2}$, spire elevated; body whorl rounded; without spot; aperture elongate; crenulated outer lip margin, Collumella concave; sculptured with transverse flat ridges interstices with longitudinal striae. Thus appearing reticulated.

Distribution : INDIA : Andaman and Nicobar Islands; Orissa; West Bengal : South 24 Parganas.

Elsewhere : Persian Gulf; China; Madagascar; Secyelles; South Japan.

Remarks : Resemblance with *Ficus reticulata* in its sculpture but differs in having more elevated spire, elongate canal and slender body whorl with axial brown streaks.

Family BURSIDAE

Genus *Bursa* Roeding, 179820. *Bursa rana* (Linnaeus)1758. *Murex rana* Linnaeus, *Syst. Nat., ed. 10* : 748, sp. 452, (Type locality : O Asiatico)2003. *Bursa (Bufonaria) rana* : Subha Rao, *Rec. zool. Surv. India, Occ. Paper No.*, **192** : 213, pl. 48, fig. 8, 9.*Material examined* : 1 ex., 12-2-1999, Kanur, m-4447; 1 ex., 10-12-2000, Gilakaladindi, m-4700.*Measurements* : L = 60, D = 35.*Diagnostic characters* : Shell narrow; Outer lip region in the form of a wing; varices with spires; presence of spiral rows of spinose, tubercles; anterior canal broad.*Distribution* : INDIA : Orissa : Baleswar Bay, Chandipur, Cuttack coast, Puri Coast; Tamil nadu : Madras, Porto Novo, Pamban; West Bengal : Sand Heads nr. Hoogly mouth;*Elsewhere* : Persian Gulf; Indo-Pacific region.*Remarks* : This species has got similarities with *Bursa spinosa* but differ in having short spires and spire. Synonym : *Bursa elegans* Sowerby, 1838. (*B. elegans* is smaller, differ in sculpture, Nodules on the shoulder are large and shareer on the varices they are sindller. It's distribution restricted between Andaman and Borneo (Beu, 1986).21. *Bursa echinata* (Link)1807. *Gyrinus echinata* Link, *Mus. Rost. 3* : 1231843. *Ranella spinosa* Lamarck, *Hist. Nat. Anim. Sans, Vert.*, 9 (Deshayes ed) p. 545.1985. *Bursa spinosa* : Mookherjee, *Rec. zool. Surv. India, Occ. Paper No.*, **75** : 82, pl. 15. fig. 58.*Material examined* : 1 ex., 10-10-96, Kanur, m-3974; 1 ex., 26-9-1998, Sorlagondi, m-4306; 1 ex., 12-2-1999, Kanur, m-4446.*Measurement* : L = 31-64, D = 17-36mm*Diagnostic character* : Shell large with elevated spire; varices developed into strong spires at regular intervals with close set spiral ridges and spinose nodes; Spire directed backward; aperture creamy coloured and canaliculate on both sides; outer lip flesh brown coloured and with irregular denticulations.*Distribution* : INDIA : Andaman and Nicobar Island; Gujarat; Kerala; Maharashtra; Orissa : Mahanadi Estuary; Tamil Nadu.*Elsewhere* : Myanmar; Java; Philippines.*Remarks* : Found on rocky substratum near mesolittoral zone. Commonly known as spiny frog.

Order NEOGASTROPODA
Sub order MURICOIDEA
Family MURICIDAE
Sub Family MURICINAE
Genus *Murex* Linnaeus, 1758

22. *Murex tribulus* Linnaeus

1758. *Murex tribulus* Linnaeus, *Syst. Nat.* ed. 10 : 746, (Type locality : O. Asia)

1977. *Murex tribulus* : Ray, Contribution to the knowledge of the molluscan fauna of Maungmagan, Lower Burma : 46.

Material examined : 1 ex., 13-2-1997, Kammavaricheruvu, m-4050; 1 ex., 12-2-1999, Kanur, m-4445; 1 ex., 19-2-1999, Light House, m-4471; 1 ex., 10-1-2000, Sorlagondi, m-4583.

Measurement : L = 65-75, D = 23-27

Diagnostic characters : Shell club shaped; Spire acute with 6-7 whorls; Body whorl globose; Varices with long spire; Aperture large, outer lip erect with limited crenulations; Canal elongate and narrow.

Distribution : INDIA : Andhra Pradesh : Godavari Estuary; very common on both the coasts of India.

Elsewhere : Red sea to Philippines and Japan.

Remarks : Highly variable in colour and shows polymorphism. Found in the marine littoral region.

23. *Murex trapa* Roeding

1798. *Murex trapa* Roeding *Museum Boltexianum* : 145 (Type locality : Not given).

2003. *Murex trapa* : Subba rao, *Rec. zool. Surv. India, Occ. Paper No.*, 192 : 229, pl. 54, fig. 1, 2.

Material examined : 1 ex., 11-10-1996, Pedapatnam, m-3982; 1 ex., 13-2-1997, Kaluamundi, m-4029.

Measurement : L = 75, D = 26-27.

Diagnostic characters : This species has resemblance with *M. tribulus* but differ in having angular whorls and long labial tooth on outer margin.

Distribution : INDIA : Andhra Pradesh : Godavari Estuary; Andaman Islands; Orissa : Mahanadi Estuary; common to east-coast of India from sand heads in Hoogly mouth to Madras coast.

Remarks : Usually collected in fishermen's nets in shallow water.

Sub Family ERGALATAXINAE

Genus *Cronia* H. AND A. Adams, 185324. *Cronia subnodulosa* (Melvill)1893. *Ricinella (Sistrum) subnodulosa* Melvill Mem. Proc. Manchr. Lit. Phil. Soc., (4) 7 : 154, pl. 1, fig. 6.2003. *Cronia subnodulosa* : Subba Rao, Rec. zool. Surv. India, Occ. Paper No., 192 : 237, Pl. 56, fig. 7.*Material examined* : 1 ex., 13-2-1997, Chenta kaluamundi, M-4027.*Measurement* : L = 13, D = 8.*Diagnostic characters* : Shell small, Colour chocolate brown; spire with six whorls; aperture narrow and elongate; Outer lip thick with crenulated margin : presence of a single prominent row of nodules on spire whorls.*Distribution* : INDIA : Andaman Islands; Gujarat; Karnataka; Maharashtra.*Elsewhere* : Pakistan (Karachi); Myanmar.

Sub Family THAIDINAE

Genus *Thais* Roeding, 179825. *Thais lacera* (Born)1778. *Murex lacera* Born, Index Rerum natur. Musei. Caes. Vindob., 308.2003. *Thais lacera* : Subba Rao, Rec. zool. Surv. India, Occ. Paper No., 192 : 244, pl. 58, fig. 5.*Material examined*; 2 ex., 9-10-1996, Bhavanipuram, m-3959; 1 ex., 15-10-1996, Lankavenithppa, m-3863; 1 ex., 7-9-1997, Kanur, m-4102; 1 ex., 12-2-1999, Kanur, m-4448; 1 ex., 7-1-2000, Palleshumulapalem, m-4578.*Measurements* : L = 24-43, D = 16-22*Diagnostic character* : Whorls sharply angulate, carinate; body whorl with two rows of spinose tubercles; surface of shell with spiral ribs and grooves; aperture dentifulate inside on outer lip.*Distribution* : East and West Coast of India.*Elsewhere* : East-Africa to Japan.*Remarks* : Occurs in brackish and estuarine waters.*Synonym* : *Cymia lacera*, *Thais carinifera*, *Cymia carinifera*.

26. *Thais tissoti* (Petit)

1852. *Purpura tissoti* Petit, J. *Conch. Paris*, 3 : 163, pl.7, figs : 4a-b (Type locality : Bombay, India)

2003. *Thais tissoti* : Subba Rao, *Rec. zool. Surv. India, Occ. Paper No.*, **192** : 245, pl. 58, fig. 6.

Material examined : 1 ex., 12-2-1999, Kanur, m-4449; 2 ex., 5-1-2000, Kanur, m-4608; 2 ex., 6-1-2000, Palleshumulapalem, m-4543; 5 ex., 7-1-2000, Palleshumulapalem, m-4579; 2 ex., 11-1-2000, Gollalamoda, m-4599; 4 ex., 20-12-2000, Nachugunta, m-4691.

Measurement : L = 8-29, D = 8-18

Diagnostic character : Shell small in size and stout, colour white with brown nodules; tubercles present on entire surface.

Distribution : INDIA : Maharashtra : Konkan coast extending from Mumbai to Ratnagiri; Orissa : Mahanadi Estuary. Bay of Bengal and Arabian Sea.

Remarks : Common, usually found on rocky substratum (remain hidden under rocks).

Sub Family RAPANINAE

Genus *Rapana* Schumacher, 1817

27. *Rapana rapiformis* (Born)

1778. *Murex rapiformis* var. a Born, *Index rerum naturalium musei Caesarei vinodobonensis*, pl.1.

2003. *Rapana rapiformis* : Subba Rao, *Rec. zool. Surv. India. Occ. Paper No.*, **192** : 236, pl. 56, fig. 3.

Material examined : 1 ex., 4-1-2000, Kanur, m-4592.

Measurement : L = 63, D = 54.

Diagnostic character : Pyriform shell with 4 to 5 whorls and short spire; Outer lip denticulate; sculptured with three prominent rows of tubercles.

Distribution : INDIA : Andaman and Nicobar Islands; Gujarat; Orissa : Mahanandi Estuary; Pondichery; Tamil Nadu; West Bengal : Medinipur.

Family NASSARIIDAE

Sub Family NASSARINAE

Genus *Nassarius* Dumeril, 1806

Sub Genus *Hima* Gray, 1852

28. *Nassarius (Hima) stolatus* (Gmelin)

1791. *Buccinum stolatus* Gmelin, *Syst.Nat. ed.* 13 : 3496, Sp. No. 121 (type locality : Tranquebar).

2003. *Nassarius stolatus* : Subba Rao, *Rec. zool. Surv. India Occ. Paper No.*, **192** : 267, pl. 65, fig. 6, 7.

Material examined : 1 ex., 10-10-1996, Palleshumulapalem, m-3973; 2 ex., 12-10-1996, Palleshumulapalem, (Karwaka mangrove) m-3941; 1 ex., 15-10-1996, Lankavenithippa, m-3862; 2 ex., 15-9-1997, Lankavenithippa, m-4115; 1 ex., 18-9-1997, Edurumundi, m-4135; 1 ex., 18-2-1998, Yesupuram, m-4219; 1 ex., 12-2-1999, Kanur, m-4432; 2 ex., 19-2-1999, Light House, m-4470; 12 ex., 4-1-2000, Kanur, m-4593; 2 ex., 5-1-2000, Kanur, m-4612; 1 ex., 11-1-2000, Gollalamoda, m-4600; 2 ex., 11-12-2000, Kanur, m-4720.

Measurements : L = 7-22, D = 4-14.

Diagnostic characters : Shell small, Yellowish white in colour with three broad chestnut spiral bands, ovately conical in shape; Inflated body whorl; pointed spire, few spiral cords below suture.

Distribution : INDIA : Andhra Pradesh : Kakinada Bay, Godavari Estuary, Maharashtra : Bombay; Orissa : Chilika lagoon, Mahanadi Estuary (Hukitola); Tamil Nadu : Tranquebar, Pamban, Madras; West Bengal : Kolkotta, Sagar Island, Digha, Hugli Matla Estuary.

Elsewhere : Gulf of Aden; Persian gulf, Red Sea to Philippines and to Japan.

Remarks : Similarity with *N. jacksonianus*. Spiral ridges are more prominent in juvenile form.

Sub Genus *Plicarcularia* Thiele, 1929.

29. *Nassarius (Plicarcularia) pullus* (Linnaeus)

1758. *Buccinum pullus* Linnaeus, *Syst. Nat.* ed. 10 : 737, no. 396 (Type locality : Mediterranean Sea) = error (Asiatic Ocean Brugiere 1789).

2003. *Nassarius (Plicarcularia) pullus* : Subba Rao, *Rec. zool. Surv. India Occ. Paper No.*, 192 : 270, pl. 65, fig. 1,2.

Material examined : 1 ex., 9-9-1999, Palleshumulapalem, m-4168.

Measurement : L = 20, D = 11.

Diagnostic characters : Body whorl with hump in middle; parietal callus spread posteriorly; suture shallow.

Distribution : INDIA : Andaman Islands; Gujarat; Maharashtra : Ratnagiri, Bombay; Orissa : Chatrapur (Ganjam coast); Pondichery; Tamil Nadu : Krusadai Islands, Kundugal Point, Pamban, Shingle Island.

Elsewhere : Persian Gulf; Mauritius; Maldives; Sri Lanka; Myanmar : Mergui Archipelago.

Remarks : Earlier this species has been reported as *N. thersites*., *N. gracilis*.

Sub Genus *Zeuxis* H and A. Adams, 195330. *Nassarius (Zeuxis) foveolatus* (Reeve)

1847. *Buccinum foveolatum* Dunker, Zeit. F. Malakozool., 4 : 63, (Type locality : Orient India)

2003. *Nassarius (Zeuxis) foveolatus* : Subba Rao, Rec. zool. Surv. India, Occ. Paper No., 192 : 271, pl. 65, fig. 5.

Material examined : 3 ex., 12-10-1996, Palleshumulupalem (Karwaka mangrove), m-3940; 1 ex., 15-10-1996, Lankavenithippa, m- 3860; 1 ex., 17-9-1998, Kanur, m-4256.

Measurement : L = 15-22, D = 8-10

Diagnostic characters : Shell oblong; Colour yellowish brown, surface of the shell smooth but fine axial ribs restricted to spiral whorls only; suture channeled; inner lip less curved.

Distribution : INDIA : Andhra Pradesh : Godavari Estuary; Kerala : Khozicode; Maharashtra : Bombay; Orissa : Chilika Lagoon; Tamil Nadu : Madras; West Bengal : Hugli-Matla Estuary, Ganga Sagar.

Elsewhere : Myanmar : Chaduba, Akyab; Hong Kong : Malaysia : Penang; Mauritius; Sri Lanka.

Remarks : Generally found crawling on mud flat in Estuary.

Genus *Bullia* Gray in Griffith and Pidgeon, 183431. *Bullia vittata* (Linnaeus)

1767. *Buccinum vittatum*. Linnaeus, Syst. Nat. ed. 12 : 1206 No.483 (Type locality : ?)

1969. *Bullia vittata* : Nagabhushanam et al., Proc. Zool. Soc. Calcutta, 22(1) : 6.

Material examined : 2 ex., 13-2-1997, Kaluamundi, m-4030, 1ex (wet), 13-2-1997, Kaluamundi, m-4049.

Measurements : L = 14-41, D = 7-15.

Diagnostic characters : Shell turreted; Spire more elongated and longer than body whorl; Spiral ridges distinctly interrupted by spiral grooves; Body whorl without varices; Outer lip margin of aperture simple.

Distribution : INDIA : Andhra Pradesh : Visakhapatnam; Maharashtra : Bombay; Orissa : Mahanandi Estuary, Chilika lagoon, Puricoast (Konark), Cuttack coast; Ganjam coast (Chatrapur, Gopalpur); Tamilnadu : Madras.

Elsewhere : Tanzania : Zanzibar; Iran : makran coast; Mauritius; Sri Lanka; Philippines.

Remarks : Generally found on sandy coasts. By the help of its massive foot it quickly burrows into the sand. Resembles *Bullia livida* but differs in having spiral grooves through out the length of the whorl and beaded spiral cords below suture.

Family MELOGENIDAE

Genus *ugilina* Schumacher, 1817Sub Genus *Hemifusus*32. *Pugilina (Hemifusus) cochlidium* (Linnaeus)1758. *Murex cochlidium* Linnaeus, *Syst. Nat. ed.* 10 : 753, sp. 482. (Type locality : Not given).2003. *Pugilina (Hemifusus) cochlidium* : Subba Rao, *Rec. zool. Surv. India, Occ. Paper No.*, **192** : 274, pl. 66, fig. 3, 4.*Material examined*; 1 ex., 7-9-1997, Kanur, m- 4101; 1 ex., 12-2-1999, Kanur, m-4439; 1 ex., 19-2-1999, Light House, m-4364.*Measurements* : L = 40-88, D = 20-51*Diagnostic characters* : Shell large, redish brown in colour, pear shaped; Spire high; Whorl angulate; aperture narrow and elongate; presence of axial ribs on the spire whorls; presence of about eight compressed tubercles at the angular shoulder of the last two whorls.*Distribution* : INDIA : East and West Coast; Andhra Pradesh : Kakinada Bay, Godavari Estuary.*Elsewhere* : Indian ocean.*Remarks* : Generally found in the muddy areas and estuaries.

Family OLIVIDAE

Genus *Olivancillaria* d' Oribigny, 1839.33. *Olivancillaria gibbosa* (Born)1778. *Voluta gibbosa* Born. *Index rerum naturalium musei Caesanei Vindobonensis*, P. 202.2003. *Olivancillaria gibbosa* : Subba Rao, *Rec. zool. Surv. India, Occ. Paper No.*, **192** : 292, pl. 72, fi. 14.*Material examined* : 1 ex., 21-2-1997, Lankavenithippa, m-4484.*Measurements* : L = 43-63, W = 22-34.*Diagnostic characters* : Shell thick and ovate in shape; spire short; suture not canaliculated; columella callous; aperture narrow and elongated; highly polished surface.*Distribution* : INDIA : Andhra Pradesh : Visakhapatnam, Kakinada, Pulicat lake; Andaman and Nicobar Island; Gujarat : Gulf of Kutch; Maharashtra : Bombay; Orissa : Mahanadi Estuary, Chandipur, Cuttack Coast (Lion's Rumph, Paradeep), Puri coast, Chilika Lagoon, Ganjam coast (Chatrapur); Tamil Nadu : Madras, Pamban, Krusadai Island, Palk Bay.*Elsewhere* : East and West Africa; Sri Lanka; Myanmar : Akyab Maungmagan; Gulf of Thailand; Philippines.*Remarks* : It differ from other species by having gibbous shape towards upper par of body whorl and prominent colour zones at anterior part.

Super Family CONOIDEA

Family TURRIDAE

Sub Family TURRINAE

Genus *Turricula* Schumacher, 181734. *Turricula javana* (Linnaeus)

1767. *Murex javanus* Linnaeus, *Syst. Nat.*, 12ed. Sp. 550 : 1221 (Type locality : Not known)

2003. *Turricula javana* : Subba Rao, *Rec. zool. Surv. India, Occ. Paper No.*, 192 : 324, pl. 84, fig. 8, 9.

Material examined : 1 ex., 10-10-1996, Palleshumulapalem, m-3975.

Measurements : L = 30 mm, D = 12 mm.

Diagnostic characters : Shell large; brownish in colour; spire high; aperture broad; presence of two narrow spiral ridges below suture; whorls rounded in middle.

Distribution : INDIA : Andhra Pradesh : Visakhapatnam; Andaman and Nicobar Islands; Gujarat : Gulf of Kutch; Goa; Kerala; Maharashtra : Bombay, Devgarh; Orissa : Mahanadi Estuary, Chandipur, Cuttack Coast, Lion's Rumph, Puri coast, Chatrapur (Ganjam Coast); Tamil Nadu : Madras, Tranquebar; West Bengal : Sand heads.

Elsewhere : Tanzania : Dar es Salam; Persian Gulf; Pakistan : Karachi; Sri Lanka; Malacca; Penang; Thailand; China; Philippines. Ranges from South West India to Southern China (Powell, 1969).

Family TEREBRIDAE

Genus *Hastula* H and A. Adams35. *Hastula bacillum* (Deshayes)

1859. *Terebra bacillum* Deshayes, *Proc. Zool. Soc. Lond.*, 1859, 255 (Type locality : Iles Sandwich)

1990. *Hastula bacillum* : Subba Rao *et al.*, Molluscs (marine), *Fauna of Orissa, State Fauna Ser.*, 1(3) : pp. 89 and 90, pls. 12, fig. 5.

Material examined : 1 ex., 21-9-1998, Kammavaricheruvu, m-4261; 1 ex., 20-9-1998n Manginapudi, m-4320.

Measurements : L = 20-87; D = 4.

Diagnostic characters : Shell white in colour and glossy; spiral sculpture absent; siphonal canal with deep notch; tip of spire dark brown in colour; absence of keel at the base of columella.

Distribution : INDIA : Andhra Pradesh : Visakhapatnam, Bhimilipatnam; Orissa : Cuttack Coast, Puri Coast, Ganjam Coast (Gopalpur).

Elsewhere : Red sea : Annesley Bay; Sandwich Island.

Remarks : A sand burrowing form.

Sub Class OPISTHOBRANCHIA
Order CEPHALASPIDEA
Super Family PHILINOIDEA
Family HAMINEIDAE
Sub Family HAMINEINAE
Genus *Haminoea* (Leach) Gray, 1847.

36. *Haminoea crocata* (Reeve)

1860. *Bulla (Haminoea) crocata* Pease, *Proc. Zool. Soc. Lond.*, p. 19.

2003. *Haminoea crocata* : Subba Rao, *Rec. zool. Surv. India, Occ. Paper No.*, **192** : 354, pl. 94, fig. 2,3.

Material examined : 22 ex., 13-12-2000, Palleshummalapalem, m-4723.

Measurements : L = 7-13, W = 5-10

Diagnostic characters : Shell thin, fragile; oval shape; smooth surface; aperture oval towards lower part; Posterior end broad; Semi transparent and light blue in colour.

Distribution : INDIA : Orissa : Puri Coast; Chilika Lagoon (Satapada); TamilNadu : Madras; West Bengal : Ganga Sagar Island, South 24 Parganas, Hugli Matla Estuary.

Elsewhere : Sri Lanka; New South Wales; South Africa : Natal.

Remarks : Found on the muddy areas near estuaries most part of the shell is covered by foot and mantle during live condition.

Sub Class GYMNOMORPHA
Order SYSTELLOMMATOPHORA
Sub Order ONCHIDIDOIDEA
Family ONCHIDIIDAE
Genus *Onchidium* Buchanan, 1800

37. *Onchidium* sp.

Material examined : 1 ex., 18-12-2000, Gollalamoda, m-4692.

Measurements : L = 39, W = 25.

Description : Elongately oval in shape, thick and warty mantle, foot elongate and transversely wrinkled, dorsal surface with tubercles, Presence of vertical slit.

Sub class PULMONATA
Order BASOMMATOPHORA
Super Family ELLOBIOIDEA
Family ELLOBIIDAE
Genus *Ellobium* Roeding, 1798.

38. *Ellobium aurisjudae* (Linnaeus)

1758. *Bulla aurisjudae* Linnaeus, *Syst. Nat.* ed. 10 : 728.

2003. *Ellobium aurisjudae* : Subba Rao, *Rec. zool. Surv. India. Occ. Paper No.*, 192 : 370, pl. 95, fig. 5.

Material examined : 1 ex., 18-10-1996, Nachugunta, m- 3846; 9 ex., 19-9-1997, Nagayalanka, m- 4126; 1 ex., 19-9-1998, Palakayatippa, m- 4572; 1 ex., 19-2-1999, Light House area, m- 4474; 1 ex., 20-2-1999, Palakayatippa-4492; 1 ex., 10-1-2000, Sorlagondi, m- 4626; 3 ex., 14-12-2000, Pallethumulapalem, m- 4656; 1 ex., 12-12-2000, Kanur, m- 4712.

Measurements : L = 11-53, D = 7-24.

Diagnostic characters : Shell elongately ovate; Spire elongate; aperture narrow; columella with callous bearing three folds (central one large); no umbilicus; outer lip thickened on its lower part.

Distribution : INDIA : Andhra Pradesh : Godavari Estuary, Andaman and Nicobar Islands; Gujarat : Kandla; Maharashtra : Bombay; Orissa : Mahanadi Estuary, Chandipur, Kasafal; West Bengal : Hugli-Matla Estuary, Sagar Island, Port Canning.

Elsewhere : Myanmar : Irrawady Delta, Arakan; Malaysia : Penang; Singapore.

Remarks : Found in estuaries and mangroves. Un common and ranges westward from the Western Pacific (Cernohorsky, 1972).

39. *Ellobium gangeticum* (Pfeiffer)

1855. *Auricula gangetica* (BensonmSS) Pfeiffer *Malak Blatt.*, 2 : 7.

2003. *Ellobium gangeticum* : Subba Rao, *Rec. zool. Surv. India, Occ. Paper No.*, 192 : 170, pl.95, fig.6.

Material examined : 1 ex., 8-10-1996. Pallethumulapalem, m-3894; 10 ex., 12-10-1996, Pallethumulapalem (Karwaka), m-3942; 7 ex., 15-10-1996, Lankavenithippa, m- 3859; 1 ex., 16-10-1996, Eelachetladibba, m- 3930; 1 ex., 17-10-1996, Gollalamoda, m- 3876; 1 ex., 21-2-1997, Palakayathippa, m-4004; 10 ex., 10-9-1997, Pallethumulapalem, m- 4104; 1 ex., 24-9-1998, Sorlagondi, m- 4272; 2 ex., 25-9-1998, Lankavenithippa, m- 4239; 3 ex., 20-2-1999, Palakayatippa, m- 4493; 2 ex., 22-2-1999, Lankavenithippa, m- 4390; 5 ex., 12-1-2000, Palakayatippa, m- 4573; 1 ex., 13-12-2000, Pallethumulapalem, m-4729.

Measurements : L = 9-26, D = 6-11.

Diagnostic characters : Shell fusiformly ovate; thin; spire short; whorls tumid; columella with two folds.

Distribution : INDIA : Godavari Estuary; Maharashtra : Bombay; Orissa : False Point (Paradeep)Mahanadi Estuary; Tamilnadu : Vellar Estuary; West Bengal : Sunderbands, Hugli-Matla Estuary.

Elsewhere : Myanmar : Irrawady Delta; Sri Lanka.

Remarks : Shell smaller than *E. aurisjudae* (upto 30mm in height). Generally inhabit salt marshes and Estuary crawling on damp mud banks and among roots of the mangrove trees.

40. *Ellobium* sp.

Material examined : 1 ex., 8-10-1996, Pallethumulapalem, m-3895; 8 ex., 9-10-1996, Bhavanipuram, m-3956; 2 ex., 15-10-1996, Lankavenithippa, m- 3864; 4 ex., 9-9-1997, m-4169.

Measurements : L = 15-25, D = 7-14.

Descriptions : Shell oblong oval; outer lip thickened; whorls not compressed; columella folded.

Genus *Cassidula* Gray

41. *Cassidula nucleus* Martyn

1791. *Auricula nucleus* Martyn, Index Moll. Mus. Ch. Fred., (1) : 52.

2003. *Cassidula nucleus* : Subba Rao, Rec. zool. Surv. India, Occ. Paper No., 192 : 370, pl. 95, fig. 1.

Material examined : 4 ex., 8-10-1996, Pallethumulapalem, m-3898; 1 ex., 12-10-1996, Pallethumulapalem (Karwaka), m-3944; 1 ex., 10-9-1997, Pallethumulapalem, m-4109; 1 ex., 11-9-1997, Bhavanipuram, m- 4131; 2 ex., 25-9-1998, Lankavenithippa, m- 4236; 1 ex., 12-2-1999, Kanur, m- 4433; 1 ex., 13-12-2000, Pallethumulapalem, m-4728.

Measurements : L = 11-28, D = 7-17.

Diagnostic characters : Shell small, thick and ovate in shape; short spire; Convex body whorl and angular at the shoulder; aperture narrow and longer than the spire; Outer lip thick; presence of denticulation (up to three); Columella with a callous shield.

Distribution : INDIA : Maharashtra; Tamil Nadu : Pichavaram mangroves; West Bengal : North and South 24 Parganas, Hugli- Matla Estuary.

Elsewhere : Myanmar.

Genus *Pythia* Roeding, 179842. *Pythia plicata* (Gray)

1825. *Scarabus plicatus* (Ferussac) Gray, *Ann. Phil.*, 25 : 415.

2003. *Pythia plicata* : subba Rao, *Rec. zool. Surv. India, Occ. Paper No.*, **192** : 371, pl. 95, fig.7.

Material examined : 4 ex., 8-10-1996, Palleshumulapalem, m-3893; 8 ex., 9-10-1996, Bhavanipuram, m-3949; 18 ex., 15-10-1996, Lankavenithippa, m- 3861; 5 ex., 16-10-1996, Eelachetladibba, m- 3921; 10 ex., 17-10-1996, Gollalamoda, m- 3868; 1 ex., 17-10-1996, Edurumundi, m- 3821; 1 ex., 18-10-1996, Nachukunta, m- 3845; 1 ex., 10-2-1997, Gilakaladindi, m-4019; 2 ex., 9-9-1997, Palleshumulapalem, m-4167; 1 ex., 15-9-1997, Lankavenithippa, m- 4114; 8 ex., 19-9-1997, Nagayalanka, m- 4121; 7 ex., 15-9-1998, Palakayatippa, m-4193; 5 ex., 25-9-1998, Lankavenithippa, m- 4235; 1 ex., 15-2-1999, Palleshumulapalem, m-4358; 1 ex., 17-2-1999, Opp. Hamsaldivi, m- 4458; 4 ex., 20-2-1999, Palakayatippa, m-4489; 5 ex., 22-2-1999, Lankavenithippa, m- 4388; 1 ex., 6-1-2000, Palleshumulapalem, m-4541; 1 ex., 10-1-2000, Sorlagondi, m- 4624; 11 ex., 12-1-2000, Palakayatippa., m- 4569; 1 ex., 13-12-2000, Palleshumulapalem, m-4726.

Measurements : L = 10-24, D = 8-25

Diagnostic characters : Shell small, ovate, compressed; spire acute; whorls compressed with varix on either side; outer lip thin and dentate internally (six teeth); columella plicated; sculptured with longitudinal growth striae; light purple in colour with a white band along the outer lip.

Distribution : INDIA : Andhra Pradesh : Godavari Estuary; Orissa : False Point (Paradeep)Mahanadi Estuary; Pondichery; Tamil Nadu : Madras, Portonovo; West Bengal : Hugli-Matla Estuary, Port Canning, Sunderban.

Elsewhere Srilanka; Myanmar; Borneo; Java; Siam; Hongkong.

Remarks : Generally occur in moist places near shed in woods; on land found under stones, dead leaves and holes in rotten tree trunks; after shower they are seen crawling actively in the night.

Sub Family MELAMPINAE

Genus *Melampus* Mont fort, 181043. *Melampus pulchella* (Petit)

1842. *Auricula pulchella* Petit, *Proc. Zool. Soc. Lond.*, p. 202.

1857. *Melampus pulchella* : Pfeiffer, *Catalogue Auriculidae*, British mus.(nat. Hist.),p. 25.

2003. *Melampus pulchella* : Subba Rao, *Rec. zool. Surv. India, Occ. Paper No.*, **192** : 371, pl. 95, fig. 4.

Material examined : 3 ex., 18-10-1996, Nachugunta, m-3850.

Measurement : L = 10-13, D = 6-8.

Diagnostic characters : Shell very small (upto 8mm in height); Light brown in colour, ovately fusiform; whorls six to seven; outer lip denticulate.

Distribution : INDIA : Orissa : Mahanadi Estuary; Pondichery; Tamil Nadu : Pitchavaram mangroves; West Bengal : Hugli Matla Estuary, North and South 24 parganas.

Elsewhere : Sri Lanka; Myanmar; Borneo; Java; Philippines; Hongkong.

44. *Melampus* sp.

Material examined : 62 ex., 8-10-1996, Palleshumulapalem, m-3896; 3 ex., 9-10-1996, Palleshumulapalem (Karwaka), m-3950; 17 ex., 12-10-1996, Palleshumulapalem (Karwaka), m- 3943; 53 ex., 15-10-1996, Lankavenithippa, m- 3865; 8 ex., 16-10-1996, Eelachetladibba, m- 3929; 5 ex., 17-10-1996, Edurumundi, m- 3822; 3 ex., 18-10-1996, Nachugunta, m- 3850; 1 ex., 11-9-1997, Kammavaricheruvu, m- 4128; 4 ex., 19-9-1997, Nagayalanka, m- 4125; 1 ex., 13-2-1998, Palakayatippa, m-4194; 1 ex., 18-2-1998, Yesupuram, m-4220; 9 ex., 24-9-1998, Sorlagondi, m- 4273; 10 ex., 25-9-1998, Lankavenithippa, m- 4238; 5 ex., 15-2-1999, Light House Area, m- 4361; 6 ex., 20-2-1999, Palakayatippa, m- 4496; 4 ex., 22-2-1999, Palleshumulapalem, m-4389; 5 ex., 6-1-2000, Palleshumulapalem, m-4542; 2 ex., 11-1-2000, Gollalamoda, m- 4605.

Measurements : L = 6-14, D-4-9.

Descriptions : Shell ovate; spire depressed; Columella and outer lip dentate internally; whorl not compressed.

Class CEPHALOPODA

Sub class NAUTILOIDEA

Order NAUTILIDA

Family NAUTILIDAE

Genus *Nautilus* Linnaeus, 1758

45. *Nautilus pompilius* (Linnaeus)

1758. *Nautilus pompilius* Linnaeus. *Syst. Nat.*, 10 : 709.

1968. *Nautilus pompilius* : Silas. *Proc. Symp. Moll.*, pt. 1, (3), p. 293.

Material examined : 1 ex., 10-9-1997, Palleshumulapalem, m-4087.

Measurements : D = 120 mm.

Diagnostic characters : Shell present externally and large in size; roundish in shape; light saffron in colour.

Distribution : INDIA : Andaman Islands.

Elsewhere : Indian Ocean, Western and Central Pacific.

Sub class COLEOIDEA

Order SEPIIDA

Family SEPIIDAE

Genus *Sepiella* Gray, 1849

46. *Sepiella inermis* (Ferussac and d' Orbigny)

1848. *Sepiella inermis* d' Orbigny, *Hist. Nat. Gen. Part. Paris*, P. 286, pl. 20, figs. 1-9.

1987. *Sepiella innermis* : Jothinayagam, *Tech. Mon. Gr Zool. Surv. India*, **19** : 29, fig.10.

Material examined : 1 ex., 15-2-1999, Palleshumulapalem, m-4437; 1 ex., 7-1-2000, Palleshumulapalem, m-4615; 4 ex., 11-1-2000, Sorlagondi, m- 4618; 1 ex., 24-1-2000, Kanur, m- 4620; 2 ex., 11-12-2000, Kanur, m- 4683; 2 ex., 12-12-2000, Palleshumulapalem, m-4757.

Measurements : Mantle length = 33-75.

Diagnostic characters : Dorsal side of mantle dark in colour but ventral side pale white; body oblong, width 2/3 of length; arms short and eight in number; tentacular suckers minute and irregular; Cuttle bone flat, laminate, without any rostrum on its lower part, small, narrowly ovate in shape.

Distribution : INDIA : Andhra Pradesh : Godavari Estuary; Andaman Islands; Kerala : Cannanore, Cochin, Tellicherry; Lakshadweep; Maharashtra : Bombay; Orissa : Baleswar Bay, Off Paradeep, Puri Coast, Chilika Lagoon; Mahanadi Estuary, Gopalpur; Pondichery; Tamilnadu : Madras, Palk Bay, Pamban, Rameswaram and Kundugal Point; West Bengal : Hugli Matla Estuary Medinipur, North and South 24 Parganas.

Elsewhere : Red Sea; Malaya Archipelago; Indonesia; Vietnam; China Sea.

Remarks : Commonly occur in off shore.

Order TEUTHIDA

Sub order MYOPSIDA

Family LOLIGINIDAE

Genus *Loliolopsis* Berry, 1929

47. *Loliolopsis* sp.

Material examined : 1 ex., 12-12-2000, Kanur m- 4685.

Measurement : Mantle length = 25 mm.

Descriptions : Body elongate; Arms eight in number; Tentacles not retracile; fin large.

Order OCTOPODA
Sub order INCIRRATA
Family OCTOPODIDAE
Sub Family OCTOPODINAE
Genus *Octopus* Lamarck, 1798

48. *Octopus* sp.

Material examined : 3 ex., 19-2-1999, Light House area, m- 4436; 2 ex., 7-1-2000, Palleshumulapalem, m-4616.

Measurement : Mantle length = 26-35 mm.

Description : Ten arms; Eight oral and two tentacular; suckers stalked with horny rings.

Class BIVALVIA
Order ARCOIDA
Super Family ARCACEA
Family ARCIDAE
Genus *Arca* Linnacus, 1758
Sub Genus *Arca* S. Str.

49. *Arca (Arca) ventricosa* Lamarck

1819. *Arca ventricosa* Lamarck, *Hist. Nat. Anim Sans. Vert.*, 6(1) : 38

2000. *Arca (Arca) ventricosa* : Subba Rao and Dey, *Rec. zool. Surv. India, Occ. Paper No.*, 187 : 202

Material examined : 1 valve, 17-2-1997, Eelachetladibba, m-4033.

Measurements : L = 17, Ht = 11

Diagnostic characters : Shell radiately ribbed; hinge Straight; teeth arranged in straight line; muscle scar without myophoric ridge.

Distribution : INDIA : Andaman and Nicobar Islands.

Elsewhere : Indo-Pacific.

Genus *Trisidos* Roeding, 1798
50. *Trisidos tortuosa* (Linnaeus)

1758. *Arca tortuosa* Linnaeus, *Syst.Nat.*, 10 : 693

2000. *Trisidos tortuosa* : Subba Rao and Dey, *Rec. zool. Surv. India, Occ. Paper No.*, 187 : 204.

Material examined : 1 valve, 17-10-1996, Gollalamoda, m-3918

Measurement : L = 20, Ht = 20

Diagnostic characters : Shell thin and twisted; white; Hinge straight and elongated; Posterior margin broad and squarely truncated; Valve with angular and oblique Keel; Presence of radiating and concentric growth ridges.

Distribution : INDIA : Andhra Pradesh : Estuary; Gujarat : Okha; Tamil Nadu : Krusadai, Pambam.

Remarks : Generally found on sandy bottom or coral sand in meosolittoral zone.

Subfamily ANADARINAE

Genus *Anadara* Gray, 1847

51. *Anadara granosa* (Linnaeus)

1758. *Arca granosa* Linnaeus, *Syst. Nat.* ed. 10 : 594 (Type locality : 'O' Europemardionalis).

1992. *Anadara granosa* : Subba Rao, *et al.*, *State Fauna Series*, 1 : *Fauna of Orissa* (Part-3) : 102.

Material examined : 9 valves, 8-10-1996, Pallethumulapalem, m-3961; 1 valve, 9-10-1996, Kamavericheruvu, m-3985; 1 valve, 10-10-1996, Kanur, m-3994; 1 valve, 11-10-1996, Pedapatnam, m-3993; 2 valves, 15-10-1996, Lankavenithippa, m-3880; 16-10-1996, Eelachetladibba, m-3815; 1 valve, 17-10-1996, Gollalamoda, m-3909; 2 ex., 18-10-1996, Nachukunta, m-3906; 1 valve, 10-2-97, Gilakaladindi, m-4040; 1 valve, 14-2-1997, Kamavericheruvu m-4047; 4 valves, 16-2-1997, Yesupuram, m-4020; 3 valves, 17-2-1997, Eelachetladibba, m-4031; 1 ex., 17-2-1997, Eelachetladibba, m-4070; 2 valve, 18-2-1997, Edurumundi, m-4013 : 1 valve, 9-9-1997, Pallethumulapalem, m-4089; 3 Valve, 10-9-1997, Pallethumulapalem, m-4140; 1 Valve, 11-9-1997, Kamavericheruvu, m-4095; 8 valve, 15-9-1997, Lankavenithippa, m-4155; 1 ex., 17-9-1997, Light House Area m-4176; 4 valve, 18-9-1997, Edurumundi, m-4149; 1 valve 19-9-1997, Palakayatippa, m-4138; 2 valves, 19-9-1997, Eelachetladibba, m-4142; 1 valve, 19-9-1997, Palakayatippa, m-4138; 2 valves, 15-2-1998, Lankavenithippa, m-4210; 4 valve 18-9-1998, Pallethumulapalem, m-4245; 3 valve, 19-9-1998, Pallethumulapalem, m-4290; 3 ex., 24-9-1998, Sorlagondi, m-4297; 2 valves, 25-9-1998, Lankavenithippa, m-4281; 1 ex., 26-9-1998, Sangameswar, m-4275; 11 valves, 12-10-1998, Pallethumulapalem m-3823; 1 valve, 12-2-1999, Kanur, m-4418; 2 valves, 15-2-1999, Pallethumulapalem, m-4382; 3 ex., 21-2-1999, Lankavenithippa, m-4393; 1 valve, 10-1-2000, Sorlagondi, m-4510; 2 valves, 10-1-2000, Sorlagondi, m-4520; 1 valve, 13-12-2000, Pallethumulapalem, m-4703; 4 valves, 14-12-2000, Pallethumulapalem, m-4620.

Measurement : L = 12-84, Ht = 9-68

Diagnostic characters : Shell thick, equivalved, Sculptured with regular ribs. ventral margin crenulated; Keel on posterior part absent.

Distribution : INDIA : Andhra Pradesh : Godavari Estuary, Kakinada; Gujarat; Kerala; matabar Coast; Maharashtra : Bombay; Orissa : Chandipur Mahanadi Estuary, Chilika lagoon, Puri Coast; Tamil Nadu : Ennur Back Waters, Tranquebar; West Bengal : Hugli Matla estuary, Medinipur, North and South 24 Paraganas.

Elsewhere : Indo Pacific.

Remarks : Common name : Ask Shell. Generally found buried in soft mud in Estuary and back waters. Commercially cultured as its soft parts are edible. Shell is used in lime industry.

52. *Anadara rhombea* (Born)

1780. *Arca rhombea* Born, Test. Mus. Caesaeri Vindobnonsis, 90.

1991. *Anadara rhombea* : Subba Rao, et al., *State Fauna Series*, 1 : *Fauna of Orissa* (Part-3) : 103.

Material examined : 17 Valves, 8-10-191996, Pallethumulapalem, m-3962; 2 Valves, 15-10-1996, Lankavenithippa, m-3884; 4 Valevs, 17-10-1996, Gollalamoda, m-3910; 5Valves, 21-2-1997, Palakayatippa, m-4179; 1 ex., 13-2-1998, Palakayatippa, m-4179; 1 Valve, 19-9-1998, Pallethumulapalem, m-4291; 2 ex., 20-9-1998 Manganapudi, m-4252; 3 Valves 21-9-1998, Kamavericheruvu, m-4225; 9 Valve, 12-2-1999; Kanur, m-4420; 1 Valve, 15-2-1999, Pallethumulapalem, m-4383, 3 Valves 19-2-1999, Light house m-4349, 1 Valve, 20-2-1999, Palakayatippa, m-4372, 4 ex., 21-2-1999, Lankavenithippa, m-4392; 2 Valves, 4-1-2000, Kanur, m-4536; 1 Valve, 6-1-2000, Pallethumulapalem m-4498; 1 ex., 11-1-2000, Gollalamoda, m-4524; 2 ex., 11-1-2000, Gollalamoda, m-4551; 8 ex., 12-1-2000, Palakayatippa, m-4498; 1 Valve, 11-12-2000, Kanur, m-4666; 1 Valve, 13-12-2000, Pallethumulapalem, m-4702; 1 Valve, 14-12-2000, Pallethumulapalem, m-4661; 1 Valves, 21-12-2000, Puligadda, m-4682.

Measurement : L = 9-47, Ht = 9-47

Diagnostic characters : Shell rhomboidal in shape; ligament area broad; prominent keel at posterior part; ribs on posterior slope not nodulose.

Distribution : INDIA : Andhra Pradesh : Godavari Estuary; Andaman and Nicobal Islands; Gujarat : Gulf of Kutch; Maharashtra : Ranagiri, Bombay; Orissa : Mahanadi Estuary, Chandipur, Hukitola, Puri Coast (Konark), Gopalpur; Tamil Nadu : Coromandal CoastMadrass, Tranquebar.

Elsewhere : China Sea; Indonesia : Salong, Sumatra, Java, Philippines, Pakistan : Karachi : Sri Lanka.

Remarks : The species can be distinguished from *A. Granosa* in having more no. of ribs which are nodulose except for posterior slope and in having angulate Postero-Ventral margin.

Genus *Scapharca* Gray, 184753. *Scapharca deyrollei* (Joussaeume)

1893. *Scapharca deyrollei* Joussaecume, *Le Naturaliste*, 15 lanne, P-191.

1992. *Scapharca deyrollei* : Subba Rao, *et al.*, *State Fauna Series*, 1 : *Fauna of Orissa* (Part-3) : 104.

Material examined : 1 Valve, 8-10-1996, Pallethumulapalem, m-3963; 1 Valve, 17-10-1996, 1 Valve, 15-10 1996, Lankavenithippa, m-3882; 1 Valve, 17-10-1996, Gollalamoda, m-3911; 1 Valve, 18-10-1996, Nachukunta, m-3903; 5 Valves, 12-2-1999, Kanur, m-4421; 1 Valve, 17-12-2000, Puligadda, m-4698.

Measurement : L = 18-44, Ht = 11-37

Diagnostic character : Elongated inequivalves; umbo low; cardinal area narrow; dorsal surface of valve angulated and radiately ribbed (ribs 33 to 35 nos.).

Distribution : INDIA : Andhra Pradesh : Godavari Estuary; Orissa : Mahanadi Estuary, Chandipur, Puri Coast, Chatrapur; Maharashtra : Bombay, Alibag, Ratnagiri; Tamil Nadu : Madras, Coromandal Coast; West Bengal : Sand Heads, Medinipur.

Elsewhere : Sri Lanka; Myanmar : Tavoy; Malaysia : Penang; Indonesia : Sumatra, Java and China sea.

Remarks : Can be differentiated from *Scapharca inaequivalvis* by its elongate shell and oblique keel.

54. *Scapharca inaequivalvis* (Bruguiere)

1789. *Arca inaequivalvis* Brugiere, *Ency. Meth. Vers.* 1, 106, pl. 305, fig. 3c (Type locality : unknown).

1992. *Scapharea inaequivalvis* : Subba Rao, *et al.*, *State Fauna Series*, 3 : *Fauna of West Bengal* (Part-9) : 219, Pl. 15, figs. 6 and 7.

Material examined : 1 Valve, 15-10-1996, Lankavenithippa, m-3880; 1 Valve, 13-2-1998, Palakayatippa, m-4180; 4 Valves, 21-2-1999, Lankavenithippa, m-4397; 1 Valve, 24-9-1998, Sorlagondi, m-4300; 1 Valve, 19-12-2000, Sorlagondi, m-4643.

Measurement : L = 19-36, Ht = 15-32

Diagnostic characters : Shell rhomboidal/elongately ovate, inequivalve; umbo elevated; cardinal area not so narrow; side angulated at the dorsal margin; shell surface sculptured with flat radial ribs and more than thirty, in number.

Distribution : INDIA : Andhra Pradesh : Godavari Estuary; Goa; Gujrat : Pirotan Island in Gulf of Kutch; Kerala : Cochin; Maharashtra : Bombay; Orissa : Mahanadi Estuary, False Point, Konark Coast, Ganjam Coast; Tamil Nadu : Madras, Krusdai, Kundugal Point, Tranquebar, West Bengal : Medinipur, South 24 Parganas.

Elsewhere : Myanmar : Mergui-Archipelago; China; Indonesia; Japan; Philippines; Persian Gulf.

Remark : Widely distributed in the Indo-Pacific region.

Family NOETIIDAE

Genus *Striarca* Conand, 1862,

55. *Striarca lactea* (Linnaeus)

1858. *Arca lactea* Linnaeus, *Syst.Nat.* ed. 10, p.649, No. 143.

1992. *Striaca lactea* : Subba Rao, *et al.*, *State Fauna Series, 3 : Fauna of West Bengal (Part-9)* : 219, Pl. 15, figs. 8 and 9.

Material examined : 28 Valves, 12-10-1996, Pallethumulapalem, m-3834; 1 Valve, 17-10-1996, Golalamatar, m-3912; 1 Valve, 12-2-1999, Kanur, m-4426; 5 Valves, 14-2-1999, Kanur, m-4377; 5 Valves, 15-2-1999, Pallethumulapalem, m-4385; 1 Valve, 11-1-2000, Sorlagondi, m-4528; 5 Valves, 14-12-2000, Pallethumulapalem, m-4665.

Measurement : L = 13-25 Ht = 9-20

Diagnostic Character : Squarely oval shaped Shell with striae; anterior side obtusely rounded where as posterior is angularly rounded; sides are angulated at the dorsal region.

Distribution : INDIA : Orissa : Mahanadi Eastuary, Chilika Lagoon, False Point, Puri Coast, Cuttack Coast; Tamil Nadu : Ennur Back Waters; Maharashtra : Bombay; Gujrat; Lakshadweep; West Bengal : Hugli Matla Estuary, North and South 24 Paraganas.

Elsewhere : Mediteranean; Suez; Red Sea; Pakistan : Arakan; Singapore; Myanmar; Philippines; Common in Europe and East Atlantic Ocean and S. Africa.

Remarks : Occurs on mud covered rocks and oyster beds.

Order MYTILOIDA

Super Family MYTILACEA

Family MYTILIDAE

Sub Family MYTILINAE

Genus *Perna* Philipsson, 1788

56. *Perna viridis* (Linnaeus)

1758. *Mytilus viridis* Linnaeus *Syst. Nat.* ed. 10 : 706, sp. no. 220

1980. *Perna viridis* : Kuriakose, *Bull. Cent. Mar. Fish. Res. Inst.* No 19 : 3.

Material examined : 1 Valve, 14-2-1999, Kanur, m-4380; 1 Valve, 21-9-1998, Bhavanipuram, m-4223.

Measurement : L = 6 Ht = 12

Diagnostic characters : Shell elongately triangular; Umbo situated on the anterior end; Posterior end pointed; Periostracum greenish black.

Distribution : INDIA : Andhra pradesh : Visakhapatnam, Bhimilipatnam, Kakinada; Gujarat : Gulf of Kutch; Goa; Kerala : Cochin, Allepy; Maharashtra : Malvan, Ratnagiri, Bombay; Orissa : Mahanadi Estuary, Chandipur, Chilika Lagoon (manikapatna), Chatrapur, Goppalpur, Sunupur; Pondichery; Tamil Nadu : Madras, Pamban, Porto Novo West Bengal-Medinipur.

Elsewhere : From Hong Kong to Arabian sea.

Remarks : Commonly known as green mussel, occurs in clusters.

Sub Family MODIOLINAE

Genus *Modiolus* Lamarck, 1799

57. *Modiolus striatulus* (Hanley)

1844. *Modiola striatula* Hanley, *Proc. Zool. Soc. Lond.* 1844. pt. 7 : 14 : (Type locality : Batangas, Philippines)

1992. *Modiolus striatula* : Subba Rao, *et al.*, *State Fauna Series*, 3 : *Fauna of West Bengal* (Part-9) : 221, Pl. 16, figs. 2 and 4.

Material examined : 6 ex., 17-2-1999, opposite side of Hamsaldivi, m-4464.

Measurement : L = 6 Ht = 12

Diagnostic characters : Shell modioliform; surface with radial striations which are wider and more distinct on the anterior margin.

Distribution : INDIA : Andaman and Nicobar islands; Kerala : Cochin; Maharashtra : Bombay; Orissa : False Point Mahanadi Estuary, Chilika Lagoon (Barkul, Barkuda, Breakfast Island, Satapada, Baranikuda, Kalijaimanikapatna); Tamil Nadu : Ennur back waters. nr. Madras; West Bengal : Port Canning, Hugli Matla Estuary, Kiderpore Docks, Kolkata, Howrha, North and South 24 Parganas.

Elsewhere : Sri Lanka; Myanmar; Singapore; Gulf of Thailand; Philippines; China and Japan.

Remarks : Usually found attached to rocks, stones, wooden jetties in submerged waters and on algal mass on stone. It creates nuisance in water works. Common and highly variable species, differs from *M. undulatus* in having strongly elevated upper margins, posterior dorsal margin more declines and narrowed posterior end.

Super Family PTERIACEA

Family ANOMIIDAE

Genus *Anomia* Linnaeus, 175858. *Anomia achaeus* (Gray)

1849. *Anomia achaeus* Gray, *Proc. Zool. Soc. Lond*; 116.

1992. *Anomia achaeus* : Subba Rao, *et al.*, *State Fauna Series, 3 : Fauna of West Bengal (Part-9)* : 223, Pl. 17, figs. 4 and 5.

Material examined : 1 Valve, 21-2-1997, Palakayatippa, m-4008; 5 Valves, 13-2-1998, Palakayatippa, m-4183; 1 Valve, 21-9-1998, Bhavanipuram, m-4224; 8 Valves, 21-2-1999, Lankavenithippa, m-4406; 1 Valve, 11-2-2000, Kanur, m-4571.

Measurements : L = 28-49 Ht-22-45

Diagnostic characters : Shell irregular in shape, broadly ovate, golden yellow in colour, small (not exceeding 40mm in length); Upper valve more inflated; lower valve with hole, through which byssus thread passes.

Distribution : Andhra Pradesh : Godavari Estuary; West Bengal, North and South 24 Parganas.

Elsewhere : Bangladesh; Myanmar; Singapore; Philippines.

Remarks : Some times Shells found attached to oysters and trunk of mangrove plants.

59. *Anomia* Sp.

Material examined : 1 Valve, 17-10-1998, Gollalamodi, m-3917; 1 ex., 17-9-1998, Kanur, m-4323; 1 Valve, 20-9-1998; Mangalpudi, m-4254.

Measurements : L = 20-22; Ht = 12-19

Genus *Placuna* Light foot, 1786

60. *Placuna placenta* (Linnaeus)

1758. *Anomia Placenta* Linnaeus, *Syst. Nat.*, ed. 10, P. 703

1992. *Placuna (Placuna) Placenta* : Subba Rao, *et al.*, *State Fauna Series, 3 : Fauna of West Bengal (Part-9)* : 223, Pl. 17, figs. 1 and 3.

Material examined : 1 ex., 21-2-1999, Lankavenithippa, m-4401; 2 ex., 10-1-2000, Sorlagondi, m-4506; 1 ex., 19-12-2000, Sorlagondi, m-4639.

Measurement : L = 71-117; Ht = 63-111

Diagnostic characters : Shell compressed, orbicular, large, translucent, fragile and glossy; upper valve slightly inflated; lower valve flat; presence of prominent growth lines and radial

striae on outer surface; Umbo small and inconspicuous; presence of two ridge like cardinal teeth.

Distribution : INDIA : Andhra Pradesh : Godavari Estuary; Backwaters of Kakinada; Andaman and Nicobar Islands; Gujarat : marshy Area of Gulf of Kutch; Orissa : Mahanadi Estuary; Chilika lagoon; Tamil Nadu : Ennur Estuary; West Bengal : Hugli Matla Estuary; North and South 24 Parganas.

Elsewhere : Gulf of Aden; Malaya; China; Borneo; Philippines.

Remarks : Common in Indo-Pacific, Under this genus single species has been reported from India.

Super Family OSTRACEA

Family OSTREIDAE

Genus *Crassostrea* Sacco, 1897

61. *Crassostrea cuttackensis* (Newton and Smith)

1912. *Ostrea Gryphoides* var. *cuttackensis* Newton and Smith, *Rec. zool. Surv. India*, 42 (1) : 13 pls. 7, 8, figs. A. B.

1992. *Crassostrea cuttackensis* : Subba Rao, *et al.*, *State Fauna Series*, 3 : *Fauna of West Bengal* (Part-9) : 224.

Material examined : 6 Valves, 16-9-1998, Kanur, m- 4280 and m-4278; 4 Valves, 14-2-1999, Kanur, m-4375 and m-4376; 10 Valve, 17-2-1999, Opp Hamsaldivi, m-4343 and m-4341; 5 Valves 15-2-1999, Pallethumulapalem, M-4381; 3 Valves, 6-1-2000, Pallethumulapalem, m-4500 and m-4502; 1 Valve, 7-1-2000, Pallethumulapalem, m-4565; 2 Valves, 10-1 2000, Opp. Eelachetladibba, m-4507; 1 valve, 11-1 2000, Gollalamoda, m-4525; 1 Valve, 14-12-2000, Pallethumulapalem, m-4658.

Measurements : L = 21-62; Ht = 28-139

Diagnostic characters : Shell thick, heavy, externally scaly and of variable shapes; inner surface of the valve procellanous and whitish.

Distribution : INDIA : Andhra Pradesh : Godavari Estuary, Chittivalsa nr, Visakhapatnam, Gokulapalli; Gujarat : Gulf of Kutch; Kerala : Vembanad Lake, Cochin, Khozikode; Karnataka : Karwar; Maharashtra : Bombay; Orissa : Mahanadi Estuary, Chandipur, Kasaphal, Hukitola, Chilika Lagoon (Manikpatna), Ganjam Coast (Chatrapur, Gopalpur); Tamil Nadu : Ennur Backwater, Pulicate Lake, Krusadai, Single Island; West Bengal : Hugli Matla Estuary, Sunderbans, North 24 Parganas.

Elsewhere : Bangladesh; Myanmar : Mergui Archipelago; Malaysia : Penang; Singapore; Indonesia : Sumatra, Borneo; Vietnam; Philippines; Hong Kong.

Remarks : Under different environmental conditions the shape, size and impression of muscle scars of valve change and create problem during identification. Occur in most of the estuaries and back water along the east coast. Along the West Coast this species is found in more number in southern region only (Kerala). Extensive beds are found in the Mahanadi Estuary in Orissa, Gokulapalli in A.P and Vembanad Lake in Kerala.

Genus *Saccostrea* Dollfus and Dautzenberg, 1920

62. *Saccostrea cucullata* (Born)

1778. *Ostrea cucullata* Born, Index Rerum Naturalium musei Caesarei Vinod bonensis : 100.

1992. *Saccostrea cucullata* : Subba Rao, *et al.*, *State Fauna Series*, 3 : *Fauna of West Bengal* (Part-9) : 225, Pl. 19. fig. 1.

Material examined : 1 Valve, 14-2-1998, Eelachetladibba m-4185; 1 Valve, 16-9-1998, Kanur m-4279; 4 Valves 17-2-1999, Opp. Hamsldivi, m-4342; 1 Valve, 6-1-2000, Palleshumulapalem, m-4501; 2 Valve, 13-12-2000, Palleshumulapalem, m-4705; 1 Valve, 14-12-2000, Palleshumulapalem, m-4659.

Measurements : L = 20-47 Ht = 25-59.

Diagnostic characters : Shell small (Length not exceeding 50mm); lower valve with crenulate margin; rows of tubercles present on either side of the umbonal groove.

Distribution : INDIA : Andhra Pradesh : Godavari Estuary, Bhimlipatnam, Visakhapatnam; Andaman and Nicobar Island; Gujarat : Gulf of Kutch; Kerala : Malabar Coast; Maharashtra : Bombay; Orissa : Chandipur, Paradeep, Gopalpur; Tamil Nadu : Madras, Krusadai Island, Shingle Island, Pamban; West Bengal : Hugli Matla Estuary, Port Canning.

Elsewhere : Widely Distributed in Indo Pacific area.

Remarks : Grows in clusters on rocks and coral reefs. Usually marine in habitat but also seen on backwaters. Species is highly variable.

Subclass HETERODONTA

Order VENEROIDA

Super Family CARDIACEA

Family CARDIIDAE

Genus *Acanthocardia* Gray, 1851

63. *Acanthocardia coronata* (Schroeter)

1786. *Cardium coronatum* Schroeter, *Einl. Conchill.*, 3 : 53 sp. 4, pl fig. 13.

1991. *Acanthocardia coronata* : Subba Rao, *et al.*, *State Fauna Series*, 1 : *Fauna of Orissa* (Part-3) : 122.

Material examined : 1 Valve, 13-2-1997, Chentakaluamundi, m-4041; 1 Valve, 17-9-1998, Kanur, m-4325; 1 Valve, 20-9-1998 Manganapudi, m-4250.

Measurements : L = 18-23 Ht = 17-24

Diagnostic characters : Shell thin, Pale cream coloured, rounded (height is almost equal to length); Valves more inflated; Umbonal area ribbed.

Distribution : INDIA : Andhra pradesh : Godavari Estuary, Visakhapatnam; Andamans and Nicobar Islands; Gujarat : Gulf of Kutch; Maharashtra : Deogarh, Bombay; Orissa : Mahanadi Estuary, Chandipur, Paradeep, Konark; Tamil Nadu : Madras, Kundugal Point, Krusadai, Palk Bay, Mandapam.

Elsewhere : Myanmar : Arakan Coast, Maungamagan; Indonesia : Sumatra; Persian Gulf.

Remarks : Grows to fairly large size. Extensively collected by fishermen from knee deep mud on the Bombay coast.

Genus *Trachycardium* Moersch, 1853

64. *Trachycardium asiaticum* (Bruguier)

1792. *Cardium asiaticum* Bruguier, *Encly. Meth. Vers*, 1, P, 224, no. 19. pl. 293, fig. 2.

1992. *Trachycardium asiaticum* : Subba Rao, *et al.*, *State Fauna Series*, 3 : *Fauna of West Bengal* (Part-9) : 227, Pl. 19, figs.4 and 5.

Material examined : 1 Valve, 12-2-1999, Kanur, m-4419.

Measurements : L = 15 Ht = 15

Diagnostic characters : Shell globose, Pale cream coloured; Umbonal region smooth but lamelliferous towards the posterior margin; presence of radial ribs.

Distribution : INDIA : Tamil Nadu; West Bengal : South 24 Parganas.

Remarks : According to Ray (1977) this species reported from India as *Cardium asiaticum* (Bruguier) should be under the species *Acanthocardia coronata* (Schroeter)

Super Family MACTRACEA

Family MACTRIDAE

Genus *Mactra* Linnaeus, 1767

65. *Mactra cuneata* (Gmelin)

1791. *Mactra cuneata* Gmelin, *Syst. Nat.* ed. 13 : 3260 sp. (Type locality : Not given)

1991. *Mactra cuneata* : Subba Rao *et al.*, *State Fauna Series*, 1 : *Fauna of Orissa* (Part-3) : 125.

Material examined : 7 Valves, 12-10-1996, Pallethumulapalem, m-3837.

Measurements : L = 17-27; Ht = 13-20

Diagnostic characters : Shell triangularly wedge shaped, compressed; anterior margin broadly rounded; posterior margin angulate; prominent keel running postero ventral; cardinal teeth more than one and in the left valve; hinge with inverted "V" shaped.

Distribution : INDIA : Andhra Pradesh : Visakhapatnam, Godavari Estuary; Gujarat : Veraval; Nicobar Islands; Orissa : Mahanadi Estuary, Puri, Cuttack and Gopalpur Coast; Tamil Nadu : Madras, Pamban, Krusadai, Kundugal Point, Tranquebar.

Remarks : Usually found in sandy mud in shallow water.

66. *Mactra luzonica* Dunker

1854. *Mactra luzonica* Deshayes, *Proc. Zool. Soc. Lond.*, **64** : sp. 12 (Type locality : Luzon, Philippines).

1992. *Mactra luzonica* : Subba Rao, *et al.*, *State Fauna Series*, **3** : *Fauna of West Bengal* (Part-9) : 228, Pl. 19, figs. 7 and 8.

Material examined : 1 Valve, 15-9-1997, Lankavenithippa, m- 4158.

Measurement : L = 36; Ht = 27

Diagnostic characters : Shell transversely triangular, equilateral straw coloured; Interior white with deep violet in umbonal region; ligament separated by lamellae.

Distribution : INDIA : Andhra Pradesh : Visakhapatnam, Godavari Estuary; Andaman Islands; Goa; Maharashtra : Bombay; Orissa : Mahanadi Estuary, Chandipur, Puri Beach, Gopalpur; Tamil Nadu : Madras, Gulf of Mannar; West Bengal : Hugli Matla Estuary, Medinipur, South 24 Parganas, Digha, Sagar Island.

Elsewhere : Australia : Queensland; Myanmar : Botany Bay; Philippines; Sri Lanka; Japan.

Remarks : Widely distributed in tropical and Subtropical waters; Usually occur in sandy mud in shallow water.

67. *Mactra symmetrica* Deshayes

1853. *Mactra symmetrica* Deshayes, *Proc. Zool. Soc. Lond.*, pt. 21 : 17 (Type locality : New Caledonia).

1991. *Mactra symmetrica* : Subba Rao, *et al.*, *State Fauna Series*, **1** : *Fauna of Orissa* (Part-3) : 127, Pl. 22, figs. 1 and 2.

Material examined : 2 Valves, 19-2-1999, Light House (North side), m- 4348.

Measurement : L = 26-41; Ht = 19-29

Diagnostic characters : Shell tringulate; Valve slightly compressed; Pallial sinus deep; Interior white; Umbonal tip white; Shell surface including dorsal margin on either side of umbo smooth; outer surface without bands.

Distribution : INDIA : Orissa : Puri Coast (Chandrabhaga).

Elsewhere : Red Sea; Sri Lanka; Myanmar : Maungamagan.

Remarks : This species appear almost similar to *M. luzonica* but differs from it in the absence of concentric grooves on its anterior part and absence of violet colouration.

Sub Genus *Mactrinula* Gray, 1953

68. *Mactra (Mactrinula) plicataria* (Linnaeus)

1767. *Mactra plicataria* Linnaeus, Syst. Nat., ed. 12 : 1125.

1992. *Mactra (Mactrinula) plicataria* : Subba Rao, et al., State Fauna Series, 3 : Fauna of West Bengal (Part-9) : 229, Pl.20, figs. 7 and 8.

Material examined : 1 Valve, 17-9-1998, Kanur, m-4326; 4 Valves, 12-2-1999, Kanur, m- 4414.

Measurements : L = 25-39; Ht = 21-29

Diagnostic characters : Triangular Shell, white in colour, transparent; presence of widely separated concentric placations throughout the shell surface; Posterior slope with a ridge; umbo small and elevated; anterior side rounded and posterior side angulated.

Distributions : INDIA : Andaman and Nicobar Islands; Goa; Maharashtra : Bombay, Colva Beach; Orissa : Chandipur; Tamil Nadu : Madras, Appaiah Bay; West Bengal : Medinipur, South 24 Parganas, Digha.

Elsewhere : Myanmar : Arakan; Indonesia; Sumatra.

Remarks : Rare in Bombay, common at Madras (Subrahamnyam et al., 1949)

Subgenus *Coelomactra* Dall, 1895

69. *Mactra (Coelomactra) turgida* Gmelin

1791. *Mactra turgida* Gmelin, Syst.Nat., ed. 13 : 3260 (Type locality : Tranquebriae)

1992. *Mactra (Coelomactra) turgida* : Subba Rao, et al., State Fauna Series, 3 : Fauna of West Bengal (Part-9) : 229, Pl. 20. figs 2 and 4.

Material examined : 2 Valve, 13-2-1997, Chenta Kaluamundi, m-4042; 2 Valves, 15-9-1997, Lankavenithippa, m- 4157; 1 Valve, 21-9-1998, Bhavanipuram, m- 4222.

Measurements : L = 36-68; Ht = 30-53

Diagnostic characters : Shell ovately triangular in shape, large and stout, smooth, white with pinkish violet colouration at the umbonal region; elevated umbo; presence of fine concentric striae with more prominent in the umbonal region.

Distribution : INDIA : Orissa : Mahanadi Estuary, Chandbali, Cuttack Coast, Puri Coast (Konark); Tamil Nadu : Madras, Pamban, Kudnugal Point; West Bengal : Medinipur, North 24 Parganas, Sagar Island.

Elsewhere : Sri Lanka; Myanmar : Arkan, St. Thomas island; West Indies; Indian Ocean (Abbott and Dance, 1982)

Remarks : Found in sandy mud in shallow water.

70. *Mactra (Coelomactra) violacea* Gmelin

1791. *Mactra violacea* Gmelin, *Syst. Nat.*, ed. 13 : 3260 (Type locality : Tranquebariae : refers Chemnitz).

1992. *Mactra (Coelomactra) violacea* : Subba Rao, *et al.*, *State Fauna Series*, 3 : *Fauna of West Bengal* (Part-9) : 229, Pl. 20, fig. 1 and 3.

Material examined : 2 Valves, 13-2-1997, Chentakalumundi, m-4042; 2 Valves, 15-9 1997, Lankavenithippa, m- 4157; 1 Valve, 21-9-1998, m- 4407; 4 Valves 12-2-1999, Kanur, 4416; 1 Valve, 10-1-2000, Sorlagondi, m- 4511; 1 Valve, 19-12-2000, Sorlagondi, m-4647.

Measurement : L = 40-66; Ht = 30-50

Diagnostic characteristic : Shell inequilateral, large deep violet in colour; valves thin; umbo prominent, and less inflated; broad and rounded anterior and posterior margin; presence of fine striae and growth lines.

Distribution : INDIA : Andaman Islands; Orissa : Mahanadi Estuary, Chandipur, Chandbali; Tamil Nadu : Kundugal Point, Pamban, Cormandal Coast; West Bengal : Medinipur, South 24 Parganas.

Elsewhere : Indian Ocean to Philipines (Abbott and Dance 1982).

Remarks : Generally found in fine muddy sands in the intertidal region. It closely resembles *M. turgida* but differs in having low umbo, more transversely ovate and thinner shell and violet colouration.

Super Family SOLENACEA

Family SOLENIDAE

Genus *Solen* Linnaeus, 1758

71. *Solen brevis* Gray

1842-56. *Solen brevis* Gray, in *Hunley's Recent Bivalves*, p.12. pl. 13, fi. 42.

1992. *Solen brevis* : Subba Rao, *et al.*, *State Fauna Series*, 3 : *Fauna of West Bengal* (Part-9) : 230, Pl. 21, figs. 1 and 2.

Material examined : 1 ex., 10-1-2000, Light House, M-4633, 4 valves, 19-12-2000, Sorlagondi, M-4693.

Measurements : L = 27 W = 5

Diagnostic character : Shell straight; posteior end flattened and tapering; anterior margin broad and truncated but posterior margin narrow; presence of prominent growth lines.

Distribution : INDIA : Orissa; Tamil Nadu; West Bengal : Hugli Matla Estuary, Medinipur, North and South 24 Parganas.

72. *Solen gravelyi* Ghosh

1920. *Solen gravelyi* Ghosh, *Rec. Indian Mus.*, **19** : 54, pl. 2, figs. 6-9 (Type locality : Chandipur, Balasore, Orissa)

1991. *Solen gravelyi* : Subba Rao, *et al.*, *State Fauna Series*, **1** : *Fauna of Orissa* (Part-3) : 130.

Material examined : 6 ex., 16-9-1998, Kanur, m-4335; 4 ex., 19-9 1987, Palakayatippa, m- 4336; 2 ex., 11-1-2000, Jinkapalem, m-4632,

Measurements : L = 19-36; Ht. = 3-7

Diagnostic characters : Shell narrow, thin with deep groove behind anterior margin; no marking on outer surface; anterior margin oblique truncate while posterior margin is rounded.

Distribution : INDIA : Orissa : Chandipur (Baleswar Coast).

Remarks : It resemble to the Genus *Neosolen* in having deep groove behind anterior margin, but differ from it being more elongate and having elongate anterior abductor muscle. It resembles *Solen kempi* in shape but differ in having thin and fragile shell and by presence of groove behind anterior margin.

73. *Solen kempi* Preston

1915. *Solen kempi* Preston, *Rec. Indian Mus.*, **11** : 305, fig. 18 (Type locality : S.E. Patsahanipur, Chilika Lake)

1991. *Solen kempi* : Subba Rao, *et al.*, *State Fauna Series*, **1** : *Fauna of Orissa* (Part-3) : 130, Pl. 23, figs. 5 and 6.

Material examined : 5ex. 14-2-1999, Kanur, m- 4457.

Measurements : L = 7-21; Ht = 2-5

Diagnostic characters : Shell narrow; without groove behind anterior margin; posterior part slightly narrower than anterior; dorsal margin at posterior part angular.

Distribution : INDIA : Orissa : Mahanadi Estuary, Chandipur, Kasaphal, Chilika Lagoon (Satapada and Patsahanipur); Tamil Nadu : Madras; West Bengal; Sagar Island.

Remarks : Animal had distinct greenish tinge instead of colourless in the fresh specimens collected from the sand nr. mouth of lake Chilika (Annandals and Kemp, 1916), Siphons resemble those of *S. fonesi* (Ghosh, 1920).

74. *Solen truncatus* (Wood)

1815. *Solen truncatus* Wood, *General Conchology* : Pl. 26, figs. 3 and 4 (Type locality : America and Indian Seas)

1991. *Solen truncatus* : Subba Rao, *et al.*, *State Fauna Series*, 1 : *Fauna of Orissa* (Part-3) : 130.

Material examined : 3 valves, 19-12-2000, Sorlagondi, M-4648.

Measurements : L = 9-14; Ht = 41-78

Diagnostic characters : Shell broad, thick; truncated anterior and posterior margins; outer surface with pinkish marking with oblique demarcation from anterodorsal to postero-ventral region.

Distribution : INDIA : Maharashtra : Bombay; Gujarat; Orissa : Chandipur, Kasaphal; Tamil Nadu : Madras.

Elsewhere : Pakistan : Gwadar; Sri Lanka.

Remarks : Usually found in muddy sand inside deep burrows; foot club shaped, elongate with a thickened anterior part which help the animal in making deep burrows.

Family CULTTELLIDAE

Genus *Neosolen* Ghosh, 1920.

75. *Neosolen aquaedulcioris* Ghosh

1916. *Solen fonesi* : Annandale and Kemp. *Mem. Indian Mus.*, 5 : 354, text fig. 5, pl. fig. 7 (Type locality : Off Samal Island, Chilika Lake)

1991. *Neosolen aquaedulcioris* : Subba Rao, *et al.*, *State Fauna Series*, 1 : *Fauna of Orissa* (Part-3) : 131, pl. 23, figs. 7 and 8.

Material examined : 2 ex., 20-12-2000, Nachugunta, M-4701.

Measurements : L = 26-34; Ht = 6-8

Diagnostic characters : Shell small (not exceeding 30 mm in length), thin, transparent; truncated anterior margin; Hinge with single long tooth.

Distribution : INDIA : Andhra Pradesh : Godavari Estuary; Kerala : Cochin Back Waters; Orissa : Chilika Lagoon off Samal Island (Syntype), Chilika Lagoon (off Balugaon, Off Barkuda, Rambha Bay); Tamil Nadu : Ennur Back Waters; West Bengal : Hugli Matla Estuary

Remarks : Body in considerably abbreviated anteroposteriorly in comparison with that of the species of *Solen*.

Genus *Pharella* Gray, 185476. *Pharella javanicus* (Lamarck)

1818. *Solen javanicus* Lamarck, *Hist. Nat. Anim. Sans. Vert.*, 5 : 454

1992. *Pharella javanicus* : Subba Rao, et al., *State Fauna Series*, 3 : *Fauna of West Bengal* (Part-9) : 231, Pl. 21, figs. 6 and 7.

Material examined : 2 valves, 12-10-1996, Palleshumalapalem, M-3825; 3 valves, 15-2-1999, Palleshumalapalem, M-4386; 2 valves, 21-2-1999, Lankavenithippa, M-4405; 1 valve, 10-1-2000, M-4523.

Measurements : Ht = 11-15; L = 44-60

Diagnostic characters : Shell subcylindrical, large (exceeding 30mm in length), thick, covered by periostracum; both posterior and anterior ends rounded; absence of deep furrow on anterior margin; hinge with more than one tooth; posterior side oblique, broad and curved.

Distribution : INDIA : Orissa : Baleswar Coast, Talaseri; West Bengal : Hugli Matla Estuary, Port Canning, Digha, Medinipur, North and South 24 Parganas.

Elsewhere : Malaysia : Penang; Singapore; Indonesia : Java; Philippines : Cebu.

Remarks : Generally found in upper mud flats where the substratum is hard; burrowing forms and can be recognised by their slit-shaped holes.

Genus *Siliqua* Megerle Von Muehfeld, 181177. *Siliqua radiata* (Linnaeus)

1758. *Solen radiata* Linnaeus, *Syst. Nat.*, ed. 10, p. 673, no. 28.

1992. *Siliqua radiata* : Subba Rao, et al., *State Fauna Series*, 3 : *Fauna of West Bengal* (Part-9) : 232, Pl. 21, figs. 8 and 9.

Material examined : 1 ex., 12-2-1999, Kanur, M-4422.

Measurements : L = 34 Ht = 16

Diagnostic characters : Shell oblong with four radiating bands; dorsal margin straight; rounded ventral and dorsal margin; Presence of internal ridge towards interior part; Pallial sinus wide and deep.

Distribution : INDIA : Andhra Pradesh : Visakhapatnam, Kakinada; Goa; Gujarat : Gulf of Kutch; Kerala : malabar Coast; Maharashtra : Bombay; Orissa : Chandipur, Cuttack Coast, Puri Coast (Konark)mouth Area of Chilika Lagoon (Satpada); Tamil Nadu : Madras, Pamban, Tiruchendur, Tranquebar.

Elsewhere : South Africa : Durban; Sri Lanka; Myanmar; Indonesia : Sumatra, Java, Celebes Moluccas; Common in shallow muddy area in the Indian Ocean (Abbott and Dance, 1982).

Remarks : Commonly known as 'Sunset' Shells. Generally dead shells are found washed on muddy shores. Report of live shells made by Raj Gopal and Mukherjee from Tiruchendur (Tamil Nadu coast).

Super Family TELLINACEA

Family TELLINIDAE

Genus *Tellina* Linnaeus, 1754

Sub Genus *Angulus* Megerle Von Muchlfeld, 1811

78. *Tellina (Angulus) philippinarum* (Hanley)

1844. *Tellina philippinarum*, Hanley, *Proc. Zool. Soc. London* pt., 12 : 69.

1899. *Tellina (Angulus) Philippinarum* Melvill and Standen., *J. Linn. Soc. London, Zool.*, 27 : 201, No. 438, *Summary of Phil. mar. and Fresh. Moll. Manila*, p. 88.

Material examined : 13 ex., 12-10-1996, Pallethumulapalem, M-3838; 3 ex., 15-9-1997, Lankavenithippa, M-4152; 2 ex., 18-9-1997, Edurumundi, M-4150; 1 ex., 19-9-1997, Eelachetladibba, M-4144; 4 valves, 19-2-1999, Light House (North), M-4352; 3 ex., 4-1-2000, Kanur, M-4531; 1 ex., 11-1-2000, Gollalamoda, M-4527; 1 valve, 14-12-2000, Pallethumulapalem, M-4664.

Measurements : L = 16-43; Ht = 12-27

Diagnostic characters : Shell large, valve does not fit into other; Lateral teeth present at least in one of the valves; Sculptured with striae; Palial sinus large.

Distribution : INDIA : Andhra Pradesh : Godavari Estuary; Andaman Islands.

Elsewhere : Akyab; Torres; Strait and Philippines (Cebu, Luzon, Negros, Manila) : Maungmagan, Philippine Islands, St. Nicholas, Island of Zebu and Jimmamailan and Island of Negros.

Sub Family MACOMINAE

Genus *Macoma* Leach, 1819

Sub Genus *Psammacoma* Dall, 1900

79. *Macoma (Psammacoma) birmanica* (Philippi)

1949. *Tellina birmanica* Philippi, *Abbil. Beschr.*, 3 : 27, 55 no.1 (Type locality : mergui Archipelago).

1991. *Macoma (Psammacoma) birmanica* : Subba Rao, *et al.*, *State Fauna Series*, 1 : *Fauna of Orissa* (Part-3) : 137.

Material examined : 18 valves, 12-10-1996, Pallethumulapalem, M-3829; 1 valve, 15-10-1996, Lankavenithippa, M-3881; 2 valves, 10-2-1997, Gilakaladindi, M-4039; 2 valves, 21.2.1997, Palakayatippa, M-4007; 1 valve, 9-9-1997, Pallethumulapalem, M-4091; 1 valve, 11-9-1997, Kammavaricheruvu, M-4093; 2 valves, 18-9-1998, Pallethumulapalem, M-4247; 2 valves, 19-9-1998, Pallethumulapalem, M-4294; 1 valve, 20-9-1998 Manganapudi, M-4253; 2 valves, 12-2-1999, Kanur, M-4413; 4 valves, 19-2-1999, Light House (North side), M-4351; 5 ex., 21-2-1999, Lankavenithippa, M-4400; 1 ex., 1-1-2000, Gollalamoda, M-4413; 9 valves, 14-12-2000, Pallethumulapalem, M-4663.

Measurements : Ht = 19-72; L = 16-78

Diagnostic characters : Shell elongately oval; inequivalve; pallial sinus large occupying entire shell and reaching anterior scar; hinge with only cardinal teeth; Presence of growth lines and concentric striae.

Distribution : INDIA : Andhra Pradesh : Godavari Estuary, Kakinada Bay; Orissa : Mahanadi Estuary, Baleswar Coast, Talasari; West Bengal : Digha, Chemaguri nr. Sagar Island, Port Canning, Hugli Matla Estuary.

Elsewhere : Myanmar.

Remarks : Occurs burried in the loose muddy substratum at depths twice that of Shell length (some times remain in deeper burrows). Siphons are long and golden yellow in colour in live condition.

80. *Macoma (Psammacoma) truncata* (Jonas)

1844. *Tellina truncata* Jonas, *Philippi, Abbil. Beschr.*, 1(3), Pl. 1, Fig. 2 (Type locality : manial).

1992. *Macoma (Psammacoma) truncata* : Subba Rao, *et al.*, *State Fauna Series*, 3 : *Fauna of West Bengal* (Part-9) : 236, Pl. 22, figs. 2 and 4.

Material examined : 1 valve 21-2-1997, Palakayatippa, m-4013; 2 ex., 18-9-1997, Edurumundi, m-4151; 1 ex., 19-9-1997, Eelachetladibba, m-4143; 1 valve, 19-9-1998, Pallethumulapalem, m-4295; 3 ex., 4-1-2000, Kanur, m-4534; 1 valve, 11-1-2000, Gollalamoda, m-4526.

Measurements : L = 21-46; Ht = 15-34

Diagnostic characters : Shell ovately trigonal; Umbo situated towards anterior part; Pallial sinus confluent and occupies half of the length.

Distribution : INDIA : Andaman and Nicobar Island; Goa; Gujarat : Khandla Port; Maharashtra : Bombay; Orissa : Mahanadi Estuary, Cuttack Coast, Puri Coast, Chilika Lagoon (Kalupadaghat); Pondichery : Karaikal; Tamil Nadu; West Bengal : Medinipur.

Elsewhere : Red Sea; Persian Gulf; Pakistan : Karachi; Indonesia; Philippines.

Family DONACIDAE

Genus *Donax* Linnaeus, 1758Sub Genus *Hecuba* Schumacher, 181781. *Donax (Hecuba) scortum* (Linnaeus)1758. *Venus scortum* : Linnaeus, *Syst. Nat.*, ed. 10, p 686, No. 103 (Type Locality : American).1992. *Donax (Hecuba) scortum* : Subba Rao, *et al.*, *State Fauna Series*, 3 : *Fauna of West Bengal* (Part-9) : 236, Pl. 23, figs. 3 and 5.*Material examined* : 1 valve, 12-10-1996, Palleshumulapalem, M-3827; 1 valve, 16-10-1996, Eelachetladibba, M-3816; 1 valve, 18-10-1996, Nachugunta, M-3901.*Measurements* : L = 30; Ht = 20*Diagnostic characters* : Shell thick, dirty white in colour; sculptured with concentric and radial ribs; prominent keel extends from umbo to postero-ventral margin.*Distribution* : INDIA : Andhra Pradesh : Visakhapatnam, Godavari Estuary; Goa; Gujarat : Gulf of Kutch; Karnataka; Kerala : malabar Coast; Maharashtra : Bombay; Orissa : Mahanadi Estuary, Chandipur, Puri Coast, Ganjam Coast; Pondichery; Tamilnadu : Madras, Krusadai Island, Shingle Island, Kundugal Point; West Bengal : Medinipur, Digha.*Elsewhere* : South Africa; Persian Gulf; Pakistan; Sri Lanka; Myanmar; Indonesia; China.*Remarks* : Commonly known as “wedge clam”, burrows in sandy and muddy substratum in shallow water.Sub Genus *Latona* Schumacher, 181782. *Donax (Latona) faba* Schroeter1788. *Donax faba* : Schroeter, *Conch. Cab. Nomen Reg.*, : 30 (Refers Chemnitz 1782, Pl. 26, figs. 266, 267).1986. *Donax (Latona) faba* : Subba Rao and Dey, *Rec. zool. Surv. India, Occ. Paper No.*, 91 : 14, fig. 7, 32, 33.*Material examined* : 2 valves, 19-2-1999, Light House (North side), M-4354.*Measurements* : L = 15-16; Ht = 11-17*Diagnostic characters* : Shell shape triangularly ovate, white in colour with purple blotches; outer surface smooth; ventral part of posterior area crenulate; interior white in colour and smooth.*Distribution* : INDIA : Andaman and Nicobar Islands; Kerala : Malabar Coast; Lakshadweep; Maharashtra : Bombay, Ratnagiri, Tamil Nadu Coast.*Elsewhere* : Indo-pacific.*Remarks* : Occur in the intertidal zone of Sandy beaches.

Genus *Donax* Linnaeus, 1758

Sub Genus *Latona* Schumacher, 1817

83. *Donax (Latona) incarnatus* Gmelin

1782. *Donaxincarnata* : Gmelin, *Syst. nat.*, 13 : 3265(refers : Chemnitz, *Syst. Conch. Cab.*, 6 : 265, Pl. 26, fig. 259, 206, 267).

2000. *Donax (Latona) incarnatus* : Subba Rao and Dey, *Rec. zool. Surv. India, Occ. Paper No.*, 187 : 265.

Material examined : 2 valves, 8-10-1996, Palleshumulupalem, m-3966

Measurements : L = 15-17; Ht = 13-15

Diagnostic characters : Shell trigonal; presence of fine sculpture except posterior slope; absence of groove on dorsal margin; posterior carination not conspicuous; pallial sinus shallow.

Distribution : INDIA : Gujarat : Kuda; Maharashtra : Bombay, Ratnagiri; Orissa : Chandipur; Pondichery : Karaikal; Tamilnadu : Tranquebar, Pamban; West Bengal : Medinipur, South 24 Parganas, Digha.

Elsewhere : Madagascar; Myanmar; Indonesia; Malaysia : Malacca; Hong Kong; Japan.

Family PSAMMOBIIDAE

Genus *Sanguinolaria* Lamarck, 1799

Sub Genus *Soletellina* De Blainville, 1824

84. *Sanguinolaria (Soletellina) acuminata* (Deshayes)

1857. *Soletellina acuminata* Deshayes, in *Reeve's Conch. Icon.*, 10; *Soletellina*, sp. 12, pl. 3, fig. 12 (Type locality : Phillippine Islands).

1992. *Sanguinolaria (Soletellina) acuminata* : Subba Rao, *et al.*, *State Fauna Series*, 3 : *Fauna of West Bengal* (Part 9) : 239, Pl. 23, figs. 2 and 4.

Material examined : 1 valve, 12-10-1996, Palleshumulapalem, m-3839; 2 valves, 17-10-1996, Gollalamoda, m-3908.

Measurements : L = 44-67; Ht = 20-29

Diagnostic characters : Shell much compressed, bluish purple in colour; muscle scars well developed anterior end rounded whereas posterior end acuminate with obtuse angle; gap on posterior end broad; posterior end narrower than anterior.

Distribution : INDIA : Andhra Pradesh : Godavari Estuary; Kerala : Astamudi nr. Travancore; Maharashtra; Orissa : Mahanadi Estuary, Chandipur, Puri Coast, Ganjam Coast; West Bengal : Hugli Matla Estuary, Digha, Sagar Island, Medinipur, North and South 24 Parganas.

Elsewhere : Pakistan : Karachi; Bangladesh; Sri Lanka; Myanmar; Malasiya : Malacca; Philippines; China and Japan.

Remarks : Animal lives inside burrows within intertidal. Superficial resemblance to *Hiatula diphos* (Linnaeus) as per Abbott and Dance (1982) which occurs from low water level to sea ward up to 30 metre. *S. acuiminata* differ from *H. diphos* by having very acuminate shell and anteriorly rounded palial sinus.

Family CORBICULIDAE

Genus *Geloina* Gray, 1842

85. *Geloina erosa* (Solander)

1786. *Venus erosa* Solander, *Portland Catalogue*, pp. 71, 186.

1932. *Gelonia erosa* : Prashad, *Siboga Expedition, Pelecypoda*, 55 c : 174.

Material examined : 2 valves, 9-10-1996, Bhavanipuram, m-3989; 3 valves, 21-2-1997, Palakayatippa, m-4006.

Measurements : L = 49-54; Ht = 45-50

Diagnostic characters : Shell large, solid heavy, tumid; inequilateral, concentrically and roughly striated.

Distribution : INDIA : Andhra Pradesh : Godavari Estuary; Orissa; West Bengal : Gangetic delta.

Elsewhere : Common in Indo-Pacific regions.

Remarks : Found in fresh waters, back waters and estuaries. *Cyrena ceylonica* (Chemnitz) and *Cynena galathea* (moerch) mentioned by Preston are synonyms of these species.

Super Family VENERACEA

Family VENERIDAE

Sub Family MERETRICINAE

Genus *Meretrix* Lamarck, 1799

86. *Meretrix casta* (Gmelin)

1791. *Venus casta* Gmelin, *Syst. Nat.*, ed. 13 : 3278, sp. 42 (refers to Chemnitz, 1782), (Type locality : India).

1991. *Meretrix casta* : Subba Rao, *et al.*, *State Fauna Series*, 1 : *Fauna of Orissa* (Part-3) : 149, Pl. 27, figs. 1 and 2.

Material examined : 1 valve, 21-2-1997, Palakayatippa, M-4011; 1 valve, 15-2-1998, Lankavenithippa, M-4212; 2 valves, 21-2-1999, Lankavenithippa (Creek nr. Sea), M-4395.

Measurements : L = 22-41; Ht = 19-37

Diagnostic characters : Valves thick, more inflated; hinge broad; posterior end without band. Lateral teeth left valve and corresponding groove in right valve finely denticulate, pallial sinus shallow.

Distribution : INDIA : occurs in both coasts in back waters and connecting canals,

Elsewhere; Myanmar : Arkan; Malaysia; Malacca; Signapore; Sri Lanka.

Remarks : Variable in its shape, colouration and thickness. As per revisionary work of Hornell (1917) on Indian Species of meretrix remarked that 'typical' form occurs from Chilika Lagoon to Cape Comrin on east coast and a variety satparaensis occurs in sub fossil condition in Shell deposits in Chilika Lagoon, Sunu pur, Pulicat and Madras Backwaters. Shell pit in Mandapam, Korampalem near Tuticorin and no living individuals appear to assume this form.

87. *Meretrix meretrix* (Linnaeus)

1758. *Venus meretrix* Linnaeus, *Syst. Nat.*, ed., 10 : 686, Sp. 102 (Type locality : 'o' Indico).

1992. *Meretrix meretrix* : Subba Rao, *et al.*, *State Fauna Series*, 3 : *Fauna of West Bengal* (Part-9) : 242, Pl. 25, figs. 1 and 2.

Material examined : 1 valve, 10-2-1997, Gilakaladindi, M-4038; 1 valve, 16-2-1997, Lankavenithippa, M-4045; 2 valves, 16-2-1997, Yesupuram, M-4021; 2 valves, 21-2-1997, Palakayatippa, m-4010; 1 valve, 11-9-1997, Kamavari cheruvu, M-4096; 15 ex., 15-9-1997, Lankavenithippa, M-4085; 2 ex., 16-9-1997, Eelachetladibba, M-4079; 1 ex., 18-9-1997, Edurumundi, M-4082; 2 valves, 8-2-1998, Pedakanur, M-4187; 2 valves, 15-2-1998, Lankavenithippa, M-4211; 7 ex., 16-9-1998, Kanur, M-4277; 2 valves, 23-9-1998, Sorlagondi, M-4330; 5 ex., 25-9-1998, Lankavenithippa, M-4282; 8 valves 12-10-1998, Palleshumulapalem, M-3830; 3 ex., 12-2-1999, Kanur, M-4450; 4 valves, 19-2-1999, M-4355; 2 valves, 21-2-1999, Lankavenithippa, M-4394; 2 ex., 4-1-2000, Kanur, M-4530; 2 ex., 5-1-2000, Kanur (Bridge), M-4554; 2 ex., 10-1-2000, Sorlagondi, M-4515; 1 valve, 11-1-2000, Gollalamoda, M-4550; 1 ex., 12-1-2000, Palakayatippa, 3 ex., 12-2-1999, Kanur, M-4450; 4 valves, 19-2-1999, M-4355; 2 valves, 21-2-1999, Lankavenithippa, M-4394; 8 valves, 11-12-2000, Kanur, M-4667; 2 ex., 19-12-2000, Sorlagondi, M-4640.

Measurements : L = 16-75; Ht = 14-68

Diagnostic characters : Surface of the shell smooth; pallial sinus shallow; hinge narrow; length of the shell is greater than height; Posterior end with dark band.

Distribution : INDIA : Andhra Pradesh : Godavari Estuary; Andaman and Nicobar Islands; Goa; Gujarat; Kerala; Maharashtra; Orissa : ChandipurMahanadi Estuary, Paradip, Puri Coast,

Chilika Lagoon (Satpada, Outer Channel, Arakhakuda), Chatrapur (Ganjam Coast); Pondichery; Tamil Nadu; West Bengal : Hugli Matla Estuary Medinipur, North and South 24 Praganas.

Elsewhere : Red Sea; Aden; Sri Lanka; Siam; Java; Sumatra; Borneo; Philippines; China; Japan; Myanmar.

Remarks : Commonly occurs in estuaries and back waters on both the coasts of India. Highly variable in its shape and colouration for which there are descriptions of several varieties viz. *Morphina*, *Impudica*, *Zonaria*, *Castanea* and *Durora*. It can be distinguished from *M. casta* by its ventricose shape more compressed, narrow hinge and very distinct anterior cardinal teeth on left valve.

Genus *Pelecyora* Dall, 1902

88. *Pelecyora trigona* (Reeve)

1850, *Artemis trigona* Reeve, *Conch. Icon.*, 6 pl. 7, fig. 42.

1992. *Pelecyora trigona* : Subba Rao, *et al.*, *State Fauna Series*, 3 : *Fauna of West Bengal* (Part-9) : 244, Pl. 25, figs. 5 and 6.

Material examined. 1 valve, 20-2-1999, Palakayatippa, M-4374.

Measurements : L = 17; Ht = 17

Diagnostic characters : Shell white or rust brown in colour, thick and triangularly ovate shaped; umbo curved; sculptured with concentric striae; ligament small; lunule large and superficial.

Distribution : INDIA : Kerala : Cochin; Orissa : Baleswar, Chandipur, Chatrapur (Ganjam Coast); Tamil Nadu : Pamban; West Bengal : Digha-Medinipur, North and South 24 Parganas.

Remarks : Generally found in the muddy canals/creeks. This species differs from *P. excisa* in having more inflated form and less excavated ligamental area.

Sub Family TAPETINAE

Genus *Marcia* H. and A. Adams, 1857

89. *Marcia pinguis* Schroeter

1788. *Venus pinguis*. Schroeter, *Namen, Register in Conch. Cab.*, 10 : 112 (Type locality : East Indian Seas).

1991. *Marcia pinguis* : Subba Rao, *et al.*, *State Fauna Series*, 1 : *Fauna of Orissa* (Part-3) : 152.

Material examined : 3 ex., 24-9-1998, Sorlagondi, M-4299; 1 valve, 25-9-1998, Lankavenithippa, M-4287; 1 ex., 10-1-2000, Sorlagondi, M-4519; 2 valves, 11-1-2000, Gollalamoda, M-4555.

Measurements : L = 20-51; Ht = 17-45

Diagnostic characters : Shell inflated, oval; lunule broad; surface smooth (except for concentric striae) and without markings.

Distribution : INDIA : Andhra Pradesh : Godavari Estuary; Orissa : Mahanadi Estuary, Paradip, Puri Coast, Kushabhadra Estuary (nr. Konark), Chilika Lagoon (Satapada, Outer Channelmanikpatna, Arakhakuda, Tonda and mizapur), Gopalpur; West Bengal : Hugli Matla Estuary. Common in back waters and estuaries along both the coasts of India.

Elsewhere : Australia; Myanmar; Gulf of Aden; Persian Gulf.

Remarks : Earlier known as *Katelsia opima* (Gmelin). Juvenile forms are more elongate than adults.

Genus *Paphia* Roeding, 1798

90. *Paphia textrix* (Schroeter)

1791. *Venus textrix* Gmelin, Syst. Nat. ed. 13, p. 3280.

2000. *Paphia textrix* : Subba Rao and Dey, Rec. zool. Surv. India, Occ. Paper No., 187 : 283.

Material examined : 1 ex., 16-9-1997, Eelachetladibba, M-4081.

Measurement : L = 37, Ht = 22

Diagnostic characters : Shell ovate; Surface smooth except with faint reticulations (wavy violet gray lines); posterior end attenuated.

Distribution : INDIA : Goa; Orissa : Mahanadi Estuary; West Bengal : Medinipur, South 24 Parganas.

Elsewhere : Red Sea; Siboga.

Remarks : Synonym : *P. textile*.

Sub Family CHIONINAE

Genus *Timoclea* Brown, 1828

91. *Timoclea imbricata* (Sowerby)

1853. *Venus imbricata* Sowerby, Thes., Conch., pt. 2 : 715, pl. 156.

1992. *Timoclea imbricata* : Subba Rao, et al., State Fauna Series, 3 : Fauna of West Bengal (Part-9) : 246, Pl. 26, figs. 3 and 6.

Material examined : 2 valves, 8-10-1996, Palleshumulapalem, m-3967.

Measurements : L = 37, Ht = 22

Diagnosis : Shell triangularly ovate, whitish in colour; posterior region angulate; palial sinus deep 'V' shaped; radial ribs strong and concentric ribs thin, crested.

Distribution : INDIA : Goa; Kerala : Cochin; Karnataka : mangalore; Maharashtra; Orissa : Chandipur, Cuttack Coast, Puri Coast (Chandrabhaga); Mahanadi Estuary, Ganjam Coast (Chatrapur, Gopalpur); Tamilnadu : Madras, Krusadai Island, Tranquebar, Porto Novo; West Bengal : DighaMedinipur.

Elsewhere : Sri Lanka; China; Pakistan.

Remarks : Sowerby (1853) described two species *Venus imbricata* and *V. cochinensis* which are not different. Afterwards *V. cochinensis* was synonymised with *V. imbricata* by Reeve (1863). The earlier reports from India mentioned only *Chione imbricata*. Fischer-Piette (1976) reported *T. cochinensis* from India without ever mentioning *imbricata*.

Family GLAUCONOMIDAE

Genus *Glaucanome* Gray, 1828

92. *Glaucanome sculpta* Sowerby

1894. *Glaucanome sculpta* Sowerby, *Proc. malac. Soc. Lond.*, **1** : 40 (Type locality : Bay of Bengal)

1992. *Glaucanome sculpta* : Subba Rao, *et al.*, *State Fauna Series*, **3** : *Fauna of West Bengal* (Part-9) : 246.

Material examined : 1 valves, 14-2-1998, Edurumundi, S.K and P m-4186; 1 valve, 12-2-1999, Kanur, M-4411; 17 ex., 12-2-1999, Kanur, M-4451; 1 ex., 10-1-2000, Sorlagondi, M-4509; 1 valve, 10-1-2000, Sorlagondi, M-4516; 2 valves, 11-12-2000, Kanur, M-4669.

Measurements : L = 20-39; Ht = 9-16

Diagnostic characters : Shell elongate, thin, brittle, dirty white in colour; covered with green periostracum; surface finely striated; anterior end short posterior end angularly attenuated.

Distribution : INDIA : Andhra Pradesh : Godavari Estuary; Orissa : Chandipur, Talasari Mahanadi Estuary; West Bengal : Hugli Matla Estuary, Sagar Island in Sunderbans, Medinipur, South 24 Parganas.

Elsewhere : Bay of Bengal.

Remarks : It occurs in hard muddy substratum in the Estuary. Adult one generally found partly exposing their bodies above surface level. It differ from *G.angulata* having longer, narrower form.

Order MYOIDA
 Sub order PHOLADINA
 Super Family PHOLADACEA
 Family PHOLADIDAE
 Sub Family PHOLADINAE
 Genus *Pholas* Linnaeus, 1758

93. *Pholas orientalis* Gmelin

1791. *Pholas orientalis* Gmelin, *Syst. Nat.* ed., 13 : 3216, Sp. 7 (Type locality Singapore).

1992. *Pholas orientalis* : Subba Rao, *et al.*, *State Fauna Series*, 3 : *Fauna of West Bengal* (Part-9) : 250, Pl. 28, figs. 5.

Material examined : 5 valves, 16-10-1996, Eelachetladibba, M-3818; 1 valve, 19-9-1997, Eelachetladibba, M-4145; 1 ex., 17-9-1998, Kanur, M-4322; 1 valve, 25-9-1998, Lankavenithippa, M-4284; 4 valves, 12-2-1999, Kanur, M-4417; 8 valves, 21-2-1999, Lankavenithippa, M-4403; 4 ex., 7-1-2000, Pallethumulupalem, M-4563; 2 valves 10-1-2000, Sorlagondi, M-4517; 1 valve, 11-12-2000, M-4670.

Measurements : L = 23-93; Ht = 11-28

Diagnostic characters : Umboral reflection separate; interior part with strong radial ribs; ribs nodose; posterior part with concentric growth lines.

Distribution : INDIA : Andhra Pradesh : Godavri Estuary; Kerala : Cochin; Orissa : ChandipurMahanadi Estuary; Tamil Nadu : Madras.

Elsewhere : Indo pacific.

Remarks : The members of the Family Pholadidae (Martesia, Pholas, Barnea) popularly known as 'Piddocks' The members of this Family are burrowing forms and burrow into soft mud and submerged wooden structure, in the sea water causing damage to the jetties.

Genus *Barnea* Risso, 1876

94. *Barnea candida* (Linnaeus)

1758. *Pholas candida* Linnaeus, *Syst. Nat.*, : 669.

1992. *Barnea candida* : Subba Rao, *et al.*, *State Fauna Series*, 3 : *Fauna of West Bengal* (Part-9) : 250, Pl. 28, figs. 2 and 4.

Material examined : 1 valve, 11-9-1997, Kammavaricheruvu, M-4092.

Measurements : L = 56; Ht = 21

Diagnostic characters : Shell thin, subventricose in shape and with protoplax; umbonal refelection present; valve without oblique furrow; attenuated posterior part; sculptured with strong concentric ridges but less prominent on the anterior part.

Distribution : INDIA : Orissa : Chandipur, Mahanadi Estuary; Maharashtra : Bombay; West Bengal : Medinipur, South 24 Parganas, Sundarban, Sagar Island, Digha.

Elsewhere : Atlantic and Indo-pacific.

Remarks : Found in soft mud banks at dept of 15 to 20 cm below the surface.

Sub Family MARTESIINAE

Genus *Martesia* Sowerby, 1824

95. *Martesia fragilis* (Verrill and Bush)

1873. *Pholas teredinaeformis* Sowerby and Reeves, *Conch. Icon.* 18, pl. 9. fig. 36.

1992. *Martesia fragilis* : Subba Rao, *et al.*, *State Fauna Series*, 3 : *Fauna of West Bengal* (Part-9) : 249, Pl. 29, figs. 1 and 3.

Material examined : 1 valve, 18-10-1996, Nachukunta, m-3902; 2 ex., 10-1-2000, SorlagondiM-4627.

Measurements : L = 17; Ht = 10

Diagnostic characters : Shell obliquely divided in the middle with angularly and longitudinally ribbed anterior half; posterior part with concentrically striated towards margin; Presence of one ventral shield and two dorsal shields upon the umbo; one elongated and narrow shield on posterior part.

Distribution : INDIA : Andaman and Nicobar Islands; Gujarat. Karnataka; Kerala; Maharashtra; Orissa; Tamil Nadu; West Bengal : Khidirpur Dock, Port Canning.

Elsewhere : Eastern Pacific; Indo-Pacific; West Atlantic.

DISCUSSION

The collections thus studied includes true estuarine species, marine species carried into the estuary. Many of the marine species (empty shell or valves) are either washed into the estuary by the tidal water or carried into the estuary by hermit crabs.

Based on the nature of occurrence molluscs in an estuary can be categorized as molluscs associated with vegetation (crawling/attached) molluscs living among mud flats (epifauna/In fauna) and molluscs living attached to substratum such as rocks, boulders and jetty poles etc.

Occurrence of molluscs in the estuary is mainly influenced by salinity and nature of substratum. Other factors like nature of sediment, organic content, dissolved oxygen, pH of water, temperature also influence their distribution.

In this estuary 3 classes of phylum mollusca namely Gastropoda, Bivalvia and Cephalopoda have their representatives and the families Neritidae, Littorinidae, Assimineidae, Potamididae, Naticidae, Muricidae, Nassariidae, Ellobiidae, Arcidae, Tellinidae and Veneridae are important diversity point of view from population, wide distribution and diverse point of view

Habitat wise distributions of species in this estuary are as follows

(i) *Mangrove associated species :*

Littorina melanostoma, L. scabra, Telescopium telescopium Cerithidea obtusa, Cassidula nucleus, Saccostrea cucullata, Martesia fragilis.

(ii) *Species occurring on mud flats :*

(a) Epifauna : Gastropoda : *Assiminea brevicula, Telescopium telescopium, Cerithidea cingulata, C. obtusa, Nassarius faveolatus, N. stolatus, Pugilina cochlidium, Haminoea crocata, Ellobium gangetica, E. aurisjudae, Cassidula nucleus, mellampus Sp; Onchidium Sp.*

Bivalvia : *Scapharca deyrollei, S. inaequalis, Perna viridis, Modiolus striatulus, Placuna placenta, Crassostrea cuttackensis.*

(b) Infauna (mostly Bivalvia only)/Bivalvia : *Anadara granosa, Solen brevis, S. gravelyi, S. kemp, S. truncatus, Neosolen aquaedulcioris, Pharella javanicus, Siliqua radiata, Macoma birmanica, M. truncata, Meretrix meretrix, M. casta, Glauconome sculpta, Barnea candida, Marcia pinguis.*

(iii) *Species occurring near intertidal region/mouth area of estuary :*

Gastropoda : *Umbonium vestiarium, Littorina undulata, Turritella attenuata, Turritella acutangula, Natica tigrina, Polinices didyma, P. mammilla, P. tumidus, Thais lacera, T. tissoti, Rapana rapiformis, Nassarius stolatus, N. pullus, N. foveolatus, Olivancillaria gibbosa;*

Bivalvia : *Anadara granosa, A. rhombea, Trisidos tortuosa, Striarca lactea, Anomia achaeus, Saccostrea cucullata, Acanthocardia coronata, Macra cuneata, Luzonica, M. symmetrica, M. plicataria, Coelomacra turgida, C. violacea, Tellina philippinarum, Donax scortum, D. faba, Sanguinolaria acuminata, Paphia textrix, Timoclea imbricata, Pholas orientalis.*

Comparison of estuarine molluscs reported from Hugli Matla Estuary, Mahandi Estuary, Godavari Estuary and Krishan Estuary of East Coast of India shows that many species are common to all these estuaries. Species belonging to the following families have been reported from Hugli-Matla Estuary but not recorded in other three estuaries are Acmaeidae, Cyclostrematidae, Stenothyridae, Pyrenidae, Cylichnidae, Aglajidae, Ringiculidae, Semelidae, Solecurtidae, Trapezidae, Myidae and Cuspidariidae.

Rapid growth of human population and increased human settlement around the estuaries are important factors by which both coastal and estuarine areas of our country are effected. As a result natural habitats such as mangrove forest, salt marshes, coral reefs and mud flats are modified to a considerable extent. Due to different anthropogenic activities in and around estuary, number of species are depleted. Estuarine organism play a vital role in maintaining the bio-diversity as well as productivity of coastal and oceanic water of sea. Protective measures are to be implemented for habitat conservation.

To understand the malaco faunal profile of the estuary, this attempt has been undertaken which will be helpful while making policies for conservation of coastal bio-diversity.

SUMMARY

In this study 95 species of molluscs belonging to 66 genera and 41 families have been reported. This also includes marine molluscs besides estuarine species.

ACKNOWLEDGEMENTS

The author is grateful to the Director, Zoological Survey of India, Dr. C.A. Nageswara Rao, the then Officer-in-charge, ZSI, and Berhampur and to Dr S.Z. Siddiqui, Officer-in-Charge, ZSI, and Gopalpur-on-Sea for providing facilities and encouragements. Author is also grateful to Dr. N.V. Subba Rao, retired Scientist SF, ZSI. and Dr. A. Dey, Scientist SC, ZSI, Port-Canning for their valuable suggestions.

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ECHINODERMATA : ASTEROIDEA

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INTRODUCTION

Krishna is the second major river of Andhra Pradesh after Godavary. It is the third largest river of India after Ganges and Godavary opening into the Bay of Bengal. There have been no reports earlier on the echinoderm fauna of Krishna Estuary. Collections from the recent survey of the Krishna estuary contained three specimens of asteroids consisting one of *Astropecten bengalensis* Doederlein and the other two of *Astropecten eurycanthus* Luetken.

Measurements : R – larger radius from centre of the disc to tip of the arm; r – smaller radius from the centre of the disc to intertidal margin; Br. – branchial width at the base of the arm; Px – width of the paxillar area at the base of the arm.

SYSTEMATIC ACCOUNT

Phylum ECHINODERMATA

Class ASTEROIDEA

Order PAXILLOSIDA

Family ASTROPECTINIDAE

1. *Astropecten bengalensis* Doederlein

1917. *Astropecten bengalensis* Doederlein, *Soboga Exped. Monogr.*, 46 a : 127

1910. *Astropecten mauritanus* : Koehler, *Echinoderma of the Indian Museum*, Part VI : 32.

1971. *Astropecten bengalensis* : Clark and Rowe, *Monograph of shallow-water Indo-West Pacific echinoderms*, 30-31 (distribution), 40 (notes), 45 (key).

Material : One specimen in damaged condition; Nachukunta, near Nagayalanka, Krishna District, Andhra Pradesh; 20 Dec 2000; EBA Reg. No. 3569.

Description : R = 47 mm; r = 11 mm; Br = 10 mm; Px = 7-8 mm. Arms five equal, one broken at the base and two in midway, gradually tapering to a narrow tip. Abactinal paxillae with 1-3 central and 10-15 peripheral spinelets. Superomarginal plates narrow and aligned vertically at the interradia, gradually becoming wider on the arms till the tip; each with a small superomarginal spine on the inner margin at the interradia and on the outer margin on the arms. Inferomarginal plates with a short flat marginal spine proximally at the interradia, gradually becoming rounded, longer and pointed beyond the interradius; two equal spines similar to main inferomarginal spine but a little shorter; actinal surface with short bluntly pointed spinelets. Actinal plates two on each side of the interradius. Adambulacral plates with up to 5 furrow spines proximally, only 3 distally; 3 subambulacral spines, outer one larger and thicker. Madreporite single, large and close to the interradial superomarginal plates.

Distribution : Restricted to Bay of Bengal. India-Andhra Pradesh, Orissa and Tamil Nadu.

Elsewhere : Sri Lanka and Myanmar (?).

2. *Astropecten eurycanthus* Luetken

(Plate figs. 1-4)

1872. *Astropecten eurycanthus* Luetken, *Vidensk. Meddr dansk. Naturh. Foren.*, 1871 : 231.

1910. *Astropecten nobilis* Koehler, *Echinoderma of the Indian Museum*, VI : 51.

1971. *Astropecten eurycanthus* : Clark and Rowe, *Monograph of shallow water Indo-West Pacific echinoderms*, 30-31 (distribution), 44 (key).

1995. *Astropecten eurycanthus* : Sastry, *Estuarine Ecosystem Series, Part 2 : Hugli Matla Estuary* : 327, 331.

Material : One specimen; Krishna River Mouth near Machilipatnam, Krishna District, Andhra Pradesh; 13 Feb 1997; EBA Reg. No. 3088. One specimen; Krishna Estuary, Manginapudi near Machilipatnam, Krishna District, Andhra Pradesh; 20 Sep 1998; EBA Reg. No. 3190.

Measurements :

	Reg. No. 3088	Reg. No. 3190
R	60 mm	55 mm
r	14 mm	13 mm
Br	16 mm	14 mm
Px	10 mm	8 mm

Description : Arms five, equal, tip pointed in one specimen and appears to be slightly blunt in the other. Abactinal paxillae in transverse rows on either side of the irregularly arranged radial paxillae, with 7 to 10 central and 15 to 20 peripheral spinelets. Superomarginal plates with low granule covering, peripheral granules twice as long as broad, no superomarginal spines. Inferomarginal plates slightly projecting beyond the superomarginals, with a single flat blunt spine at the margin, the marginal spine of the proximal plates pointed, two very small spinelets below the main inferomarginal spine, actinal surface with rounded scales. Actinal plates 4 on each side of the interradius in one specimen (Reg, No, 3088) and 2 to 4 in the other. Adambulacrals with 3 furrow spines of which the middle is longer, slender and deep in the furrow, 3 subambulacral spines of which the middle is larger and stouter and two spines abradial to subambulacral spines. Madreporite single, large and very close to the interradial superomarginal plates.

Description : Restricted to Bay of Bengal, India-Andhra Pradesh, West Bengal and Nicobars.

Elsewhere : Sri Lanka.

Remarks : Echinoderms are generally marine inhabitants. A few species rarely occur in the estuarine environments. The asteroid *Astropecten eurycanthus* is one such species. It was earlier reported from off the Hugli River Mouth by Koehler (1910) and Sastry (1995). There is also unpublished material in the National Zoological Collection of Zoological Survey of India, from Orissa Coast. The species of *Astropecten* inhabit the sandy areas often burrowing into the substratum of intertidal region during low tide periods. Most of their actinal side is occupied by the elongate inferomarginal plates whose actinal surface is covered with spinelets. In *A. eurycanthus* these are particularly rounded and scale-like. These help the animal in efficiently burrowing into the coarse sand. *Astropectens* generally feed on infaunal elements such as mollusks and crabs.

ACKNOWLEDGEMENTS

The author is grateful to the Director, Zoological Survey of India, Calcutta for encouragement and facilities and Dr. C.A.N. Rao, Scientist-D and Officer-in-Charge, Estuarine Biological Station, Berhampur for making the collection available for study.

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FISHES

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INTRODUCTION

This work forms the first report on the Ichthyofaunal study of the estuarine zone of the Krishna River, Andhra Pradesh. Barman (1993) has not included any collection from Krishna estuary in his account on fish fauna of Andhra Pradesh. David (1963) was first to study the fish and fisheries of Andhra Pradesh including some fishes from the estuary. Jayaram (1995) in his 'Bio-resources study of the Krishna river system' reported 195 species of fishes from the entire river system, after incorporating David (1963). Of these fishes only about 60 species are known to inhabit estuarine waters. Rao and Sharma (1987) have mentioned only two species belonging to the family Engraulidae.

The River Krishna is known to originate near Mahabaleswar at Ondishi village, in Maharashtra and traverse through Karnataka and Andhra Pradesh for a distance of 1349 km to drain in to the Bay of Bengal beyond Nagailanka (Jayaram, 1995). The river gives rise to a left branch called Pulleru at Bobarlanka, near Puligada. It is observed that during highest high-tide period water from the main branch swells up to run through Pulleru at Bobarlanka. But tidal effect is very little at Avanigada in Pulleru. The main stream continues from Puligada on to the right for another 24 km and breaks up in to three branches to join the sea 34 km away from Nagailanka.

The present work depicts our knowledge of distribution of 269 species of freshwater to marine elements of fishes belonging to 160 genera accommodated in 78 families. It is based on approximately 3700 samples collected from different localities of the Krishna estuarine system by various survey parties during the period from 1996 to 2000. The identification of the specimens was mainly based on Day (1875-78 (1888)); Koumans (1941, 1953); Munro (1955); Fischer and Bianchi (1984); Talwar and Kacker (1984); Smith and Heemstra (1986); Talwar and Jhingran (1991) and Talwar (1995).

All the studied samples have been properly preserved, registered and deposited with the Estuarine Biological Station of the Zoological Survey of India at Berhampur (Orissa).

The body proportions and meristic characters are mostly from actual observations. The various body measurements are given in relation to standard length, except otherwise mentioned.

Abbreviations used in the text are :

D – Dorsal fin; A – Anal fin; P – Pectoral fin; V – Pelvic fin; C – Caudal fin; GR – Gill rakers; LL – Lateral line scales; LS – Lateral scale series; Ltr – Lateral transverse scales; preD – Predorsal scales; SL – Standard length; TL – Total length; CANR – C. A. Nageswara Rao and party; – S. Krishnan and party.

SYSTEMATIC LIST

Order LAMNIFORMES

Family CARCHARHINIDAE

- 01. *Rhizoprionodon acutus* (Ruppell)
- 02. *Scoliodon laticaudus* Muller & Henle

Order ELOPIFORMES

Family ELOPIDAE

- 03. *Elops machnata* (Forsk.)

Family MEGALOPIDAE

- 04. *Megalops cyprinoides* (Broussonet)

Order ANGUILLIFORMES

Family ANGUILLIDAE

- 05. *Anguilla bengalensis* (Gray)
- 06. *Anguilla bicolor* McClelland

Family MORINGUIDAE

- 07. *Moringua raitaborua* (Hamilton)

Family MURAENIDAE

- 08. *Lycodontis sathete* (Hamilton)
- 09. *Lycodontis tile* (Hamilton)
- 10. *Thyrsoidea macrura* (Bleeker)

Family OPHICTHIDAE

- 11. *Bascanichthys deraniyagalai* Menon
- 12. *Muraenichthys gymnopterus* Bleeker

13. *Ophichthus apicalis* (Bennett)
14. *Ophichthus microcephalus* Day
15. *Pisodonophis boro* (Hamilton)

Family CONGRIDAE

16. *Ariosoma anago* (Schlegel)
17. *Uroconger lepturus* (Richardson)

Family MURAENESOCIDAE

18. *Muraenesox bagio* (Hamilton)

Order CLUPEIFORMES

Family CLUPEIDAE

19. *Anadontosoma chacunda* (Hamilton)
20. *Dussumieria acuta* Valenciennes
21. *Escualosa thoracata* (Valenciennes)
22. *Hilsa kelee* (Cuvier)
23. *Nematalosa galathea* Nelson & Rothman
24. *Nematalosa nasus* (Bloch)
25. *Sardinella albela* (Valenciennes)
26. *Sardinella fimbriata* (Valenciennes)
27. *Tenuialosa ilisha* (Hamilton)

Family PRISTIGASTERIDAE

28. *Ilisha elongata* (Bennett)
29. *Ilisha kampeni* (Weber & de Beaufort)
30. *Ilisha melastoma* (Schneider)
31. *Opisthopecterus tardoore* (Cuvier)
32. *Raconda russeliana* Gray

Family ENGRAULIDIDAE

33. *Coilia dussumieri* Valenciennes
34. *Coilia neglecta* Whitehead
35. *Coilia ramcarati* (Hamilton)
36. *Coilia reynaldi* Valenciennes
37. *Setipinna phasa* (Hamilton)
38. *Setipinna taty* (Valenciennes)
39. *Setipinna tenuifilis* Valenciennes
40. *Stolephorus commersonii* Lacepede

- 41. *Stolephorus dubiosus* Wongratana
- 42. *Stolephorus indicus* (van Hasselt)
- 43. *Thryssa dussumieri* (Valenciennes)
- 44. *Thryssa gautamiensis* Rao
- 45. *Thryssa hamiltonii* (Gray)
- 46. *Thryssa mystax* (Schneider)
- 47. *Thryssa purava* (Hamilton)
- 48. *Thryssa setirostris* (Broussonet)

Order GONORHYNCHIFORMES
Family CHANIDAE

- 49. *Chanos chanos* (Forsal)

Order CYPRINIFORMES
Family CYPRINIDAE

- 50. *Amblypharyngodon mola* (Hamilton)
- 51. *Labeo boga* (Hamilton)
- 52. *Labeo fimbriatus* (Bloch)
- 53. *Parluciosoma daniconius* (Hamilton)
- 54. *Puntius chola* (Hamilton)
- 55. *Puntius sophore* (Hamilton)

Order SILURIFORMES
Family BAGRIDAE

- 56. *Mystus bleekeri* (Day)
- 57. *Mystus cavasius* (Hamilton)
- 58. *Mystus gulio* (Hamilton)
- 59. *Mystus vittatus* (Bloch)

Family SILURIDAE

- 60. *Ompok bimaculatus* (Bloch)

Family SCHILBEIDAE

- 61. *Pseudeutropius atherinoides* (Bloch)
- 62. *Silonia childreni* (Sykes)

Family ARIIDAE

- 63. *Ariodes dussumieri* (Valenciennes)
- 64. *Arius arius* (Hamilton)

65. *Arius caelatus* Valenciennes

66. *Arius jella* Day

Family PLOTOSIDAE

67. *Plotosus canius* Hamilton

Order AULOPIFORMES

Family SYNODIDAE

68. *Saurida longimanus* Norman

69. *Saurida undosquamis* (Richardson)

Family HARPADONTIDAE

70. *Harpadon nehereus* (Hamilton)

Order GADIFORMES

Family BREGMACEROTIDAE

71. *Begmaceros maclellandi* Thompson

Order CYPRINODONTIFORMES

Family HEMIRAMPHIDAE

72. *Hyporhamphus limbatus* (Valenciennes)

73. *Rhynchorhamphus georgii* (Valenciennes)

74. *Zenarchopterus buffonis* (Valenciennes)

Family BELONIDAE

75. *Strongylura leiura* (Bleeker)

76. *Strongylura strongylura* (van Hasselt)

77. *Tylosurus crocodilus* (Peron & LeSueur)

Family ORYZIIDAE

78. *Oryzias melastigma* (McClelland)

Order SYNGNATHIFORMES

Family FISTULARIIDAE

79. *Fistularia petimba* Lacepede

Family SYNGNATHIDAE

80. *Hippichthys spicifer* (Ruppell)

81. *Ichthyocampus carce* (Hamilton)

Order SYNBRANCHIFORMES
Family SYNBRANCHIDAE

82. *Ophisternon bengalense* McClelland

Order SCORPAENIFORMES
Family PLATYCEPHALIDAE

83. *Cociella crocodila* (Tilesius)
84. *Platycephalus indicus* (Linnaeus)
85. *Suggrundus bengalensis* (Rao)

Order PERCIFORMES
Family CENTROPOMIDAE

86. *Lates calcarifer* (Bloch)

Family AMBASSIDAE

87. *Ambassis commersonii* Cuvier
88. *Ambassis gymnocephalus* (Lacepede)
89. *Ambassis miops* Gunther

Family ACROPOMATIDAE

90. *Acropoma japonicum* Gunther

Family SERRANIDAE

91. *Epinephelus coioides* (Hamilton)
92. *Epinephelus erythrurus* (Valenciennes)
93. *Epinephelus latifasciatus* (Temm. & Schl.)

Family TERAPONIDAE

94. *Pelates quadrilineatus* (Bloch)
95. *Terapon jarbua* (Forsal)
96. *Terapon theraps* (Cuvier)

Family PRIACANTHIDAE

97. *Priacanthus hamrur* (Forsal)

Family APOGONIDAE

98. *Apogon quadrifasciatus* Cuvier
99. *Apogonichthys ellioti* (Day)
100. *Apogonichthys poecilopterus* (Kuhl & van Hasselt)

Family SILLAGINIDAE

- 101. *Sillago indica* McKay, Dutt & Sujatha
- 102. *Sillago lutea* McKay
- 103. *Sillago sihama* (Forsal)
- 104. *Sillago vincenti* McKay

Family LACTARIDAE

- 105. *Lactarius lactarius* (Bloch & Schneider)

Family CARANGIDAE

- 106. *Alectis indicus* (Ruppell)
- 107. *Alepes djedaba* (Forsal)
- 108. *Atropus atropos* (Schneider)
- 109. *Atule mate* (Cuvier)
- 110. *Carangoides armatus* (Ruppell)
- 111. *Carangoides hedlandensis* (Whitley)
- 112. *Carangoides malabaricus* (Bloch & Schn.)
- 113. *Caranx carangus* (Bloch)
- 114. *Caranx ignobilis* (Forsal)
- 115. *Caranx para* Cuvier
- 116. *Caranx sem* Cuvier
- 117. *Caranx sexfasciatus* Quoy & Gaimard
- 118. *Gnathanodon speciosus* (Schneider)
- 119. *Megalaspis cordyla* (Linnaeus)
- 120. *Selaroides leptolepis* (Cuvier)
- 121. *Scomberoides commersonianus* Lacepede
- 122. *Scomberoides lysan* (Forsal)

Family LEIOGNATHIDAE

- 123. *Gazza minuta* (Bloch)
- 124. *Leiognathus berbis* (Valenciennes)
- 125. *Leiognathus blochii* (Valenciennes)
- 126. *Leiognathus brevirostris* (Valenciennes)
- 127. *Leiognathus daura* (Cuvier)
- 128. *Leiognathus equulus* (Forsal)
- 129. *Leiognathus fasciatus* (Lacepede)
- 130. *Leiognathus splendens* (Cuvier)
- 131. *Secutor insidiator* (Bloch)

Family LUTJANIDAE

- 132. *Lutjanus argentimaculatus* (Forsal)
- 133. *Lutjanus fulviflammus* (Forsal)
- 134. *Lutjanus johni* (Bloch)
- 135. *Lutjanus lutjanus* Bloch
- 136. *Lutjanus russelli* (Bleeker)

Family GERREIDAE

- 137. *Gerres abbreviatus* Bleeker
- 138. *Gerres acinaces* Bleeker
- 139. *Gerres filamentosus* Cuvier
- 140. *Gerres lucidus* Cuvier
- 141. *Gerres macracanthus* Bleeker
- 142. *Gerres oyena* (Forsal)
- 143. *Gerres setifer* (Hamilton)

Family HAEMULIDAE

- 144. *Plectorhinchus gibbosus* (Lacepede)
- 145. *Pomadasys argyreus* (Valenciennes)
- 146. *Pomadasys kaakan* (Cuvier)
- 147. *Pomadasys maculatum* (Bloch)

Family SPARIDAE

- 148. *Acanthopargus berda* (Forsal)

Family NEMIPTERIDAE

- 149. *Nemipterus furcosus* (Valenciennes)
- 150. *Nemipterus japonicus* (Bloch)

Family SCIAENIDAE

- 151. *Chrysochir aureus* (Richardson)
- 152. *Daysciaena albida* (Cuvier)
- 153. *Dendrophysa russelli* (Cuvier)
- 154. *Johnieops borneensis* (Bleeker)
- 155. *Johnieops dorsalis* (Peters)
- 156. *Johnieops dussumieri* (Cuvier)
- 157. *Johnieops osseus* (Day)
- 158. *Johnius belangerii* (Cuvier)
- 159. *Johnius carouna* (Cuvier)

- 160. *Johnius carutta* Bloch
- 161. *Johnius dussumieri* (Valenciennes)
- 162. *Johnius macropterus* (Bleeker)
- 163. *Nibea maculata* (Schneider)
- 164. *Otolithes ruber* (Schneider)
- 165. *Panna microdon* (Bleeker)
- 166. *Paranibea semiluctuosa* (Cuvier)
- 167. *Pennahia anea* (Bloch)
- 168. *Protonibea diacanthus* (Lacepede)

Family MULLIDAE

- 169. *Upeneus moluccensis* (Bleeker)
- 170. *Upeneus sulphureus* Cuvier
- 171. *Upeneus vittatus* (Forsal)

Family MONODACTYLIDAE

- 172. *Monodactylus argenteus* (Linnaeus)

Family TOXOTIDAE

- 173. *Toxotes chatareus* (Hamilton)

Family DREPANIDAE

- 174. *Drepane longimanus* (Bloch & Schn.)
- 175. *Drepane puntatus* (Linnaeus)

Family EPHIPPIDIDAE

- 176. *Ephippus orbis* (Bloch)

Family SCATOPHAGIDAE

- 177. *Scatophagus argus* (Linnaeus)

Family NANDIDAE

- 178. *Nandus nandus* (Hamilton)

Family CICHLIDAE

- 179. *Etroplus maculatus* (Bloch)
- 180. *Etroplus suratensis* (Bloch)
- 181. *Oreochromis mossambica* (Peters)

Family MUGILIDAE

- 182. *Liza macrolepis* (Smith)
- 183. *Liza melinoptera* (Valenciennes)

- 184. *Liza parsia* (Hamilton)
- 185. *Liza tade* (Forsal)
- 186. *Mugil cephalus* Linnaeus
- 187. *Rhinomugil corsula* (Hamilton)
- 188. *Valamugil cunnesius* (Valenciennes)
- 189. *Valamugil speigleri* (Bleeker)

Family SPHYRAENIDAE

- 190. *Sphyraena obtusata* Cuvier
- 191. *Sphyraena putnamiae* Jordan & Seale

Family POLYNAMIDAE

- 192. *Eleutheronema tetradactylum* (Shaw)
- 193. *Polydactylus sexfilis* (Valenciennes)
- 194. *Polydactylus sextarius* (Bloch)

Family URANOSCOPIDAE

- 195. *Uranoscopus cognatus* Cantor

Family BLENNIIDAE

- 196. *Omobranchus punctatus* (Valenciennes)
- 197. *Omobranchus zebra* (Bleeker)

Family CALLIONYMIDAE

- 198. *Callionymus fluviatilis* Day

Family ELEOTRIDIDAE

- 199. *Butis butis* (Hamilton)
- 200. *Butis malanostigma* (Bleeker)
- 201. *Eleotris fusca* (Schneider)
- 202. *Eleotris malanosoma* Bleeker
- 203. *Odonteleotris macrodon* (Bleeker)
- 204. *Ophieleotris aporos* (Bleeker)
- 205. *Prionobutis koilomatodon* (Bleeker)

Family GOBIIDAE

- 206. *Acentrogobius caninus* (Valenciennes)
- 207. *Acentrogobius cyanomos* (Bleeker)
- 208. *Acentrogobius madraspatensis* (Day)
- 209. *Acentrogobius viridipunctatus* (Valenciennes)

- 210. *Apocryptodon madurensis* (Bleeker)
- 211. *Bathygobius fuscus* (Ruppell)
- 212. *Boleophthalmus boddarti* (Pallas)
- 213. *Boleophthalmus sculptus* (Gunther)
- 214. *Favonigobius reichei* (Bleeker)
- 215. *Glossogobius biocellatus* (Valenciennes)
- 216. *Glossogobius giuris* (Hamilton)
- 217. *Gobiopsis macrostoma* Steindachner
- 218. *Oligolepis acutipennis* (Valenciennes)
- 219. *Oxyurichthys formosanus* Nichols
- 220. *Oxyurichthys microlepis* (Bleeker)
- 221. *Oxyurichthys papuensis* (Valenciennes)
- 222. *Oxyurichthys tentacularis* (Valenciennes)
- 223. *Parachaeturichthys polynema* (Bleeker)
- 224. *Parapocryptes rictuosus* (Valenciennes)
- 225. *Parapocryptes serperaster* (Richardson)
- 226. *Periophthalmus koelreuteri* (Pallas)
- 227. *Periophthalmus pearsi* Eggert
- 228. *Pseudapocryptes lanceolatus* (Valenciennes)
- 229. *Stigmatogobius sadanundio* (Hamilton)
- 230. *Yongeichthys criniger* (Valenciennes)

Family GOBIOIDIDAE

- 231. *Brachyamblyopus urolepis* (Bleeker)
- 232. *Taenioides anguillaris* (Linnaeus)
- 233. *Taenioides buchanani* (Day)

Family TRYPACHENIDAE

- 234. *Trypauchen vagina* (Bloch & Schn.)

Family KURTIDAE

- 235. *Kurtus indicus* Bloch

Family SIGANIDAE

- 236. *Siganus canaliculatus* (Park)
- 237. *Siganus javus* (Linnaeus)

Family TRICHIURIDAE

- 238. *Eupleurogrammus glossodon* (Bleeker)
- 239. *Eupleurogrammus muticus* (Gray)

- 240. *Lepturacanthus savala* (Cuvier)
- 241. *Trichiurus gangeticus* Gupta
- 242. *Trichiurus lepturus* Linnaeus

Family SCOMBRIDAE

- 243. *Rastrelliger kanagurta* (Cuvier)
- 244. *Scomberomorus guttatus* (Bloch & Schn.)

Family STROMATEIDAE

- 245. *Pampus argenteus* (Euphrasen)
- 246. *Pampus chinensis* (Euphrasen)

Family BELONTIDAE

- 247. *Colisa fasciatus* (Schneider)

Family CHANNIDAE

- 248. *Channa marulius* (Hamilton)
- 249. *Channa orientalis* Bloch & Schneider
- 250. *Channa punctatus* (Bloch)

Family MASTACEMBELIDAE

- 251. *Mastacembelus armatus* (Lacepede)

Order PLEURONECTIFORMES

Family PSETTODIDAE

- 252. *Psettodes erumei* (Schneider)

Family BOTHIDAE

- 253. *Pseudorhombus arsius* (Hamilton)
- 254. *Pseudorhombus elevatus* Ogilby

Family SOLEIDAE

- 255. *Euryglossa orientalis* (Bloch & Schn.)
- 256. *Synaptura commersoniana* (Lacepede)

Family CYNIGLOSSIDAE

- 257. *Cynoglossus arel* (Schneider)
- 258. *Cynoglossus bilineatus* (Lacepede)
- 259. *Cynoglossus lida* (Bleeker)
- 260. *Cynoglossus lingua* Hamilton

- 261. *Cynoglossus macrostomus* Norman
- 262. *Cynoglossus punticeps* (Richardson)
- 263. *Cynoglossus semifasciatus* Day

Order TETRAODONTIFORMES
Family TRIACANTHIDAE

- 264. *Triacanthus biaculeatus* (Bloch)

Family TETRAODONTIDAE

- 265. *Chelonodon fluviatilis* (Hamilton)
- 266. *Chelonodon patoca* (Hamilton)
- 267. *Lagocephalus lunaris* (Bloch & Schn.)
- 268. *Lagocephalus spadiceus* (Richardson)
- 269. *Takifugu oblongus* (Bloch)

SYSTEMATIC ACCOUNT

1. *Rhizoprionodon acutus* (Ruppell)

1837. *Charcharias acutus* Ruppell, *Neue Wirbel. Fauna Abyssinien, Fische Rhothen Meers*, (11) : 65, pl. 18, fig. 4 (Djedda, Red Sea).
1991. *Rhizoprionodon acutus* : Talwar and Jhingran, *Inland Fishes of India*, 1 : 23.

Material examined : 1 ex., 210 mm, 16-02-97, Lankavenitippa, F-2410; 1 ex., 187 mm, 12-02-98, Jilagaladindi, F-2792.

Diagnostic features : A small slender shark. Head moderately depressed; prenarial snout 4.0-5.4% of TL; upper labial furrow long, about eye length; teeth without cusplets. First D base twice or less in distance between P and V bases; 2nd D much smaller than 1st D; free rear tip of 1st D reaching at most to V origin; 2nd D origin well behind A origin; P narrower, its length 4/5 or less of anterior margin; preanal ridges long. Grey or grey-brown above, white below; D and A dusky or blackish.

Distribution : Indo-west Pacific and the Eastern Atlantic.

2. *Scoliodon laticaudus* Muller & Henle

1838. *Scoliodon laticaudus* Muller and Henle. *Syst. Besch. Plagiost.*, (1) : 27 ("Aus Indien").

Material examined : 1 ex., 126 mm, 19-09-98, Pallithummulapalem, F-2917; 1 ex., 165 mm, 20-09-98, Manginipudi, F-2923.

Diagnostic features : Body slender, fusiform. Head broadly depressed; snout long, flat, trowel-shaped. Upper labial furrow poorly developed, as a short crease directed at right angle

from lower furrow. Free rear tip of 1st D about over mid-bases of V; 2nd D considerably smaller than 1st D. P broadly triangular, its length from origin to free rear tips about equal to their anterior margins. Post-ventral margin of C moderately concave. Bronzy grey above, white below; fins often darker than body.

Distribution : Indo-west Pacific. Inhabits inshore and offshore coasts, enters estuaries/brackish waters.

3. *Elops machnata* (Forsal)

1775. *Argentina machnata* Forsal, *Descript. Animal.* : xii, 68 (Jiddah, Red Sea).

1991. *Elops machnata* : Talwar and Jhingran, *Inland Fishes of India*, 1 : 67.

Material examined : 1 ex., 55 mm, 11-09-97, Kamavericheruvu, F-2202; 1 ex., 250 mm, 16-10-96, Yelchettutippa, F-2207; 1 ex., 112 mm, 08-10-96, Pallithummulapalem, F-2237; 1 ex., 208 mm, 16-02-97, Yesupuram, F-2376; 1 ex., 230 mm, 16-02-97, Lankaveni-tippa, F-2418; 3 ex., 150-180 mm, 10-02-97, Jilagaladindi, F-2449; 4 ex., 50-56 mm, 10-09-97, Pallithummulapalem, F-2552; 1 ex., 160 mm, 15-02-98, Lankavenitippa, F-2713; 1 ex 114 mm, 18-09-98, Pallithummulapalem, F-2885; 1 ex., 180 mm, 19-09-98, Palli-thummulapalem, F-2904; 1 ex., 175 mm, 21-09-98, Kamavericheruvu, F-2937; 2 ex., 108-123 mm, 11-01-2000, Gollalamanda, F-3232.

Diagnostic features : D 20-25; A 14-17; P 17-18; V 12-16; GR (7-9) + (13-15); LL 90-100. Body round or oval in cross-section; maxilla reaching well behind eye; teeth on jaws villiform. D origin in posterior half of body, behind V base. A base shorter than D base. Back blue or grey, sides silvery with yellow tinge.

Distribution : Indo-west Pacific. Inhabits coastal marine waters, entering lagoons and estuaries.

4. *Megalops cyprinoides* (Broussonet)

1782. *Clupea cyprinoides* Broussonet, *Ichthyol.* : pl. 9 (Thanna Ids., New Hebrides).

1991. *Megalops cyprinoides* : Talwar and Jhingran, *Inland Fishes of India*, 1 : 69.

Material examined : 5 ex., 63-76 mm, 12-12-2000, Kannur bridge, F-3454.

Diagnostic features : D 17-20; A 24-31; P 15-16; V 10-11; GR (15-17) + (30-35); LL 37-42. Eyes large, more than inter-orbital space; lower jaw projecting; no teeth on jaws. Last ray of D produced, filamentous; that of A slightly elongated; A base longer than D base. Blue or green above, flanks silvery.

Distribution : Indo-west Pacific. Coastal, pelagic, solitary, swift-swimming, predatory species; entering lagoons, estuaries and freshwaters.

5. *Anguilla bengalensis* (Gray)

1831. *Muraena bengalensis* Gray, *Illust. Indian Zool.* : pl. 95, fig. 5 (Ganges river).

1991. *Anguilla bengalensis bengalensis* : Talwar and Jhingran, *Inland Fishes of India*, 1 : 74.

Material examined : 1 ex., 290 mm, 10-10-96, Kannur, F-2285.

Diagnostic features : D 250-305; A 220-250; P 18. Body elongate; mouth terminal; lips prominent tooth bands on jaws and vomer relatively narrow. D inserted nearer to anus than gill opening. Variegated yellow-olive, mottled with brown markings; lighter below; juveniles not mottled.

Distribution : Pakistan, India, Sri Lanka, Myanmar and the East Indies (Sumatra). Inhabits freshwaters, occurs in estuaries and in the sea during early life.

6. *Anguilla bicolor* McClelland

1844. *Anguilla bicolor* McClelland, *Calcutta J. nat. Hist.*, 5(8) : 178, pl. 6, fig. 1 (India).

Material examined : Not obtained.

Diagnostic features : D 220-245; A 200-220; P 18. Head conical, flattened dorsally. Mouth terminal; lips prominent; teeth small, in broad bands on jaws and vomer. D inserted slightly before or after anus. Olive to dark bluish-brown above, lighter below.

Distribution : East Africa to India and Sri Lanka.

Remarks : Jayaram (1995) obtained 2 examples from Machilipatnam, which were reported to be from Bunder canal estuary.

7. *Moringua raitaborua* (Hamilton)

1822. *Muraena raitaborua* Hamilton, *Fishes of Ganges* : 25, 364 (Ganges river).

1991. *Moringua raitaborua* : Talwar and Jhingran, *Inland Fishes of India*, 1 : 77.

Material examined : 1 ex., 11-02-97, Kannur, river mouth, F-2361; 3 ex., 270-360 mm, 08-09-97, Kannur bridge, F-2534; 3 ex., 217-270 mm, 16-09-98, Kannur, river mouth, F-2854; 2 ex., 220-235 mm, Kannur, river mouth, F-3591.

Diagnostic features : Body elongated; depth 31-45 in TL; head, not conspicuous from rest of body, 8-10 in TL; occipital crest not elevated. D and A, inserted a short distance behind anus, confluent with C. Purplish above, silvery below.

Distribution : India : Gangetic estuary, probably Bangladesh.

Remarks : Record of this species from the Krishna estuary and also from the Godavari estuary (Krishnan and Mishra, 2001) indicates its southward extension of range along the east coast of India.

8. *Lycodontis sathete* (Hamilton)

1822. *Muraenophis sathete* Hamilton, *Fishes of Ganges* : 17, 363 (Gangetic estuary near Calcutta).

1991. *Lycodontis sathete* : Talwar and Jhingran, *Inland Fishes of India*, 1 : 79.

Material examined : 2 ex., 330-425 mm, Kishna estuary, North of Light House, 19-02-99, F-3155.

Diagnostic features : Tail longer than rest of body; eyes small; teeth small, biserial, inner series enlarged. Dark greenish-olive, becoming greenish-yellow below; with silvery dots along the sides, usually confused as lateral line pores.

Distribution : India : Hooghly estuary and Bay of Bengal.

9. *Lycodontis tile* (Hamilton)

1822. *Muraenophis tile* Hamilton, *Fishes of Ganges* : 18, 363 (Gangetic estuary near Calcutta).

1991. *Lycodontis tile* : Talwar and Jhingran, *Inland Fishes of India*, 1 : 79.

Material examined : 1 ex., 263 mm, 11-10-96, Pulleru mouth, Pedapatnam, F-2246; 1 ex., 500 mm, 18-09-97, Yedurumundi, F-2481.

Diagnostic features : Tail longer than rest of body; eyes small; teeth very sharp, more or less in 2 rows, inner series longer. Brownish-yellow to greenish, lighter below with pupil-sized white specks; specks often absent in adults.

Distribution : India, the East Indies, The Philippines and Hawaii. Inhabits estuaries and river mouths.

10. *Thyrsoidea macrura* (Bleeker)

1854. *Muraena macrurus* Bleeker, *Nat. Tijdschr. Ned.-Indie*, 7 : 324 (Java, Indonesia).

1984. *Thyrsoidea macrura* : Talwar and Kacker, *Comm. Sea Fish. India* : 228.

Material examined : 2 ex., 555-630 mm, 11-12-2000, Kannur, river mouth, F-3592.

Diagnostic features : A very elongate, slender eel. Head and trunk combined 1.5-2.0 in tail length; head 12, depth about 40 in TL. Biserial sharp teeth on jaws, those in front and inner row larger; a few depressible fangs on inter-maxillary; uniserial, much smaller teeth on vomer. D originate before gill opening. Brownish grey above, lighter below.

Distribution : Tropical Indo-Pacific, in estuaries.

11. *Bascanichthys deraniyagalai* Menon

1961. *Bascanichthys deraniyagalai* Menon, *J. zool. Soc. India*, 13(1) : 13, fig. (Arasalar river at Karaikal, Tamil Nadu).

Material examined : 1 ex., 453 mm, 18-10-96, Nachukunta nr. Nagailanka, F-2265; 1 ex., 372 mm, 18-02-97, Yedurumundi, F-2400; 1 ex., 139 mm, 17-12-2000, Pulligada, F-3568.

Diagnostic features : Body slender, cylindrical; trunk slightly longer than tail. Snout blunt; eyes small; mouth small; teeth small, conical, uniserial on jaws. Gill opening lateral, nearly horizontal. D origin well forward on head, a little before gill opening. P vestigial, as a flap of in. Olive brown dorsally, yellow ventrally.

Distribution : India : Arasalar river mouth (Tamil Nadu); probably Sri Lanka.

Remarks : This author has examined the specimens from other localities in Orissa and Andhra Pradesh and has the opinion that this species is well distributed along the east coast of India.

12. *Muraenichthys gymnopterus* Bleeker

1853. *Muraena gymnopterus* Bleeker, *Verh. Batav. Gen. Kunst. Wet.*, 25 : 52 (Batavia).

1913. *Muraenichthys gymnopterus* : Weber and de Beaufort, *Fish. Indo-Aust. Archip.*, 3 : 276.

Material examined : 5 ex., 114-199 mm, 13-02-99, Kannur bridge, F-3187; 1 ex., 250 mm, 11-01-2000, Gollalamoda, F-3229; 1 ex., 157 mm, 05-01-2000, Kannur bridge, F-3366.

Diagnostic features : Depth about 30, head 7.5-8.5 in TL. D originates before vent, nearer to vent than gill opening. Cleft of mouth reaching more than 3 eye diameters behind eye. Vomerine and mandibular teeth anteriorly 3 rows, posteriorly 1-2 rows; maxillary teeth in narrow band. Brownish.

Distribution : India, eastward to west Pacific.

13. *Ophichthus apicalis* (Bennett)

1830. *Ophisurus apicalis* Bennett, *Mem. life of Raffles* : 694 (Celebes).

1986. *Ophichthus apicalis* : McCoer and Castle, *Smith's Sea Fishes* : 182, pl. 8, fig. 42.16.

Material examined : 3 ex., 680-820 mm, 11-12-2000, Kannur, river mouth, F-3608.

Diagnostic features : Depth 26-33, head 9-11 in TL. Head and trunk combined 1.5-1.6 in tail. Snout blunt; cleft of mouth extends slightly posterior margin of eye. Teeth small, sharp, uniserial on sides of jaws, in a cluster on inter-maxillary and irregularly biserial on vomer. D origin over or behind P base. Pale brown with greenish tint, whitish ventrally.

Distribution : Indo-Pacific.

14. *Ophichthus microcephalus* Day

1878. *Ophichthus microcephalus* Day, *Fishes of India* : 665, pl. 170, fig. 2 (Malabar, India).

Material examined : 1 ex., 325 mm, 15-09-98, Kannur bridge, F-2832; 1 ex., 353 mm, 10-01-2000, Sorlagandi, F-3201; 1 ex., 344 mm, 12-12-2000, Kannur bridge, F-3439; 3 ex., 296-311 mm, 13-12-2000, Pallithummula-palem, F-3541.

Diagnostic features : Head 7.3-8.0 in pre-anal length; head and trunk combined about 1.8 in tail. Teeth in 3 rows on sides of upper jaw. D origin behind P base. Olive above, dull yellow below. Fins dark.

Distribution : India.

15. *Pisodonophis boro* (Hamilton)

1822. *Ophisurus boro* Hamilton, *Fishes of Ganges* : 20, 363, pl. 5 (Hooghly estuary near Calcutta).

1991. *Pisodonophis boro* : Talwar and Jhingran, *Inland Fishes of India*, 1 : 86.

Material examined : 1 ex., 285 mm, 16-10-96, Yelchetutippa, F-2210; 1 ex., 465 mm, 18-10-96, Nachukunta, F-2266; 3 ex., 275-307 mm, 12-10-96, Karuwaka mangroves nr. Pallithummulapalem, F-2306; 1 ex., 310 mm, 18-09-97, Yedurumundi, F-2482; 1 ex., 329 mm, 16-09-98, Kannur, river mouth, F-2853; 4 ex., 180-460 mm, 23-09-98, Sorlagandi at confluence, F-2969; 1 ex., 300 mm, 26-09-98, Sangameswara, F-3033; 1 ex., 340 mm, 15-02-99, Pallithummulapalem, F-3092; 1 ex., 300 mm, 06-01-2000, Pallithummulapalem, F-3192; 5 ex., 202-430 mm, 05-01-2000, Kannur bridge, F-3354; 1 ex., 515 mm, 12-12-2000, Kannur bridge, F-3488; 1 ex., 502 mm, 13-12-2000, Palli-thummulapalem, F-3540; 2 ex., 260-280 mm, 11-12-2000, Kannur, river mouth, F-3609.

Diagnostic features : Body depth 30-36, head 9-12 (3.5-4.0 in trunk), tail 1.6-1.8 in TL. Teeth molariform, in multiserial bands on jaws and vomer. D origin about P length behind P tip; tail tip stiff and finless. Uniform olive-brown above, lighter below. D with a narrow dark edge.

Distribution : Indo-Pacific. Inhabits mostly in estuaries, entering freshwater and paddy fields.

16. *Ariosoma anago* (Schlegel)

1846. *Conger anago* Schlegel, *Fauna Japonica, Pisces* : 259, pl. 113, fig. 1 (Japan).

1955. *Ariosoma anago* : Munro, *The marine and freshwater fishes of Ceylon* : 64, pl. 12, fig. 180.

Material examined : 3 ex., 150-180 mm, 10-12-2000, Jilagaladindi, F-3617.

Diagnostic features : Depth 16-18, head 6 in TL. Head and trunk combined about equal to tail. Snout equals eye diameter. Lips thick. Anterior nostril tubular. Teeth small, pointed and

in bands in both jaws. D origin above P base. D and A covered with in. Brown; fins yellowish hyaline.

Distribution : From east coast of India to Malay Archipelago, Japan.

17. *Uroconger lepturus* (Richardson)

1845. *Conger lepturus* Richardson, *Zool. Voy. Sulphur.* : 106, pl. 56, figs. 1-6 (Canton).

1984. *Uroconger lepturus* : Talwar and Kacker, *Comm. Sea Fish. India* : 232.

Material examined : 7 ex., 225-335 mm, 11-02-98, Jilagaladindi, F-2778; 1 ex., 330 mm, 12-02-98, Jilagaladindi, F-2806; 2 ex., 245-305 mm, 19-09-98, Pallithummulapalem, F-2916; 2 ex., 150-266 mm, 17-02-99, Krishna River mouth at Hamsaldivi, F-3123; 2 ex., 99-195 mm, 19-02-99, Krishna estuary, N. of Light House, F-3153; 11 ex., 142-213 mm, 13-02-99, Kannur bridge, F-3169; 1 ex., 195 mm, 11-01-2000, Gollalmanda, F-3243; 2 ex., 190-210 mm, 07-01-2000, Krishna R. confluence nr. Pallithummulapalem, F-3261; 1 ex., 202 mm, 04-01-2000, Kannur, F-3315; 3 ex., 148-238 mm, 05-01-2000, Kannur bridge, F-3352; 1 ex., 85 mm, 19-12-2000, Sorlagandi, F-3475; 1 ex., 240 mm, 10-12-2000, Jilagaladindi, F-3616.

Diagnostic features : Body elongate, cylindrical; tail tapering to a point. Head 7.4-8.3, depth 20-25 in TL. Snout broad, blunt, projecting. Teeth prominent and sharp, biserial on jaws, inner row longer; 10-20 small teeth in one row on vomer; inter-maxillary teeth in a small patch, almost exposed outside of mouth when closed. Light grey-brown; fins darker; LL pores pale.

Distribution : Indo-Pacific.

18. *Muraenesox bagio* (Hamilton)

1822. *Muraena bagio* Hamilton, *Fishes of Ganges* : 364 (Ganges estuary).

1991. *Muraenesox bagio* : Talwar and Jhingran, *Inland Fishes of India*, 1 : 91.

Material examined : 1 ex., 222 mm, 11-10-96, Pulleru mouth nr. Pedapatnam, F-2245; 2 ex., 230-250 mm, 10-10-96, Kannur, F-2284; 2 ex., 80-266 mm, 11-02-97, Kannur, river mouth, F-2360; 1 ex., 435 mm, 16-09-98, Kannur, F-2852; 1 ex., 493 mm, 17-09-98, Kannur, F-2857; 1 ex., 302 mm, 24-09-98, Sorlagandi, F-2997; 3 ex., 252-275 mm, 19-02-99, Krishna est., N. of Light House, F-3154; 1 ex., 221 mm, 11-01-2000, Gollalamanda, F-3242.

Diagnostic features : D 47-59 before vent; LL pores 33-39 before vent; eye about 3 in snout; inter-orbital width 10-11 in head; largest teeth on lower jaw and vomer laterally compressed, sharp with prominent anterior and posterior basal bulges. Brownish grey.

Distribution : Indo-west Pacific. Inhabits coastal soft bottoms and estuaries.

19. *Anadontosoma chacunda* (Hamilton)

1822. *Clupanodon chacunda* Hamilton, *Fishes of Ganges* : 246 (Ganges estuaries).

1991. *Anadontosoma chacunda* : Talwar and Jhingran, *Inland Fishes of India*, 1 : 104.

Material examined : 2 ex., 70-77 mm, 10-10-96, Kannur, F-2282; 1 ex., 77 mm, 18-02-98, Yesupuram, F-2700; 2 ex., 53-69 mm, 23-09-98, Sorlagandi, F-2973; 2 ex., 105-110 mm, 08-01-2000, Manganapudi, F-3282; 1 ex., 70 mm, 13-12-2000, Pallithummulapalem, F-3501; 1 ex., 125 mm, 10-12-2000, Jilagaladindi, F-3589.

Diagnostic features : D iii-v, 13-15; A ii-iv, 16-18; P I, 14-15; V i, 7; lower GR 54-96, shorter than corresponding gill filaments; LL 40-43; belly scutes (15-18) + (9-12). Depth 1.4-2.5 in SL. Silvery; a large black spot behind gill opening.

Distribution : From the Gulf, India, to west Pacific.

20. *Dussumieria acuta* Valenciennes

1847. *Dussumieria acuta* Valenciennes, *Hist. nat. Poiss.*, 20 : 467, pl. 606 (Bombay, Coromandel).

Material examined : 2 ex., 125-126 mm, 10-12-2000, Jilagaladindi, F-3590.

Diagnostic features : D iii-iv, 16-17; A ii-iii, 13-14; P i, 13; V i, 7; LS 40-42; Ltr 11/12; lower GR 19-26; branchiostegal rays 12-15. Depth 3.4-4.5 in SL. Posterior part of scales with numerous tiny radiating striae. Black iridescent blue with a shiny golden line below.

Distribution : Tropical Indo-west Pacific.

21. *Escualosa thoracata* (Valenciennes)

1847. *Kowala thoracata* Valenciennes, *Hist. nat. Poiss.*, 20 : 363 (Pondicherry).

1984. *Escualosa thoracata* : Talwar and Kacker, *Comm. Sea Fish. India* : 133.

Material examined : 1 ex., 68 mm, 16-10-96, Yelchettutippa, F-2225; 2 ex., 50-54 mm, 11-10-96, Pulleru mouth nr. Pedapatnam, F-2256; 2 ex., 53-65 mm, 10-10-96, Kannur, F-2292; 2 ex., 55-58 mm, 18-09-97, Yedurumundi, F-2493; 4 ex., 44-48 mm, 08-09-97, Kannur bridge, F-2505; 7 ex., 46-69 mm, 16-09-97, Eakhetulutippa, F-2539; 5 ex., 43-51 mm, 10-09-97, Pallithummula-palem, F-2562; 3 ex., 52-69 mm, 17-09-97, Krishna R. mouth nr. Light House, F-2599; 1 ex., 57 mm, 14-02-98, Yelchettutippa, F-2633; 1 ex., 66 mm, 08-02-98, Pedakannur, F-2661; 5 ex., 60-65 mm, 15-02-98, Lankavenitippa, F-2723; 5 ex., 61-68 mm, 11-02-98, Jilagaladindi, F-2772; 2 ex., 28-47 mm, 18-09-98, Pallithummulapalem, F-2897; 3 ex., 40-44 mm, 23-09-98, Sorlagandi, F-2972; 1 ex., 39 mm, 25-09-98, Lankavenitippa, F-3017; 1 ex., 38 mm, 24-09-98, Krishna estuary, F-3034; 1 ex., 52 mm, 21-02-99, Pallithummulapalem, F-3091; 1 ex., 68 mm, 13-01-2000, Nachukunta, F-3297; 2 ex., 55-56 mm, 04-01-2000, Kannur, F-3323; 2 ex., 41-52 mm, 05-01-2000, Kannur bridge,

F-3349; 2 ex., 41-47 mm, 14-12-2000, Pallithummulapalem, F-3380; 1 ex., 62 mm, 12-12-2000, Kannur bridge, F-3459; 5 ex., 36-55 mm, 13-12-2000, Pallithummula-palem, F-3503.

Diagnostic features : D iii, 12-14; A ii-iii, 14-18; V i, 6; lower GR 28-40; belly scutes (17-19) + (10-12). Back dull white, flanks with silvery lateral stripe; a dark double mid-dorsal line.

Distribution : Pakistan India, through Indonesia, to Queensland (Australia).

22. *Hilsa kelee* (Cuvier)

1829. *Clupea kelee* Cuvier, *Regne Animal*. (2nd ed.), 2 : 320 (Vizagapatnam).

1985. *Hilsa kelee* : Whitehead, *FAO Fish. Synop.*, (125) 7(1) : 220.

Material examined : 1 ex., 150 mm, 18-02-98, Yesupuram, F-2682; 2 ex., 122-150 mm, 25-09-98, Lankavenitippa, F-3005; 1 ex., 137 mm, 21-02-99, Creek nr. Sea, Lankavenitippa, F-3072; 1 ex., 145 mm, 08-01-2000, Manganapudi, F-3283; 1 ex., 73 mm, 12-12-2000, Kannur bridge, F-3458.

Diagnostic features : D iv, 13-14; A iii, 17-19; P i, 14-15; V i, 7; LS 39-44; lower GR 75-175; belly scutes (15-17) + (12-14). Depth 2.5-3.3 in SL. Distinct median notch in upper jaw. Fronto-parietal striae exposed. GR on 2nd arch curled outward. Scales perforated. A black blotch behind gill opening, usually followed by a series of oval blotches down flank.

Distribution : Indo-west Pacific. Marine, pelagic; entering estuaries and able to tolerate low salinity.

23. *Nematalosa galathea* Nelson & Rothman

1973. *Nematalosa galathea* Nelson & Rothman, *Bull. Am. Mus. nat. Hist.*, **150**(2) : 158, figs. 8B, 9 (Rangoon Province, Andaman Sea, Thailand, at mouth of Pakchan river).

Material examined : 2 ex., 114-135 mm, 16-02-97, Yesupuram, F-2378; 3 ex., 135-160 mm, 16-02-97, Lankavenitippa, F-2407; 1 ex., 117 mm, 20-02-98, Nagailanka ferry point, F-2646; 2 ex., 130 mm each, 18-02-98, Yesupuram, F-2683 & F-2689.

Diagnostic features : D iv-v, 11-13; A ii-iii, 19-22; P i, 13-14; V i, 7; belly scutes (16-17) + (8-11), total 25-30. Depth 2.3-2.8 in SL. Mouth inferior; lower jaw strongly flared outward. A pair of grooves in spongy in on top of head, converging posteriorly. Hind edge of scales not toothed. Greyish-green above, flanks and belly silvery; a dark spot behind gill opening, followed by a series of smaller spots along flank.

Distribution : South-west coast of India, Bay of Bengal, Andaman Sea, Gulf of Thailand, Singapore and Vietnam.

24. *Nematalosa nasus* (Bloch)

1795. *Clupea nasus* Bloch, *Naturges. ausland. Fische*, (19) : 116, pl. 429, fig. 1 (Malabar).

1991. *Nematalosa nasus* : Talwar and Jhingran, *Inland Fishes of India*, 1 : 111.

Material examined : 2 ex., 52-55 mm, 11-09-97, Kamavericheruvu, F-2205; 1 ex., 82 mm, 10-10-96, Kannur, F-2281; 1 ex., 95 mm, 10-02-97, Jilagaladindi, F-2451; 1 ex., 120 mm, 09-09-97, Pallithummulapalem, F-2464; 1 ex., 127 mm, 10-09-97, Palli-thummulapalem, F-2550; 1 ex., 105 mm, 15-02-98, Lankavenitippa, F-2724; 9 ex., 42-47 mm, 17-09-98, Kannur, F-2872; 14 ex., 39-50 mm, 18-09-98, Pallithummulapalem, F-2896; 4 ex., 38-45 mm, 19-09-98, Palli-thummulapalem, F-2921; 1 ex., 47 mm, 21-09-98, Kamavericheruvu, F-2946; 1 ex., 78 mm, 13-12-2000, Pallithummulapalem, F-3502.

Diagnostic features : D iii-v, 11-14; A ii-iii, 18-23; P i, 14; V i, 7; LS 46-49; belly scutes (17-19) + (10-13), total 28-32. Depth 2.4-2.9 in SL. Mouth inferior; lower jaw strongly flared outward. Hind edge of scales toothed. Dark bluish dorsally, silvery below; a dark spot behind gill opening.

Distribution : Indo-west Pacific. Marine, but entering estuaries.

25. *Sardinella albela* (Valenciennes)

1847. *Kowala albela* Valenciennes, *Hist nat. Poiss.*, 20 : 362 (Pondicherry).

1984. *Sardinella albela* : Talwar and Kacker, *Comm. Sea Fish. India* : 138.

Material examined : 1 ex., 125 mm, 11-02-98, Jilagaladindi, F-2755.

Diagnostic features : D iv, 14-16; A iii, 16-20; P i, 13-16; V i, 7; LS 40-45; lower GR 41-65; belly scutes (17-19) + (11-15), total 29-33. Body depth 2.5-4.1 in SL. Ventral striae on scales not meeting at center. Anterior scales perforated and fimbriated at posterior margin. Back blue-green; flanks silvery; hind margin of C duy.

Distribution : Widespread in Indo-Pacific.

26. *Sardinella fimbriata* (Valenciennes)

1847. *Spartella fimbriata* Valenciennes, *Hist nat. Poiss.*, 20 : 359 (Malabar).

1985. *Sardinella fimbriata* : Whitehead, *FAO Fish. Synop.*, (125)7(1) : 98.

Material examined : 3 ex., 62-90 mm, CANR 13-02-99. Kannur bridge, F-3186; 1 ex., 80 mm, 11-01-2000, Gollalamoda, F-3227; 1 ex., 80 mm, 04-01-2000, Kannur, F-3324; 1 ex., 75 mm, 11-12-2000, Kannur, river mouth, F-3412.

Diagnostic features : D iv, 14-16; A iii, 16-19; P i, 13-15; V i, 7; LS 40-45; lower GR 53-82 (at 50-120 mm SL); belly scutes (17-18) + (12-14). Body depth 2.9-4.0 in SL. Ventral

striae on scales not meeting at center. Hind part of scales with few perforations and fimbriated at posterior margin and somewhat produced posteriorly. Back blue-green; flanks silvery; a dark spot at D origin.

Distribution : Southern coast of India, Bay of Bengal, to the Philippines; also eastern tip of Papua New Guinea. Marine, coastal.

27. *Tenuالosa ilisha* (Hamilton)

1822. *Chapanodon ilisha* Hamilton, *Fishes of Ganges* : 243, 382, pl. 19, fig. 73 (Ganges estuaries).

1985. *Tenuالosa ilisha* : Whitehead, *FAO Fish. Synop.*, (125) 7(1) : 222.

Material examined : Not obtained by us.

Diagnostic features : D iv-v, 14-16; A ii-iii, 16-20; P i, 14; V i, 7 lower GR 100-250; belly scutes 30-33. Body depth 3.1-3.7, head 3.3-3.6, C 3.2-4.0 in SL. A black blotch behind gill opening, followed by a series of small spots along flanks in young.

Distribution : From the Gulf, India, to Myanmar.

Remarks : Although no specimens were obtained during the present study, this species is known as an inhabitant of the area and caught occasionally.

28. *Ilisha elongata* (Bennett)

1830. *Alosa elongata* Bennett, *Mem. Life of Raffles* : 691 (Sumatra).

1984. *Ilisha elongata* : Talwar and Kacker, *Comm. Sea Fish. India* : 151.

Material examined : 1 ex., 204 mm, 12-02-98, Jilagaladindi, F-2780.

Diagnostic features : D ii, 14-15; A ii, 40-48; P i, 15-16; V i, 6; lower GR 19-25; belly scutes (24-26) + (10-15). Depth 3.2-3.7, head 4.2-4.5 in SL. Vertical striae on scales not continuous. D origin nearer to C base than snout tip. Swim bladder with a single post-coelomic extension, on right side. Back blue-green, flanks silvery.

Distribution : South-east coast of India to Sumatra, China and Japan.

29. *Ilisha kampeni* (Weber & de Beaufort)

1913. *Pellona kampeni* Weber and de Beaufort, *Fish. Indo-Aust. Archip.*, 2 : 87 (Java, Borneo).

1991. *Ilisha kampeni* : Talwar and Jhingran, *Inland Fishes of India*, 1 : 119.

Material examined : 1 ex., 100 mm, 16-02-97, Yesupuram, F-2389; 1 ex., 162 mm, 16-02-97, Lankavenitippa, F-2419; 3 ex., 80-85 mm, 08-09-97, Kannur bridge, F-2511; 1 ex., 109 mm, 14-02-98, Yelchetuthippa, F-2634; 1 ex., 115 mm, 20-02-98, Nagailanka ferry point, F-2651; 1 ex., 112 mm, 08-02-98, Pedakannur, F-2658; 1 ex., 95 mm, 15-02-98, Lanka-

venitippa, F-2725; 1 ex., 155 mm, 10-02-98, Jilagaladindi, F-2732; 1 ex., 145 mm, 11-02-98, Jilagaladindi, F-2771; 2 ex., 86-115 mm, 19-09-98, Pallithummulapalem, F-2908; 1 ex., 109 mm, 20-09-98, Manganapudi, F-2926; 1 ex., 117 mm, 17-12-2000, Palakaitippa, F-3370; 1 ex., 108 mm, 18-12-2000, Yesupuram, F-3371; 1 ex., 63 mm, 12-12-2000, Kannur bridge, F-3460.

Diagnostic features : D ii, 14-16; A ii, 35-42; P i, 14-15; V i, 6; lower GR 20-24; belly scutes (19-21) + 8. Body depth 3.1-4.1; P length 5.9-6.6 in SL. D origin at about midpoint of body. Vertical striae on scales not continuous. Swim bladder with two post-coelomic extensions, on either side of haemal spine. Dark grey dorsally, flanks silvery.

Distribution : East coast of India, Indonesia.

30. *Ilisha melastoma* (Schneider)

1801. *Clupea melastoma* Schneider, *Syst. Ichth. Bloch* : 427 (near Coromandel, Tamil Nadu).

1991. *Ilisha melastoma* : Talwar and Jhingran, *Inland Fishes of India*, 1 : 121.

Material examined : 1 ex., 101 mm, 10-12-2000, Jilagaladindi, F-3515.

Diagnostic features : D i-ii, 15-17; A ii, 35-46; P i, 15-16; V i, 6; lower GR 21-25; belly scutes (17-21) + (8-9), total 25-30. D inserted slightly before midpoint of body; A origin under hind part of D base. Vertical striae on scales traversing whole scale or overlapping across center of scale. Swim bladder with two tubes passing posteriorly. Back brown, lower flanks silvery-white.

Distribution : Kerala coast and east coast of India, Java Sea, South China Sea and East China Sea.

31. *Opisthopterus tardoore* (Cuvier)

1829. *Pristigaster tardoore* Cuvier, *Regne Animal*. (2nd ed.), 2 : 382 (Vizagapatnam).

1991. *Opisthopterus tardoore* : Talwar and Jhingran, *Inland Fishes of India*, 1 : 123.

Material examined : 2 ex., 136-141 mm, 11-02-98, Jilagaladindi, F-2770; 2 ex., 118-135 mm, 12-02-98, Jilagaladindi, F-2822; 1 ex., 115 mm, 08-01-2000, Manganapudi, F-3277; 2 ex., 123-132 mm, 10-12-2000, Jilagaladindi, F-3574.

Diagnostic features : D ii-iii, 11-14; A iii, 48-60; P i, 11-13; V absent; lower GR 22-28; LS 46-51; belly scutes 29-35. Body depth 3.3-3.7 in SL. D in posterior half of body. Back blue-green.

Distribution : Gulf of Oman, India, Sri Lanka, Myanmar, and Indonesia.

32. *Raconda russeliana* Gray

1831. *Raconda russeliana* Gray, *Zool. Miscellany*, 1 : 9 (Sangar Roads, India).

Material examined : 1 ex., 126 mm, 13-02-97, Chentakaluamundi, F-2427; 3 ex., 130-132 mm, 11-02-98, Jilagaladindi, F-2769; 2 ex., 145-149 mm, 12-02-98, Jilagaladindi, F-2821; 2 ex., 125-168 mm, 25-09-98, Lankaveni-tippa, F-3011; 1 ex., 145 mm, 08-01-2000, Manganapudi, F-3276.

Diagnostic features : D absent; A ii, 79-88; V absent; lower GR 23-27; belly scutes 33-38. Body depth 3.6-4.0 in SL; P length equal to head. Back black bluish, flanks yellowish; silvery below; a dark spot behind gill opening; juveniles purplish with silvery band on sides.

Distribution : East coast of India, to Java Sea.

33. *Coilia dussumieri* Valenciennes

1848. *Coilia dussumieri* Valenciennes, *Hist. nat. Poiss.*, 21 : 81, pl. 610 (Bombay).

Material examined : 2 ex., 98-128 mm, 10-12-2000, Jilagaladindi, F-3587; 5 ex., 101-137 mm, 11-02-98, Jilagaladindi, F-2753; 1 ex., 86 mm, 18-09-98, Pallithummulapalem, F-2893; 1 ex., 94 mm, 20-09-98, Manganapudi, F-2927.

Diagnostic features : D iii, 10-12; A ii, 100-103; P vi + 8-9; V i, 6; lower GR 24-26; belly scutes (4-6) + (7-9). Maxilla not reaching to edge of opercle. Back light brown, silvery below; with rows of pearly spots (become silvery when preserved).

Distribution : India, to Southeast Asia.

34. *Coilia neglecta* Whitehead

1968. *Coilia neglecta* Whitehead, *J. mar. biol. Ass. India*, 9(1) : 33, fig. 4 (Arabian Sea, NW of Bombay; also off Indus, Ganges and Irrawaddy deltas).

Material examined : 1 ex., 127 mm, 13-02-97, Chentakaluamundi, F-2425; 1 ex., 129 mm, 14-02-99, Kannur bridge, F-3060; 8 ex., 94-139 mm, 21-02-99, Creek near Sea, Lankavenitippa, F-3075; 3 ex., 125-137 mm, 08-01-2000, Manganapudi, F-3279.

Diagnostic features : D iii, 10-11; A iii, 96-107; P vi + 10-11; V i, 6; lower GR 23-27; belly scutes (6-9) + (7-11). Maxilla reaching to edge of opercle. Back light brown; flanks silvery, no pearly spots.

Distribution : India, Sri Lanka, to Southeast Asia.

35. *Coilia ramcarati* (Hamilton)

1822. *Mystus ramcarati* Hamilton, *Fishes of Ganges* : 232, 382 (Ganges estuaries).

1991. *Coilia ramcarati* : Talwar and Jhingran, *Inland Fishes of India*, 1 : 130.

Material examined : 1 ex., 194 mm, 13-02-97, Chentakaluamundi, F-2424; 1 ex., 180 mm, 08-01-2000, Manganapudi, F-3278.

Diagnostic features : D iii, 13-14; A ii, 90; P vi + 5-6; V i, 8-9; lower GR 29-30; belly scutes 5 + 10 or 11. Golden brown, with darker pigmentation behind gill opening.

Distribution : Ganges delta and Andaman Sea, south of Rangoon.

Remarks : This record extends its distributional range southward to Krishna estuary. It is also recorded from Godavari estuary (Krishnan and Mishra, 2001)

36. *Coilia reynaldi* Valenciennes

1848. *Coilia reynaldi* Valenciennes, *Hist. nat. Poiss.*, 21 : 81 (Irrawaddy River at Rangoon, Burma).

Material examined : 1 ex., 95 mm, 18-09-98, Pallithummulapalem, F-2894; 2 ex., 90-91 mm, 12-12-2000, Kannur bridge, F-3461.

Diagnostic features : D iii, 11; A ii, 111; P x-xiii + 6-7; V i, 6; lower GR 28-36; belly scutes (6-9) + (7-11). Back greenish; flanks golden-yellow, abdomen pale yellow.

Distribution : East coast of India, Myanmar.

37. *Setipinna phasa* (Hamilton)

1822. *Clupea phasa* Hamilton, *Fishes of Ganges* : 240, 382 (Brackish rivers of Bengal).

1991. *Setipinna phasa* : Talwar and Jhingran, *Inland Fishes of India*, 1 : 136.

Material examined : 1 ex., 112 mm, 12-02-98, Jilagaladindi, F-2823.

Diagnostic features : D i, 14-15; A iii, 66-78; P i, 14; V i, 6; lower GR 17-19; belly scutes 15 + (6-7). Head 5.5-6.4 in SL; maxilla just reaches gill opening. P filaments long, reaching to base of 15th-39th A ray. Back brownish-grey; flanks and belly silvery shot with gold. P hyaline, blue-black in adults; upper C lobe and upper edge of D duy.

Distribution : Ganges river system and Orissa. Inhabits rivers and estuaries.

Remarks : This record extends its distributional range southward to Krishna estuary. David (1963) recorded this species from this locality but Jayaram (1995) questioned its occurrence.

38. *Setipinna taty* (Valenciennes)

1848. *Engraulis taty* Valenciennes, *Hist. nat. Poiss.*, **21** : 60 (Pondicherry).

1988. *Setipinna taty* : Whitehead *et. al.*, *FAO Fish. Synop.*, (125)7(2) : 457.

Material examined : 1 ex., 90 mm, 18-10-96, Nachukunta, F-2270; 1 ex., 129 mm, Creek nr. Sea, Lankavenitippa, F-3077; 1 ex., 110 mm, 08-01-2000, Manganapudi, F-3280.

Diagnostic features : D i, 15-16; A iii, 45-55; P i, 22-24; V i, 6; lower GR 18-21, serrae in distinct clumps; belly scutes (20-29) + (10-14). Back yellowish-brown or bluish, silvery below.

Distribution : Sri Lanka, east coast of India, Andaman Islands, Indonesia.

39. *Setipinna tenuifilis* Valenciennes

1848. *Engraulis tenuifilis* Valenciennes, *Hist. nat. Poiss.*, **21** : 62 (Rangoon, Burma).

Material examined : 1 ex., 114 mm, 13-02-97, Chentakalumundi, F-2426; 1 ex., 93 mm, 12-02-98, Jilagaladindi, F-2824; 1 ex., 77 mm, 17-09-98, Kannur, F-2871; 1 ex., 80 mm, 18-09-98, Pallithummulapalem, F-2895; 1 ex., 124 mm, 21-02-99, Creek nr. Sea, Lankavenitippa, F-3076; 2 ex., 105-120 mm, 10-12-2000, Jilagaladindi, F-3588.

Diagnostic features : D i, 15; A iii, 46-55; P i, 10-12; V i, 6; lower GR 13-14, serrae uneven, with distinct clumps; belly scutes (18-20) + 7. Back greenish-black, flanks silvery dashed with gold.

Distribution : Bay of Bengal and Northern Borneo.

40. *Stolephorus commersonii* Lacepede

1803. *Stolephorus commersonii* Lacepede, *Hist. nat. Poiss.*, **5** : 381, pl. 12, fig. 1 (Mauritius).

Material examined : 1 ex., 100 mm, 08-09-97, Kannur bridge, F-2507; 1 ex., 96 mm, 11-01-2000, Gollalmanda, F-3246; 1 ex., 99 mm, 04-01-2000, Kannur, F-3322; 2 ex., 93-102 mm, 10-12-2000, Jilagaladindi, F-3586; 1 ex., 102 mm, 11-12-2000, Kannur, river mouth, F-3606.

Diagnostic features : D iii, 12-14; A iii, 18-19; lower GR 23-28; belly with 1-4 needle-like pre-pelvic scutes; no spine on pelvic scute and before D. Hind border of pre-operculum evenly rounded near maxilla tip. Maxilla tips reaching to gill opening. V tips reaching beyond D origin. Creamy white with a silvery stripe along flanks; a double pigment line on back before D.

Distribution : East coast of Africa, India, Indonesia, to Samoa.

41. *Stolephorus dubiosus* Wongratana

1983. *Stolephorus dubiosus* Wongratana, *Jap. J. Ichthyol.*, **29**(4) : 400, fig. 18 (Songkhala Lake, Thailand and Chilka Lake, Orissa, India).

Material examined : 1 ex., 59 mm, 13-02-99, Kannur bridge, F-3184; 1 ex., 52 mm, 12-12-2000, Kannur bridge, F-3462; 1 ex., 56 mm, 11-12-2000, Kannur, river mouth, F-3607.

Diagnostic features : D ii, 14; A iii, 18-19; lower GR 25-31; belly with 6-7 needle-like pre-pelvic scutes; pre-dorsal spine and spine of pelvic scute present. Hind border of pre-operculum evenly rounded near maxilla tip; maxilla tip pointed, reaching to or beyond posterior border of pre-operculum. A silvery stripe along flanks; double pigment line along back behind D.

Distribution : Chilka Lake and Godavari estuary; and the Gulf of Thailand.

Remarks : Probably have a wider range of distribution in the brackish waters along the northern Bay of Bengal.

42. *Stolephorus indicus* (van Hasselt)

1823. *Engraulis indica* van Hasselt, *Algemeene Konst.-en Letterbode*, **1**(23) : 329 (Java).

1988. *Stolephorus indicus* : Whitehead *et. al.*, *FAO Fish. Synop.*, (125)7(2) : 412.

Material examined : 1 ex., 62 mm, 12-10-96, Karuwaka mangroves, Pallithummulapalem, F-2323; 4 ex., 54-68 mm, 23-09-98, Sorlagandi nr. Confluence, F-2975; 5 ex., 59-64 mm, Sorlagandi nr. Light House, F-2993; 1 ex., 54 mm, 14-12-2000, Pallithummula-palem, F-3381; 2 ex., 54-55 mm, 13-12-2000, Pallithummulapalem, F-3504.

Diagnostic features : D iii, 12-14; A iii, 16-18; lower GR 21-28; belly with 3-5 needle-like pre-pelvic scutes; no pre-dorsal spine; no spine on pelvic scute. Hind border of pre-operculum evenly rounded near maxilla tip; maxilla tip pointed, reaching to or just beyond anterior border of pre-operculum. A silvery stripe along flanks.

Distribution : Indo-west Pacific.

43. *Thryssa dussumieri* (Valenciennes)

1848. *Engraulis dussumieri* Valenciennes, *Hist. nat. Poiss.*, **21** : 69 (Arabian Sea).

1988. *Thryssa dussumieri* : Whitehead *et. al.*, *FAO Fish. Synop.*, (125)7(2) : 429.

Material examined : 1 ex., 81 mm, 12-12-2000, Kannur bridge, F-3463; 1 ex., 79 mm, 10-12-2000, Jilagaladindi, F-3583.

Diagnostic features : D iii, 9-12; A iii, 31-35; P i, 9; V i, 6; lower GR 17-19, serrae in distinct clumps; scutes (15-16) + (6-9). Maxilla very long, reaching at least halfway along P;

first supra-maxilla absent. A dark blotch behind upper part of gill opening often joined to a dark saddle on nape.

Distribution : Pakistan, India, Sri Lanka, Myanmar, and western Pacific.

44. *Thryssa gautamiensis* Rao

1971. *Thryssa gautamiensis* Babu Rao, *Copeia*, (3) : 473, fig. 1 (Godavari estuary).

Material examined : 1 ex., 135 mm, 25-09-98, Lankavenitippa, F-3013; 1 ex., 92 mm, 13-01-2000, Nachukunta, F-3308; 3 ex., 49-68 mm, 14-12-2000, Pallithummulapalem, F-3382; 3 ex., 75-81 mm, 11-12-2000, Kannur, river mouth, F-3411; 1 ex., 142 mm, 19-12-2000, Sorlagandi, at river mouth, F-3423; 1 ex., 67 mm, 12-12-2000, Kannur bridge, F-3464; 1 ex., 58 mm, 13-12-2000, Pallithummulapalem, F-3506; 1 ex., 175 mm, 20-12-2000, Nachukunta, F-3547.

Diagnostic features : D iii, 10; A iii, 34-37; P i, 13; V i, 6; lower GR 17-20; scutes (14-17) + 10. Tip of snout at about upper rim of eye. Maxilla projecting slightly beyond edge of gill-cover. A dark blotch behind upper part of gill opening; a pair of dark lines on back, from nape to C.

Distribution : East coast of India.

45. *Thryssa hamiltonii* (Gray)

1835. *Thryssa hamiltonii* Gray, *Illustr. Indian Zoology*, 2 : pl. 92, fig. 3 (no locality).

1988. *Thryssa hamiltonii* : Whitehead *et. al.*, *FAO Fish. Synop.*, (125)7(2) : 432.

Material examined : 1 ex., 85 mm, 16-10-96, Yelchettutippa, F-2224; 2 ex., 84-88 mm, 18-10-96, Nachukunta, F-2272; 1 ex., 55 mm, 12-10-96, Karuwaka mangroves nr. Pallithummulapalem, F-2322; 2 ex., 110-113 mm, 16-02-97, Yesupuram, F-2388; 2 ex., 88-107 mm, 08-09-97, Kannur bridge, F-2508; 2 ex., 110-120 mm, 14-02-98, Yelchettutippa, F-2632; 1 ex., 117 mm, 18-02-98, Yesupuram, F-2697; 1 ex., 100 mm, 15-02-98, Lankavenitippa, F-2726; 1 ex., 158 mm, 12-02-98, Jilagaladindi, F-2811; 1 ex., 77 mm, 23-09-98, Sorlagandi, at confluence, F-2974; 2 ex., 75-90 mm, 24-09-98, Sorlagandi nr. Light House, F-2994; 1 ex., 138 mm, 25-09-98, Lankavenitippa, F-3012; 2 ex., 100-105 mm, 13-01-2000, Nachukunta, F-3307; 2 ex., 59-59 mm, 14-12-2000, Pallithummulapalem, F-3383; 2 ex., 88-112 mm, 11-12-2000, Kannur, river mouth, F-3410; 1 ex., 96 mm, 13-12-2000, Pallithummulapalem, F-3505; 1 ex., 154 mm, 10-12-2000, Jilagaladindi, F-3585.

Diagnostic features : D iii, 10-12; A iii, 32-39; P i, 11-12; V i, 6; lower GR 12-14; scutes (16-19) + (8-9). Maxilla tip reaching to edge of gill cover or slightly beyond. A dark blotch behind upper part of gill opening; pigmented line along back.

Distribution : Indo-west Pacific.

46. *Thryssa mystax* (Schneider)

1801. *Clupea mystax* Schneider, *Syst. Ichthyol. Bloch* : 426, pl. 83 (Malabar).

1973. *Thryssa mystax* : Whitehead, *J. mar. biol. Ass. India*, 14(1) : 231, fig. 54.

Material examined : 1 ex., 173 mm, 14-02-98, Yelchettutippa, F-2631; 1 ex., 155 mm, 13-02-99, Kannur bridge, F-3156; 1 ex., 115 mm, 08-01-2000, Manganapudi, F-3281; 1 ex., 98 mm, 13-01-2000, Nachukunta, F-3306; 1 ex., 148 mm, 10-12-2000, Jilagaladindi, F-3584.

Diagnostic features : D iii, 10-12; A iii, 29-37; P i, 12; V i, 6; lower GR 13-16, serrae not clumped; scutes (16-20) + (8-13). Maxilla tip reaching to or beyond P base. A dark venulose area behind upper part of gill opening.

Distribution : India, Sri Lanka, east to Indonesia.

47. *Thryssa purava* (Hamilton)

1822. *Clupea purava* Hamilton, *Fishes of Ganges* : 238, 382 (Ganges estuaries).

1988. *Thryssa purava* : Whitehead *et. al.*, *FAO Fish. Synop.*, (125)7(2) : 440.

Material examined : 2 ex., 37-51 mm, 13-02-99, Kannur bridge, F-3185; 2 ex., 78-150 mm, 05-01-2000, Kannur bridge, F-3353; 3 ex., 57-88 mm, 12-12-2000, Kannur bridge, F-3465;

Diagnostic features : D iii, 9-12; A iii, 38-44; P i, 14; V i, 6; lower GR 17-21; scutes (15-17) + (10-11). Maxilla tip projecting slightly beyond edge of gill cover or to halfway to P base. An indistinct blotch behind upper part of gill opening and a faint mid-dorsal line.

Distribution : East coast of India

48. *Thryssa setirostris* (Broussonet)

1762. *Clupea setirostris* Broussonet, *Ichthyol.* : Text and pl. 2, no pagination (near Thanna Island, Society Islands).

1984. *Thryssa setirostris* : Talwar and Kacker, *Comm. Sea Fish. India* : 204.

Material examined : 1 ex., 122 mm, 15-02-99, Pallithummulapalem, F-3085.

Diagnostic features : D iii, 10-12; A iii, 29-36; P i, 12-13; V i, 6; lower GR 10-12; scutes (16-18) + (9-10). Maxilla very long, extending beyond P tip. A faint venulose area behind upper gill opening.

Distribution : Indo-Pacific

49. *Chanos chanos* (Forsal)

1775. *Mugil chanos* Forsal, *Descript. Animal.* : xiv, 74 (Djedda, Red Sea).

1991. *Chanos chanos* : Talwar and Jhingran, *Inland Fishes of India*, 1 : 150.

Material examined : 2 ex., 38-41 mm, 11-09-97, Kamavericheruvu, F-2197; 2 ex., 72 mm each, 08-10-96, Pallithummulapalem, F-2236; 1 ex., 137 mm, 09-09-97, Palli-thummulapalem, F-2458; 3 ex., 38-123 mm, 10-09-97, Pallithummulapalem, F-2553; 3 ex., 116-135 mm, 17-09-98, Kannur, F-2859; 1 ex., 120 mm, 20-09-98, Mangana-pudi, F-2925; 2 ex., 135-155 mm, 21-09-98, Kamavericheruvu, F-2939; 7 ex., 99-113 mm, 25-09-98, Lankavenitippa, F-3004; 1 ex., 136 mm, 15-02-99, Pallithummulapalem, F-3083.

Diagnostic features : D 13-17; A 9-11; P 15-17; V 11-12; LL 75-90; GR (147-160) + (107-165). Depth 3.1-4.7 in SL. Mouth terminal, small; jaws without teeth. Scales small, cycloid. P and V with large axillary scales. Brilliant silvery, darker dorsally.

Distribution : Indo-west Pacific. Inhabits coastal waters, enters estuaries, rivers and lakes.

50. *Amblypharyngodon mola* (Hamilton)

1822. *Cyprinus mola* Hamilton, *Fishes of Ganges* : 334, 392, pl. 38, fig. 92 (Ponds and rivers of Gangetic Province).

1991. *Amblypharyngodon mola* : Talwar and Jhingran, *Inland Fishes of India*, 1 : 338.

Material examined : 6 ex., 60-68 mm, 07-02-98, Pedakannur, F-2613.

Diagnostic features : D ii-iii, 7; A ii-iii, 5-6; P i, 13-15; V i, 8; LL incomplete, 9-18; LS 65-90; 9-10 scale rows between LL and V base. Depth 3.5-3.8 in SL; eyes 3.5-4.0 in head. Mouth small, upper lip absent; no barbels. Golden yellow with a broad silvery lateral band.

Distribution : Pakistan, India (except Kerala), Bangladesh and Myanmar.

51. *Labeo boga* (Hamilton)

1822. *Cyprinus boga* Hamilton, *Fishes of Ganges* : 286, 386, pl. 12, fig. 1 (Brahmaputra river).

1991. *Labeo boga* : Talwar and Jhingran, *Inland Fishes of India*, 1 : 200.

Material examined : 2 ex., 150-155 mm, 19-02-98, Avanigada fish market, F-2676; 1 ex., 145 mm, 15-02-98, Lankavenitippa, F-2717.

Diagnostic features : D ii-iii, 9-10; A ii, 5; P i, 15; V i, 8; LL 37-39. Depth 4.7-5.3, head 4.5-5.0 in SL; eye 3.7-4.0 in head. Snout without lateral lobe. Mouth narrow; lips thick; lower lip joined to isthmus by a bridge. Barbels-a minute maxillary pair only. D inserted above or slightly anterior to P tip. P tip not reaching V base. Five scale rows between LL and V base. Often with a dark spot above P.

Distribution : Pakistan, India, Nepal, Bangladesh and Myanmar.

52. *Labeo fimbriatus* (Bloch)

1795. *Cyprinus fimbriatus* Bloch, *Naturges. ausland. Fische*, 12 : 50, pl. 409 ("Malabarischen Kueste"= ?Madras).
 1991. *Labeo fimbriatus* : Talwar and Jhingran, *Inland Fishes of India*, 1 : 208.

Material examined : Not obtained.

Diagnostic features : D iii-iv, 15-18; A ii-iii, 5; P i, 15-18; V i, 8; LL 43-47; 6-7 scale-rows between LL and V base; preD 13-18. Eyes 3.7-4.5 in head. Lips thick and fringed. Snout without lateral lobe, studded with minute pores. Barbels 2 short pairs. Dark brown on back; a diffused black blotch often at C base; scales on sides with a red spot each.

Distribution : Pakistan; India-West Bengal and Eastern Ghats; Nepal and Myanmar.

Remarks : Jayaram (1995) recorded this species 'in the entire river stretch including an example from Puligada'

53. *Parluciosoma daniconius* (Hamilton)

1822. *Cyprinus daniconius* Hamilton, *Fishes of Ganges* : 327, 391, pl. 15, fig. 89 (Rivers of southern Bengal).
 1991. *Parluciosoma daniconius* : Talwar and Jhingran, *Inland Fishes of India*, 1 : 382.

Material examined : 1 ex., 44 mm, 12-10-96, Karuwaka mangroves nr. Pallithummulapalem, F-2329.

Diagnostic features : D ii, 7; A ii, 5; P i, 14; V i, 8; LL nearly complete, 31-34; Ltr 4½/1/2½. Mouth small; lips simple; lower jaw with a symphyseal process; no barbels. D inserted behind A origin. Back olive, flanks and belly silvery; a distinct blue-black mid-lateral stripe from eye to base of C, edged above and below by a thin, metallic golden line; a narrow dark stripe above A.

Distribution : Pakistan, India, Sri Lanka, Bangladesh, Myanmar and Mekong.

54. *Puntius chola* (Hamilton)

1822. *Cyprinus chola* Hamilton, *Fishes of Ganges* : 312, 289, (Northern parts of Bengal).
 1991. *Puntius chola* : Talwar and Jhingran, *Inland Fishes of India*, 1 : 263.

Material examined : 1 ex., 45 mm, 10-09-97, Pallithummulapalem, F-2561.

Diagnostic features : D iii, 8; A ii, 5; P i, 14; V i, 8; LL 26-28, complete; preD 10-12. Depth 2.8-3.1 in SL. Barbels one short maxillary pair. D inserted equidistant between snout-tip and C base; last unbranched ray of D osseous, strong and smooth. A large rosy spot on operculum; often a black blotch behind gill cover and a deep black blotch near C base.

Distribution : Pakistan, India, Nepal, Bangladesh, Sri Lanka and Myanmar.

55. *Puntius sophore* (Hamilton)

1822. *Cyprinus sophore* Hamilton, *Fishes of Ganges* : 310, 389 (Ponds and rivers of Gangetic Provinces).

1991. *Puntius sophore* : Talwar and Jhingran, *Inland Fishes of India*, 1 : 288.

Material examined : 2 ex., 37-44 mm, 08-09-97, Kannur bridge, F-2525; 6 ex., 52-56 mm, 07-02-98, Pedakannur, F-2612; 1 ex., 50 mm, 08-02-98, Pedakannur, F-2672; 2 ex., 43-44 mm, 24-09-98, Sorlagandi, near Light House, F-2998; 1 ex., 45 mm, 13-02-99, Kannur bridge, F-3172; 3 ex., 50-61 mm, 11-12-2000, Kannur, river mouth, F-3409; 1 ex., 32 mm, 12-12-2000, Kannur bridge, F-3451.

Diagnostic features : D iii-iv, 8-9; A iii, 5; P i, 14-16; V i, 8; LL 22-27, incomplete; Ltr 4-5/3; preD 8-10. Depth 2.7-3.0, head 3.8-4.1 in SL. No barbels. D inserted equidistant between snout-tip and C base; last unbranched ray of D osseous and smooth. A black blotch at C base and another on central part of D.

Distribution : Pakistan, India, Nepal, Bangladesh, Myanmar and Yunan (China).

56. *Mystus bleekeri* (Day)

1877. *Macrones bleekeri* Day, *Fishes of India* : 451, pl. 101, fig. 1 (replacement name for *Bagrus keletius* Bleeker, 1846) (Bengal).

1991. *Mystus bleekeri* : Talwar and Jhingran, *Inland Fishes of India*, 2 : 558.

Material examined : 1 ex., 76 mm, 07-02-98, Pedakannur, F-2610.

Diagnostic features : D I, 7-8; A iii, 6-7; P I, 9-10. Depth 3.8-4.3 in SL; eyes 4.0-4.5 in head, 1.5 in inter-orbital width. Branchiostegal rays 10. Barbels 4 pairs, maxillary barbel extend up to A. Occipital process twice as long as broad at its base, extends to basal bone of D. Vomerine teeth in a continuous crescentic band. Adipose D large, inserted just behind rayed D. Brownish above, lighter below, with two longitudinal bands, one above and the other below LL.

Distribution : Pakistan, northern India, Bangladesh, Nepal, Myanmar, Sumatra.

Remarks : Its distributional southernmost limit known to be Mahanadi headwaters, while Jayaram (1995) recorded it from Krishna estuary.

57. *Mystus cavasius* (Hamilton)

1822. *Pimelodus cavasius* Hamilton, *Fishes of Ganges* : 203, 379, pl. 11, fig. 67 (Gangetic provinces).

1991. *Mystus cavasius* : Talwar and Jhingran, *Inland Fishes of India*, 2 : 259.

Material examined : Not obtained by us.

Diagnostic features : D I, 7; A iv, 7-9; P I, 8. Depth 4.0-4.5 in SL. Eye 3.2-4.0 in head. Barbels 4 pairs, maxillary barbel extends posteriorly to beyond C base in adults, but up to A

in young. Occipital process narrow, 3.5-4.0 times as long as broad, extends to basal bone of D; median longitudinal groove on head extends to base of occipital process. Vomerine teeth in a continuous crescentic band. Adipose D long, inserted close behind D, almost contiguous with it. Least height of C peduncle about 1.4 in its length. Branchiostegal rays 6. Greyish with a mid-lateral longitudinal stripe; a dark humeral spot present.

Distribution : Pakistan, India, Sri Lanka, Nepal, Bangladesh, Myanmar and Thailand.

Remarks : This species is known to inhabit freshwater, tidal rivers and lakes. Although not recorded from the estuarine region, but occur in Krishna river system (Jayaram, 1995) and also found in other estuarine habitats.

58. *Mystus gulio* (Hamilton)

1822. *Pimelodus gulio* Hamilton, *Fishes of Ganges* : 201, 379, pl. 23, fig. 66 (Higher parts of Gangetic estuaries).

1991. *Mystus gulio* : Talwar and Jhingran, *Inland Fishes of India*, 2 : 260.

Material examined : 2 ex., 86-105 mm, 11-09-97, Kamavericheruvu, F-2204; 2 ex., 78-90 mm, 08-10-96, Pallithummulapalem, F-2239; 1 ex., 114 mm, 18-10-96, Nachukunta, F-2269; 2 ex., 87-110 mm, 10-10-96, Kannur, F-2283; 4 ex., 57-98 mm, Karuwaka mangroves, Pallithummula-palem, F-2325; 1 ex., 85 mm, 11-02-97, Kannur, river mouth, F-2357; 1 ex., 48 mm, 12-02-97, Pallithummulapalem, F-2371; 3 ex., 46-60 mm, 12-02-97, Pallithummulapalem, F-2395; 1 ex., 81 mm, 18-02-97, Yedurumundi, F-2397; 2 ex., 135-150 mm, 13-02-97, Chenta-kaluamundi, F-2434; 21 ex., 95-212 mm, 17-02-97, Yelchettutippa, F-2445; 54 ex., 56-128 mm, 10-02-97, Jilagaladindi, F-24456; 2 ex., 66-87 mm, 09-09-97, Pallithummula-palem, F-2460; 1 ex., 93 mm, 18-09-97, Yeduru-mundi, F-2484; 3 ex., 80-95 mm, 08-09-97, Kannur bridge, F-2514; 4 ex., 75-112 mm, CANR 10-09-97, Pallithummulapalem, F-2555; 1 ex., 86 mm, 15-09-97, Lankavenitippa; F-2572; 2 ex., 105-130 mm, Krishna R. mouth nr. Light House, F-2593; 2 ex., 103-117 mm, 07-02-98, Pedakannur, F-2609; 3 ex., 53-65 mm, 08-02-98, Pedakannur, F-2667; 6 ex., 62-92 mm, 09-02-98, Pallithummulapalem, F-2711; 1 ex., 65 mm, 10-02-98, Jilagaladindi, F-2735; 3 ex., 59-102 mm, 12-02-99, Channel mouth, Kannur, F-3047; 1 ex., 60 mm, 14-02-99, Kannur bridge, F-3052; 2 ex., 65-91 mm, 15-02-99, Pallithummula-palem, F-3086; 2 ex., 78-88 mm, Pulleru mouth, Palakaitippa, F-3102; 1 ex., 70 mm, 17-02-99, Hamsaldivi, F-3114; 2 ex., 70-98 mm, 19-02-99, Krishna estuary, nr. Light House, F-3128; 3 ex., 49-55 mm, 13-02-99, Kannur bridge, F-3162; 1 ex., 71 mm, 10-01-2000, Sorlagandi, F-3197; 3 ex., 53-68 mm, 11-01-2000, Gollalamoda, F-3206; 2 ex., 65-78 mm, 11-01-2000, Gollalmanda, F-3236; 1 ex., 95 mm, 13-01-2000, Nachukunta, F-3294; 2 ex., 70-83 mm, 05-01-2000, Kannur bridge, F-3337; 5 ex., 55-73 mm, 12-12-2000, Kannur bridge, F-3425; 2 ex., 68-70 mm, 13-12-2000, Pallithummula-palem, F-3479; 2 ex., 80-88 mm, 20-12-2000, Nachukunta, F-3544.

Diagnostic features : D I, 7; A ii-iv, 9-11; P I, 8-9. Depth 3.8-4.1 in SL; eye 5-6 in head. Occipital process triangular, about 1.5 times longer than broad at its base, extends to basal bone of D; median longitudinal groove on head short, not reaching base of occipital process. Barbels 4 pairs. D spine strong, serrated on its inner edge; adipose fin small, inserted well behind D. Least height of C peduncle equals its length. Branchiostegal rays 9. Bluish-brown on head and back, dull white below; maxillary barbels black.

Distribution : Pakistan, India, Bangladesh, and Myanmar.

59. *Mystus vittatus* (Bloch)

1797. *Silurus vittatus* Bloch, *Ichthyol. Hist. nat. des. Poiss.*, 11 : 40, pl. 371, fig. 2 (Tranquebar, Tamil Nadu).

1991. *Mystus vittatus* : Talwar and Jhingran, *Inland Fishes of India*, 2 : 573.

Material examined : 1 ex., 89 mm, 07-02-98, Pedakannur, F-2611; 1 ex., 71 mm, 26-09-98, Sangameswara, F-3029.

Diagnostic features : D I, 7; A ii-iii, 7-9; P I, 9. Depth 3.8-4.2 in SL; eyes 4.5-6.0 in head, 1.5-2.0 in inter-orbital width. Occipital process about 3 times as long as broad at its base, reaching basal bone of D; median longitudinal groove on head short, not extending to base of occipital process. Barbels 4 pairs. D spine weak, finely serrated on its inner edge; adipose fin small, inserted much behind D. Least height of C peduncle 1.2 in its length. Branchiostegal rays 10. Colour variable with age; generally grey-silvery to shining golden, with about 5 pale blue or dark brown to deep black longitudinal bands on flanks; a narrow dusky shoulder spot often present.

Distribution : Pakistan, India, Bangladesh, Nepal, Sri Lanka, Myanmar and Thailand.

60. *Ompok bimaculatus* (Bloch)

1797. *Silurus bimaculatus* Bloch, *Ichthyol. Hist. nat. des. Poiss.*, 11 : 17, pl. 364 (Malabar).

1991. *Ompok bimaculatus* : Talwar and Jhingran, *Inland Fishes of India*, 2 : 582.

Material examined : 1 ex., 255 mm, 17-12-2000, Puligada, F-3566.

Diagnostic features : D 4, A ii-iii, 57-58; P I, 12-14; V i, 7-8. Barbels two pairs; maxillary barbels extend to or slightly beyond A origin, the mandibular pair very short. A large dusky spot on shoulder on LL; a small black spot on C peduncle just above LL; often a dark transverse bar across base of C.

Distribution : Afghanistan, Pakistan, India, Sri Lanka, Bangladesh, Myanmar, Thailand, Java and Sumatra, Borneo, China.

61. *Pseudeutropius atherinoides* (Bloch)

1794. *Silurus atherinoides* Bloch, *Naturges. ausland Fische*, 8 : 48, pl. 371, fig. 1 (Tranquebar, Tamil Nadu).

1991. *Pseudeutropius atherinoides* : Talwar and Jhingran, *Inland Fishes of India*, 2 : 606.

Material examined : Not obtained.

Diagnostic features : D I, 5-6, A iii, 30-43; P I, 7. Head 4.1-4.8 in SL; eye 2.5-3.0 in head. Mouth small, cleft of mouth reaching below anterior margin of eye or shorter; vomero-palatine teeth in 2 distinct widely separated patches. Barbels 4 pairs, maxillary pair extends to A. A originate slightly behind D. Branchiostegal rays 6. Silvery-green above; 3-4 longitudinal bands on flank; a pale golden stripe along LL ending in a dusky spot at C base; a black spot at nape; area above P translucent.

Distribution : India, Bangladesh, Myanmar, and Nepal.

Remarks : This species is known to inhabit tidal rivers and freshwaters, and also reported from Godavari estuary (Rao, 1976). Its presence in the Krishna river system (Jayaram, 1995) leads the author to include here.

62. *Silonia childreni* (Sykes)

1838. *Ageniosus childreni* Sykes, *Proc. zool. Soc. Lond.*, (6) : 165 (Mula Matha river, near Poona).

1991. *Silonia childreni* : Talwar and Jhingran, *Inland Fishes of India*, 2 : 611.

Material examined : Not obtained.

Diagnostic features : D I, 7; A ii-iii, 44-50; P I, 12. Depth 4.5-5.0 in SL. Teeth in jaws caniniform. Barbels 2 pairs; mandibular barbel equal to eye-diameter; maxillary barbel extends to operculum; Airbladder large. Bluish on back, white below.

Distribution : Western Ghats, and the Krishna, Godavari and Cauvery river systems.

Remarks : Jayaram (1995) obtained this species from Puligada and Avanigada.

63. *Ariodes dussumieri* (Valenciennes)

1840. *Arius dussumieri* Valenciennes, *Hist. nat. Poiss.*, 15 : 84 (Malabar, India).

1986. *Ariodes dussumieri* : Taylor, in Smith and Heemstra, *Smith's Sea Fishes* : 59.

Material examined : 1 ex., 175 mm, 13-02-97, Chentakaluamundi, F-2436; 1 ex., 126 mm, 21-09-98, Kamavericheruvu, F-2944.

Diagnostic features : D I, 7; A iv-v, 10-11; P I, 12; GR 14-16. A prominent protuberance of the supra-ethmoid bone on either side of eye. Supra-occipital process more or less evident, sub-triangular, rugose, striated. Teeth on palate in two patches on each side, arranged in a

longitudinal series, anterior patch small and posterior patch large, elliptical and diverging posteriorly. Bluish above, lighter below; adipose fin with a black spot.

Distribution : Indian Ocean.

64. *Arius arius* (Hamilton)

1822. *Pimelodus arius* Hamilton, *Fishes of Ganges* : 170, 376 (Estuaries of Bengal).

1991. *Arius arius* : Talwar and Jhingran, *Inland Fishes of India*, 2 : 700.

Material examined : 1 ex., 185 mm, 16-02-97, Lankavenitippa, F-2413; 1 ex., 95 mm, 13-02-97, Chentakalumundi, F-2435; 1 ex., 121 mm, 14-02-98, Yelchettutippa, F-2629; 2 ex., 102-115 mm, 15-02-98, Lankavenitippa, F-2721; 1 ex., 110 mm, 12-12-2000, Kannur bridge, F-3426.

Diagnostic features : D I, 7; A v-vi, 14-16; P I, 10; V i, 5. Median fontanelle groove on top of head shallow, not reaching to base of supra-occipital process. Eyes 1.6-2.5 in inter-orbital width. Teeth on palate globular, in a single ovate patch on each side with a horn-like conical anterior projection. Tip of D spine prolonged into a filament. Back dark bluish to silvery; adipose fin with black spot.

Distribution : Pakistan, India, Bangladesh, and Myanmar.

65. *Arius caelatus* Valenciennes

1840. *Arius caelatus* Valenciennes, *Hist. nat. Poiss.*, 15 : 66 (Bombay).

Material examined : 1 ex., 160 mm, 12-02-98, Jilagaladindi, F-2809.

Diagnostic features : D I, 7; A v-vi, 14-16; P I, 9; V i, 5. Head shield strongly granulated behind orbit; a conical protuberance above eye, tapering as a wide 'V' towards occiput. Teeth on palate villiform, densely packed in a single small, roughly triangular patch, with a single concavity, on each side. Outer ray of D prolonged some times into a black filament. Fin tips black edged; adipose fin black, at least on upper half. Fresh specimens with scarlet-red fins, body and sides gold glossed.

Distribution : Pakistan, India, to Indonesia.

66. *Arius jella* Day

1877. *Arius jella* Day, *Fishes of India*, (3) : 467, pl. 106, fig. 3 (Madras).

Material examined : 1 ex., 95 mm, 18-10-96, Nachukunta, F-2271; 12 ex., 62-100 mm, 11-02-97, Kannur, river mouth, F-2352; 4 ex., 115-125 mm, 16-02-97, Yesupuram, F-2380; 1 ex., 127 mm, 16-02-97, Lankavenitippa, F-2414; 6 ex., 84-138 mm, 10-02-97, Jilagaladindi,

F-2452; 1 ex., 68 mm, 18-09-97, Yeduru-mundi, F-2483; 3 ex., 68-70 mm, 08-09-97, Kannur bridge, F-2517; 1 ex., 72 mm, 12-09-97, Kannur, F-2588; 1 ex., 71 mm, 07-02-98, Pedakannur, F-2614; 2 ex., 95-96 mm, 18-02-98, Yesupuram, F-2698; 2 ex., 145-170 mm, 23-09-98, Sorlagandi, near confluence, F-2965; 8 ex., 61-104 mm, 12-02-99, Channel mouth, Kannur, F-3046.

Diagnostic features : D I, 7; A iv-v, 12-14; P I, 10; V i, 5. Eye 6-7 in head. Median fontanelle on top of head broad and flat, reaching to base of supra-occipital process. Palatine teeth globular, in a single large ovate patch on each side, with loosely packed teeth; inner margins of the patches not straight. D and P spine strongly serrated. Bluish-black above; adipose fin with a black blotch.

Distribution : India, Sri Lanka, and Myanmar.

67. *Plotosus canius* Hamilton

1822. *Plotosus canius* Hamilton, *Fishes of Ganges* : 142, 374, pl. 15, fig. 44 (Rivers of lower Bengal).

Material examined : 1 ex., 40 mm, 18-02-97, Krishna R. mouth, S of Nagailanka, F-2338; 1 ex., 75 mm, 11-01-00, Gollalmanda, F-3244.

Diagnostic features : D I, 4; D procurrent C 69-115; A 58-82; P I, 11-14; V i, 11-15; C 9-11; GR 22-26. Eye 8.3-14.3 in head. Barbels 4 pairs; nasal barbels long, reaching well behind eyes, usually to nape; maxillary barbels extending to P base. Dark olive-green above, below soiled creamy buff.

Distribution : Pakistan, India, through Indonesia to Papua New Guinea, the Philippines.

68. *Saurida longimanus* Norman

1939. *Saurida longimanus* Norman, *Fishes, Rept. John Murray Exped. 1933-34*, 7(1) : 1-116 (Gulf of Oman).

Material examined : 1 ex., 140 mm, 10-12-2000, Jilagaladindi, F-3557.

Diagnostic features : D 11-12; A 11-12; P 14; V 9; LL 48-50. P very long, reaching beyond level of D origin. No spots on upper edge of C.

Distribution : Gulf of Oman, north Arabian Sea, East coast of India.

69. *Saurida undosquamis* (Richardson)

1848. *Saurus undosquamis* Richardson, *Zool. 'Erebus and Terror' Fishes* : 138, pl. 51, figs. 1-6 (Northwest Australia).

1984. *Saurida undosquamis* : Talwar and Kacker, *Comm. Sea fish. India* : 285.

Material examined : 1 ex., 148 mm, 17-09-98, Kannur, F-2862.

Diagnostic features : D 11-13; A 9-12; P 14-15; LL 45-50; Ltr 4½/5½. P reaches line from D origin to V origin. Body brown grey, with 8-10 dark blotches along LL; a series of dark spots along front edge of D and upper edge of C.

Distribution : Indo-west Pacific, Mediterranean.

70. *Harpadon nehereus* (Hamilton)

1822. *Osmerus nehereus* Hamilton, *Fishes of Ganges* : 209 (Mouth of Ganges river).

1991. *Harpadon nehereus* : Talwar and Jhingran, *Inland Fishes of India*, 2 : 724.

Material examined : 1 ex., 150 mm, 19-09-98, Pallithummulapalem, F-2905; 1 ex., 200 mm, 21-02-99, Creek nr. sea, Lankavenitippa, F-3067.

Diagnostic features : D 12-14; A 13-15; P i, 10-11; V i, 8; adipose D present. Eyes small, covered by adipose membrane; snout very short. Mouth wide, armed with slender and depressible teeth of unequal size; palatine teeth large, depressible; lower jaw longer than upper. P long, its tip reaching beyond V origin; V tip extending beyond A origin. Uniform light grey, speckled with black.

Distribution : Indo-west Pacific.

71. *Bregmaceros maclellandi* Thompson

1840. *Bregmaceros maclellandi* Thompson, *Mag. Nat. Hist. Charlesworth*, 4 : 184, fig. (Gangetic Delta).

Material examined : 2 ex., 57-63 mm, 13-12-2000, Pallithummulapalem, F-3490.

Diagnostic features : D I + 56-65; A 58-69; P 17-24; V 5-7; LS 70-90; Ltr 13-15. V jugular, outer 3 rays very long and unbranched. Depth 6.5-9.2 in SL. D origin opposite A origin. Brown above with speckling, silvery below.

Distribution : Circum-tropical, except eastern Pacific.

72. *Hyporhamphus limbatus* (Valenciennes)

1846. *Hemiramphus limbatus* Valenciennes, *Hist. nat. Poiss.*, 19 : 44 (Malabar, Bombay and Pondicherry).

1991. *Hyporhamphus limbatus* : Talwar and Jhingran, *Inland Fishes of India*, 2 : 734.

Material examined : 5 ex., 77-135 mm, 11-09-97, Kamavericheruvu, F-2206; 7 ex., 75-131 mm, 08-10-96, Pallithummulapalem, F-2240; 1 ex., 82 mm, Kannur, F-2288; 3 ex., 80-127 mm, 10-09-97, Pallithummulapalem, F-2563; 1 ex., 133 mm, 14-02-98, Yelchettutippa, F-2630; 1 ex., 157 mm, 20-02-98, Nagailanka ferry point, F-2652; 5 ex., 68-110 mm, 17-09-98, Kannur, F-2873; 14 ex., 70-130 mm, 18-09-98, Pallithummulapalem, F-2879; 1 ex., 52 mm, 20-09-98, Mangana-pudi, F-2931; 1 ex., 67 mm, 21-09-98, Kamavericheruvu,

F-2942; 4 ex., 64-88 mm, 24-09-98, Sorlagandi, near Light House, F-2996; 1 ex., 82 mm, 10-01-2000, Sorlagandi, F-3199; 1 ex., 65 mm, 11-12-2000, Kannur river mouth, F-3408; 5 ex., 61-92 mm, 12-12-2000, Kannur bridge, F-3441.

Diagnostic features : D 12-16; A 13-16; P i, 10-11; GR 23-37. Head 3.5-3.7 in trunk. Upper jaw triangular, short and scaly; its width 0.6-0.8 in length. Lower jaw longer than head length. Teeth minute, tricuspid. Preorbital canal simple, without posterior branch. C emarginate. Greenish above, flank with silvery stripe; fleshy tip of beak reddish; fins hyaline.

Distribution : Persian Gulf, through India, to Thailand and China.

73. *Rhynchorhamphus georgii* (Valenciennes)

1846. *Hemiramphus georgii* Valenciennes, *Hist. nat. Poiss.*, 19 : 37, pl. 555 (Bombay, India).

1984. *Rhynchorhamphus georgii* : Talwar and Kacker, *Comm. Sea Fish. India* : 316 (name only in key to species).

Material examined : 2 ex., 180-190 mm, 18-02-98, Yesupuram, F-2684; 2 ex., 195-205 mm, 13-12-2000, Pallithummulapalem, F-3495.

Diagnostic features : D 14-17; A 13-15; P 11; LL 54-58; GR 47-67 (usually less than 62). Upper jaw longer and more domed and scaly; its width 1.2-1.3 in its length. Nasal papilla fimbriate. Rays of D plus A, usually 29 or more. C distinctly forked, lower lobe longer. Two branches of LL running towards P base. Bluish-green above, silvery-white below; fleshy tip of beak red.

Distribution : Coasts of India, to Indonesia.

74. *Zenarchopterus buffonis* (Valenciennes)

1846. *Hemiramphus buffonis* Valenciennes, *Hist. nat. Poiss.*, 19 : 48 (Pulo-Pinan, Philippines).

1991. *Zenarchopterus buffonis* : Talwar and Jhingran, *Inland Fishes of India*, 2 : 736.

Material examined : 1 ex., 123 mm, 15-02-99, Pallithummulapalem, F-3093; 3 ex., 109-115 mm, 19-02-99, Krishna estuary, N of Light House, F-3135; 1 ex., 100 mm, 07-01-2000, Pallithummulapalem, F-3263; 4 ex., 107-136 mm, 13-01-2000, Nachukunta, F-3310; 2 ex., 75-108 mm, 13/14-12-2000, Pallithummulapalem, F-3379; 3 ex., 87-104 mm, 13-12-2000, Pallithummulapalem, F-3494.

Diagnostic features : D 11-14; A 10-12; P 10; preD 27-32. Upper jaw wider than long, its length 6.6-7.5 in free lower jaw. In adult male 4th-7th ray of D slightly elongated and 6th ray of A expanded and somewhat elongated. A prominent dark brown stripe along midline of snout; beak black. D and anterior outer half of A blackish.

Distribution : India : Hooghly estuary, Andaman Islands; Malaya Peninsula; Indonesia; the Philippines; northern Australia.

Remarks : It was earlier known only from Hooghly estuary along Indian coast. This report extends its distributional range southward to the Krishna estuary along the east coast of India.

75. *Strongylura leiura* (Bleeker)

1851. *Belone leiurus* Bleeker, *Nat. Tijdschr. Ned.-Indie*, 1 : 94 (Java).

1991. *Strongylura leiura* : Talwar and Jhingran, *Inland Fishes of India*, 2 : 741.

Material examined : 1 ex., 121 mm, 13-12-2000, Pallithummulapalem, F-3492.

Diagnostic features : D 17-21; A 23-25; P 10-11. Body rectangular in cross-section. C emarginate. D origin over 7-10th ray of A. P with a distal spot.

Distribution : Indo-west Pacific.

76. *Strongylura strongylura* (van Hasselt)

1823. *Belone strongylura* van Hasselt, *Algem. Konst. Letterbode*, 2 : 130 (Vizagapatnam).

1991. *Strongylura strongylura* : Talwar and Jhingran, *Inland Fishes of India*, 2 : 742.

Material examined : 1 ex., 325 mm, 18-02-98, Yesupuram, F-2687; 2 ex., 137-144 mm, 05-01-00. Kannur bridge, F-3342; 1 ex., 233 mm, 13-12-00, Pallithummulapalem, F-3493.

Diagnostic features : D 12-15; A 15-18; P 10-12. Body rounded in cross-section; C rounded or truncate; D inserted behind A origin. A prominent rounded black spot on upper part of C base.

Distribution : Indo-west Pacific.

77. *Tylosurus crocodilus* (Peron & LeSueur)

1821. *Belone crocodila* Peron and LeSueur, in LeSueur, *J. Acad. nat. Sci. Phillad.*, 2(2) : 129 (Mauritius).

1984. *Tylosurus crocodilus* : Talwar and Kacker, *Comm. Sea Fish. India* : 326.

Material examined : 1 ex., 455 mm, 18-02-98, Yesupuram, F-2686.

Diagnostic features : D 21-24; A 19-22; P 14-15. Depth 8.8-14.1, head 2.1-2.5 in body length. C deeply forked, lower lobe much longer than upper. Teeth in upper jaw usually inclined anteriorly. Back dark bluish-green, silvery below.

Distribution : Worldwide, in tropical and warm temperate seas.

78. *Oryzias melastigma* (McClelland)

1839. *Aplocheilus melastigmus* McClelland, *Asiatic Res.*, 19(2) : 301, 427, pl. 42, fig. 3 & pl. 35, fig. 4 (? Calcutta).

1991. *Oryzias melastigma* : Talwar and Jhingran, *Inland Fishes of India*, 2 : 745.

Material examined : 4 ex., 30-35 mm, 10-09-97, Pallithummulapalem, F-2560; 1 ex., 20 mm, 11-01-2000, Gollalamoda, F-3221.

Diagnostic features : D 6-7; A 20-24; P 15; V 6; LS 27; Ltr 9-11. Mouth upturned; eyes large. D inserted above posterior 7th of A. Several dark blotches on flanks; a thin dark line along middle of sides of body ending as a caudal spot.

Distribution : India, Bangladesh and Myanmar.

79. *Fistularia petimba* Lacepede

1803. *Fistularia petimba* Lacepede, *Hist. nat. Poiss.*, 5 : 189 (New Britain, Reunion and equatorial Pacific).

Material examined : 1 ex., 315 mm, 11-02-98, Jilagaladindi, F-2749; 2 ex., 285-295 mm, 10-12-2000, Jilagaladindi, F-3569.

Diagnostic features : D 14-17; A 14-15; P 15-17; LL about 80. Upper, lateral and lower ridges of snout serrate; post-temporal ridge with large antrorse serrae. Elongate bony plates along dorsal midline in front of and behind D. Posterior LL ossifications ending in a retrorse spine. Reddish to orange-brown dorsally, silvery ventrally.

Distribution : Atlantic, Indian and western Pacific Oceans.

80. *Hippichthys spicifer* (Ruppell)

1838. *Syngnathus spicifer* Ruppell, *Neue Wirbelth. Zu der Fauna von Abyssien gehorig, Fische* : 143, pl. 33, fig. 4 (Red Sea).

1991. *Hippichthys spicifer* : Talwar and Jhingran, *Inland Fishes of India*, 2 : 766.

Material examined : 1 ex., 83 mm, 11-01-2000, Gollalmanda, F-3247.

Diagnostic features : D 25-30; A 2-3; P 15-18; Rings (14-16) + (36-41); total sub-dorsal rings 5-6. Lateral snout ridge vestigial or obsolete; scutula with distinct longitudinal keel. Head 6.9-10.3 (average 8.0) in SL. D origin on 2nd or 3rd tail ring. Variably brownish, mottled or with prominent dark bars crossing lower half of side and venter of trunk; bars obscured in some adults.

Distribution : Indo-west Pacific.

81. *Ichthyocampus carce* (Hamilton)

1822. *Syngnathus carce* Hamilton, *Fishes of Ganges* : 13, 362 (Ganges estuary).

1991. *Ichthyocampus carce* : Talwar and Jhingran, *Inland Fishes of India*, 2 : 768.

Material examined : 1 ex., 92 mm, 04-01-2000, Kannur, F-3326; 7 ex., 76-98 mm, 05-01-00, Kannur bridge, F-3355; 1 ex., 107 mm, Pallithummulapalem, F-3377; 1 ex., 100 mm, 12-12-00, Kannur bridge, F-3447.

Diagnostic features : D 22-27; A 2; P 14-16; rings (14-15) + (37-40); total sub-dorsal rings 4.5-5.5. Head 8.5-10.9 in SL. Superior and inferior ridges of trunk and tail continuous; lateral trunk ridge deflected ventrad near anal ring but not confluent with inferior ridge. D origin above rear margin of 1st tail ring to middle of 3rd. Brownish, often with diffuse bars on body; usually with a pale spot on or above the inferior ridge on each trunk ring.

Distribution : West coast of India to the Celebes.

82. *Ophisternon bengalense* McClelland

1845. *Ophisternon bengalensis* McClelland, *Calcutta J. nat. Hist.*, 5(18) : 197, 220, pl. 11, fig. 1 (Hooghly river).

1991. *Ophisternon bengalense* : Talwar and Jhingran, *Inland Fishes of India*, 2 : 780.

Material examined : 2 ex., 210-300 mm, 11-10-96, Pulleru mouth, Pedapatnam, F-2244; 2 ex., 212-220 mm, 10-10-96, Kannur, F-2278; 1 ex., 350 mm, 08-09-97, Kannur bridge, F-2533; 1 ex., 430 mm, 12-12-2000, Kannur bridge, F-3440.

Diagnostic features : Body eel-like and robust. Eyes minute; mouth large; lips fleshy; teeth on jaws small and pointed, not continuous at symphysis; teeth on palates in a band. Gill opening a simple crescentic transverse fold free from isthmus. LL conspicuous. Branchiostegal rays 6. Brownish-red to black.

Distribution : Indo-Malayan region and the Philippines.

83. *Cociella crocodila* (Tilesius)

1812. *Platycephalus crocodiles* Tilesius, *Dan. Bayer. Akad. Wiss.* : pl. 59, fig. 2 (Nagasaki, Japan).

1986. *Cociella crocodila* : Knapp, in Smith and Heemstra, *Smith's Sea Fishes* : 483.

Material examined : Not obtained.

Diagnostic features : D I/VIII + 11; A 11; P 19-21; LL 53-55. Head 2.6-3.0 in SL. Teeth in vomer in 2 separate patch. Bony ridge crossing cheek below eye with 3 spines-1 in front of eye, 1 below middle of eye, 1 below rear margin of eye, rarely a minute 4th spine behind eye. Number of scale series slanting downward and backward above LL greater than number of

pored LL scales. Brownish, with many dark spots dorsally; back crossed by 4-5 dark brown bands. Spiny D with a broad black band near edge; other fins spotted.

Distribution : Indo-west Pacific.

Remarks : Included here following Jayaram (1995).

84. *Platycephalus indicus* (Linnaeus)

1758. *Callionymus indicus* Linnaeus, *Systema Naturae* (ed. 10), 1 : 250 (Asia).

1991. *Platycephalus indicus* : Talwar and Jhingran, *Inland Fishes of India*, 2 : 782.

Material examined : 1 ex., 137 mm, 19-02-99, Krishna estuary, N of Light House, F-3126; 1 ex., 136 mm, 11-01-2000, Gollalamoda, F-3205; 2 ex., 65-92 mm, 11-01-2000, Gollalmanda, F-3234; 2 ex., 128-146 mm, 13-01-2000, Nachukunta, F-3289; 1 ex., 183 mm, 20-12-2000, Nachukunta, F-3545.

Diagnostic features : D I/VIII + 13; A 13; P 18; V I, 5; GR (2-3) + (7-8); LL 68-82. Head bearing smooth bony ridges; a small pre-ocular spine and two pre-opercular spines. Teeth on vomer in one transverse patch. Brownish above, whitish below; C with 2-3 horizontal black stripes.

Distribution : Indo-west Pacific.

85. *Suggrundus bengalensis* (Rao)

1966. *Platycephalus bengalensis* Rao, *Ann. Mag. nat. Hist.*, (13)9 : 124, fig. 1 (Visakhapatnam).

Material examined : 2 ex., 85-145 mm, 11-02-98, Jilagaladindi, F-2745.

Diagnostic features : D IX + 11; A 12; P 17-19; GR (2-3) + (8-10); LL 72-78, 7 or 8 anterior scales with spines. Head 3.0-3.3 in SL. A sharp spine before and behind upper margin of eye; supra-orbital ridge serrated; preopercular spine strong, not extending to gill opening. Teeth on vomer in two patches. Dark grey-brown, with irregular lighter blotches. Spinous D with a black blotch between 2nd and 3rd spine; soft D not spotted. P black, with a pale ocellus at the middle.

Distribution : Northeast coast of India.

Remarks : Some authors consider this species as junior synonym of *S. rodricensis* (Cuvier).

86. *Lates calcarifer* (Bloch)

1790. *Holocentrus calcarifer* Bloch, *Naturges. ausland. Fische*, (4) : 100, pl. 244 (? Indonesia).

1991. *Lates calcarifer* : Talwar and Jhingran, *Inland Fishes of India*, 2 : 789.

Material examined : 1 ex., 102 mm, 17-10-96, Goalмата Light House area, F-2234; 1 ex., 141 mm, 12-02-97, Pallithummulapalem, F-2363; 1 ex., 124 mm, 10-02-97, Jilagaladindi, F-

2448; 1 ex., 210 mm, 08-02-98, Pedakannur, F-2656; 2 ex., 132-171 mm, 19-09-98, Pallithummulapalem, F-2901; 2 ex., 105-129 mm, 21-09-98, Kamavericheruvu, F-2938; 1 ex., 76 mm, 11-01-2000, Gollalamoda, F-3207; 1 ex., 70 mm, 07-01-2000, Palli-thummulapalem, F-3255; 1 ex., 125 mm, 17-12-2000, Palakaitippa, F-3367; 3 ex., 56-145 mm, 13-12-2000, Pallithummulapalem, F-3487; 1 ex., 89 mm, 20-12-2000, Nachukunta, F-3546.

Diagnostic features : D VII-IX + I, 10-11; A III, 7-8; P 17; V I, 5; lower GR 16-17; LL 52-61. Upper jaw reaching to behind eyes; nostrils close together; lower edge of preopercle serrated; tongue smooth. Olive-brown above, silvery below.

Distribution : Indo-west Pacific.

87. *Ambassis commersonii* Cuvier

1828. *Ambassis commersonii* Cuvier (*partim*), *Hist. nat. Poiss.*, 2 : 176, pl.25, fig. 29 (Pondicherry).

Material examined : 1 ex., 54 mm, 11-09-97, Kamavericheruvu, F-2194; 9 ex., 45-95 mm, 16-10-96, Yelchettutippa, F-2226; 3 ex., 61-85 mm, 18-10-96, Nachukunta, F-2273; 1 ex., 51 mm, 10-10-96, Kannur, F-2290; 8 ex., 42-73 mm, 12-10-96, Karuwaka mangroves, Pallithummulapalem, F-2310; 3 ex., 49-64 mm, 18-02-97, Krishna R. mouth, F-2343; 2 ex., 49-56 mm, 11-02-97, Kannur river mouth, F-2345; 2 ex., 69-70 mm, 12-02-97, Pallithummulapalem, F-2364; 6 ex., 52-72 mm, 18-02-97, Yedurumundi, F-2405; 1 ex., 78 mm, 16-02-97, Lankavenitippa, F-2412; 1 ex., 57 mm, 13-02-97, Chentakalua-mundi, F-2429; 1 ex., 78 mm, 09-09-97, Pallithummulapalem, F-2463; 1 ex., 33 mm, 19-09-97, Palakaitippa, F-2471; 1 ex., 35 mm, 18-09-97, Yedurumundi, F-2491; 3 ex., 52-82 mm, 08-09-97, Kannur bridge, F-2515; 7 ex., 42-65 mm, 16-09-97 Eakhetulutippa, F-2546; 2 ex., 82-88 mm, 10-09-97, Pallithummulapalem, F-2557; 14 ex., 39-62 mm, 15-09-97, Lankavenitippa, F-2581; 9 ex., 35-77 mm, 17-09-97, Light House, Krishna R. mouth, F-2601; 1 ex., 51 mm, 08-02-98, Pedakannur, F-2616; 1 ex., 59 mm, 14-02-98, Yelchettutippa, F-2635; 1 ex., 88 mm, 08-02-98, Pedakannur, F-2665; 2 ex., 81-89 mm, 19-02-98, Avanigada fish market, F-2677; 5 ex., 70-85 mm, 15-02-98, Lanka-venithippa, F-2722; 2 ex., 47-53 mm, 16-09-98, Kannur river mouth, F-2848; 1 ex., 70 mm, 18-09-98, Pallithummulapalem, F-2886; 5 ex., 55-66 mm, 23-09-98, Sorlagandi, confluence, F-2952; 7 ex., 50-77 mm, 24-09-98, Sorlagandi, nr. Light House, F-2983; 14 ex., 60-85 mm, 17-02-99, Hamsaldivi, F-3109; 4 ex., 67-84 mm, 19-02-99, Krishna estuary, North of Light House, F-3142; 9 ex., 36-53 mm, 13-02-99, Kannur bridge, F-3166; 2 ex., 64-65 mm, 11-01-2000, Gollala-moda, F-3214; 1 ex., 75 mm, 11-01-2000, Gollalmanda, F-3238; 3 ex., 64-81 mm, 13-01-2000, Nachukunta, F-3299; 1 ex., 76 mm, 04-01-2000, Kannur, F-3314; 1 ex., 92 mm, 05-01-2000,

Kannur bridge, F-3344; 1 ex., 75 mm, 18-12-2000, Yesupuram, F-3372; 2 ex., 56-57 mm, 11-12-2000, Kannur river mouth, F-3399; 4 ex., 57-70 mm, 12-12-2000, Kannur bridge, F-3433; 1 ex., 56 mm, 19-12-2000, Sorlagandi, F-3422; 8 ex., 51-72 mm, 13-12-2000, Pallithummulapalem, F-3497.

Diagnostic features : D VII + I, 8-9; A III, 8-9; P i, 12-14; V I, 5; LL 27-30, complete; preD 16-21; cheek with 2 scale rows. Supra-orbital ridge smooth, ending posteriorly in a spine; preorbital ridge entire. Bright silvery with mid-lateral stripe.

Distribution : Indo-west Pacific.

88. *Ambassis gymnocephalus* (Lacepede)

1802. *Lutjanus gymnocephalus* Lacepede, *Hist. nat. Poiss.*, 3 : 181, 216, pl. 23, fig. 3 (Indo-Pacific).

1991. *Ambassis gymnocephalus* : Talwar and Jhingran, *Inland Fishes*, 2 : 796.

Material examined : 1 ex., 39 mm, 11-09-97, Kamavericheruvu, F-2195; 4 ex., 36-41 mm, 11-10-96, Pulleru mouth, F-2257; 2 ex., 35-39 mm, 10-10-96, Kannur, F-2291; 23 ex., 26-47 mm, 18-02-97, Krishna R. mouth, S of Nagailanka, F-2342; 7 ex., 40-43 mm, 12-02-97, Pallithummulapalem, F-2365; 3 ex., 44-49 mm, 18-02-97, Yedurumundi, F-2406; 1 ex., 33 mm, 13-02-97, Chentakaluamundi, F-2430; 1 ex., 30 mm, 10-02-97, Jilagaladindi, F-2454; 63 ex., 36-45 mm, 19-09-97, Palakaitippa, F-2470; 9 ex., 34-43 mm, 18-09-97, Yedurumundi, F-2492; 51 ex., 33-42 mm, 16-09-97, Eakhetulutippa, F-2547; 3 ex., 41-46 mm, 10-09-97, Pallithummula-palem, F-2558; 61 ex., 33-41 mm, 07-09-97, Kannur river mouth, F-2564; 64 mm, 33-38 mm, 12-09-97, Kannur, F-2584; 49 ex., 39-44 mm, 17-09-97, Krishna R. mouth, nr. Light House, F-2600; 1 ex., 46 mm, 07-02-98, Pedakannur, F-2617; 1 ex., 41 mm, 08-02-98, Pedakannur, F-2666; 1 ex., 33 mm, 09-02-98, Pallithummulapalem, F-2710; 3 ex., 34-38 mm, 15-09-98, Kannur bridge, F-2829; 3 ex., 35-44 mm, 16-09-98, Kannur river mouth, F-2849; 3 ex., 35-41 mm, 17-09-98, Kannur, F-2870; 6 ex., 37-43 mm, 18-09-98, Pallithummulapalem, F-2887; 1 ex., 43 mm, 20-09-98, Manganapudi, F-2930; 3 ex., 41-47 mm, 23-09-98, Sorlagandi, confluence, F-2951; 2 ex., 39-40 mm, 24-09-98, Sorlagandi, nr. Light House, F-2984; 2 ex., 36-39 mm, 17-02-99, Hamsaldivi, F-3110; 25 ex., 31-51 mm, 20-02-99, Pulleru mouth, Palakaitippa, F-3104; 6 ex., 30-45 mm, 19-02-99, Krishna estuary, N of Light House, F-3143; 23 ex., 31-48 mm, 13-02-99, Kannur bridge, F-3167; 6 ex., 22-42 mm, 11-01-2000, Gollalamoda, F-3215; 3 ex., 43-47 mm, 11-01-2000, Gollalmanda, F-3239; 1 ex., 40 mm, 07-01-2000, Pallithummulapalem, F-3260; 2 ex., 38-43 mm, 10-01-2000, Sorlagandi, nr. Light House, F-3265; 19 ex., 40-49 mm, 19-12-2000, Sorlagandi, river mouth, F-3421; 2 ex., 34-43 mm, 12-12-2000, Kannur bridge, F-3434; 7 ex., 31-39 mm, 13-12-2000, Pallithummulapalem, F-3498.

Diagnostic features : D VIII + I, 8-10; A III, 9-10; P ii, 12-14; V I, 5; LL interrupted; LS 24-28; preD 12-15; cheek with 2 scale rows. Supra-orbital ridge dentate, with 2-4 spines posteriorly; pre-orbital ridge dentate; pre-opercular ridge serrated. Silvery with mid-lateral stripe.

Distribution : Indo-west Pacific.

89. *Ambassis miops* Gunther

1871. *Ambassis miops* Gunther, *Proc. zool. Soc. London* : 655 (Rarotonga, Cooks Is., Pacific Ocean).

Material examined : 2 ex., 45-48 mm, 11-01-2000, Gollalamoda, F-3216.

Diagnostic features : D VII + I, 8; A III, 9; P i, 14; V I, 5; LL about 28, complete; cheek with 2 scale rows. Supra-orbital ridge smooth; pre-orbital edge serrated, ridge smooth; pre-operculum denticulate on ridge and edge, hind margin entire. Yellowish-white with pepper-like pigments on scale margin on upper side; a thin black stripe along flank.

Distribution : Indo-west Pacific.

90. *Acropoma japonicum* Gunther

1859. *Acropoma japonicum* Gunther, *Cat. Brit. Mus.*, 1 : 250 (based on *Acropoma* Temminck and Schlegel, 1843 : 31, pl. 12, figs. 2 & 3; Japan).

Material examined : 1 ex., 73 mm, 10-12-2000, Jilagaladindi, F-3614.

Diagnostic features : D VIII-IX + I, 10; A III, 7; P 15-16; LL 43-45; GR (5-8) + (15-18). Anus nearer to V origin than to A. Scales ctenoid, easily shed. Two large canines at front of upper jaw, between which fits a pair of smaller canines at front of lower jaw. Pink; silvery below and covered with small dark spots.

Distribution : Indian Ocean, the Philippines, northern Australia and Japan.

Remarks : This is known to inhabit deep waters, so probably a stray specimen.

91. *Epinephelus coioides* (Hamilton)

1822. *Bola coioides* Hamilton, *Fishes of Ganges* : 82 (Ganges estuaries).

1993. *Epinephelus coioides* : Heemstra and Randal, *FAO Fish. Synop.*, (125)16 : 130.

Material examined : 1 ex., 80 mm, 18-02-97, Krishna R mouth, S of Nagailanka, F-2340; 2 ex., 160-175 mm, 11-02-98, Jilagaladindi, F-2766; 1 ex., 78 mm, 19-02-99, Krishna estuary, N of Light House, F-3149; 1 ex., 66 mm, 11-01-2000, Gollalamoda, F-3228.

Diagnostic features : D XI, 14-16; A III, 8; P 18-20; GR (8-10) + (14-17), total 23-26; LL pored 58-65; LS 100-118. Depth 2.9-3.7, head 2.3-2.6 in SL; inter-orbital width 5.0-6.2 in

head; snout 1.8-1.9 in upper jaw. Bony platelets on lateral side of 1st gill arch present. Preopercle angular. Mid-lateral body scales ctenoid. Orange or reddish-brown dorsally, fading to white ventrally; numerous small dark spots on head, body and median fins, largest spots about 4 or 5 times that of rear nostrils. Five faint. Irregular, oblique, dark bars which bifurcate ventrally.

Distribution : Indo-west Pacific.

Remarks : This species is often confused with and misidentified as *E. tauvina* 'along our coast.

92. *Epinephelus erythrurus* (Valenciennes)

1828. *Serranus erythrurus* Valenciennes, *Hist. nat. poiss.*, 2 : 320 (Malabar, India).

1993. *Epinephelus erythrurus* : Heemstra and Randal, *FAO Fish. Synop.*, (125)16 : 146, fig. 299, pl. 13A.

Material examined : 1 ex., 128 mm, 14-02-99, Kannur bridge, F-3056.

Diagnostic features : D XI, 15-17; A III, 8; P 17-19; GR (8-9) + (14-17); LL pored 53-62; LS 92-107. Depth 2.8-3.2, head 2.4-2.7 in SL. Inter-spinous membrane of D not incised or moderately incised; C rounded. Olive to reddish-brown, usually with irregular pale spots and blotches that join randomly to form an irregular reticulum of background colour; 3 dark streaks across operculum. V and median fins mottled; P uniform.

Distribution : Indo-west Pacific.

93. *Epinephelus latifasciatus* (Temminck & Schlegel)

1842. *Serranus latifasciatus* Temminck and Schlegel, *Fauna Japonica, Pisces* : 6 (Nagasaki, Japan).

1993. *Epinephelus latifasciatus* : Heemstra and Randall, *FAO Fish. Synop.*, (125)16 : 176, fig. 339, pl. 16E, F.

Material examined : 1 ex., 155 mm, 12-02-98, Jilagaladindi, F-2781.

Diagnostic features : D XI, 12-14; A III, 8; P 17-19; GR (8-11) + (15-18); LL pored 56-65; LS 92-106. Depth 2.9-3.4, head 2.3-2.6 in SL. Preopercle angular, with 3-7 distinctly enlarged serrae at angle. Lateral body scales smooth. C rounded. Juveniles lavender-grey or pale brown, shading to whitish ventrally; 2 longitudinal white bands with black-edge, upper band from above eye to anterior rays of D, the lower band from below eye to lower rays of C; D and C with black spots and streaks; white bands disappearing in adults, the dark edges breaking in to dashes and spots.

Distribution : Indo-west Pacific.

94. *Pelates quadrilineatus* (Bloch)

1790. *Holocentrus quadrilineatus* Bloch, *Naturges. ausland. Fische*, (4) : 82, pl. 238, fig. 2 ('the Orient').

1991. *Pelates quadrilineatus* : Talwar and Jhingran, *Inland Fishes of India*, 2 : 809.

Material examined : 1 ex., 125 mm, 12-02-98, Jilagaladindi, F-2810.

Diagnostic features : D XII-XIII, 9-11; A III, 9-10; P 13-16; GR (16-18) + (22-27) LL 66-75; Ltr 9-11/19-23. Lower opercular spine not extending beyond edge of opercular lobe; post-temporal bone covered with in and scales. Four to six narrow, dark brown horizontal stripes on body. Spinous D with a black blotch between 3rd to 7th spines; a blotch on posterior to nape.

Distribution : Indo-west Pacific.

95. *Terapon jarbua* (Forsal)

1775. *Sciaena jarbua* Forsal, *Descript. Animal.* : 50 (Djedda, Red Sea).

1991. *Terapon jarbua* : Talwar and Jhingran, *Inland Fishes of India*, 2 : 811.

Material examined : 2 ex., 34-83 mm, 11-09-97, Kamavericheruvu, F-2201; 3 ex., 83-123 mm, 16-10-96, Yelchettutippa, F-2208; 2 ex., 60-71 mm, 17-10-97, Goalmata, F-2233; 1 ex., 87 mm, CANR 11-10-96, Pulleru mouth, Pedapatnam, F-2248; 13 ex., 36-80 mm, 11-02-97, Kannur river mouth, F-2344; 2 ex., 47-60 mm, 12-02-97, Pallithummulapalem, F-2366; 1 ex., 75 mm, 18-02-97, Yedurumundi, F-2398; 4 ex., 58-71 mm, 17-02-97, Yelchettu-tippa, F-2439; 14 ex., 59-104 mm, 10-02-97, Jilagaladindi, F-2447; 3 ex., 64-90 mm, 09-09-97, Pallithummulapalem, F-2459; 1 ex., 92 mm, 19-09-97, Palakaitippa, F-2473; 2 ex., 48-80 mm, 08-09-97, Kannur bridge, F-2500; 2 ex., 42-55 mm, 16-09-97, Eakhetulutippa, F-2535; 3 ex., 61-65 mm, 10-09-97, Pallithummulapalem, F-2548; 7 ex., 33-79 mm, 15-09-97, Lankavenitippa, F-2570; 2 ex., 29-41 mm, 12-09-97, Kannur, F-2585; 9 ex., 31-69 mm, 07-02-98, Pedakannur, F-2606; 1 ex., 40 mm, 13-02-98, Krishna river, Avanigada, F-2642; 14 ex., 41-88 mm, 08-02-98, Pedakannur, F-2657; 1 ex., 97 mm, 19-02-98, Avanigada fish market, F-2675; 1 ex., 86 mm, 18-02-98, Yesupuram, F-2692; 3 ex., 85-92 mm, 09-02-98, Pallithummulapalem, F-2708; 1 ex., 138 mm, 11-02-98, Jilagaladindi, F-2742; 1 ex., 44 mm, 15-09-98 Kannur bridge, F-2828; 4 ex., 52-82 mm, 16-09-98, Kannur, river mouth, F-2836; 1 ex., 89 mm, 17-09-98, Kannur, F-2861; 2 ex., 70-71 mm, 23-09-98, Sorlagandi, confluence, F-2950; 1 ex., 62 mm, 24-09-98, Sorlagandi, nr. Light House, F-2986; 1 ex., 42 mm, 25-09-98, Lankavenitippa, F-3016; 2 ex., 58-61 mm, 26-09-98, Sangameswar, F-3025; 3 ex., 49-75 mm, 12-02-99, Channel mouth, Kannur, F-3044; 3 ex., 50-70 mm, 15-02-99, Pallithummulapalem, F-3081; 2 ex., 62-70 mm, 20-02-99, Pulleru mouth, Palakaitippa, F-3103; 2 ex., 72-90 mm, 17-02-99, Hamsaldivi, F-3112; 2 ex., 66-76 mm, 19-02-99, Krishna

estuary, N of Light House, F-3127; 6 ex., 40-57 mm, 11-01-2000, Gollalamoda, F-3210; 2 ex., 32-55 mm, 11-01-2000, Gollalmanda, F-3231; 1 ex., 49 mm, 10-01-2000, Sorlagandi, nr. Light House, F-3264; 2 ex., 62-78 mm, 13-01-2000, Nachukunta, F-3292; 1 ex., 84 mm, 04-01-2000, Kannur, F-3311; 3 ex., 67-83 mm, 05-01-2000, Kannur bridge, F-3338; 2 ex., 35-72 mm, 11-12-2000, Kannur, river mouth, F-3394; 2 ex., 42-50 mm, 19-12-2000, River mouth, Sorlagandi, F-3419; 4 ex., 40-63 mm, 12-12-2000, Kannur bridge, F-3429; 7 ex., 41-74, 13-12-2000, Palli-thummulapalem, F-3477.

Diagnostic features : D XI-Xii, 9-11; A III, 7-10; P 13-14; GR (6-8) + (12-15); LL pored 75-100, Ltr 13-17/19-24. Back with 3-4 longitudinal downwardly curved black stripes; D with a large black spot; C with 3 horizontal oblique stripes.

Distribution : Indo-west Pacific.

96. *Terapon theraps* (Cuvier)

1829. *Terapon theraps* Cuvier, *Hist. nat. Poiss.*, 3 : 129, pl. 43 (Java; Mahe).

1991. *Terapon theraps* : Talwar and Jhingran, *Inland Fishes of India*, 2 : 812.

Material examined : 1 ex., 90 mm, 08-01-2000, Manganapudi, F-3274.

Diagnostic features : D XI-XII, 9-11; A III, 7-9; P 14-15; GR (6-8) + (14-17); LL pored 46-56; Ltr 6-8/14-16. Body with 2-4 horizontal stripes; spiny D with a black blotch between 3rd and 7th spine; C striped.

Distribution : Indo-west Pacific.

97. *Priacanthus hamrur* (Forsal)

1775. *Sciaena hamrur* Forsal, *Descript. Animal.* : 45 (Djedda, Red Sea).

1984. *Priacanthus hamrur* : Talwar and Kacker, *Comm. Sea Fish. India* : 415.

Material examined : 1 ex., 135 mm, 08-01-2000, Manganapudi, F-3275; 2 ex., 112-122 mm, 10-12-2000, Jilagaladindi, F-3556.

Diagnostic features : D X, 14-15; A III, 13-16; P 17-20; LL 65-75; developed GR (3-5) + (18-24). Depth 2.5-2.8, head 2.9-3.3 in SL. V equal to or shorter than head. Crimson; fins dusky. V with a black spot at base of first 3 rays.

Distribution : Widespread in central Indo-Pacific.

98. *Apogon quadrifasciatus* Cuvier

1828. *Apogon quadrifasciatus* Cuvier, *Hist. nat. Poiss.*, 2 : 153 (India).

Material examined : 2 ex., 53-67 mm, 11-02-98, Jilagaladindi, F-2757; 1 ex., 64 mm, 10-12-2000, Jilagaladindi, F-3612.

Diagnostic features : D VII + I, 9; A II, 8; P 15-16; LL 28; preD 5; GR (5-6) + 14. Depth 2.8-3.0, head 2.5-2.6 in SL; eye 2.9-3.2 in head. Preopercle ridge smooth in young, serrated around angle in adult; suborbital undulate, sometimes with spinules. Two or three dark horizontal stripes along upper sides of body, lower stripe extends to tip of mid C rays.

Distribution : Indo-west Pacific.

99. *Apogonichthys ellioti* (Day)

1875. *Apogon ellioti* Day, *Fishes of India*, (1) : 63, pl. 17, fig. 1 (Madras, India).

1955. *Apogonichthys ellioti* : Munro, *The marine and freshwater fishes of Ceylon* : 119, pl. 21, fig. 326.

Material examined : 1 ex., 76 mm, 11-02-98, Jilagaladindi, F-2756; 1 ex., 76 mm, 10-12-2000, Jilagaladindi, F-3613.

Diagnostic features : D VII + I, 9; A II, 8; P 15; LL 25-26. Depth 3.2, head 2.8 in SL; eye 3.5-3.7 in head. Preopercle edge smooth; palatine without teeth; supra-maxilla present. Second D much higher than the first; 3rd to 5th spine of first D sub-equal; C rounded or sub-truncate. Scales thin and easily displaced. Upper part of first D black; 2nd D with a marginal and median black band; A with a black median band. Juveniles with an indistinct lateral blotch on tail.

Distribution : Indo-west Pacific.

100. *Apogonichthys poecilopterus* (Kuhl & van Hasselt)

1828. *Apogon poecilopterus* Kuhl and van Hasselt, *In* : Cuvier and Valenciennes, *Hist. nat. Poiss.*, 2 : 114.

Material examined : 1 ex., 49 mm, 08-01-2000, Manganapudi, F-3335.

Diagnostic features : D VII + I, 8-9; A II, 8; P 16; LL 25-26. Depth 2.6-3.0 in SL; eye 3.0-3.4 in head; snout 2rd of eye. Preopercle edge smooth. Mouth oblique; upper jaw with one or two rows of caninoid, curved teeth anteriorly and a villiform band posteriorly; lower jaw with one row of caninoid teeth; palatine teeth absent. C feebly rounded, almost truncate. Upper part of 1st D black between 3rd and 5th spine; 2nd D and C dusky.

Distribution : Indo-west Pacific.

Remarks : The generic allocation is in parlance with existing systematics.

101. *Sillago indica* McKay, Dutt & Sujatha

1985. *Sillago (Parasillago) indica* McKay, Dutt and Sujatha, *in* McKay, *Mem. Queensland Mus.*, 23(1) : 38-39, fig. 5E (India).

1992. *Sillago indica* : McKay, *FAO Fish. Synop.*, (125)14 : 45.

Material examined : 1 ex., 190 mm, 12-02-98, Jilagaladindi, F-2791.

Diagnostic features : D XI + I, 21-22; A II, 22-23; LL 68-70. Airbladder with bifurcate anterior extension, antero-lateral extensions recurved and extend to ventral duct; posterior extension single. A dark stripe on sides, sometimes broken into blotches,

Distribution : East and west coast of India.

102. *Sillago lutea* McKay

1985. *Sillago (Parasillago) lutea* McKay, *Mem. Queensland Mus.*, 23(1) : 40-42, figs. 10D, 13H-I, 18 (Australia, India and Sri Lanka).

1992. *Sillago lutea* : McKay, *FAO Fish. Synop.*, (125)14 : 50.

Material examined : 1 ex., 125 mm, 09-09-97, Pallithummulapalem, F-2466; 1 ex., 180 mm, 19-09-97, Palakaitippa, F-2474; 1 ex., 102 mm, 13-01-2000, Nachukunta, F-3302; 2 ex., 59-60 mm, 04-01-2000, Kannur, F-3321; 3 ex., 51-80 mm, 12-12-2000, Kannur bridge, F-3436.

Diagnostic features : D XI + I, 20-22; A II, 21-23; LL 67-72. Airbladder with a median anterior extension and with or without rudimentary anteriorly directed antero-lateral projections; posterior extension single. Body light sandy-brown above, pale below.

Distribution : India, Sri Lanka and northern Australia.

103. *Sillago sihama* (Forsal)

1775. *Atherina sihama* Forsal, *Descript. Animal.* : 70 (Lohaja, Red Sea).

1991. *Sillago sihama* : Talwar and Jhingran, *Inland Fishes of India*, 2 : 818.

Material examined : 1 ex., 60 mm, 11-09-97, Kamavericheruvu, F-2203; 2 ex., 78-80 mm, 16-10-96, Yelchettutippa, F-2213; 2 ex., 93-103 mm, 12-10-96, Karuwaka mangroves, Pallithummulapalem, F-2326; 1 ex., 125 mm, 17-02-97, Yelchettutippa, F-2442; 1 ex., 94 mm, 09-09-97, Pallithummulapalem, F-2465; 3 ex., 90-102 mm, 08-09-97, Kannur bridge, F-2506; 3 ex., 42-70 mm, 16-09-97, Eakhetulutippa, F-2538; 2 ex., 61 mm each, 12-09-97, Kannur, F-2587; 1 ex., 116 mm, 20-02-98, Nagailanka ferry point, F-2650; 1 ex., 80 mm, 08-02-98, Pedakannur, F-2662; 2 ex., 111-114 mm, 18-02-98, Yesupuram, F-2699; 1 ex., 113 mm, 11-02-98, Jilagaladindi, F-2752; 1 ex., 142 mm, 12-02-98, Jilagaladindi, F-2790; 1 ex., 105 mm, 16-09-98, Kannur, river mouth, F-2837; 1 ex., 79 mm, 18-09-98, Pallithummulapalem, F-2892; 3 ex., 80-135 mm, 19-09-98, Pallithummulapalem, F-2906; 3 ex., 74-90 mm, 23-09-98, Sorlagandi, confluence, F-2971; 2 ex., 64-67 mm, 24-09-98, Sorlagandi, nr. Light House, F-2990; 3 ex., 91-106 mm, 12-02-99, Channel mouth, Kannur, F-3045; 1 ex., 114 mm, 19-02-99, Krishna estuary, N of Light House, F-3140; 4 ex., 67-89 mm, 11-01-2000, Gollalamoda, F-3211; 5 ex., 76-120 mm, 11-01-2000, Gollalmanda, F-3248; 3 ex., 95-

116 mm, 13-01-2000, Nachukunta, F-3301; 2 ex., 52-76 mm, 05-01-2000, Kannur bridge, F-3350; 1 ex., 99 mm, 11-12-2000, Kannur, river mouth, F-3404; 2 ex., 88-95 mm, 19-12-2000, Sorlagandi, F-3420; 1 ex., 80 mm, 13-12-2000, Pallithummulapalem, F-3489.

Diagnostic features : D XI + I, 20-23; A II, 21-24; P 17; lower GR 7-9; LL 67-72. Airbladder with two post-coelomic extensions. Light brown, fading to white below.

Distribution : Indo-west Pacific.

104. *Sillago vincenti* McKay

1980. *Sillago vincenti* McKay, *J. mar. biol. Ass. India*, **18**(2) : 378, fig. 1 (Kavanad near Neendakara, Kerala).

Material examined : 1 ex., 149 mm, 20-02-98, Nagailanka ferry point, F-2649; 1 ex., 105 mm, 26-09-98, Sangameswara, F-3027; 1 ex., 131 mm, 14-09-99, Kannur bridge, F-3057; 1 ex., 87 mm, 12-12-2000, Kannur bridge, F-3455.

Diagnostic features : D XI + I, 21-23; A II, 22-24; P 17; LL 70-74. Airbladder with a single post-coelomic extension, with a bulbous anterior projection and without antero-lateral extensions. Light brown, fading to white; soft D with 5-7 rows of brown or black spots.

Distribution : Southern coasts of India.

105. *Lactarius lactarius* (Bloch & Schneider)

1801. *Scomber lactarius* Schneider, *Syst. Ichthyol. Bloch* : 31 (Tranquebar).

1984. *Lactarius lactarius* : Talwar and Kacker, *Comm. Sea Fish. India* : 427.

Material examined : 1 ex., 105 mm, 11-02-98, Jilagaladindi, F-2750; 1 ex., 150 mm, 12-02-98, Jilagaladindi, F-2807.

Diagnostic features : D VII-VIII + I, 20-22; A III, 25-28. Body oblong and strongly compressed. Depth more than head length; head 2.5 in SL. Mouth large, oblique; lower jaw prominent; teeth on jaws small; a pair of canine at symphysis. V placed below P base. Scales cycloid, deciduous. A duy spot on upper part of operculum.

Distribution : Indo-west Pacific.

106. *Alectis indicus* (Ruppell)

1830. *Scyris indicus* Ruppell, *Atlas nordle. Afrika, Fische Rothen Meers* : 128, pl. 33, fig 1 (Red Sea).

1984. *Alectis indicus* : Talwar and Kacker, *Comm. Sea Fish. India* : 435.

Material examined : 1 ex., 140 mm, 11-01-2000, Gollalamoda, F-3202; 1 ex., 125 mm, 10-12-2000, Jilagaladindi, F-3560.

Diagnostic features : D VI + I, 18-20; A II + I, 16-18; GR (8-11) + (21-26); LL scutes 5-12. D spines embedded, not apparent in adults. Anterior rays of D and A extended into filaments in juveniles. Eye diameter 1.4-1.7 in sub-orbital depth; sub-orbital depth 0.8-1.0 in upper jaw length. Body superficially naked, scales minute and embedded. Silvery, with small dark opercular spot.

Distribution : Indo-west Pacific.

107. *Alepes djedaba* (Forsal)

1775. *Scomber djedaba* Forsal, *Descript. Animal* : 56 (Red Sea).

1984. *Alepes djedaba* : Talwar and Kacker, *Comm. Sea Fish. India* : 438.

Material examined : 1 ex., 150 mm, 12-02-98, Jilagaladindi, F-2815; 1 ex., 180 mm, 25-09-98, Lankavenitippa, F-3009.

Diagnostic features : D VIII + I, 23-25; A II + I, 18-20; GR (10-14) + (27-33). Both jaws with a single row of numerous comb-like teeth; upper jaw with supramaxilla relatively large and with a spine-like projection; adipose eyelids well developed only on rear half of eye. Straight LL with 0-2 scales and 39-51 scutes. Last ray of D and A longer than penultimate ray. A distinct dark blotch on margin of opercle, bordered above by a smaller white spot. Spinous D pale to dusky.

Distribution : Indo-west Pacific.

108. *Atropus atropus* (Schneider)

1801. *Brama atropus* Bloch, *Syst. Ichthyol* : 98 (Tranquebar).

1984. *Atropus atropus* : Smith-Vaniz, in, Fischer and Bianchi, *FAO species identification sheets. W. Indian Ocean (Fishing Area 51)*, 1 : no pagination.

Material examined : 1 ex., 69 mm, 21-09-98, Kamavericheruvu, F-2947; 1 ex., 67 mm, 11-12-2000, Kannur, river mouth, F-3401.

Diagnostic features : D I/VIII + I, 22-23; A II + I, 18; LL scutes 30-35. Abdomen with a deep longitudinal groove between A and V, accommodating V. Body deeply ovate; strongly compressed. V length equal to head. Bluish-green above, silvery below; V deep black; juveniles with vertical bands.

Distribution : Indo-Pacific.

109. *Atule mate* (Cuvier)

1833. *Caranx mate* Cuvier, *Hist. nat. Poiss.*, 9 : 54 (Pondicherry, India; Seychelles; New Guinea).

1984. *Atule mate* : Talwar and Kacker, *Comm. Sea Fish. India* : 444.

Material examined : 1 ex., 144 mm, 10-12-2000, Jilagaladindi, F-3561.

Diagnostic features : D VIII + I, 22-25; A II + I, 18-21; terminal D and A rays finlet-like but joined to adjacent rays by inter-radial membrane; GR (10-13) + (26-31); LL scutes 36-39. Both jaws with a single series of small, conspicuous teeth and in large adults, upper jaw with 2-3 rows of small canines anteriorly. Adipose eyelids completely covering eye except for a vertical slit centered on pupil. Olive green dorsally, white ventrally; 9-10 grey bands, wider than pale interspaces, usually present dorso-laterally; opercle with a black spot.

Distribution : Tropical Indo-west Pacific.

110. *Carangoides armatus* (Ruppell)

1830. *Citula armata* Ruppell, *Atlas nordl. Afrika Fische, Rothen Meers* : 103 (Red Sea).

1984. *Carangoides armatus* : Talwar and Kacker, *Comm. Sea Fish. India* : 447.

Material examined : 2 ex., 85-105 mm, 11-02-98, Jilagaladindi, F-2748.

Diagnostic features : D VIII + I, 19-22; A II + I, 16-18; adult males with 3-12 central D and A rays filamentous; GR (10-15) + (20-24); straight LL with 11-24 weak scutes. Breast naked to behind V origin and laterally to P base. Soft D lobe falcate, longer than head length. Bluish grey dorsally, silvery below; blackish blotch on upper opercular margin; V blackish in young, pale in adults.

Distribution : Widespread in tropical Indo-west Pacific.

111. *Carangoides hedlandensis* (Whitley)

1934. *Olistus hedlandensis* Whitley, *Rec. Austral. Mus.*, **24**(2) : 156, fig. 2 (Port Hedland, western Australia).

1984. *Carangoides hedlandensis* : Talwar and Kacker, *Comm. Sea Fish. India* : 452.

Material examined : 1 ex., 117 mm, 10-12-2000, Jilagaladindi, F-3562.

Diagnostic features : D VIII + I, 20-22; A II + I, 16-18; adult males with 3-8 central D and A rays filamentous; GR (6-11) + (14-17); straight LL with 17-29 weak scutes. Breast naked to behind V origin and laterally to P base. Soft D lobe longer than head length. Adults with distinct bulge in inter-orbital region. Greenish-blue dorsally, silvery grey below; a blackish blotch on upper opercular margin; V blackish in young, pale in adults; C yellowish.

Distribution : South Africa, the Seychelles, south and east coast of India, Sri Lanka, northern Bay of Bengal, Gulf of Thailand, to Japan, the Philippines, New Guinea, Australia and Samoa.

112. *Carangoides malabaricus* (Bloch and Schneider)

1801. *Scomber malabaricus* Bloch and Schneider, *Syst. Ichthyol.* : 31 (Tranquebar, India).

1984. *Carangoides malabaricus* : Talwar and Kacker, *Comm. Sea Fish. India* : 453.

Material examined : 2 ex., 116-119 mm, 11-02-98, Jilagaladindi, F-2747; 1 ex., 120 mm, 10-02-98, Jilagaladindi, F-2734; 1 ex., 120 mm, 12-02-98, Jilagaladindi, F-2813.

Diagnostic features : D VIII+I, 20-23; A II + I, 17-19; GR (8-12) + (21-27). Breast naked to behind and laterally to P base, including small area anteriorly just above P base. LL with 19-36 weak scutes. Soft D lobe slightly falcate, shorter than head. Usually silvery, bluish-grey above; opercle with a small black spot on upper margin; small white spot often at base of A rays.

Distribution : Widespread in tropical coastal waters of Indo-west Pacific.

113. *Caranx carangus* (Bloch)

1793. *Scomber carangus* Bloch, *Naturges. ausland. Fische*, (7) : 69 (Antiles, Atlantic Ocean).

1991. *Caranx carangus* : Talwar and Jhingran, *Inland Fishes of India*, 2 : 823.

Material examined : 1 ex., 50 mm, 08-09-97, Kannur bridge, F-2519.

Diagnostic features : D I/VIII + I, 20-22; A II + I, 15-18; LL scutes 33-37. Breast naked ventrally, often with a small patch of pre-pelvic scales. Eye 3.5-4.0 in head; cleft of mouth opposite lower 1/3rd of eye. Silvery, darker above with golden hue; young with 4-5 dark crossbars; a small opercular spot.

Distribution : India, through Indonesia, the Philippines, to Japan and tropical Atlantic.

114. *Caranx ignobilis* (Forsal)

1775. *Scomber ignobilis* Forsal, *Descript. Animal.* : 55 (Red Sea).

1991. *Caranx ignobilis* : Talwar and Jhingran, *Inland Fishes of India*, 2 : 823.

Material examined : 1 ex., 66 mm, 11-10-96, Pulleru mouth, Pedapatnam, F-2254; 2 ex., 64-89 mm, 10-10-96, Kannur, F-2295; 1 ex., 153 mm, 12-10-96, Karuwaka mangroves, Pallithummulapalem, F-2311; 3 ex., 47-51 mm, 12-10-96, Karuwaka mangroves, Pallithummulapalem, F-2319; 1 ex., 70 mm, 08-09-97, Kannur bridge, F-2518; 1 ex., 33 mm, 15-09-97, Lankavenitippa, F-2577; 1 ex., 135 mm, 14-02-98, Yelchettutippa, F-2628; 1 ex., 145 mm, 20-02-98, Nagailanka ferry point, F-2647; 1 ex., 49 mm, 24-09-98, Krishna estuary, F-3037; 1 ex., 83 mm, 11-12-2000, Kannur, river mouth, F-3402.

Diagnostic features : D I/VIII + I, 19-20; A II + I, 15-17; lower GR 16-17; LL scutes 28-30. Breast naked ventrally, typically with a small patch of pre-pelvic scales. Silvery-grey.

Distribution : Indo-west Pacific.

115. *Caranx para* Cuvier

1833. *Caranx para* Cuvier, *Hist. nat. Poiss.*, 9 : 58 (Malabar).

Material examined : 1 ex., 105 mm, 12-02-98, Jilagaladindi, F-2816; 1 ex., 117 mm, 20-09-98, Manganapudi, F-2924; 1 ex., 105 mm, 25-09-98, Lankavenitippa, F-3008; 1 ex., 117 mm, 14-09-99, Kannur bridge, F-3053; 3 ex., 105-108 mm, 21-02-99, Creek near Sea, South of Lankavenitippa, F-3069; 3 ex., 92-103 mm, 08-01-2000, Manganapudi, F-3270.

Diagnostic features : D I/VIII + I, 23-24; A II + I, 18-22; GR (10-12) + (27-32), total 38-44; LL scutes 40-46. Ventral profile distinctly more convex than dorsal; adipose eyelid well developed on posterior part of eye. Upper jaw anteriorly with 2 irregular rows of conical teeth, inner surface with blunt teeth posteriorly. A large black spot on upper margin of opercle and adjacent areas of shoulder.

Distribution : Indo-west Pacific (except African coast).

Remarks : In current parlance of nomenclature this species is known as *Alepes kleini* (Bloch).

116. *Caranx sem* Cuvier

1833. *Caranx sem* Cuvier, *Hist. nat. Poiss.*, 9 : 79 (Pondicherry).

Material examined : 1 ex., 53 mm, 16-10-96, Yelchettutippa, F-2223.

Diagnostic features : D VIII + I, 19-21; A II + I, 15-17; total D + A rays 34-38; GR (6-8) + (17-19); LL scutes 30-40. Breast completely scaled to naked ventrally but typically with a patch of pre-pelvic scales. Adults dark bronze to yellow-green above, silvery bronze to yellowish below; C bright yellow to dusky, often with distal half of upper lobe darker to black; other fins bright yellow to dusky.

Distribution : East coast of Africa to India, Sri Lanka, eastward to Indonesia, Okinawa to Australia, New Britain and Fiji Islands.

117. *Caranx sexfasciatus* Quoy & Gaimard

1825. *Caranx sexfasciatus* Quoy and Gaimard, *Voy. 'Uranie' et. Physic. Zool.* : 358, pl. 65, fig. 4 (Waigeo, Indonesia).

Material examined : 1 ex., 96 mm, 11-09-97, Kamavericheruvu, F-2196; 2 ex., 64 mm each, 12-10-96, Karuwaka mangroves, Palli-thummulapalem, F-2320; 1 ex., 100 mm, 16-02-97, Yesupuram, F-2387; 1 ex., 133 mm, 16-02-97, Lankavenitippa, F-2421; 1 ex., 41 mm, 08-02-98, Pedakannur, F-2674; 1 ex., 135 mm, 18-02-98, Yesupuram, F-2688; 1 ex., 150 mm, 15-02-98, Lankavenitippa, F-2715; 1 ex., 150 mm, 12-02-98, Jilagaladindi, F-2812.

Diagnostic features : D I/VIII + I, 18-22; A II + I, 14-17; GR (6-8) + (15-19); LL scutes 24-36. Breast fully scaled. Dark grey above, silvery below; a small black spot on upper edge of operculum. Soft D lobe with white tip. Juveniles with crossbars.

Distribution : Indo-west Pacific.

118. *Gnathanodon speciosus* (Schneider)

1775. *Scomber rim speciosus* Forsal, *Descript. Animal.* : 54 (Red Sea, Arabia).

1984. *Gnathanodon speciosus* : Talwar and Kacker, *Comm. Sea Fish. India* : 470.

Material examined : 1 ex., 177 mm, 12-02-98, Jilagaladindi, F-2779.

Diagnostic features : D VII + I, 18-20; A II + I, 15-17; GR (7-9) + (19-22), total 27-30; LL scutes 17-26. Upper jaw without teeth; lower jaw with a few feeble teeth in young, absent in adults. Breast completely scaled. Juveniles and young adults silvery to yellow with 7-11 black bands, usually alternating broad and narrow; the 1st band oblique through eye; upper margin of opercle black; all fins yellow, tips of C lobes black. In large adults, yellow-green dorsally, pale yellow ventrally; black bands replaced by few black patches or spots; opercular spot fades with age.

Distribution : Indo-west Pacific.

119. *Megalaspis cordyla* (Linnaeus)

1758. *Scomber cordyla* Linnaeus, *Syst. Nat.* (ed. 10), 1 : 298 (no locality).

1986. *Megalaspis cordyla* : Smith-Vaniz, in Smith and Heemstra, *Smith's Sea Fishes* : 653, fig. 210.34.

Material examined : 1 ex., 44 mm, 08-09-97, Kannur bridge, F-2520; 1 ex., 152 mm, 25-09-98, Lankavenitippa, F-3007; 1 ex., 140 mm, 21-02-99, Creek nr. Sea, S of Lanka-venithippa, F-3070; 2 ex., 119-140 mm, 08-01-2000, Manganapudi, F-3271; 1 ex., 162 mm, 10-12-2000, Jilagaladindi, F-3559.

Diagnostic features : D VIII + I, 10 + 8-9 finlets; A II + I, 10 + 6-8 finlets; GR (8-11) + (18-22); LL scutes 51-59, well developed, broad. Breast naked. Bluish-green above, silvery below; prominent black spot on posterior edge of operculum.

Distribution : Indo-west Pacific.

120. *Selaroides leptolepis* (Cuvier)

1833. *Caranx leptolepis* Cuvier, *Hist. nat. Poiss.*, 9 : 63 (Java).

1984. *Selaroides leptolepis* : Talwar and Kacker, *Comm. Sea Fish. India* : 482.

Material examined : 1 ex., 145 mm, 12-02-98, Jilagaladindi, F-2814.

Diagnostic features : D VIII + I, 24-26; A II + I, 20-23; GR (10-14) + (27-32); LL scutes 24-30. Body elongate, oblong and compressed; dorsal and ventral profiles equally convex. Eye equal to or slightly less than snout length, 3.2-3.5 in head; adipose eyelid developed on posterior half of eye. Upper jaw with out teeth, lower jaw with a series of minute teeth. Shoulder girdle margin smooth. Breast completely scaled. Metallic blue above, silvery white below, with a broad yellow stripe from upper margin of eye to C peduncle; prominent black opercular spot present.

Distribution : Persian Gulf, to India, Sri Lanka, through Indonesia, to the Philippines, Japan and northern Australia.

121. *Scomberoides commersonianus* Lacepede

1802. *Scomberoides commersonien* Lacepede, *Hist. nat. Poiss.*, 2 : 50 (Madagascar).

Material examined : 1 ex., 141 mm, 25-09-98, Lankavenitippa, F-3006.

Diagnostic features : D VI-VII + I, 19-21; A II + I, 16-19; posterior soft D and A rays consisting of semidetached finlets; GR (0-3) + (7-12), total 8-15. Body oblong to elliptical, strongly compressed. Upper jaw extends well beyond posterior margin of eye in adults; lower jaw teeth in inner row about equal size to those in outer row in adults. No scutes; scales on mid-body below LL broadly lanceolate. Dory green above, silvery or golden below; sides with 5-8 oval blotches above or touching LL; first two may intersect LL.

Distribution : Indo-west Pacific. Periodically entering estuaries, but intolerant to low salinities.

122. *Scomberoides lysan* (Forsal)

1775. *Scomber lysan* Forsal, *Descript. Anim.* : 54 (Red Sea).

1991. *Scomberoides lysan* : Talwar and Jhingran, *Inland Fishes of India*, 2 : 825.

Material examined : 1 ex., 59 mm, 23-09-98, Sorlagandi, F-2961; 1 ex., 80 mm, 11-12-2000, Kannur, river mouth, F-3403; 3 ex., 72-88 mm, 12-12-2000, Kannur bridge, F-3437.

Diagnostic features : D I/VI-VII + I, 19-21; A II + I, 17-19; GR 21-27. Upper jaw extends to posterior margin of eye in adults. Scales on mid-body below LL lanceolate. Double series of 6-8 dory round or oval blotches above and below LL; distal half of D black.

Distribution : Indo-west Pacific.

123. *Gazza minuta* (Bloch)

1797. *Scomber minutus* Bloch, *Ichthyologie* : 110, pl. 429, fig. 2 (Malabar, India).

1991. *Gazza minuta* : Talwar and Jhingran, *Inland Fishes of India*, 2 : 827.

Material examined : 1 ex., 117 mm, 10-02-98, Jilagaladindi, F-2733; 1 ex., 93 mm, 17-09-98, F-2864.

Diagnostic features : D VIII, 16; A III, 14; P i, 16. Depth 2.3-3.1 in SL. Mouth pointing forward when protracted, with distinct canines on both jaws. Scales covering body except for breast ahead of a line from base of P to origin of A. Dark irregular marks extending to below LL. Underside of P and snout with black dots.

Distribution : Indo-west Pacific.

124. *Leiognathus berbis* (Valenciennes)

1835. *Equula berbis* Valenciennes, *Hist. nat. Poiss.*, 10 : 85 (Red Sea).

1984. *Leiognathus berbis* : Talwar and Kacker, *Comm. Sea Fish. India* : 503.

Material examined : 1 ex., 53 mm, 08-09-97, Kannur bridge, F-2510; 2 ex., 76-86 mm, 11-02-98, Jilagaladindi, F-2751.

Diagnostic features : D VIII, 16; A III, 14; P i, 17. Depth 2.6-3.0 in SL. Dorsal and ventral profiles equally convex. Cleft of mouth opposite lower third of eye. Breast scaly. Silvery, with greenish vermiculate marks on back.

Distribution : Madagascar, India, Sri Lanka, through Indonesia, to Japan and Queensland.

125. *Leiognathus blochii* (Valenciennes)

1835. *Equula blochii* Valenciennes, *Hist. nat. Poiss.*, 10 : 84 (Malabar, India).

1991. *Leiognathus blochii* : Talwar and Jhingran, *Inland Fishes of India*, 2 : 830.

Material examined : 1 ex., 65 mm, 18-10-96, Nachukunta, F-2275; 1 ex., 43 mm, 17-09-97, Light House, Krishna R. mouth, F-2597.

Diagnostic features : D VIII, 16; A III, 14; P i, 17. Depth 2.3-2.7 in SL. Cleft of mouth opposite lower third of eye; narrow band of villiform teeth on jaws. Breast scaly. Silvery, upper half with irregular lines; a dark saddle-shaped blotch on nape; a jet-black blotch on upper half of D between 3rd and 6th spine.

Distribution : India, Gulf of Thailand, to the Philippines and northern Australia.

126. *Leiognathus brevirostris* (Valenciennes)

1835. *Equula brevirostris* Valenciennes, *Hist. nat. Poiss.*, 10 : 83 (Malabar, India).

1984. *Leiognathus brevirostris* : Talwar and Kacker, *Comm. Sea Fish. India* : 506.

Material examined : 1 ex., 63 mm, 16-10-96, Yelchettutippa, F-2214; 1 ex., 62 mm, 18-10-96, Nachukunta, F-2274; 1 ex., 59 mm, 12-10-96, Karuwaka mangroves, Palli-

thummulapalem, F-2315; 1 ex., 75 mm, 19-02-98, Avanigada fish market, F-2680; 11 ex., 64-75 mm, 18-02-98, Yesupuram, F-2707; 6 ex., 58-65 mm, 23-09-98; Sorlagandi, confluence, F-2956; 4 ex., 48-60 mm, 24-09-98, nr. Light House, Sorlagandi, F-2992; 1 ex., 70 mm, 13-02-99, Kannur bridge, F-3158; 3 ex., 59-67 mm, 13-01-2000, Nachukunta, F-3296; 1 ex., 72 mm, 04-01-2000, Kannur, F-3317.

Diagnostic features : D VIII, 16; A III, 14; P i, 17. Depth 2.0-2.2 in SL. Cleft of mouth opposite lower edge of eye; snout not truncate. Dorsal profile sub-equal in convexity to ventral. LL continued to the base of caudal. Breast naked. Silvery, with irregular markings on back; a dark brown saddle on nape; a yellow stripe along LL; a yellow oblique blotch on abdomen below P.

Distribution : India, Sri Lanka, through Indonesia, the Philippines.

127. *Leiognathus daura* (Cuvier)

1829. *Equula daura* Cuvier, *Regne Anomal.* (ed. 2), 2 : 212 (on Dacer-karah of Russell, 1803, *Fish. Coromadel*, 1 : 51, pl. 65) (Vizagapatnam).

1984. *Leiognathus daura* : Talwar and Kacker, *Comm. Sea Fish. India* : 507.

Material examined : 2 ex., 30-36 mm, 16-09-97, Eakhetulutippa, F-2544.

Diagnostic features : D VIII, 16; A III, 14; P i, 17. Depth 2.2 in SL. Cleft of mouth opposite lower third of eye. Breast naked. Silvery, back greenish with irregular grey streaks; a yellow band along LL. Upper half of spinous D black; tip of lower C lobe yellow; P axil black.

Distribution : Indo-west Pacific.

128. *Leiognathus equulus* (Forsal)

1775. *Scomber equula* Forsal, *Descript. Animal.* : 75 (Red Sea).

1991. *Leiognathus equulus* : Talwar and Jhingran, *Inland Fishes of India*, 2 : 831.

Material examined : 1 ex., 49 mm, 16-10-96, Yelchettutippa, F-2215; 1 ex., 28 mm, 11-10-96, Pulleru mouth, Peddapatnam, F-2249; 1 ex., 32 mm, 10-10-96, Kannur, F-2289; 3 ex., 49-66 mm, 12-10-96, Karuwaka mangroves, Pallithummulapalem, F-2316; 1 ex., 62 mm, 08-09-97, Kannur bridge, F-2509; 4 ex., 61-71 mm, 18-02-98, Yesupuram, F-2706; 1 ex., 119 mm, 12-02-98, Jilagaladindi, F-2819; 1 ex., 62 mm, 23-09-98, Sorlagandi, confluence, F-2957; 1 ex., 58 mm, 14-02-99, Kannur bridge, F-3062; 2 ex., 46-51 mm, 15-02-99, Pallithummulapalem, F-3088; 4 ex., 43-50 mm, 17-02-99, Hamsaldivi, F-3107; 1 ex., 45 mm, 19-02-99, Krishna estuary, N of Light House, F-3130; 41 ex., 38-60 mm, 13-02-99, Kannur bridge, F-3157; 1 ex., 117 mm, 11-01-2000, Gollalmanda, F-3240; 4 ex.,

50-62 mm, 04-01-2000, Kannur, F-3316; 6 ex., 50-69 mm, 05-01-2000, Kannur bridge, F-3340; 4 ex., 43-53 mm, 11-12-2000, Kannur, river mouth, F-3397; 12 ex., 39-53 mm, 12-12-2000, Kannur bridge, F-3428.

Diagnostic features : D VIII, 16; A III, 14; P i, 19. Depth 1.7-1.9 in SL. Dorsal profile strongly arched; cleft of mouth opposite lower edge of eye. Breast naked. Silvery, with faint narrow vertical lines on back; P axil dusky; a small brown saddle-shaped blotch on C peduncle.

Distribution : Indo-west Pacific.

129. *Leiognathus fasciatus* (Lacepede)

1803. *Clupea fasciata* Lacepede, *Hist. nat. Poiss.*, 5 : 460, 463 (Mauritius).

1984. *Leiognathus fasciatus* : Talwar and Kacker, *Comm. Sea Fish. India* : 511.

Material examined : 1 ex., 108 mm, 12-02-98, Jilagaladindi, F-2783.

Diagnostic features : D VIII, 16; A III, 14; P i, 19. Depth 1.7-2.0 in SL. Dorsal profile more convex; mandibular profile strongly concave. Second spine of D elongated into a filament and that of A little produced. Silvery, with dark vertical lines on back; dark blotch on C peduncle; P axil yellowish.

Distribution : Indo-west Pacific.

130. *Leiognathus splendens* (Cuvier)

1829. *Equula splendens* Cuvier, *Regne Animal*. (2nd ed.), 2 : 212 (Coromandel coast).

1991. *Leiognathus splendens* : Talwar and Jhingran, *Inland Fishes of India*, 2 : 832.

Materials examined : Not obtained.

Diagnostic features : D VIII, 16; A III, 14; P i, 19. Depth 1.7-2.0 in SL. Breast scaled. Ridge on lower arm of preopercle denticulated. D spines strong. Silvery, with wavy, close-set vertical lines on back. Spiny D with a jet-black blotch.

Distribution : Indo-west Pacific.

Remarks : Included here following Jayaram (1995).

131. *Secutor insidiator* (Bloch)

1787. *Zeus insidiator* Bloch, *Naturges. ausland. Fische*, (8) : 41, pl. 192, fig. 2 & 3 ("Suratte" India).

1991. *Secutor insidiator* : Talwar and Jhingran, *Inland Fishes of India*, 2 : 833.

Material examined : 1 ex., 37 mm, 17-09-98, Kannur, F-2865; 4 ex., 23-42 mm, 23-09-98, Sorlagandi, confluence, F-2958; 2 ex., 40-42 mm, 24-09-98, Sorlagandi, nr. Light House, F-2991; 1 ex., 36 mm, 24-09-98, Krishna estuary, F-3035; 1 ex., 66 mm, 13-01-2000,

Nachukunta, F-3295; 1 ex., 52 mm, 11-12-2000, Kannur, river mouth, F-3398; 1 ex., 48 mm, 12-12-2000, Kannur bridge, F-3427; 1 ex., 45 mm, 13-12-2000, Palli-thummulapalem, F-3480; 1 ex., 73 mm, 10-12-2000, Jilagaladindi, F-3554.

Diagnostic features : D VIII, 16; A III, 14; P i, 17. Depth 2.0-2.6 in SL. Maxilla tip reaching below lower edge of eye. Sub-orbital region naked. Silvery, with blue spots forming vertical bands.

Distribution : Indo-west Pacific.

132. *Lutjanus argentimaculatus* (Forsal)

1775. *Sciaena argentimaculata* Forsal, *Descript. Animal* : 47 (Arabia).

1991. *Lutjanus argentimaculatus* : Talwar and Jhingran, *Inland Fishes of India*, 2 : 835.

Material examined : 2 ex., 49-59 mm, 12-12-2000, Kannur bridge, F-3446.

Diagnostic features : D X, 13-14; A III, 8-9; P i, 15-16; GR (6-7) + (10-11); LL 44-48. Depth 2.5-2.9, head 2.3-2.7 in SL. Preopercle notch shallow. Longitudinal scale rows above LL parallel to dorsal profile anteriorly, but appearing to rise obliquely under soft part of D; scale rows below LL horizontal; scale on head beginning behind eyes; temporal region mostly naked with a few scales; 7-8 scale rows on pre-operculum. Red-brown, pale on belly; often with silvery spots in center of each scale.

Distribution : Indo-west Pacific.

133. *Lutjanus fulviflammus* (Forsal)

1775. *Sciaena fulviflamma* Forsal, *Descript. Animal* : 45 (Arabia).

1984. *Lutjanus fulviflammus* : Talwar and Kacker, *Comm. Sea Fish. India* : 538.

Material examined : 1 ex., 31 mm, 16-09-97, Eakhetulutippa, F-2543.

Diagnostic features : D X-XI, 12-14; A III, 7-8; P i, 15-16; GR (6-7) + (7-11); LL 46-50. Depth 2.6-2.9, head 2.4-2.7 in SL. Pre-opercle notch shallow, inter-opercle knob indistinct. Vomerine teeth in arrowhead shape. Scale rows above LL rising obliquely to dorsal profile; below LL, parallel to axis; scales on head beginning behind eyes. Silvery, with yellow lines along scale rows; a black blotch below anterior part of soft D on LL, major portion of which below LL.

Distribution : Tropical Indo-west Pacific.

134. *Lutjanus johnei* (Bloch)

1792. *Anthias johnei* Bloch, *Naturges. ausland. Fische*, (6) : 113, 318 (Surat, India).

1991. *Lutjanus johnei* : Talwar and Jhingran, *Inland Fishes of India*, 2 : 835.

Material examined : 1 ex., 65 mm, 11-10-96, Pulleru mouth, Pedakannur, F-2252; 3 ex., 60-86 mm, 11-02-97, Kannur, river mouth, F-2348; 2 ex., 88-115 mm, 16-02-97, Yesu-puram, F-2379; 1 ex., 83 mm, 16-02-97, Lankavenitippa, F-2417; 1 ex., 100 mm, 17-02-97, Yelchettutippa, F-2441; 1 ex., 24 mm, 16-09-97, Eakhetulutippa, F-2542; 1 ex., 111 mm, 18-02-98, Yesupuram, F-2691; 2 ex., 86-101 mm, 11-02-98, Jilagaladindi, F-2743; 1 ex., 110 mm, 12-02-98, Jilagaladindi, F-2786; 1 ex., 52 mm, 19-09-98, Palli-thummulapalem, F-2918; 1 ex., 43 mm, 20-09-98, Manganapudi, F-2929; 1 ex., 55 mm, 23-09-98, Sorlagandi, confluence, F-2953; 1 ex., 54 mm, 24-09-98, Sorlagandi, nr. Light House, F-2987; 1 ex., 60 mm, 26-09-98, Sangameswara, F-3026; 1 ex., 116 mm, 14-02-99, Kannur bridge, F-3054; 1 ex., 102 mm, 14-02-99, Kannur bridge, F-3055; 4 ex., 68-101 mm, 17-02-99, Hamsaldivi, F-3113; 2 ex., 68-81 mm, 19-02-99, Krishna estuary, N of Light House, F-3125; 1 ex., 111 mm, 19-02-99, Krishna estuary, N of Light House, F-3146; 1 ex., 71 mm, 13-02-99, Kannur bridge, F-3159; 2 ex., 40-48 mm, 05-01-2000, Kannur bridge, F-3341; 1 ex., 70 mm, 11-12-2000, Kannur, river mouth, F-3396; 2 ex., 65-68 mm, 12-12-2000, Kannur bridge, F-3444; 2 ex., 73-79 mm, 13-12-2000, Pallithummulapalem, F-3481.

Diagnostic features : D X, 13-14; A III, 8, P i, 16; LL 48-50. Preopercular notch shallow; no inter-opercular knob. Teeth on vomer inverted 'V' or triangular shaped. Scale rows above LL parallel to dorsal profile; scales on head beginning above middle of eyes. Yellowish; each scale spotted in center; a large black blotch below soft D, major part of which above LL.

Distribution : Indo-west Pacific.

135. *Lutjanus lutjanus* Bloch

1790. *Lutjanus lutjanus* Bloch, *Naturges. ausland. Fische*, 4 : 107 (Japan).

Material examined : Not obtained.

Diagnostic features : D XI-XII, 12; A III, 8; P 16-17; LL 48-50; GR (7-8) + 18. Depth 2.9-3.3, head 2.4-2.9 in SL. No pre-opercular notch. Scale rows above LL rising obliquely to dorsal profile, below LL parallel to axis. Silvery or bronzy with horizontal yellow or brownish lines on sides, the middle one forming a broad stripe from snout to C base. Median fins yellowish.

Distribution : Indo-west Pacific.

Remarks : Its occurrence in the Krishna estuary (Jayaram, 1995) is doubtful.

136. *Lutjanus russelli* (Bleeker)

1849. *Mesoprion russelli* Bleeker, *Verh. batav. Genoot. Kunst. Wet.*, 22 : 41 (India).

1986. *Lutjanus russelli* : Allen, in Smith and Heemstra, *Smith's Sea Fishes* : 577, pl. 56, fig. 181.17.

Material examined : 3 ex., 75-95 mm, 18-12-2000, Yesupuram, F-3374; 1 ex., 65 mm, 12-12-2000, Kannur bridge, F-3445.

Diagnostic features : D X, 14-15; A III, 8-9; P i, 15; GR (5-6) + (10-13); LL 48-52. Pre-opercular notch shallow. Teeth on vomer in a triangular patch. Scale rows above LL rising obliquely to dorsal profile. Reddish-brown; a dark brown blotch above LL below spiny and soft D; about 8 brown lines, lower ones horizontal, upper ones rising obliquely to dorsal profile.

Distribution : Indo-west Pacific.

137. *Gerres abbreviatus* Bleeker

1850. *Gerres abbreviatus* Bleeker, *Nat. Tijdschr. Ned.-Indie*, 1 : 103 (Batavia).

Material examined : 3 ex., 52-53 mm, 10-10-96, Kannur, F-2294; 1 ex., 60 mm, 10-09-97, Pallithummulapalem, F-2559.

Diagnostic features : D IX, 10; A III, 7; LL 38-41; 6 scale-rows between LL and D origin. Depth 2.0-2.3 in SL. Dorsal profile forming a sharp angle at D origin. Tip of P reaching at least to A origin. Silvery, with indistinct longitudinal lines along scale-rows on upper flank. D with thin black margin; tips of A and lower C lobe white.

Distribution : Indo-west Pacific.

138. *Gerres acinaces* Bleeker

1854. *Gerres acinaces* Bleker, *Nat. Tijdschr. Ned.-Indie*, 6 : 194 (Jakarta, Java).

Material examined : 1 ex., 66 mm, 10-10-96, Kannur, F-2293; 3 ex., 51-58 mm, 11-02-97, Kannur, river mouth, F-2362; 1 ex., 47 mm, 18-02-98, Yesupuram, F-2702; 2 ex., 47-57 mm, 16-09-98, Kannur, river mouth, F-2850; 1 ex., 46 mm, 18-09-98, Palli-thummulapalem, F-2890.

Diagnostic features : D IX, 9-11; A III, 7; LL 42-44; 4½-5½ scale-rows between LL and base of 5th D spine. Depth 2.5-2.9 in SL. Tip of P reaching to or beyond A origin. Olive above, silvery below; in young, 7-8 dark bars on sides of body; in older specimens, several vertical series of ovoid spots below LL and rows of dark spots on following scale rows above LL; trailing edge of C black.

Distribution : Tropical Indo-west Pacific.

139. *Gerres filamentosus* Cuvier

1829. *Gerres filamentosus* Cuvier, *Regne Animal*. (ed. 2), 2 : 188 (Vizagapatnam).

Material examined : 1 ex., 80 mm, 11-09-97, Kamavericheruvu, F-2199; 2 ex., 71-84 mm, 18-02-97, Yedurumundi, F-2401; 1 ex., 128 mm, 16-02-97, Lankavenitippa, F-2415; 3 ex., 95-115 mm, 10-02-97, Jilagaladindi, F-2450; 1 ex., 68 mm, 09-09-97, Pallithummula-palem, F-2462; 1 ex., 103 mm, 08-09-97, Kannur bridge, F-2501; 1 ex., 140 mm, 14-02-98, Yelchettutippa, F-2626; 2 ex., 74-78 mm, 20-02-98, Nagailanka ferry point, F-2644; 1 ex., 90 mm, 19-02-98, Avanigada fish market, F-2678; 2 ex., 83-85 mm, 15-02-98, Lanka-venitippa, F-2719; 1 ex., 128 mm, 10-02-98, Jilagaladindi, F-2730; 2 ex., 75-112 mm, 11-02-98, Jilagaladindi, F-2746.

Diagnostic features : D IX, 10-11; A III, 7; P i, 14; LL 44-47; 4½-5 scale rows between LL and base of 5th D spine. Depth 2.0-2.5 in SL. Pre-dorsal distance equal to or less than body depth. Second spine of D filamentous. Silvery, with 7-10 vertical series of ovoid spots on upper sides.

Distribution : Indo-west Pacific.

140. *Gerres lucidus* Cuvier

1830. *Gerres lucidus* Cuvier, *Hist. nat. Poiss.*, 6 : 477 (Pondicherry).

Material examined : 1 ex., 65 mm, 12-10-96, Karuwaka mangroves, Pallithummulapalem, F-2321; 1 ex., 95 mm, 11-02-97, Kannur, river mouth, F-2346; 2 ex., 920102 mm, 16-02-97, Yesupuram, F-2385; 1 ex., 77 mm, 18-02-97, Yedurumundi, F-2402; 1 ex., 87 mm, 16-02-97, Lankavenitippa, F-2416; 2 ex., 54-55 mm, 09-09-97, Pallithummulapalem, F-2461; 1 ex., 60 mm, 19-09-97, Palakaitippa, F-2475; 1 ex., 104 mm, 14-02-98, Yelchettu-tippa, F-2627; 2 ex., 89-95 mm, 20-02-98, Nagailanka ferry point, F-2645; 1 ex., 90 mm, 19-02-98, Avanigada fish market, F-2679; 2 ex., 81-90 mm, 15-02-98, Lankavenitippa, F-2720; 1 ex., 55 mm, 18-09-98, Palli-thummulapalem, F-2888; 1 ex., 57 mm, 23-09-98, Sorlagandi, confluence, F-2956; 1 ex., 57 mm, 24-09-98, Sorlagandi, nr. Light House, F-2989; 2 ex., 70-78 mm, 04-01-2000, Kannur, F-3313; 1 ex., 60 mm, 12-12-2000, Kannur bridge, F-3453; 1 ex., 72 mm, 13-12-2000, Pallithummulapalem, F-3482; 1 ex., 102 mm, 20-12-2000, Nachukunta, F-3549; 1 ex., 112 mm, 17-12-2000, Puligada, F-3567.

Diagnostic features : D IX, 10; A III, 7; LL 33-35; 3 scale rows between base of 5th D spine and LL. Depth 2.3-2.7 in SL. P tips reaching to level of anus, but not to A origin. Silvery, with 4 diffuse, dark saddles along back, extending down sides to mid-line; upper part of spiny D dark above a line between middle of 2nd spine and tip of 6th spine.

Distribution : West coast of India, eastward to South China Sea.

Remarks : In the current parlance of nomenclature this species is considered to be a junior synonym of *G. limbatus* Cuvier, 1830. Jayaram (1995) has reported the later species from the Krishna estuary.

141. *Gerres macracanthus* Bleeker

1854. *Gerres macracanthus* Bleeker, *Nat. Tijdschr. Ned.-Indie*, 6 : 195 (Batavia, Java).

Material examined : 2 ex., 85-86 mm, 10-10-96, Kannur, F-2279; 1 ex., 45 mm, 08-02-98, Pedakannur, F-2668; 1 ex., 57 mm, 26-09-98, Sangameswara, F-3030; 1 ex., 52 mm, 12-02-99, Channel mouth, Kannur, F-3048; 1 ex., 42 mm, 12-12-2000, Kannur bridge, F-3452.

Diagnostic features : D IX, 10; A III, 7; LL 42-44. Depth 2.3-2.4 in SL. Pre-dorsal distance distinctly greater than body depth. Second D spine prolonged. Silvery, with 5-10 brown diffuse vertical bars on upper flank.

Distribution : India, through Indonesia, to the Philippines, New Guinea.

142. *Gerres oyena* (Forsal)

1775. *Labrus oyena* Forsal, *Descript. Anim.*, : 35 (Red Sea).

1991. *Gerres oyena* : Talwar and Jhingran, *Inland Fishes of India*, 2 : 842.

Material examined : 1 ex., 64 mm, 11-10-96, Pulleru mouth, Peddapatnam, F-2253; 1 ex., 33 mm, 15-09-97, Lankavenitippa, F-2578.

Diagnostic features : D IX, 10; A III, 7; LL 35-39; 3½ scale rows between LL and base of 5th D spine. Depth 3.0-3.3 in SL. P tip reaching to just above anus, not to A origin. Olive above, silvery below; 7-8 dusky bars on sides; C uniformly dusky.

Distribution : Tropical Indo-Pacific.

143. *Gerres setifer* (Hamilton)

1822. *Chanda setifer* Hamilton, *Fishes of Ganges* : 105, 370 (Ganges estuaries).

1984. *Gerres setifer* : Woodland, in Fischer and Bianchi, *FAO species identification sheets. W. Indian Ocean*, 2 : GERREIDAE 3 (name only).

Material examined : 1 ex., 59 mm, 16-10-96, Yelchettutippa, F-2216; 1 ex., 84 mm, 16-02-97, Yesupuram, F-2386; 1 ex., 71 mm, 13-02-97, Chentakalumunda, F-2428; 4 ex., 33-35 mm, 19-09-97, Palakaitippa, F-2476; 2 ex., 45-50 mm, 08-09-97, Kannur bridge, F-2502; 1 ex., 42 mm, 16-09-97, Eakhetulu-tippa, F-2537; 3 ex., 29-41 mm, 12-09-97, Kannur, F-2589; 1 ex., 64 mm, 18-02-98, Yesupuram, F-2701; 2 ex., 47-48 mm, 18-09-98, Pallithummulapalem, F-2889; 4 ex., 43-60 mm, 23-09-98, Sorlagandi, confluence, F-2954; 1 ex., 55 mm, 14-12-2000, Palli-thummulapalem, F-3376.

Diagnostic features : D X, 9-10; A III, 7; P i, 16; LL 32-38. Mouth small, highly protrusible. P long, reaching to almost A. Upper half of flanks greenish; spiny D dark edged and a brown spot on each ray of D just above scaly sheath.

Distribution : East coast of India and Sri Lanka.

144. *Plectorhinchus gibbosus* (Lacepede)

1802. *Holocanthus gibbosus* Lacepede, *Hist. nat. Poiss.*, 4 : 344, 389 (no locality).

1986. *Plectorhinchus gibbosus* : Smith and McKay, *Smith's Sea Fishes* : 566, fig. 179.5.

Material examined : 1 ex., 75 mm, 17-02-97, Yelchettutippa, F-2443.

Diagnostic features : D XIV, 15-16; A III, 7; P 17; GR (9-10) + (19-20); LL 50-55. Upper lip swollen in adults. D spines strong, 4th and 5th longest, fin deeply notched; base of spiny D 2.0 times in base of soft D; 2nd A spine longer and stouter than 3rd; P slightly longer than V. Scales not reaching nostrils. Uniform dark, with reddish tinge. Distal soft D, A and C yellowish or pink in juveniles.

Distribution : Indo-west Pacific.

145. *Pomadasys argyreus* (Valenciennes)

1833. *Pristipoma argyreum* Valenciennes, *Hist. nat. Poiss.*, 9 : 385 (Coromandel coast of India).

1991. *Pomadasys argyreus* : Talwar and Jhingran, *Inland Fishes of India*, 2 : 844.

Material examined : 1 ex., 61 mm, 10-12-2000, Jilagaladindi, F-3576.

Diagnostic features : D XII, 13-14; A III, 7-8; P i, 16; LL 44-50. Depth 2.4-2.9 in SL. Head blunt, upper profile convex. Maxilla reaching at most to below margin of pupil. Silvery; gill cover with a larger blue-black blotch in juveniles; D without spots or stripes.

Distribution : Pakistan, India, eastward to the Philippines.

146. *Pomadasys kaakan* (Cuvier)

1830. *Pristipoma kaakan* Cuvier, *Hist. nat. Poiss.*, 5 : 244 (India).

1984. *Pomadasys kaakan* : McKay, in Fischer and Bianchi, *FAO species identification sheets. W. Indian Ocean*, 2 : HAEM Pomad 13.

Material examined : 2 ex., 46-48 mm, 11-09-97, Kamavericheruvu, F-2200; 2 ex., 40-85 mm, 16-10-96, Yelchettutippa, F-2217; 5 ex., 55-83 mm, 11-02-97, Kannur, river mouth, F-2347; 2 ex., 92-110 mm, 16-02-97, Lankaveni-tippa, F-2411; 1 ex., 75 mm, 17-02-97, Yelchettutippa, F-2440; 3 ex., 40-55 mm, 19-09-97, Palakaitippa, F-2477; 1 ex., 44 mm, 18-09-97, Yedurumundi, F-2494; 1 ex., 51 mm, 08-09-97, Kannur bridge, F-2504; 32 ex., 33-56 mm, 16-09-97, Eakhetulutippa, F-2545; 2 ex., 54-95 mm, 10-09-97, Pallithummulapalem, F-2556; 1 ex., 29 mm, 07-09-97, Kannur, river mouth, F-2568; 28 ex., 34-57 mm, 17-09-97, Krishna R mouth, nr, Light House, F-2594; 6 ex., 38-48 mm, 15-09-97, Lankavenitippa, F-2580; 1 ex., 110 mm, 14-02-98, Yelchettutippa, F-2625; 1 ex., 96 mm, 08-02-98, Pedakannur, F-2658; 4 ex., 75-80 mm, 18-02-98, Yesupuram, F-2690; 2 ex.,

99-100 mm, 15-02-98, Lankavenitippa, F-2716; 1 ex., 120 mm, 12-02-98, Jilagaladindi, F-2782; 2 ex., 40-45 mm, 18-09-98, Palli-thummulapalem, F-2891; 2 ex., 61-65 mm, 23-09-98, Sorlagandi, confluence, F-2959; 1 ex., 53 mm, 24-09-98, Sorlagandi, Light House, F-2988; 2 ex., 70-80 mm, 15-02-99, Pallithummulapalem, F-3082; 6 ex., 58-67 mm, 17-02-99, Hamsaldivi, F-3108; 3 ex., 59-81 mm, 19-02-99, Krishna estuary, nr. Light House, F-3134; 1 ex., 62 mm, 13-02-99, Kannur bridge, F-3160; 1 ex., 75 mm, 11-01-2000, Gollalamoda, F-3208; 1 ex., 55 mm, 11-01-2000, Gollalmanda, F-3235; 3 ex., 72-84 mm, 13-01-2000, Nachukunta, F-3291; 3 ex., 40-82 mm, 05-01-2000, Kannur bridge, F-3339; 4 ex., 61-75 mm, 11-12-2000, Kannur, river mouth, F-3395; 1 ex., 95 mm, 19-12-2000, Sorlagandi, river mouth, F-3416; 4 ex., 56-67 mm, Kannur bridge, F-3430; 1 ex., 65 mm, 13-12-2000, Pallithummulapalem, F-3478.

Diagnostic features : D XII-XIII, 13-15; A III, 7-8; P 17-18; GR (5-6) + (13-14); LL 43-52. Depth 2.5-2.8 in SL. Upper jaw extending to the level of anterior margin of eye. Second A spine longer and stronger than 3rd spine. Silvery grey; with 7-11 interrupted double brown spots forming transverse bars in juveniles; D with 2 rows of brown spots.

Distribution : Indo-west Pacific.

147. *Pomadasys maculatum* (Bloch)

1797. *Anthias maculatus* Bloch, *Naturges. ausland. Fische*, (7) : 9, pl. 326, fig. 2 (East Indies).

1986. *Pomadasys maculatum* : Smith and McKay, in Smith and Heemstra, *Smith's Sea Fishes* : 570, fig. 179.15.

Material examined : 1 ex., 112 mm, 10-02-98, Jilagaladindi, F-2731; 2 ex., 88-103 mm, 11-02-98, Jilagaladindi, F-2744; 1 ex., 104 mm, 12-02-98, Jilagaladindi, F-2785; 2 ex., 79-80 mm, 21-09-98, Kamavericheruvu, F-2940.

Diagnostic features : D XII, 13-15; A III, 7-8; LL 48-54; GR 6 + (14-16). Depth 2.7-2.9 in SL; 2nd A spine longer and stronger. A large oblique saddle-like blotch on nape; back with a series of cross bars; spiny D with a large black blotch.

Distribution : Tropical Indo-west Pacific.

148. *Acanthopargus berda* (Forsal)

1775. *Sparus berda* Forsal, *Descript. Anim.* : 32 (Arabia).

1991. *Acanthopargus berda* : Talwar and Jhingran, *Inland Fishes of India*, 2 : 847.

Material examined : 1 ex., 114 mm, 23-09-98, Sorlagandi, confluence, F-2966; 1 ex., 125 mm, 13-01-2000, Nachukunta, F-3300; 1 ex., 125 mm, 19-12-2000, Krishna R mouth, Sorlagandi, F-3413.

Diagnostic features : D XI, 11-12; A III, 8-9; P i, 13; LL 44-47. Depth 2.0-2.4 in SL. Four to 6 incisors at front of upper jaw; 6-8 on lower jaw, followed by 3-5 rows of molars. Preoperculum with 6 scale rows. Greyish-silvery to black; A and C greyish-black.

Distribution : Indo-west Pacific. Inhabits seas and estuaries, entering fresh waters.

149. *Nemipterus furcosus* (Valenciennes)

1830. *Dentex furcosus* Valenciennes, *Hist. nat. Poiss.*, **6** : 244 (Trincomalee, Sri Lanka).

1990. *Nemipterus furcosus* : Russell, *FAO Fish. Synop.*, (125)**12** : 34, fig. 64, pl. 1, f.

Material examined : 1 ex., 119 mm, 12-02-98, Jilagaladindi, F-2789; 1 ex., 90 mm, 12-02-98, Jilagaladindi, F-2805.

Diagnostic features : D X, 9; A III, 7; P 16; GR 9-12; LL 48-50. Depth 3.0-3.5 in SL; eye 2.8-4.0 in head; inter-orbital width 1.1-1.7, sub-orbital depth 0.9-1.9 in eyes. Lower margin of eye tangent to or above a line from tip of snout to upper base of P. P and V both reaching to or just short of level of anus; C lobes pointed. Pale iridescent pink; back with 9 indistinct cross-bars, extending to just below LL, the 3rd bar darker, forming a reddish shoulder spot behind origin of LL.

Distribution : Indian Ocean-Gulf of Mannar, Sri Lanka, Andaman Sea; West Pacific-southern Japan to north-eastern Australia.

150. *Nemipterus japonicus* (Bloch)

1791. *Sparus japonicus* Bloch, *Naturges. ausland. Fische*, **5** : 110 (no locality given).

1990. *Nemipterus japonicus* : Russell, *FAO Fish. Synop.*, (125)**12** : 40, fig. 72, pl. 2, b.

Material examined : 4 ex., 77-137 mm, 11-02-98, Jilagaladindi, F-2760; 1 ex., 115 mm, 12-02-98, Jilagaladindi, F-2788; 1 ex., 70 mm, 10-12-2000, Jilagaladindi, F-3610.

Diagnostic features : D X, 9; A III, 7; P 16; GR 14-17; LL 48-50. Depth 2.7-3.5 in SL; eye 3.2-4.4 in head; inter-orbital width 1.0-1.9, sub-orbital depth 1.0-1.9 in eye. Lower margin of eye above a line from tip of snout to upper base of P. P reaching to or just beyond level of A origin; V reaching to or just beyond anus; C forked, upper lobe slightly longer than lower lobe, produced into a filament. Pinkish, with 11-12 pale golden stripes from behind head to C base. A red-suffused yellow blotch below origin of LL.

Distribution : Indo-west Pacific.

151. *Chrysochir aureus* (Richardson)

1846. *Otolithus aureus* Richardson, *Rep. Br. Ass. Advmt. Sci.*, **15** : 224 (Canton).

1995. *Chrysochir aureus* : Talwar, *Fauna of India-Sciaenidae* : 54.

Material examined : 1 ex., 24 mm, 12-02-98, Jilagaladindi, F-2798.

Diagnostic features : D X + I, 25-28; A II, 6-7; GR (4-6) + (7-10); LL 48-51. Depth 3.6-4.3, head 2.8-3.6 in SL; 2nd A spine 4.0-4.2 in head. Anterior pair of pores on front of chin separated by symphysis. Mouth inferior; 1-2 pairs of canine teeth in upper jaw only. Gas-bladder carrot-shaped with 24-28 pairs of arborescent appendages, anterior pair with swollen bases and branching over posterior surface of transverse septum, not entering head. Metallic blue above, silvery below.

Distribution : East coast of India to west Pacific.

152. *Daysciaena albida* (Cuvier)

1830. *Corvina albida* Cuvier, *Hist. nat. Poiss.*, 5 : 93 (Pondicherry and Malabar).

1995. *Daysciaena albida* : Talwar, *Fauna of India-Sciaenidae* : 79.

Material examined : 1 ex., 110 mm, 15-02-98, Lankavenitippa, F-2727.

Diagnostic features : D IX-X + I, 23-26; A II, 7; P i, 17; GR (5-7) + (7-10); LL 48-51. Depth 3.0-4.0, head 3.0-3.5 in SL; 2nd A spine 2.0-2.1 in head. A pair of small tapering barbel on chin; no canines, teeth differentiated in lower jaw. Gas-bladder carrot-shaped with 17-19 pairs of arborescent appendages, anterior pair cephalic, entering into head and branching between uill and upper gill arches. Back grey, shading to silvery below; faint oblique lines along scale rows; a black blotch at P axil; outer margin of spiny D dark.

Distribution : India, Sri Lanka, eastwards to west Pacific.

153. *Dendrophysa russelli* (Cuvier)

1830. *Umbrina russelli* Cuvier, *Hist. nat. Poiss.*, 5 : 178 (Vizagapatnam).

1995. *Dendrophysa russelli* : Talwar, *Fauna of India-Sciaenidae* : 72.

Material examined : 1 ex., 90 mm, 11-02-97, Kannur, river mouth, F-2355; 2 ex., 100-102 mm, 18-02-98, Yesupuram, F-2695; 1 ex., 78 mm, 23-09-98, Sorlagandi, confluence, F-2962; 4 ex., 82-116 mm, 10-01-2000, Sorlagandi, F-3194; 1 ex., 75 mm, 12-12-2000, Kannur bridge, F-3457; 1 ex., 150 mm, 20-12-2000, Nachukunta, F-3551.

Diagnostic features : D X + I, 25-28; A II, 7; GR (4-5) + (8-10); LL 46-49. Depth 3.0-3.4, head 3.0-3.5 in SL; 2nd A spine 2.5-2.6 in head. Single mental barbel. No canines, teeth on lower jaw uniform. Gas-bladder carrot-shaped with 14-17 pairs of arborescent appendages; anterior branch entering head, and last diverticula simple or bifid. Back grey; a dark brown band on nape; a deep blue blotch on opercle; upper part of spiny D dark.

Distribution : India, eastwards to west Pacific.

154. *Johnnieops borneensis* (Bleeker)

1851. *Otolithus borneensis* Bleeker, *Natuurk. Tijdschr. Ned.-Indie*, **1** : 268 (Bandjermassing, Borneo).

2001. *Johnius (Johnnieops) borneensis* : Sasaki, *FAO species identification guide. Western Central Pacific*, **5** : 3154.

Material examined : 1 ex., 133 mm, 16-02-97, Lankavenitippa, F-2423; 3 ex., 63-66 mm, 18-02-98, Yesupuram, F-2696. [All labeled as *Johnnieops vogleri* (Bleeker)].

Diagnostic features : D IX-X + I, 27-31; A II, 7-8; P i, 16-17; GR (5-7) + (9-12), short, curved and coarsely spinulose in adults, slender in young; LL 48-50. Depth 3.4-3.6, head 2.9-3.3 in SL; 2nd A spine 4.3-4.6 in head. Snout evenly decurved, but not swollen or projecting. Teeth well differentiated in size in jaws, outer upper row and lower inner row teeth enlarged and widely spaced. Gas bladder hammer-shaped with 14-15 pairs of arborescent appendages. Spiny D duy in its upper third; A, P and V yellowish.

Distribution : Persian Gulf, through India, Sri Lanka, eastward to southern China and Taiwan, northern and northeastern Australia and New Guinea.

Remarks : Previous records from Indian coast are referred as to *Johnnieops vogleri* (Bleeker).

155. *Johnnieops dorsalis* (Peters)

1855. *Corvina dorsalis* Peters, *Arch. Naturgesch.*, **21**(1) : 242 (Mozambique).

1997. *Johnius dorsalis* : Sasaki, *Ichthyol. Res.*, **44**(3) : 312.

Material examined : 1 ex., 75 mm, 16-10-96, Yelchettutippa, F-2220; 3 ex., 73-99 mm, 16-02-97, Yesupuram, F-2391. [All labeled as *Johnnieops dussumieri* (Cuvier)].

Diagnostic features : D IX-X + I, 26-29; A II, 7-8; P i, 15-16; GR 5 + (13-16), short, stout, curved and coarsely toothed; LL 47-49. Depth 3.1-3.4, head 3.0-3.3 in SL; 2nd A spine 3.8-4.0 in head. Snout prominent, swollen and inflated. Outer teeth of upper jaw enlarged, widely spaced; inner teeth of lower jaw enlarged. Gas bladder hammer-shaped with 14-15 pairs of arborescent appendages. Duy-brown on back, silvery below; opercle with a steel-blue blotch; upper part of spiny D dark; a black spot at P base.

Distribution : Western Indian Ocean-Kenya to South Africa and Madagascar.

Remarks : The specimens in our collection are identical to the figure given in Mohan (1984) and Talwar (1995), and distinctly distinguishable from *Johnnieops sina* (Cuvier) (presently known as *J. dussumieri*). This identification is after Talwar (1995) where *J. dorsalis* is placed as a synonym of *Johnnieops dussumieri*.

156. *Johnieops dussumieri* (Cuvier)

1830. *Corvina dussumieri* Cuvier, *Hist. nat. Poiss.*, 5 : 119 (Malabar, India).

1996. *Johnius dussumieri* : Sasaki, *Mem. Fac. Sci. Kochi Univ. Ser. D (Biol.)*, 16/17 : 91-92.

Material examined : 1 ex., 55 mm, 16-10-96, Yelchettutippa, F-2221; 1 ex., 77 mm, 18-10-96, Nachukunta, F-2276; 1 ex., 52 mm, 12-10-96, Karuwaka mangroves, Pallithummulapalem, F-2330; 4 ex., 84-115 mm, 11-02-98, Jilagaladindi, F-2763; 1 ex., 88 mm, 12-02-98, Jilagaladindi, F-2803; 1 ex., 82 mm, 17-09-98, Kannur, F-2869; 1 ex., 63 mm, 18-09-98, Pallithummulapalem, F-2900; 4 ex., 61-99 mm, 19-09-98, Pallithummula-palem, F-2913; 2 ex., 59-63 mm, 20-09-98, Manganapudi, F-2935; 1 ex., 57 mm, 21-09-98, Kamavericheruvu, F-2948; 1 ex., 45 mm, 23-09-98, Sorlagandi, confluence, F-2963; 1 ex., 132 mm, 25-09-98, Lankavenitippa, F-3015; 2 ex., 40-68 mm, 24-09-98, Krishna estuary, F-3036; 1 ex., 87 mm, 14-02-99, Kannur bridge, F-3061; 3 ex., 97-112 mm, 21-09-99, creek nr. Sea, S of Lankaveni-tippa, F-3074; 5 ex., 68-93 mm, 17-02-99, Hamsaldivi, F-3119; 1 ex., 65 mm, 19-02-99, Krishna estuary, N of Light House, F-3145; 4 ex., 77-87 mm, 08-01-2000, Manganapudi, F-3334; 2 ex., 93-121 mm, 10-12-2000, Jilagaladindi, F-3582. [All specimens labeled as *Johnieops sina* (Cuvier)].

Diagnostic features : D IX-X + I, 26-31; A II, 7; P i, 16-17; GR (6-9) + (13-15), long and slender; LL 48-50. Depth and head 3.0-3.4 in SL; 2nd A spine 3.0-3.3 in head. Snout evenly decurved, not inflated. Preopercular margin finely serrated. Teeth well differentiated in size in jaws, outer teeth of upper jaw enlarged and widely spaced; inner teeth of lower jaw enlarged. Gas bladder hammer-shaped with 12-17 pairs of arborescent appendages. Dull-brown on back, silvery below; a steel-blue blotch on opercle; upper two-third of spiny D black.

Distribution : Pakistan, Sri Lanka, India, eastward to Andamans.

Remarks : This species, commonly called as sin croaker, was previously recorded as *Johnieops sina* (Cuvier) from Indian waters, is now known as *J. dussumieri* (Cuvier) (Sasaki, 1996).

157. *Johnieops osseus* (Day)

1876. *Sciaena osseus* Day, *Fishes of India*, (2) : 193, pl 46, fig. 3 (Malabar, India).

1995. *Johnius (Johnieops) osseus* : De Bruin *et al.*, *FAO species identification field guide for fishery purposes : Marine fishery resources of Sri Lanka* : 311, fig.

Material examined : 1 ex., 92 mm, 20-12-2000, Nachukunta, F-3552. [Labeled as *Johnieops aneus* (Bloch)].

Diagnostic features : D X + I, 25-29; A II, 7; LL 49-50; GR (7-8) + (15-16), short and spinulose. Depth 3.3-3.9, head 3.2-3.4 in SL; 2nd A spine 3.3-3.4 in head. Snout rounded,

rather obtuse, not inflated. Teeth slightly differentiated in size in both jaws, outer row of upper jaw teeth enlarged and spaced. Preopercular margin denticulate. Gas-bladder hammer-shaped with 13-14 pairs of arborescent appendages. Back dark grey, silvery below; upper half of spiny D duy.

Distribution : From 'the Gulf' to coasts of India, and Sri Lanka.

Remarks : Previously recorded as *Johnieops aneus* (Bloch) or *Johnius aneus*, a name that is now considered as a senior synonym of *Pennahia macrophthalmus* (Bleeker). Recent authors consider *J. osseus* as a junior synonym of *Johnieops dussumieri*, but with the feeling of its separate identity this has been determined so in accordance with de Bruin *et al.* (1995).

158. *Johnius belangerii* (Cuvier)

1830. *Corvina belangerii* Cuvier, *Hist. nat. Poiss.*, 5 : 120 (Pondicherry).

1995. *Johnius belangerii* : Talwar, *Fauna of India-Sciaenidae* : 103.

Material examined : 6 ex., 57-108 mm, 12-10-96, Karuwaka mangrove, Pallithummulapalem, F-2331; 1 ex., 92 mm, 16-02-97, Yesupuram, F-2390; 1 ex., 60 mm, 08-09-97, Kannur bridge, F-2512; 1 ex., 128 mm, 08-02-98, Pedakannur, F-2660; 2 ex., 119-120 mm, 12-02-98, Jilagaladindi, F-2802; 2 ex., 79-89 mm, 18-09-98, Pallithummulapalem, F-2899; 1 ex., 80 mm, 19-09-98, Pallithummula-palem, F-2912; 1 ex., 102 mm, 13-12-2000, Pallithummulapalem, F-3486.

Diagnostic features : D IX-X + I, 27-31; A II, 7-8; P i, 15-16; GR (5-6) + (7-9), very short, often club-shaped, spinulose; LL 48-52. Depth 3.2-3.9, head 3.1-3.7 in SL; 2nd A spine 2.0-2.5 in head. Snout steeply rounded, not or but slightly projecting. Teeth differentiated in size in upper jaw only, outer row enlarged, close-set. Gas bladder hammer-shaped with 11-14 pairs of arborescent appendages. Spiny D black; gill-cover with a dark blotch.

Distribution : Pakistan, India, Sri Lanka, through Indonesia, to China, Japan and eastern coast of Australia.

159. *Johnius carouna* (Cuvier)

1830. *Corvina carouna* Cuvier, *Hist. nat. Poiss.*, 5 : 125 (Malabar).

1995. *Johnius carouna* : Talwar, *Fauna of India-Sciaenidae* : 106.

Material examined : 3 ex., 122-155 mm, 13-02-97, Chentakalumundi, F-2438; 1 ex., 121 mm, 17-09-98, Kannur, F-2867; 1 ex., 63 mm, 11-12-2000, Kannur, river mouth, F-3406; 1 ex., 160 mm, 19-12-2000, river mouth, opp. Light House, Sorlagandi, F-3415.

Diagnostic features : D X + I, 26-29; A II, 7; P i, 15-16; GR (5-6) + (10-12); LL 46-49. Depth 3.4-3.8, head 3.3-3.6 in SL; 2nd A spine 2.1-2.2 in head. Snout abruptly rounded,

slightly projecting. Teeth differentiated in size in upper jaw only, outer row slightly enlarged and close-set. Gas bladder hammer-shaped with 14 or 15 pairs of arborescent appendages. Operculum with a bluish blotch; D light grey; other fins with yellowish tinge.

Distribution : Coasts of India.

160. *Johnius carutta* Bloch

1793. *Johnius carutta* Bloch, *Naturges. ausland. Fische*, (7) : 133, pl. 356 (Tranquebar).

Material examined : 1 ex., 139 mm, 12-02-98, Jilagaladindi, F-2799; 1 ex., 115 mm, 10-12-2000, Jilagaladindi, F-3580.

Diagnostic features : D IX-X + I, 25-30; A II, 7; P i, 17; GR (4-5) + (7-9), short; LL 48-50. Depth 3.0-3.6, head 3.0-3.3 in SL; 2nd A spine 3.4-3.6 in head. Snout rounded; teeth differentiated in size in upper jaw only, outer row slightly enlarged and close-set. Inter-orbital width 10.7-11.2 in SL. Scales on head and breast cycloid, and most of body scales either cycloid or has a feebly ctenoid zone. Gas bladder hammer-shaped. LL silvery, with a characteristic pale yellow median streak along its entire length in strong contrast to the purple-brown background. Upper two-thirds of spiny D black.

Distribution : Pakistan, India, Sri Lanka, eastward to Malay Peninsula and Thailand.

161. *Johnius dussumieri* (Valenciennes)

1833. *Umbrina dussumieri* Valenciennes, *Hist. nat. Poiss.*, 9 : 481 (Coromandel coast of India).

1995. *Johnius dussumieri* : Talwar, *Fauna of India-Sciaenidae* : 94.

Material examined : 5 ex., 48-107 mm, 11-02-98, Jilagaladindi, F-2764; 1 ex., 105 mm, 12-02-98, Jilagaladindi, F-2800; 2 ex., 104-106 mm, 10-12-2000, Jilagaladindi, F-3579.

Diagnostic features : D X + I, 22-26; A II, 7; P i, 16; GR (4-5) + (5-9); LL 48-50. Depth 3.0-3.5, head 3.0-3.4 in SL; 2nd A spine 3.3-3.6 in head. A blunt barbel on chin. Snout rounded, projecting. Teeth differentiated in size in upper jaw only, outer row slightly enlarged and close-set. Scales cycloid on body. Gas bladder hammer-shaped with 14 or 15 pairs of arborescent appendages. Head and back black, silvery below; upper part of spinous D black.

Distribution : Indo-Pacific.

Remarks : This species is known as *Johnius amblycephalus* (Bleeker) by recent authors (Sasaki, 1996) which is the nearest available name for *Johnius dussumieri* (Valenciennes) when generic status of *Johnieops* is not considered. While keeping *Johnius* and *Johnieops* as two separate genus this author opted to use the name *J. dussumieri* (Valenciennes) as in Talwar (1995).

162. *Johnius macropterus* (Bleeker)

1853. *Umbrina macropterus* Bleeker, *Natuurk. Tijdschr. Ned.-Indie*, 4 : 254 (Priaman, Sumatra).

1995. *Johnius macropterus* : Talwar, *Fauna of India-Sciaenidae* : 91.

Material examined : 2 ex., 105-112 mm, 12-02-98, Jilagaladindi, F-2801; 2 ex., 70-104 mm, 10-02-98, Jilagaladindi, F-2804; 3 ex., 69-75 mm, 20-09-98, Manganapudi, F-2963; 2 ex., 79-108 mm, 08-01-2000, Manganapudi, F-3288; 1 ex., 125 mm, 10-12-2000, Jilagaladindi, F-3581.

Diagnostic features : D X + I, 30-34; A II, 7; P i, 14-16; GR (5-6) + (8-11); LL 44-50. Depth 3.2-3.8, head 3.4-4.0 in SL; 2nd A spine 2.9-3.4 in head. A blunt barbel on chin. Snout rounded, slightly projecting. Teeth in upper jaw differentiated in size, outer row enlarged and close-set. Scales cycloid on snout and breast, ctenoid on body. Gas bladder hammer-shaped with 13-16 pairs of arborescent appendages. Back dark grey, flanks and belly whitish silvery reflections; barbel and chin whitish; spiny D darkish.

Distribution : Indo-west Pacific.

163. *Nibea maculata* (Schneider)

1801. *Jonnius maculatus* Schneider, *Syst. Ichthyol.* : 75 (Tranquebar).

1995. *Nibea maculata* : Talwar, *Fauna of India-Sciaenidae* : 87.

Material examined : 1 ex., 115 mm, 10-12-2000, Jilagaladindi, F-3577.

Diagnostic features : D X + I, 24-26; A II, 7; P i, 17; GR (3-5) + (5-10); LL 45-48. Depth 3.0-3.3, head 2.8-3.5 in SL; 2nd A spine 3.6-3.8 in head. Snout acute, prominent and projecting. Teeth well differentiated in jaws. Gas bladder carrot-shaped with 18-21 pairs of arborescent appendages, anterior pair extending into head. A distinct colour pattern of 5 dark bars extending obliquely from back to lower part of flanks, and a 6th dark blotch on top of C peduncle; 1st bar broadest, from nape obliquely backward; spiny D black except along base; soft D margin black.

Distribution : Pakistan, India, Sri Lanka, eastward to Malaysia.

164. *Otolithes ruber* (Schneider)

1801. *Jonnius ruber* Schneider, *Syst. Ichthyol.* : 75, pl. 17 (Tranquebar).

1995. *Otolithes ruber* : Talwar, *Fauna of India-Sciaenidae* : 58.

Material examined : 3 ex., 80-102 mm, 16-10-96, Yelchettutippa, F-2218; 1 ex., 204 mm, 13-02-97, Chentakaluamundi, F-2437; 1 ex., 71 mm, 11-02-98, Jilagaladindi, F-2761; 3 ex., 115-120 mm, 12-02-98, Jilagaladindi, F-2796, 1 ex., 150 mm, 25-09-98, Lankavenitippa, F-3014.

Diagnostic features : D IX-X + I, 27-30; A II, 7; P i, 15; GR 4 + (8-11), long, slender; LL 52-54. Depth 3.9-4.8, head 2.9-3.4 in SL; 2nd A spine 5.7-5.9 in head. Mouth large, terminal; lower jaw projecting. Teeth in upper jaw in 2 rows, with 1 or 2 pairs of strong canines near symphysis; lower jaw with a single or a pair of canine at the tip. Gas bladder carrot-shaped with 32-36 pairs of arborescent appendages, anterior pair branching on posterior surface of transverse septum and not entering head. Brownish above, silvery with a golden sheen on flanks and belly, often with oblique dark streaks dorsally.

Distribution : Indo-west Pacific.

165. *Panna microdon* (Bleeker)

1849. *Otolithus microdon* Bleeker, *Verh. batav. Genoot. Kunst. Wet.*, 22(4) : 10 (Madura, East Indies).

1995. *Panna microdon* : Talwar, *Fauna of India-Sciaenidae* : 31.

Material examined : 2 ex., 113-150 mm, 11-02-98, Jilagaladindi, F-2762; 1 ex., 167 mm, 12-02-98, Jilagaladindi, F-2797; 2 ex., 122-128 mm, 17-09-98, Kannur, F-2868; 5 ex., 93-126 mm, 19-09-98, Pallithummulapalem, F-2911; 1 ex., 120 mm, 21-02-99, creek near Sea, S of Lankavenitippa, F-3073.

Diagnostic features : D VIII-X + I, 31-37; A II, 6-7; P i, 17-18; GR (7-8) + (10-12), lanceolate; LL 92-95. Depth 3.8-5.0, head 2.8-3.9 in SL; 2nd A spine 3.2-3.5 in head. Mouth large, terminal; snout pointed; maxilla extending beyond eye; teeth in both jaw differentiated, outer row in upper jaw enlarged and spaced with 1 or 2 canines at tip. Gas bladder carrot-shaped with one pair of tubular appendage arising at its outer end, dividing into a cephalic branch, entering head and a long posterior tubular branch lying beside the main bladder to its posterior end. Brown, lighter below.

Distribution : India, Sri Lanka, to Borneo, the South China Sea.

166. *Paranibea semiluctuosa* (Cuvier)

1830. *Corvina semiluctuosa* Cuvier, *Hist. nat. Poiss.*, 5 : 106 (Malabar, Goa, Pondicherry).

1995. *Paranibea semiluctuosa* : Talwar, *Fauna of India-Sciaenidae* : 76.

Material examined : 1 ex., 134 mm, 08-09-97, Kannur bridge, F-2513.

Diagnostic features : D IX-X + I, 27-31; A II, 7; P i, 18; GR (4-5) + (7-9); LL 49-53. Depth 2.8-3.3, head 2.9-3.2 in SL; 2nd A spine 2.0-2.1 in head. Dorsal profile much more arched; the profile from snout to occiput straight. Snout moderately acute, slightly projecting. Teeth differentiated in size in upper jaw only, outer row moderately enlarged and spaced. Body scales coarsely ctenoid. Gas bladder carrot-shaped with 15-21 pairs of arborescent

appendages, 1st appendage entering into head. Dark brown with a series of narrow dark stripes along the scale rows; fins dark.

Distribution : India, eastward to Sumatra and Java.

167. *Pennahia anea* (Bloch)

1793. *Johnius aneus* Bloch, *Naturges. ausland. Fische*, (7) : 135, pl. 357 (Malabar).

1995. *Pennahia anea* : De Bruin *et al.*, *FAO species identification field guide for fishery purposes : Marine fishery resources of Sri Lanka* : 312, fig.

Material examined : 1 ex., 128 mm, 10-12-2000, Jilagaladindi, F-3578. (Labeled as *Pennahia macrophthalmus*)

Diagnostic features : D IX-X + I, 21-26; A II, 7; P i, 17; GR (5-8) + (8-11), lanceolate; LL 52-54. Depth 3.1-3.6, head 2.8-3.0 in SL; 2nd A spine 3.7-4.4 in head. Mouth large, terminal and oblique; upper jaw reaching to below hind part of eye. Teeth differentiated in jaws, outer upper and lower inner series enlarged and spaced, but no canines. Gas bladder carrot-shaped with 18-21 pairs of arborescent appendages, anterior pair branching on posterior surface of transverse septum and not entering head. Nape with a diffused dusky blotch; upper two-third of spiny D dusky.

Distribution : The Gulf, Pakistan, India, Sri Lanka, through Indonesia, to China, the Philippines.

Remarks : Early records from Indian coast were mostly referred as *Pennahia macrophthalmus* (Bleeker), which is a junior synonym of this species.

168. *Protonibea diacanthus* (Lacepede)

1802. *Lutjanus diacanthus* Lacepede, *Hist. nat. Poiss.*, 4 : 240 (no locality).

1995. *Protonibea diacanthus* : Talwar, *Fauna of India-Sciaenidae* : 69.

Material examined : 1 ex., 82 mm, 16-10-96, Yelchettutippa, F-2219; 1 ex., 150 mm, 16-02-97, Lankavenitippa, F-2422; 1 ex., 132 mm, 11-02-98, Jilagaladindi, F-2767; 1 ex., 145 mm, 12-02-98, Jilagaladindi, F-2795.

Diagnostic features : D IX-X + I, 22-25; A II, 7; P i, 17-18; GR (5-7) + (5-8); LL 51-52. Depth 3.2-4.2, head 2.9-3.3 in SL; 2nd A spine 3.0-3.2 in head. Snout acute; mouth large and terminal; teeth in jaws differentiated in size, outer row in upper jaw enlarged and spaced. Gas bladder carrot-shaped with 16-20 pairs of arborescent appendages, anterior pair branching on posterior surface of transverse septum, but not entering head. Dark-grey; 5 dark blotches along back; many smaller black spots on head, upper half of body and on D and C.

Distribution : Gulf of Oman, through India, Indonesia, to the Philippines, China and Japan.

169. *Upeneus moluccensis* (Bleeker)

1855. *Upeneoides moluccensis* Bleeker, *Nat. Tijdschr. Ned.-Indie*, 8 : 409 (Ambonia).

1984. *Upeneus moluccensis* : Kumaran, *FAO species identification sheets for fishery purposes. W. Indian Ocean (Fishing Area 51)*, 3 : MULL Upen 1.

Material examined : 1 ex., 106 mm, 08-01-2000, Manganapudi, F-3284.

Diagnostic features : D VIII + I, 8; A I, 6; P 15-18; GR 9 + (18-20); LL 33-36. Depth 3.5-3.9 in SL; barbels 1.6-2.1 in head; 5½ scale rows between both D; 12-13 scale rows along upper part of C peduncle. A golden yellow stripe from eye to upper C base; 1st D with 3-4 and 2nd D with 2-3 orange stripes; upper C lobe with 6-7 transverse orange bands; lower C lobe longitudinally streaked orange and whitish.

Distribution : Indo-west Pacific.

170. *Upeneus sulphureus* Cuvier

1829. *Upeneus sulphureus* Cuvier, *Hist. nat. Poiss.*, 3 : 450 (Anjer Straits of Sunda).

Material examined : 2 ex., 53-58 mm, 16-10-96, Yelchettutippa, F-2222; 1 ex., 50 mm, 08-09-97, Kannur bridge, F-2516; 3 ex., 95-102 mm, 11-02-98, Jilagaladindi, F-2768; 2 ex., 118-120 mm, 12-02-98, Jilagaladindi, F-2784; 8 ex., 54-75 mm, 23-09-98, Sorlagandi, F-2960; 4 ex., 55-62 mm, 24-09-98, Sorlagandi, nr. Light House, F-2999; 2 ex., 48-52 mm, 15-02-99, Pallithummula-palem, F-3087; 3 ex., 50-55 mm, 19-02-99, Krishna estuary, N of Light House, F-3131; 29 ex., 48-54 mm, 13-02-99, Kannur bridge, F-3163; 2 ex., 56-76 mm, 10-01-2000, Sorlagandi, F-3195; 3 ex., 50-53 mm, 11-01-2000, Gollalamoda, F-3209; 9 ex., 49-65 mm, 04-01-2000, Kannur, F-3312; 1 ex., 49 mm, 05-01-2000, Kannur bridge, F-3347; 1 ex., 105 mm, 10-12-2000, Jilagaladindi, F-3572.

Diagnostic features : D VIII + I, 8; A I, 7; P 16; GR 8 + (20-21); LL 34-37. Depth 3.2-3.6, head 3.1-3.3 in SL; 5-7 scale rows between both D; 12 scale rows along upper part of C peduncle. D with 3 horizontal stripes; no crossbars on C.

Distribution : Indo-west Pacific.

171. *Upeneus vittatus* (Forsal)

1775. *Mullus vittatus* Forsal, *Descript. Animal* : 31 (Djedda).

1986. *Upeneus vittatus* : Ben-Tuvia, in Smith and Heemstra, *Smith's Sea Fishes* : 613, pl. 70, fig. 196.13.

Material examined : 1 ex., 115 mm, 12-02-98, Jilagaladindi, F-2825; 2 ex., 100-110 mm, 08-01-2000, Manganapudi, F-3285; 2 ex., 100-117 mm, 10-12-2000, Jilagaladindi, F-3573.

Diagnostic features : D VIII + I, 8; A I, 7; P 15-17; GR (8-9) + (18-21); LL 34-37. Depth 3.6-3.8, head 3.3-3.4 in SL; snout 2.6-2.9, eye 3.8-4.2, barbels 1.7-1.9 in head; 5½ scale rows

between both D; 11-12 scale rows along upper part of C peduncle. Greenish on back, silvery on sides, pale yellow ventrally with 4 orange yellow stripes. First D with 3 broad black stripes, tip black; 2nd D with 3 dark bands. Upper lobe of C with 4-5 dark bands and the lower lobe with 3-4 broad black bands, the distal one broadest and darkest.

Distribution : Indo-Pacific.

172. *Monodactylus argenteus* (Linnaeus)

1758. *Chaetodon argenteus* Linnaeus, *Syst. Nat.* (ed. 10), 1 : 272 ("Indies").

1991. *Monodactylus argenteus* : Talwar and Jhingran, *Inland Fishes of India*, 2 : 868.

Material examined : 1 ex., 37 mm, 11-01-2000, Gollalmanda, F-3245; 1 ex., 40 mm, 11-12-2000, Kannur, river mouth, F-3405.

Diagnostic features : D VII-VIII, 26-30; A III, 26-30; P i, 16; lower GR 18-22. Depth 1.2-1.6 in SL. Mouth small; jaws with band of tiny conical teeth; granular tooth patches on palate and tongue. V very small, or absent in adults. D spines small and inconspicuous. Silvery; tips of D and A lobes dusky; juveniles with 2 curved dark stripes across head.

Distribution : Indo-west Pacific.

173. *Toxotes chatareus* (Hamilton)

1822. *Coius chatareus* Hamilton, *Fishes of Ganges* : 101, 370, pl. 14, fig. 3 (mouth of Ganges river).

1991. *Toxotes chatareus* : Talwar and Jhingran, *Inland Fishes of India*, 2 : 871.

Material examined : 1 ex., 82 mm, 15-10-96, Lankavenitippa, F-2301; 3 ex., 48-74 mm, 13-12-2000, Pallithummulapalem, F-3488.

Diagnostic features : D V, 12; A III, 16-17; P 13; LL 29-34; Ltr 3-4/9-11. Depth 1.9-2.4, head 2.5-3.0 in SL. Head flattened dorsally; mouth large, terminal. D inserted far back on posterior half of body. A series of 5-7 black blotches on upper side.

Distribution : India, Sri Lanka, Myanmar, Malay, Thailand, and eastward to New Guinea and northern Australia.

174. *Drepane longimanus* (Bloch & Schneider)

1801. *Chaetodon longimanus* Bloch and Schneider, *Syst. Ichthyol.*, : 299 (Tranquebar).

1986. *Drepane longimanus* : Smith, in Smith and Heemstra, *Smith's Sea Fishes* : 610.

Material examined : 1 ex., 50 mm, 16-10-96, Yelchettutippa, F-2209; 2 ex., 56-59 mm, 08-09-97, Kannur bridge, F-2499; 1 ex., 66 mm, 19-09-98, Pallithummulapalem, F-2903; 1 ex., 57 mm, 05-01-2000, Kannur bridge, F-3343.

Diagnostic features : D VIII, 21-22; A III, 17-19; P i, 15-17; LL 45-55. Third spine of D longest. Silvery with 4-9 grey vertical bars on upper half.

Distribution : Tropical Indo-west Pacific.

175. *Drepane puntatus* (Linnaeus)

1758. *Chaetodon punctatus* Linnaeus, *Syst. Nat.* (ed. 10), **1** : 273 (Asia).

1991. *Drepane punctatus* : Talwar and Jhingran, *Inland Fishes of India*, **2** : 874.

Material examined : 1 ex., 95 mm, 12-02-98, Jilagaladindi, F-2817; 2 ex., 58-65 mm, 12-12-2000, Kannur bridge, F-3432.

Diagnostic features : D IX, 19-22; A III, 17-19; P i, 17. Fourth D spine longest. Silvery, with 4-11 vertical bars of small spots on upper half.

Distribution : Indo-west Pacific.

176. *Ephippus orbis* (Bloch)

1787. *Chaetodon orbis* Bloch, *Naturges. ausland. Fische*, **3** : 81, pl. 202, fig. 2 (East Indies).

1984. *Ephippus orbis* : Talwar and Kacker, *Comm. Sea Fish. India* : 700.

Material examined : 1 ex., 100 mm, 11-02-98, Jilagaladindi, F-2741; 1 ex., 102 mm, 12-02-98, Jilagaladindi, F-2818.

Diagnostic features : D I/IX, 19-20; A III, 15-16. Body strongly compressed, orbicular. Depth 1.2-1.3 in SL. Mouth small, terminal. Eye diameter larger than distance from mouth to eye margin. Teeth in bands, setiform. Top of head and operculum scaled. Scales small, finely ciliated. Four or 5 vertical black bars on body from D base to belly.

Distribution : Pakistan, India, Sri Lanka, eastward to Indonesia, Australia and Taiwan.

177. *Scatophagus argus* (Linnaeus)

1766. *Chaetodon argus* Linnaeus, *Syst. Nat.* (ed. 12), **1** : 464 (India).

1991. *Scatophagus argus* : Talwar and Jhingran, *Inland Fishes of India*, **2** : 875.

Material examined : 2 ex., 75-88 mm, 10-10-96, Kannur, F-2277; 20 ex., 36-73 mm, 18-02-97, Krishna R mouth nr. Nagailanka, F-2336; 3 ex., 53-60 mm, 18-02-97, Yedurumundi, F-2399; 2 ex., 68-88 mm, 08-09-97, Kannur bridge, F-2498; 1 ex., 23 mm, 15-09-97, Lankavenitippa, F-2576; 1 ex., 67 mm, 12-02-99, Channel mouth, Kannur, F-3043; 1 ex., 60 mm, 20-02-99, Pulleru mouth, Palakai-tippa, F-3101; 2 ex., 50-90 mm, 19-02-99, Krishna estuary, N of Light House, F-3124; 2 ex., 50-63 mm, 13-02-99, Kannur bridge, F-3161; 2 ex.,

49-53 mm, 10-01-2000, Sorlagandi, F-3196; 2 ex., 54-55 mm, 11-01-2000, Gollalamoda, F-3204; 1 ex., 54 mm, 11-01-2000, Gollalmanda, F-3230; 2 ex., 44-95 mm, 13-01-2000, Nachukunta, F-3290; 1 ex., 56 mm, 05-01-2000, Kannur bridge, F-3336; 1 ex., 73 mm, 14-12-2000, Pallithummulapalem, F-3375; 5 ex., 30-55 mm, 11-12-2000, Kannur, river mouth, F-3393; 3 ex., 35-41 mm, 12-12-2000, Kannur bridge, F-3431; 5 ex., 42-90 mm, 13-12-2000, Pallithummulapalem, F-3476.

Diagnostic features : D XI, 16-18; A VI, 14-15; P 16-17. Body quadrangular. Scales very small. Body with numerous dark round spots.

Distribution : India, Sri Lanka, through Indonesia, to Australia, New Hebrides and Solomon Island.

178. *Nandus nandus* (Hamilton)

1822. *Cois nandus* Hamilton, *Fishes of Ganges* : 96, 370, pl. 30, fig. 32 (Ponds of Gangetic province).

1991. *Nandus nandus* : Talwar and Jhingran, *Inland Fishes of India*, 2 : 878.

Material examined : Not obtained by us.

Diagnostic features : D XII-XIV, 11-13; A III, 7-9; P 15; LS 46-57, LL interrupted at about 36th scale; eyes 5-6 in head. Greenish-brown with brassy reflections; vertically marbled with 3 broad patchy blotches; a duy blotch on C base; some narrow bands radiating from eye.

Distribution : Pakistan, India, Nepal, Bangladesh, Myanmar and Thailand.

Remarks : This species is known to occur in estuaries and its occurrence in Krishna river system (Jayaram, 1995) leads this author to include it here.

179. *Etroplus maculatus* (Bloch)

1785. *Chaetodon maculatus* Bloch, *Syst. Ichthyol.* : pl. 427, fig. 2 (India).

1991. *Etroplus maculatus* : Talwar and Jhingran, *Inland Fishes of India*, 2 : 885.

Material examined : 32 ex., 33-67 mm, 15-10-96, Lankavenitippa, F-2299; 1 ex., 55 mm, 12-10-96, Karuwaka mangroves, Palli-thummulapalem, F-2309; 1 ex., 55 mm, 18-02-97, Krishna R mouth nr. Nagailanka, F-2337; 5 ex., 34-50 mm, 15-09-97, Lankavenitippa, F-2571; 1 ex., 40 mm, 07-02-98, Pedakannur, F-2607.

Diagnostic features : D XVII-XX, 8-10; A XII-XV, 8-9; P i, 15-16; LL interrupted; LS 35. Three large, round, black blotches on flanks.

Distribution : Peninsular India and Sri Lanka.

180. *Etroplus suratensis* (Bloch)

1785. *Chaetodon suratensis* Bloch, *Syst. Ichthyol.* : 217 (?Surat).

1991. *Etroplus suratensis* : Talwar and Jhingran, *Inland Fishes of India*, 2 : 885.

Material examined : 11 ex., 32-50 mm, 15-10-96, Lankavenitippa, F-2300; 1 ex., 32 mm, 18-09-97, Yedurumundi, F-2490; 1 ex., 96 mm, 17-12-2000, Puligada, F-3563.

Diagnostic features : D XVIII-XIX, 14-15; A XII-XIII, 11-12; P i, 16; LL interrupted at 16th-18th scale; LS 35-40. Light green with 6-8 faint vertical bands; most of scales above LL with a central white pearly spot; P base with a black blotch.

Distribution : India-Orissa, Andhra Pradesh, Tamil Nadu, Kerala; and Sri Lanka.

181. *Oreochromis mossambica* (Peters)

1852. *Chromis (Tilapia) mossambicus* Peters, *Montab. Akad. Wiss. Berlin* : 681 (Mozambique).

1991. *Oreochromis mossambicus* : Talwar and Jhingran, *Inland Fishes of India*, 2 : 887.

Material examined : 17 ex., 16-64 mm, 11-09-97, Kamavericheruvu, F-2198; 6 ex., 95-105 mm, 12-02-97, Pallithummulapalem, F-2392; 4 ex., 71-95mm, 12-02-97, Pallithummulapalem F-2393; 2 ex., 52-53 mm, 09-09-97, Pallithummulapalem, F-2467; 53 ex., 20-58 mm, 10-09-97, Pallithummulapalem, F-2551; 1 ex., 45 mm, 07-02-98, Pedakannur, F-2608; 11 ex., 54-102 mm, 09-02-98, Pallithummula-palem, F-2712; 1 ex., 92 mm, 14-02-99, Kannur bridge, F-3059; 3 ex., 74-85 mm, 15-02-99, Pallithummulapalem, F-3090.

Diagnostic features : D XV-XVI, 10-12; A III, 10-11; P 14-15; LS 30-32. Teeth in 3-5 series in jaws; palate edentulous. Longest ray of D extending to above proximal part of C in females and immature males, but in breeding males to $\frac{1}{2}$ or $\frac{3}{4}$ length of C. Scales cycloid. Females and non-breeding males watery-grey to yellowish, with 3-4 dark blotches often present along flanks; males in breeding season deep black. D black with a red margin; C with a broad red margin.

Distribution : East Africa. Introduced in India, Sri Lanka and Pakistan etc.

182. *Liza macrolepis* (Smith)

1849. *Mugil macrolepis* Smith, *Illust. Zool. S. Africa*, 4 : pl. 28, fig. 2 (Rivers and Lakes of S. Africa).

1991. *Liza macrolepis* : Talwar and Jhingran, *Inland Fishes of India*, 2 : 891.

Material examined : 10 ex., 55-76 mm, 15-09-97, Lankavenitippa, F-2582.

Diagnostic features : D IV + I, 8; A III, 9; P 15; LS 31-34; Ltr 12. Head 3.5-4.3 in SL. P tip not reaching vertical through D origin; 1st D inserted nearer to C base than snout tip; 2nd D origin above middle of A base. Greenish above, silvery below.

Distribution : Indo-west Pacific.

183. *Liza melinoptera* (Valenciennes)

1836. *Mugil melinopterus* Valenciennes, *Hist. nat. Poiss.*, 11 : 146, pl. 313 (Vanicola).

1991. *Liza melinoptera* : Talwar and Jhingran, *Inland Fishes of India*, 2 : 892.

Material examined : 3 ex., 39-104 mm, 11-10-96, Pulleru mouth, Pedapatnam, F-2258; 3 ex., 39-95 mm, 10-10-96, Kannur, F-2296; 2 ex., 105-113 mm, 15-10-96, Lankaveni-tippa, F-2304; 1 ex., 95 mm, 18-02-97, Krishna R mouth, nr. Nagailanka, F-2341; 12 ex., 39-100 mm, 11-02-97, Kannur, river mouth, F-2358; 12 ex., 41-85 mm, 12-02-97, Pallithummulapalem, F-2375; 2 ex., 132-141 mm, 16-02-97, Yesupuram, F-2384; 1 ex., 91 mm, 18-02-97, Yedurumundi, F-2403; 3 ex., 97-116 mm, 10-02-97, Jilagaladindi, F-2453; 10 ex., 71-132 mm, 09-09-97, Pallithummula-palem, F-2469; 11 ex., 41-90 mm, 19-09-97, Palakaitippa, F-2479; 3 ex., 98-110 mm, 18-09-97, Yedurumundi, F-2488; 2 ex., 113-140 mm, 16-09-97, Eakhetulutippa, F-2536; 3 ex., 101-124 mm, 10-09-97, Pallithummulapalem, F-2554; 7 ex., 38-107 mm, 07-09-97, Kannur, river mouth, F-2569; 6 ex., 42-51 mm, 15-09-97, Lankavenitippa, F-2583; 1 ex., 43 mm, 17-09-97, Krishna R mouth, nr. Light House, F-2602; 7 ex., 34-54 mm, 12-09-97, Kannur, F-2604; 5 ex., 47-64 mm, 07-02-98, Pedakannur, F-2624; 4 ex., 104-180 mm, 20-02-98, Nagailanka ferry point, F-2655; 7 ex., 51-90 mm, 08-02-98, Pedakannur, F-2670; 1 ex., 102 mm, 19-02-98, Avaniidaga fish market, F-2681; 2 ex., 108-110 mm, 09-02-98, Pallithummulapalem, F-2709; 3 ex., 79-145 mm, 15-02-98, Lankavenitippa, F-2728; 3 ex., 57-66 mm, 15-09-98, Kannur bridge, F-2834; 12 ex., 69-115 mm, 16-09-98, Kannur, river mouth, F-2856; 3 ex., 56-73 mm, 17-09-98, Kannur, F-2874; 3 ex., 60-91 mm, 18-09-98, Pallithum-mulapalem, F-2898; 3 ex., 68-137 mm, 19-09-98, Pallithummulapalem, F-2910; 1 ex., 95 mm, 20-09-98, Manganapudi, F-2928; 1 ex., 100 mm, 26-09-98, Sangameswara, F-3023; 8 ex., 53-93 mm, 12-02-99, Channel mouth, Kannur, F-3050; 7 ex., 46-85 mm, 14-02-99, Kannur bridge, F-3066; 3 ex., 85-94 mm, 21-02-99, creek nr. sea, S of Lanka-venitippa, F-3078; 7 ex., 60-103 mm, 15-02-99, Pallithummulapalem, F-3100; 4 ex., 44-85 mm, 20-02-99, Pulleru mouth, Palakai-tippa, F-3106; 13 ex., 63-91 mm, 17-02-99, Hamsaldivi, F-3118; 2 ex., 41-73 mm, 19-02-99, Krishna estuary, N of Light House, F-3148; 19 ex., 41-54 mm, 11-01-2000, Gollala-moda, F-3217; 7 ex., 47-55 mm, 11-01-2000, Gollalmanda, F-3250; 1 ex., 88 mm, Pallithummulapalem, F-3262; 1 ex., 60 mm, 13-01-2000, Nachukunta, F-3304; 3 ex., 62-90 mm, 18-12-2000, Yesupuram, F-3373; 1 ex., 60 mm, 17-12-2000, Palakai-tippa, F-3369; 1 ex., 65 mm, 11-12-2000, Kannur, river mouth, F-3407; 4 ex., 55-61 mm, 12-12-2000, Kannur bridge, F-3456; 2 ex., 95-175 mm, 13-12-2000, Pallithummula-palem, F-3542; 1 ex., 108 mm, 20-12-2000, Nachukunta, F-3548.

Diagnostic features : D IV + I, 8; A III, 9; P 15; LS 26-31; Ltr 9-10. Head 3.4-3.8 in SL. Pre-orbital filling space between lip and eye. D origin nearer to C base than to snout tip; 2nd D origin above anterior half of A base. Greenish-brown dorsally.

Distribution : Indo-west Pacific.

184. *Liza parsia* (Hamilton)

1822. *Mugil parsia* Hamilton, *Fishes of Ganges* : 215, pl. 17, fig. 71 (Freshwater rivers of Bengal).

1991. *Liza parsia* : Talwar and Jhingran, *Inland Fishes of India*, 2 : 893.

Material examined : 1 ex., 97 mm, 07-02-98, Pedakannur, F-2623; 2 ex., 104-138 mm, 21-09-98, Kamavericheruvu, F-2945.

Diagnostic features : D IV + I, 8; A III, 9; P 14; LS 31-36; Ltr 11. Head 4.0-4.3 in SL. Pre-orbital filling space between lip and eye. First D inserted nearer to snout tip than to C base; 2nd D origin over anterior half of A base. Greenish-brown above, silvery below; a golden spot on upper part of operculum.

Distribution : Pakistan, India and Sri Lanka.

185. *Liza tade* (Forsal)

1775. *Mugil crenilabrus tade* Forsal, *Descript. Animal.* : 74 (Arabia).

1991. *Liza tade* : Talwar and Jhingran, *Inland Fishes of India*, 2 : 894.

Material examined : 4 ex., 35-70 mm, 12-09-97, Kannur, F-2605; 5 ex., 61-97 mm, 25-09-98, Lankavenitippa, F-3021; 1 ex., 90 mm, 26-09-98, Sangameswara, F-3022; 1 ex., 92 mm, 13-01-2000, Nachukunta, F-3303.

Diagnostic features : D IV + I, 8; A III, 9; P 17; LS 30-35; Ltr 11. Head 4.0-5.2 in SL. Pre-orbital filling space between lip and eye. First D inserted nearer to snout tip than C base; 2nd D origin over posterior half of A base. Greenish-brown above, silvery below.

Distribution : Indo-west Pacific.

186. *Mugil cephalus* Linnaeus

1758. *Mugil cephalus* Linnaeus, *Syst. Nat.* (ed. 10), 1 : 316 (European Seas).

Material examined : 1 ex., 58 mm, 12-02-97, Pallithummulapalem, F-2373; 1 ex., 157 mm, 20-02-98, Nagailanka ferry point, F-2653; 1 ex., 120 mm, 25-09-98, Lankavenitippa, F-3019; 8 ex., 66-101 mm, 15-02-99, Palli-thummulapalem, F-3098.

Diagnostic features : D IV + I, 8; A III, 8; P 15; LS 38-42; Ltr 14-15. Head 3.4-3.7 in SL. P axillary scale long. First D inserted nearer to snout tip than C base. Pre-orbital slender, filling only half space between lip and eye. Olive-green above, silvery below.

Distribution : Circum-global-temperate and tropical waters.

187. *Rhinomugil corsula* (Hamilton)

1822. *Mugil corsula* Hamilton, *Fishes of Ganges* : 221, 381, pl. 9, fig. 97 (Ganges river).

1991. *Rhinomugil corsula* : Talwar and Jhingran, *Inland Fishes of India*, 2 : 897.

Material examined : Not obtained.

Diagnostic features : D IV + I, 8; A III, 9; P 16; LS 48-52. Head concave between eyes; mouth ventral, protrusible. First D inserted nearer to C base than to snout-tip. Dull brown above, silvery below.

Distribution : India, Bangladesh, Nepal, Myanmar.

Remarks : This species is stated to be 'well established in the Krishna system in all the three reaches', probably in the estuary (Jayaram, 1995).

188. *Valamugil cunnesius* (Valenciennes)

1836. *Mugil cunnesius* Valenciennes, *Hist. nat. Poiss.*, 11 : 114 (Malabar).

1991. *Valamugil cunnesius* : Talwar and Jhingran, *Inland Fishes of India*, 2 : 901.

Material examined : 4 ex., 85-111, 17-10-96, Goalmata, nr. Light House, F-2235; 1 ex., 74 mm, 08-10-96, Pallithummulapalem, F-2238; 1 ex., 70 mm, 11-02-97, Kannur, river mouth, F-2359; 10 ex., 56-68 mm, 12-02-97, Pallithummulapalem, F-2374; 1 ex., 149 mm, 16-02-97, Yesupuram, F-2383; 1 ex., 73 mm, 18-02-97, Yedurumundi, F-2404; 1 ex., 150 mm, 16-02-97, Lankavenitippa, F-2420; 3 ex., 94-134 mm, 17-02-97, Yelchettutippa, F-2444; 4 ex., 45-64 mm, 19-09-97, Palakaitippa, F-2480; 1 ex., 104 mm, 18-09-97, Yeduru-mundi, F-2487; 1 ex., 81 mm, 08-09-97, Kannur bridge, F-2522; 7 ex., 54-78 mm, 12-09-97, Kannur, F-2603; 1 ex., 57 mm, 07-02-98, Pedakannur, F-2622; 1 ex., 130 mm, 20-02-98, Nagailanka ferry point, F-2654; 2 ex., 58-66 mm, 08-02-98, Pedakannur, F-2669; 1 ex., 129 mm, 18-02-98, Yesupuram, F-2685; 1 ex., 127 mm, 18-02-98, Yesupuram, F-2694; 2 ex., 120-125 mm, 15-02-98, Lankavenitippa, F-2729; 1 ex., 103 mm, 12-02-98, Jilagala-dindi, F-2826; 1 ex., 69 mm, 15-09-98, Kannur bridge, F-2833; 5 ex., 63-75 mm, 16-09-98, Kannur, river mouth, F-2855; 2 ex., 57-61 mm, 23-09-98, Sorlagandi, confluence, F-2970; 3 ex., 34-62 mm, 24-09-98, Sorlagandi, nr Light House, F-3000; 2 ex., 108-113 mm, 25-09-98, Lankavenitippa, F-3020; 13 ex., 75-102 mm, 26-09-98, Sangameswara, F-3024; 1 ex., 75 mm, 12-02-99, Channel mouth, Kannur, F-3049; 3 ex., 85-120 mm, 21-02-99, creek nr sea, S of Lankavenitippa, F-3079; 1 ex., 85 mm, 15-02-99, Pallithummula-palem, F-3099; 17 ex., 50-75 mm, 20-02-99, Pulleru mouth, Palakaitippa, F-3105; 1 ex., 81 mm, 13-02-99, Kannur bridge, F-3173; 3 ex., 73-79 mm, 05-01-2000, Kannur bridge, F-3346; 7 ex., 48-80 mm, 19-12-2000, River mouth, Sorlagandi, F-3424; 2 ex., 55-60 mm, 12-12-2000, Kannur bridge, F-3455; 3 ex., 67-94 mm, 13-12-2000, Palli-thummulapalem, F-3543.

Diagnostic features : D IV + I, 8; A III, 9; P 15-16; LS 30-35; Ltr 11-12. Head 3.4-4.2 in SL. Adipose eyelid well developed, covering half or more of iris. First D inserted nearer to snout tip than to C base; 2nd D origin on vertical through anterior third of A base. P axillary

scale long. Scales with membranous digitated hind margin. Yellow-brown to dark grey on back, silvery below; a dark axillary spot on P base.

Distribution : Indo-west Pacific.

189. *Valamugil speigleri* (Bleeker)

1858. *Mugil speigleri* Bleeker, *Nat. Tijdschr. Ned.-Indie*, **16** : 279 (Java).

1991. *Valamugil speigleri* : Talwar and Jhingran, *Inland Fishes of India*, **2** : 903.

Material examined : 1 ex., 123 mm, 11-02-98, Jilagaladindi, F-2773; 1 ex., 118 mm, 12-02-98, Jilagaladindi, F-2827; 1 ex., 128 mm, 19-09-98, Pallithummulapalem, F-2909; 1 ex., 52 mm, 11-01-2000, Gollalamoda, F-3218; 1 ex., 131 mm, 10-12-2000, Jilagaladindi, F-3570.

Diagnostic features : D IV + I, 8; A III, 9; P 16; LS 37-40. Head 4.2-4.4 in SL. Adipose eyelid well developed, covering half or more of iris. Second D origin behind A origin. Axillary scale of P long, 32-34% of P length. P with a black axillary spot; D margin black.

Distribution : Pakistan, India, Sri Lanka, Indonesia and Australia.

190. *Sphyraena obtusata* Cuvier

1829. *Sphyraena obtusata* Cuvier, *Hist. nat. Poiss.*, **3** : 350, pl. 10, fig. 2 (Pondicherry).

Material examined : 4 ex., 190-195 mm, 11-02-98, Jilagaladindi, F-2765; 1 ex., 215 mm, 12-02-98, Jilagaladindi, F-2808.

Diagnostic features : D V + I, i, 8; A II, i, 8; P ii, 11-13; GR 2; LL 80-96. Depth 6.0-7.5, head 2.8-3.0 in SL; height of 1st D equal to or greater than post-orbital head length. Tip of P reaches past 1st D origin. Grey-brown with greenish tinge above, silvery white below; no bars or chevrons.

Distribution : Indo-west Pacific.

191. *Sphyraena putnamiae* Jordan & Seale

1905. *Sphyraena putnamiae* Jordan and Seale, *Proc. Davenport Acad. Sci.*, **10** : 4, pl. 13 (Hong Kong).

Material examined : 1 ex., 227 mm, 13-12-2000, Pallithummulapalem, F-3485.

Diagnostic features : D V + I, i, 8; A II, i, 7; P ii, 12-14; GR absent. Pre-opercle rounded; teeth slanting backwards. Body with 12-15 acutely angled chevrons on sides, their apices directed forward.

Distribution : Tropical Indo-Pacific.

192. *Eleutheronema tetradactylum* (Shaw)

1804. *Polynemus tetradactylum* Shaw, *General Zool.*, **5** : 155 (Vizagapatnam).

1991. *Eleutheronema tetradactylum* : Talwar and Jhingran, *Inland Fishes of India*, **2** : 907.

Material examined : 1 ex., 142 mm, 12-10-96, Karuwaka mangroves, Pallithummulapalem, F-2308; 1 ex., 115 mm, 16-02-97, Yesupuram, F-2377; 1 ex., 55 mm, 18-09-97, Yedurumundi, F-2485; 1 ex., 94 mm, 08-09-97, Kannur bridge, F-2503; 1 ex., 155 mm, 20-02-98, Nagailanka ferry point, F-2643; 1 ex., 125 mm, 15-02-98, Lankavenitippa, F-2714; 1 ex., 173 mm, 25-09-98, Lankavenitippa, F-3003; 2 ex., 112-116 mm, 17-02-99, Hamsaldivi, F-3111; 1 ex., 88 mm, 19-02-99, Krishna estuary, N of Light House, F-3129; 1 ex., 93 mm, CANR 11-01-2000, Gollalmanda, F-3233; 1 ex., 155 mm, 08-01-2000, Manganapudi, F-3272; 1 ex., 141 mm, 17-12-2000, Palakai-tippa, F-3368; 1 ex., 150 mm, 19-12-2000, river mouth, Sorlagandi, F-3414.

Diagnostic features : D VIII+I, 13-15; A II, 15-17; P 17 + iv. Lower lip absent except towards rictus; teeth extending on posterior part of jaws. Silvery-green above, yellowish-white below.

Distribution : Persian Gulf, to India, Indonesia, to China, the Philippines, north and west Australia.

193. *Polydactylus sexfilis* (Valenciennes)

1831. *Polynemus sexfilis* Valenciennes, *Hist. nat. Poiss.*, **7** : 515.

1991. *Polydactylus sexfilis* : Talwar and Jhingran, *Inland Fishes of India*, **2** : 909.

Material examined : 1 ex., 81 mm, 19-09-98, Pallithummulapalem, F-2907.

Diagnostic features : D VIII + I, 12-13; A III, 11-12; P 15 + vi, upper rays unbranched; LL 48-50. Eyes 4.0 in head. Golden yellow; P black; A margin black.

Distribution : Coasts of India, Sri Lanka, and Mauritius.

194. *Polydactylus sextarius* (Bloch)

1801. *Polynemus sextarius* Bloch, *Syst. Ichthyol.* : 18, pl. 4 (Tranquebar).

1991. *Polydactylus sextarius* : Talwar and Jhingran, *Inland Fishes of India*, **2** : 910.

Material examined : 1 ex., 120 mm, 12-02-98, Jilagaladindi, F-2787; 1 ex., 121 mm, 12-02-98, Jilagaladindi, F-2820; 1 ex., 98 mm, 08-01-2000, Manganapudi, F-3273.

Diagnostic features : D VIII + I, 12-13; A II-III, 12-13; P 14 + vi, most of the upper rays branched; LL 48-50. Eyes 3.0-3.8 in head. Golden-olive above, silvery below; a large black blotch at margin of LL.

Distribution : Indo-west Pacific.

195. *Uranoscopus cognatus* Cantor

1850. *Uranoscopus cognatus* Cantor, *Journ. Asiatic Soc. Bengal*, **18**(2) : 1003 (Sea of Pinang).

Material examined : 1 ex., 115 mm, 10-12-2000, Jilagaladindi, F-3558.

Diagnostic features : D III, iii, 11; A 13; P i, 16; LL 60-67. Four spines along lower edge of pre-opercle. Depth 4.0-5.1, head 2.4-3.1 in TL. Humeral spine obliquely directed upwards and backwards. Lower lip with a row of fleshy tentacles; upper lip with short filaments. Three pairs of short, forwardly directed spines under head. Vomer with transverse patch of teeth. Brown above, light below; anterior part of D black.

Distribution : India, to Malaysia, Indonesia.

196. *Omobranchus punctatus* (Valenciennes)

1836. *Blennechis punctatus* Valenciennes, *Hist. nat. Poiss.*, **11** : 286 (Bombay).

1991. *Omobranchus punctatus* : Talwar and Jhingran, *Inland Fishes of India*, **2** : 914.

Material examined : 1 ex., 44 mm, 06-01-2000, Pallithummulapalem, F-3193; 2 ex., 19-29 mm, 10-01-2000, River mouth nr. Light House, Sorlagandi, F-3267.

Diagnostic features : D XII, 19-22; A II, 21-24; P 13; V I, 2. Gill opening restricted to area dorsal to level of dorsal most P ray. Bi-pored LL tubes 4-8, extending posteriorly to below level of 7th-11th D spine. Dwy band in pre-dorsal area; faint bands posteriorly on body; short, slender, dwy stripes on body in region covered by P.

Distribution : Indo-west Pacific.

197. *Omobranchus zebra* (Bleeker)

1868. *Petroscirtes zebra* Bleeker, *Versl. Med. Kon. Akad. Wet. Letterkunde Sch. Kun. Amsterdam*, (2)**2** : 279 (Singapore).

1991. *Omobranchus zebra* : Talwar and Jhingran, *Inland Fishes of India*, **2** : 914.

Material examined : 2 ex., 38-42 mm, 10-01-2000, River mouth near Light House, Sorlagandi, F-3268.

Diagnostic features : D XII, 18-20; A II, 20-22; P 14; V I, 2. Gill opening restricted to area dorsal to level of dorsal most P ray. Bi-pored LL tubes 1-4, extending posteriorly to below level of 2nd-5th D spine. Four broad, dark bands on head; about 8 broad dark bands on body in male, which are either faint or absent in female.

Distribution : East coast of India to Singapore.

198. *Callionymus fluviatilis* Day

1876. *Callionymus fluviatilis* Day, *Fishes of India*, (2) : 322 (Hooghly river at Calcutta).

Material examined : 1 ex., 62 mm, 08-09-97, Kannur bridge, F-2523; 1 ex., 59 mm, 17-02-99, Hamsaldivi, F-3116; 44 ex., 48-65 mm, 13-02-99, Kannur bridge, F-3168; 5 ex., 45-57 mm, 04-01-2000, Kannur, F-3320; 1 ex., 56 mm, 05-01-2000, Kannur bridge, F-3348; 2 ex., 47-51 mm, 11-12-2000, Kannur, river mouth, F-3400; 3 ex., 38-56 mm, 13-12-2000, Pallithummulapalem, F-3491.

Diagnostic features : D IV + 10; A 9; P 17-20. Head 3.8 in SL. Occipital region with a low, rough bony plate. Branchial opening dorsal in position. Pre-opercular spine with a short, slightly upcurved main tip, and internally armed with 2-3 curved teeth. Greyish, ocellated with white in back; spotted brown along upper side of LL; 1st D black or spotted; 2nd D with 4-5 rows of spots; C spotted.

Distribution : East coast of India to Viet Nam.

199. *Butis butis* (Hamilton)

1822. *Cheilodipterus butis* Hamilton, *Fishes of Ganges* : 57, 367 (Ganges river below Calcutta).

1991. *Butis butis* : Talwar and Jhingran, *Inland Fishes of India*, 2 : 973.

Material examined : 3 ex., 45-50 mm, 16-09-98, Kannur, river mouth, F-2847.

Diagnostic features : D VI + I, 8; A I, 8; P 18-20; LS 29-30; Ltr 9-10; preD $\pm$ 20. Depth 5-6, head 2.7-3.0 in SL. Two indistinct crests on each side of snout; maxilla extends to below front edge of eye; outer row teeth in jaws enlarged. Ctenoid scales between eye and the orbital crest; inter-opercle naked or only with a few scales. C obtuse, as long as head. Blackish, with several dark longitudinal and irregular cross bands; C black with a white margin; P base with one or two black spots.

Distribution : Indo-west Pacific.

200. *Butis malanostigma* (Bleeker)

1849. *Eleotris melanostigma* Bleeker, *Verh. batav. Genoot. Kunst. Wet.*, 22 : 23 (Indonesia).

1991. *Butis melanostigma* : Talwar and Jhingran, *Inland Fishes of India*, 2 : 973.

Material examined : 1 ex., 47 mm, 14-02-98, Yelchettutippa, F-2641; 4 ex., 60-82 mm, 19-02-99, Krishna estuary, N of Light House, F-3139; 1 ex., 110 mm, 07-01-2000, Pallithummulapalem, confluence, F-3258; 1 ex., 75 mm, 05-01-2000, Kannur bridge, F-3364; 2 ex., 41-52 mm, 11-12-2000, Kannur, river mouth, F-3598.

Diagnostic features : D VI + I, 8; A I, 8; P 18-19; LS 29-30; Ltr 9-10; preD $\pm$ 25. Depth 4.5-5.0, head 2.7-3.0 in SL. Three crests on snout; maxilla extends to below front to middle

of eye; outer row teeth in jaws enlarged. Ctenoid scales between eye and the orbital crest; inter-opercle scaled. C little shorter than head. Body dark with several thin longitudinal dark lines and often with irregular black spots; P base with large black spot; C black.

Distribution : Indo-west Pacific.

201. *Eleotris fusca* (Schneider)

1801. *Poecilia fusca* Schneider, *Syst. Ichthyol.* : 453 ("Oriadeae insulae rivulis"—Pacific Islands).

1991. *Eleotris fusca* : Talwar and Jhingran, *Inland Fishes of India*, 2 : 975.

Material examined : 2 ex., 29-40 mm, 13-02-99, Kannur bridge, F-3176.

Diagnostic features : D VI + I, 8-9; A I, 8; P 15-18; LS 60-68; Ltr 16-19; preD $\pm$ 50. Depth 4.2-4.8, head 3.0-3.5 in SL; eyes 5-6 in head. Maxilla extends to below middle of eye. Anterior most and third papillae row under eye extend below longitudinal row. Head scaled above, between and behind eyes, on cheeks and opercle. Middle of C peduncle with 12-14 transverse scale rows. Head, body and fins dark brown to black; numerous horizontal lines on body; fins spotted.

Distribution : Indo-west Pacific.

202. *Eleotris malanosoma* Bleeker

1852. *Eleotris malanosoma* Bleeker, *Natuurk. Tijdschr. Ned.-Indie*, 3 : 705 (Wahai, Celebes and West Sumatra).

Material examined : 1 ex., 70 mm, 10-02-97, Jilagaladindi, F-2457; 2 ex., 38-45 mm, 16-09-98, Kannur, river mouth, F-2846; 1 ex., 11-01-2000, Gollalamoda, F-3225; 2 ex., 28-32 mm, 04-01-2000, Kannur, F-3333; 1 ex., 30 mm, 05-01-2000, Kannur bridge, F-3365; 1 ex., 87 mm, 11-12-2000, Kannur, river mouth, F-3599.

Diagnostic features : D VI + I, 8; A I, 8; P 15-16; LS 45-55; Ltr 14-15; preD $\pm$ 40-45. Depth 4.5-5.5, head 2.7-3.5 in SL; eyes 4.5-5.5 in head. Maxilla reaches to below rear half of eye. Anterior 3 vertical papillae rows below eye extend below longitudinal row on mid-cheek. Pre-opercle scaled dorsally, scales not reaching to below eyes. Middle of C peduncle with 11 or 12 transverse scale rows. Dark brown to black, often with pale longitudinal lines; fins spotted in young.

Distribution : Tropical Indo-west Pacific.

203. *Odonteleotris macrodon* (Bleeker)

1853. *Eleotris macrodon* Bleeker, *Verh. batav. Genoot. Kunst. Wet.*, 25 : 104, pl. 2, fig. 1, 1a, 1b (Hooghly river at Calcutta).

1991. *Odonteleotris macrodon* : Talwar and Jhingran, *Inland Fishes of India*, 2 : 978.

Material examined : 1 ex., 47 mm, 07-01-2000, confluence, Pallithummulapalem, F-3254.

Diagnostic features : D VI + I, 9-10; A I, 8; P 16-17; LS 90-100. Eyes small, about 8 times in head. Jaw teeth in bands, outer upper row with 2-3 canines on each side, inner upper row behind symphysis with a curved canine, outer lower row with 2 canines on each side. Head scaled on sides. Brownish-green above, pink below; 2-4 blackish stripes radiate on cheek from eye; a red spot at base of C; D and C violet, often spotted; A with red margin.

Distribution : India-West Bengal; Myanmar and Indonesia.

Remarks : This report extends its distributional range southward to Krishna estuary along east coast of India.

204. *Ophieleotris aporos* (Bleeker)

1854. *Eleotris aporos* Bleeker, *Nat. Tijdschr. Ned.-Indie*, 6 : 59 (Sindangole, Halmaheira).

1991. *Ophieleotris aporos* : Talwar and Jhingran, *Inland Fishes of India*, 2 : 979.

Material examined : 1 ex., 30 mm, 18-09-97, Yedurumundi, F-2497.

Diagnostic features : D VI + I, 9; A I, 9; P 14-16; LS 30-32; Ltr 10-11; preD 13-18. Depth 4.0-4.8, head 3.2-3.5 in SL; eye 4.0-5.5 in head. Head fully scaled; sensory canal pores only on posterior margin of pre-operculum; maxilla extends to below anterior margin of eye. Dark brown, shading to pale below; two dark lines from eye downwards to lower part of opercle; C pale with a dark elongated spot.

Distribution : India, eastward to west Pacific.

205. *Prionobutis koilomatodon* (Bleeker)

1849. *Eleotris koilomatodon* Bleeker, *Verh. batav. Genoot. Kunst. Wet.*, 22 : 21 (not known).

1941. *Prionobutis koilomatodon* : Koumans, *Mem. Indian Mus.*, 13 : 319.

Material examined : 1 ex., 56 mm, 08-09-97, Kannur bridge, F-2532; 1 ex., 37 mm, 14-02-98, Yelchettutippa, F-2640; 1 ex., 49 mm, 15-09-98, Kannur bridge, F-2831; 1 ex., 55 mm, 18-09-98, Pallithummulapalem, F-2884; 1 ex., 59 mm, 19-02-99; Krishna estuary, N of Light House, F-3138; 1 ex., 37 mm, 13-02-99, Kannur bridge, F-3177; 1 ex., 35 mm, 11-01-2000, Gollalamoda, F-3226; 1 ex., 40 mm, 04-01-2000, Kannur, F-3332; 1 ex., 43 mm, 14-12-2000, Pallithummulapalem, F-3389; 5 ex., 31-50 mm, 12-12-2000, Kannur bridge, F-3474; 5 ex., 38-55 mm, 13-12-2000, Pallithummulapalem, F-3521; 1 ex., 46 mm, 11-12-2000, Kannur, river mouth, F-3597.

Diagnostic features : D VI + I, 8; A I, 8 : P 19-21; LS 30; Ltr 7-10; preD 12-14. Depth 3.7-4.0, head 3.0-3.2 in SL; eye 4.0-4.5 in head. Orbital crest denticulated; snout with 2

denticulate crests on each side. Head short, obtuse; jaws sub-equal; snout rounded, sub-equal to eye. Head scales above, behind eyes, on upper part of cheek and on opercle. Dull-green to olivaceous, lighter below; P base with black spot bordered with red; 2nd D and A spotted; A and C bordered with red.

Distribution : India, eastwards to west Pacific.

206. *Acentrogobius caninus* (Valenciennes)

1837. *Gobius caninus* Valenciennes, *Hist. nat. Poiss.*, **12** : 86 (Java, Indonesia).

1953. *Acentrogobius caninus* : Koumans, *Fish. Indo-Aust. Archip.*, **10** : 61.

Material examined : 1 ex., 43 mm, 10-10-96, Kannur, F-2298; 1 ex., 50 mm, 16-09-98, Kannur, river mouth, F-2843; 1 ex., 50 mm, 05-01-2000, Kannur bridge, F-3363; 1 ex., 96 mm, 13-12-2000, Pallithummulapalem, F-3513; 1 ex., 50 mm, 11-12-2000, Kannur, river mouth, F-3601.

Diagnostic features : D VI + I, 9; A I, 9; P 18-19; LS $\pm$ 30; Ltr 9; preD 17-20. Depth 4.0-5.0, head 4.7-5.0 in SL; eye 3.5-4.0 in head. Head scaled above behind eye and on upper part of opercle; cheek naked. Olive above, lighter below; head with blue or pearly spots; body with alternating rows of large black spots; scapula with a large blue spot; fins violet; soft D with 3 rows of dark spots bordered with blue; C spotted black.

Distribution : Indo-west Pacific.

207. *Acentrogobius cyanomos* (Bleeker)

1849. *Gobius cyanomos* Bleeker, *Verh. batav. Genoot. Kunst. Wet.*, **22** : 25 (Java).

1991. *Acentrogobius cyanomos* : Talwar and Jhingran, *Inland Fishes of India*, **2** : 924.

Material examined : 1 ex., 37 mm, 18-09-97, Yedurumundi, F-2496; 2 ex., 66-71 mm, 08-09-97, Kannur bridge, F-2529; 3 ex., 45-55 mm, 14-02-98, Yelchettutippa, F-2638; 2 ex., 45-49 mm, 17-09-98, Kannur, F-2878; 6 ex., 48-64 mm, 18-09-98, Palli-thummulapalem, F-2920; 1 ex., 75 mm, 20-09-98, Manganapudi, F-2933; 1 ex., 50 mm, 13-02-99, Kannur bridge, F-3181; 2 ex., 58-60 mm, 14-12-2000, Pallithummula-palem, F-3386; 2 ex., 52-85 mm, 12-12-2000, Kannur bridge, F-3471; 3 ex., 55-67 mm, 13-12-2000, Pallithummulapalem, F-3514.

Diagnostic features : D VI + I, 10; A I, 8-10; P 18-19; LS $\pm$ 30; Ltr 8-9; preD 14. Depth 4.5-5.0, head 3.6-4.0 in SL; eye 4.0-5.0 in head. Head scaled above behind eyes, rest naked; often with few scales on upper part of opercle. Blackish-green to olive above, lighter below; scales with shiny greenish spots; similar spots on opercle; a blue spot on shoulder; 1st D yellowish; membrane of 2nd D and C with 3-5 rows of whitish spots between rays; a dark blotch at the upper part of C near base.

Distribution : India, Thailand, tropical west Pacific.

208. *Acentrogobius madraspatensis* (Day)

1868. *Gobius madraspatensis* Day, *Proc. Zool. Soc. London* : 152 (Madras backwaters).

1991. *Acentrogobius madraspatensis* : Talwar and Jhingran, *Inland Fishes of India*, 2 : 925.

Material examined : 1 ex., 33 mm, 12-12-2000, Kannur bridge, F-3472; 1 ex., 33 mm, 13-12-2000, Pallithummulapalem, F-3519; 1 ex., 44 mm, 11-12-2000, Kannur, river mouth, F-3602.

Diagnostic features : D VI + I, 9; A I, 9; P 17; LS 28-29; Ltr 8; preD $\pm$ 18. Depth 4.25, head 3.5 in SL; eyes 4.0 in head. Longitudinal mucous canals over cheek. Head scaled above behind eyes; cheek and operculum naked. Olivaceous with irregular, ill-defined brownish blotches and dots; 5-8 very narrow vertical black lines to belly, between base of V and middle of A. First D with a broad dark band in middle; C minutely dotted in rows.

Distribution : India-Madras and Andhra Pradesh.

209. *Acentrogobius viridipunctatus* (Valenciennes)

1837. *Gobius viridipunctatus* Valenciennes, *Hist. nat. Poiss.*, 12 : 62 (Bombay).

1991. *Acentrogobius viridipunctatus* : Talwar and Jhingran, *Inland Fishes of India*, 2 : 926.

Material examined : 1 ex., 70 mm, 16-10-96, Yelchettutippa, F-2227; 2 ex., 76-118 mm, 12-10-96, Karuwaka mangroves, Palli-thummulapalem, F-2335; 1 ex., 45 mm, 12-09-97, Kannur, F-2592; 1 ex., 67 mm, 08-02-98, Pedakannur, F-2664; 1 ex., 85 mm, 14-02-99, Kannur bridge, F-3065; 1 ex., 80 mm, 17-02-99, Hamsaldivi, F-3121; 1 ex., 86 mm, 06-01-2000, Pallithummulapalem, F-3191; 1 ex., 75 mm, 14-12-2000, Palli-thummulapalem, F-3385.

Diagnostic features : D VI + I, 10; A I, 9; P 18-20; LS 35-36; Ltr 10; preD $\pm$ 30. Depth 4.0-5.5, head 3.3-4.0 in SL; eye 4.0-5.0 in head. Longitudinal rows of papillae on cheek. Head scaled above behind eyes; upper part of pre-operculum and operculum scaled. Blackish-green, Laterally with dark spots, half way the flank a longitudinal row of larger spots. A blackish longitudinal stripe at base of D; 2nd D with 2 dark longitudinal bands; C membrane spotted black, upper part of C base without spots.

Distribution : Indo-west Pacific.

210. *Apocryptodon madurensis* (Bleeker)

1849. *Apocryptes madurensis* Bleeker, *Verh. batav. Genoot. Kunst. Wet.*, 22 : 35 (Strait of Madura).

1991. *Apocryptodon madurensis* : Talwar and Jhingran, *Inland Fishes of India*, 2 : 952.

Material examined : 1 ex., 59 mm, 17-09-98, Kannur, F-2877; 2 ex., 50-57 mm, 24-09-98, Sorlagandi, Light House, F-3039; 1 ex., 66 mm, 11-01-2000, Gollalamoda, F-3224; 1 ex., 67 mm, 11-01-2000, Gollalmanda, F-3253.

Diagnostic features : D VI + I, 22; A I, 20-22; P 21-22; LS 50-55; Ltr 13. Depth 5.5, head 4.0 in SL. Free lower eyelid absent; teeth on both jaws uniserial, in upper jaw caninoid; in lower jaw horizontal and bilobate, with symphyseal canines. Greyish, with 5 indistinct red blotches; lower part of head with numerous black spots; 1st D with a dark spot in its upper ¼ between 3rd and 5th spine.

Distribution : India, Indonesia, the Philippines and Japan.

211. *Bathygobius fuscus* (Ruppell)

1828. *Gobius fuscus* Ruppell, *Atl. Reise N. Afr. Fische* : 137 (Red Sea).

1991. *Bathygobius fuscus* : Talwar and Jhingran, *Inland Fishes of India*, 2 : 929.

Material examined : 1 ex., 37 mm, 10-01-2000, river mouth near Light House, Sorlagandi, F-3269.

Diagnostic features : D VI + I, 9-10; A I, 8-9; P 19-20; LS 35-40; Ltr 11-13; preD ±20. Depth 4.7-5.0, head 3.2-3.6 in SL; eyes 3.0-4.5 in head. Tongue bilobate or emarginate. Longitudinal rows of mucous canals over cheek. Head scaled above behind eyes with rudimentary scales; upper part of opercle scaled sometimes; cheek naked. Upper 3 rays of P free from membrane, silk-like. Olive-brown, with irregular blotches on flanks; sides of head with whitish spots; D duy, often with broad stripe.

Distribution : Indo-west Pacific.

212. *Boleophthalmus boddarti* (Pallas)

1770. *Gobius boddarti* Pallas, *Spicilegia (zool.)*, 8 : 11, pl. 1, figs. 4, 5 (Indian Ocean).

1991. *Boleophthalmus boddarti* : Talwar and Jhingran, *Inland Fishes of India*, 2 : 952.

Material examined : 17 ex., 64-107 mm, 09-10-96, Bhavanipur, near Kamavericheruvu, F-2241; 1 ex., 81 mm, 10-10-96, Kannur, F-2287; 1 ex., 80 mm, 12-10-96, Karuwaka mangroves, Pallithummulapalem, F-2332; 3 ex., 96-103 mm, 11-02-97, Kannur, river mouth, F-2349; 6 ex., 64-105 mm, 12-02-97, Palli-thummulapalem, F-2368; 1 ex., 68 mm, 09-09-97, Pallithummulapalem, F-2468; 2 ex., 71-102 mm, 08-09-97, Kannur bridge, F-2528; 2 ex., 92-96 mm, 07-02-98, Pedakannur, F-2619; 6 ex., 83-86 mm, 08-02-98, Peda-kannur, F-2663; 1 ex., 73 mm, 15-09-98, Kannur bridge, F-2830; 1 ex., 68 mm, 16-09-98, Kannur, river mouth, F-2840; 1 ex., 88 mm, 23-09-98, confluence, Sorlagandi, F-2978; 2 ex., 101-105 mm, 14-02-99, Kannur bridge, F-3063; 1 ex., 95 mm, 19-02-99, Krishna estuary, N of Light House, F-3132.

Diagnostic features : D V + I, 23-27; A I, 23-27; P 17-18; LS 75-100. Depth 4.7-5.8, head 3.3-4.0 in SL; eyes 4.8-6.2 in head. Greenish-blue, 6-8 dark spots or vertical bands; head with

brownish spots; 1st D with bluish-white spots; 2nd D with 4 irregular longitudinal rows of bluish spots.

Distribution : India, Myanmar, Thailand, Malaya, and Indonesia.

213. *Boleophthalmus sculptus* Gunther

1861. *Boleophthalmus sculptus* Gunther, *Cat. Fish. Brit. Mus.*, 3 : 104 (India).

Material examined : 2 ex., 61-85 mm, 17-02-98, Hamsaldivi, F-3120; 1 ex., 80 mm, 10-01-2000, Sorlagandi, F-3198; 2 ex., 90-105 mm, 11-01-2000, Gollalamoda, F-3222; 1 ex., 87 mm, 12-12-2000, Kannur bridge, F-3467; 7 ex., 83-102 mm, 13-12-2000, Pallithummulapalem, F-3510; 4 ex., 70-90 mm, 11-12-2000, Kannur, river mouth, F-3594.

Diagnostic features : D V + I, 24-26; A I, 23-26; P 15-16; LS 80-90. Depth 4.8-5.7, head 3.2-3.8 in SL. Greenish-olive, yellowish on belly; 6 rather indistinct bands descend obliquely from back; 1st D grayish, with no spots; other fins reddish.

Distribution : India.

214. *Favonigobius reichei* (Bleeker)

1853. *Gobius reichei* Bleeker, *Natuurk. Tijdschr. Ned.-Indie*, 5 : 509 (Padong, Indonesia).

1991. *Favonigobius reichei* : Talwar and Jhingran, *Inland Fishes of India*, 2 : 934.

Material examined : 1 ex., 48 mm, 14-02-98, Yelchettutippa, F-2637; 2 ex., 35-40 mm, 14-12-2000, Pallithummulapalem, F-3387.

Diagnostic features : D VI + I, 8-9; A I, 8; P 16; LS 26-28; Ltr 7-8; pre D 12, foremost 9-10 scales fallout readily. Depth 5.0, head 3.8 in SL; eyes 3.0-4.0 in head. Teeth in several rows. An oblique narrow band of mucous canals below eye running to maxillary, a broad band bordered by 2 strongly developed canals runs longitudinally over cheek; cheek and opercle naked. Greenish above, pale below; with numerous small spots; mid-side with 4-5 slightly enlarged groups of black spots; a bar from eye to upper jaw; median fins spotted.

Distribution : Indo-west Pacific.

215. *Glossogobius biocellatus* (Valenciennes)

1837. *Gobius biocellatus* Valenciennes, *Hist. nat. Poiss.*, 12 : 73 (Pondicherry).

1991. *Glossogobius biocellatus* : Talwar and Jhingran, *Inland Fishes of India*, 2 : 935.

Material examined : 1 ex., 55 mm, 08-09-97, Kannur bridge, F-2530; 1 ex., 55 mm, 17-09-97, Krishna R mouth, near Light House, F-2595; 1 ex., 67 mm, 05-01-2000, Kannur bridge, F-3357; 1 ex., 66 mm, 13-12-2000, Pallithummulapalem, F-3511.

Diagnostic features : D VI + I, 9; A I, 8; P 17-19; LS 28-32; Ltr 7-8. Depth 5.0-6.5, head 3.0-3.3 in SL. Branchiostegal membrane form a free fold across isthmus. Body dark with small black spots in longitudinal rows; 2-3 broad saddles on back and flanks. First D black; V with dark cross bands.

Distribution : Indo-west Pacific.

216. *Glossogobius giuris* (Hamilton)

1822. *Gobius giuris* Hamilton, *Fishes of Ganges* : 51, pl. 33, fig. 15 (Gangetic Provinces).

1991. *Glossogobius giuris* : Talwar and Jhingran, *Inland Fishes of India*, 2 : 936.

Material examined : 3 ex., 108-120 mm, 17-10-96, Yedurumundi, F-2230; 2 ex., 75-83 mm, 15-10-96, Lankavenitippa, F-2303; 1 ex., 75 mm, Karuwaka mangroves, Pallithummulapalem, F-2327; 1 ex., 65 mm, 11-02-97, Kannur, river mouth, F-2353; 1 ex., 46 mm, 12-02-97, Pallithummulapalem, F-2396; 2 ex., 29-85 mm, 18-09-97, Yedurumundi, F-2495; 7 ex., 68-78 mm, 08-09-97, Kannur bridge, F-2526; 3 ex., 54-73 mm, 07-09-97, Kannur, river mouth, F-2566; 1 ex., 67 mm, 15-09-97, Lankavenitippa, F-2573; 1 ex., 53 mm, 12-09-97, Kannur, F-2590; 2 ex., 58-67 mm, 14-02-98, Yelchettutippa, F-2636; 2 ex., 139-147 mm, 20-02-98, Nagailanka ferry point, F-2648; 1 ex., 115 mm, 18-02-98, Yesupuram, F-2693; 17 ex., 51-122 mm, 10-02-98, Jilagaladindi, F-2737; 1 ex., 70 mm, 16-09-98, Kannur, river mouth, F-2839; 2 ex., 64-76 mm, 18-09-98, Pallithummulapalem, F-2882; 3 ex., 47-76 mm, 23-09-98, confluence, Sorlagandi, F-2964; 5 ex., 58-96 mm, 24-09-98, Sorlagandi, nr. Light House, F-2995; 1 ex., 70 mm, 26-09-98, Sangame-swara, F-3028; 1 ex., 75 mm, 15-02-99, Pallithummulapalem, F-3084; 3 ex., 66-95 mm, 19-02-99, Krishna estuary, N of Light House, F-3133; 1 ex., 75 mm, 13-02-99, Kannur bridge, F-3179; 1 ex., 88 mm, 06-01-2000, Pallithummulapalem, F-3190; 1 ex., 83 mm, 07-01-2000, Pallithummulapalem, F-3257; 1 ex., 110 mm, 13-01-2000, Nachukunta, F-3293; 2 ex., 74-76 mm, 04-01-2000, Kannur, F-3328; 3 ex., 58-91 mm, 05-01-2000, Kannur bridge, F-3358; 1 ex., 80 mm, 14-12-2000, Pallithummulapalem, F-3384; 1 ex., 75 mm, 12-12-2000, Kannur bridge, F-3466; 8 ex., 52-90 mm, 13-12-2000, Pallithummulapalem, F-3509; 1 ex., 160 mm, 17-12-2000, Puligada, F-3564.

Diagnostic features : D VI + I, 8-9; A I, 7-8; P 17-22; LS 28-36; Ltr 8-14. Depth 5.0-6.2, head 3.7-4.3 in SL. Branchiostegal membrane attached to sides of isthmus. Yellowish-brown with 5 dark blotches on flank; sides of head with irregular violet spots; D, P and C mottled with dark spots.

Distribution : Indo-west Pacific.

217. *Gobiopsis macrostoma* Steindachner

1860. *Gobiopsis macrostomus* Steindachner, *Sber. Akad. Wiss. Wien.*, 42(23) : 291, pl. 1, fig. 6 (Bombay).
1991. *Gobiopsis macrostoma* : Talwar and Jhingran, *Inland Fishes of India*, 2 : 937.

Material examined : 1 ex., 50 mm, 05-01-2000, Kannur bridge, F-3356; 1 ex., 46 mm, 13-12-2000, Pallithummulapalem, F-3518; 1 ex., 56 mm, 11-12-2000, Kannur, river mouth, F-3596.

Diagnostic features : D VI + I, 9-10; A I, 9-10; P 19-21; LS 36-42. Head 3.1-3.5 in SL; eyes 5.5-6.2 in head. Teeth in villiform band, outer row caninoid. Small barbels on lower surface and sides of head; horizontal fleshy fold on mid-cheek. Maxillary extends to beyond eye. Tongue rounded. Brownish; head darker; about 8 indistinct saddles on flank; fins yellowish-brown, 2nd D with faint spots.

Distribution : India and Thailand.

218. *Oligolepis acutipennis* (Valenciennes)

1837. *Gobius acutipennis* Valenciennes, *Hist. nat. Poiss.*, 12 : 80 (Malabar).
1991. *Oligolepis acutipennis* : Talwar and Jhingran, *Inland Fishes of India*, 2 : 939.

Material examined : 3 ex., 39-48 mm, 10-02-97, Jilagaladindi, F-2456; 2 ex., 42-52 mm, 23-09-98, confluence, Sorlagandi, F-2981; 1 ex., 40 mm, 24-09-98, Sorlagandi, near Light House, F-3040; 1 ex., 31 mm, 19-02-99, Krishna estuary, N of Light House, F-3152; 3 ex., 30-37 mm, 13-12-2000, Pallithummula-palem, F-3516.

Diagnostic features : D VI + I, 10-11; A I, 10-11; P 20-22; LS 27-30; Ltr 7-8. Depth 4.2-4.5, head 4.0 in SL. Tongue largely fused to floor of mouth, tip free. Teeth in several rows; in upper jaw outer row enlarged in front. Head and nape naked, with a few pre-dorsal scales. Brownish with numerous blotches along back; a series of faint blotches on mid-side, last on C base; an oblique violet streak from eye to behind maxilla.

Distribution : Indo-west Pacific.

219. *Oxyurichthys formosanus* Nichols

1959. *Oxyurichthys formosanus* Nichols, *Amer. Mus. Novit.*, (1876) : 2 (Taiwan).

Material examined : 1 ex., 54 mm, 10-10-96, Kannur, F-2297; 1 ex., 42 mm, 12-02-97, Pallithummulapalem, F-2369; 1 ex., 56 mm, 10-02-98, Jilagaladindi, F-2736; 1 ex., 39 mm, 16-09-98, Kannur, river mouth, F-2842; 4 ex., 35-39 mm, 13-02-99, Kannur bridge, F-3180; 1 ex., 36 mm, 11-01-2000, Gollal-manda, F-3251; 3 ex., 32-36 mm, 04-01-2000, Kannur, F-3331; 2 ex., 32-40 mm, 05-01-2000, Kannur bridge, F-3362; 2 ex., 37 mm each, 14-12-2000, Pallithummulapalem, F-3388; 3 ex., 39-41 mm, 13-12-2000, Pallithummulapalem, F-3517.

Diagnostic features : D VI + I, 10; A I, 11-12; P 18-20; LS 26-28. Eye without a bump dorsally. Head, nape and breast naked. Tongue rounded; teeth in upper jaw uniserial. Brownish, with a conspicuous dark vertical band below eye; a dark blotch at C base; first elongated spine of D with 5 black patches.

Distribution : India-Ennore, Godavari and Mahanadi estuaries; Taiwan.

220. *Oxyurichthys microlepis* (Bleeker)

1849. *Gobius microlepis* Bleeker, *Verh. batav. Genoot. Kunst. Wet.*, **22** : 35 (Madura Straits).

1991. *Oxyurichthys microlepis* : Talwar and Jhingran, *Inland Fishes of India*, **2** : 941.

Material examined : 1 ex., 55 mm, 16-10-96, Yelchettutippa, F-2228; 1 ex., 55 mm, 12-09-97, Kannur, F-2591; 1 ex., 55 mm, 16-09-98, Kannur, river mouth, F-2841; 4 ex., 50-67 mm, 17-09-98, Kannur, F-2875; 6 ex., 43-60 mm, 18-09-98, Pallithummula-palem, F-2883; 3 ex., 49-50 mm, 19-09-98, Pallithummula-palem, F-2919; 1 ex., 60 mm, 20-09-98, Manganapudi, F-2932; 1 ex., 63 mm, 24-09-98, Sorlagandi, Light House, F-3038; 1 ex., 62 mm, 11-12-2000, Kannur, river mouth, F-3600.

Diagnostic features : D VI + I, 12; A I, 13; P 20-22; LS ± 55 ; Ltr ± 14 . Depth 5.2-6.0, head 4.0-4.5 in SL. Eye without a bump dorsally. Head scaled above behind eyes; scales on body cycloid anteriorly; weakly ctenoid posteriorly. Tongue rounded; teeth uniserial in upper jaw. Violet; vertical fins pink; 1st D with 2 blue lines, 2nd D with blue spots; P orange with violet spots below; A pink with yellow and violet margin; C bordered below with violet, upper part with black spots.

Distribution : Indo-west Pacific.

221. *Oxyurichthys papuensis* (Valenciennes)

1837. *Gobius papuensis* Valenciennes, *Hist. nat. Poiss.*, **12** : 106 (?Sundan, Belosso).

1953. *Oxyurichthys papuensis* : Koumans, *Fish. Indo-Aust. Archip.*, **10** : 46.

Material examined : 1 ex., 56 mm, 14-02-98, Yelchettutippa, F-2639.

Diagnostic features : D VI + I, 12; A I, 13; P 21-23; LS 75-80; Ltr 20; preD 17-20. Depth 6.0-6.5, head 4.0-4.2 in SL; eyes 4.0 in head, no ocular tentacle. Upper jaw with a row of 17-20 curved, pointed teeth each side; lower jaw with 2-4 rows of teeth, inner row enlarged. Head scaled above behind eyes, median line of head and nape naked; nape with a low longitudinal dermal crest. Scales on posterior part of body ctenoid, cycloid anteriorly. C lanceolate, twice the head length; 1st D with prolonged rays. Greenish above, reddish below, with 8 indistinct transverse bands; a dark spot on middle of C peduncle.

Distribution : Persian Gulf; to the Philippines; Celebes; New Guinea; Hong Kong; Hawaii.

Remarks : This forms the first record of its occurrence from the estuarine waters in India.

222. *Oxyurichthys tentacularis* (Valenciennes)

1837. *Gobius tentacularis* Valenciennes, *Hist. nat. Poiss.*, **12** : 128 (Java).

1991. *Oxyurichthys tentacularis* : Talwar and Jhingran, *Inland Fishes of India*, **2** : 942.

Material examined : 2 ex., 55-60 mm, 23-09-98, confluence, Sorlagandi, F-2980; 1 ex., 79 mm, 05-01-2000, Kannur bridge, F-3360.

Diagnostic features : D VI + I, 12; A I, 13-14; P 19-22; LS 52-65. Depth 5.0-5.6, head 4.0-5.0 in SL. Distinct elongate tentacle over eye. Teeth in upper jaw uniserial. Head scaled above behind eyes; scales on body cycloid anteriorly; weakly ctenoid posteriorly. Reddish-green above; each scale of back and sides with a round red spot at the margin; an oblong spot below eye; 1st D with 3 longitudinal rows of reddish-violet spots; 2nd D with 5 or 6 rows of spots.

Distribution : Indo-west Pacific.

223. *Parachaeturichthys polynema* (Bleeker)

1853. *Chaeturichthys polynema* Bleeker, *Natuurk. Tijdschr. Ned.-Indie*, **5** : 325 (Japan).

1991. *Parachaeturichthys polynema* : Talwar and Jhingran, *Inland Fishes of India*, **2** : 943.

Material examined : 3 ex., 76-87 mm, 11-02-98, Jilagaladindi, F-2754; 1 ex., 80 mm, 10-12-2000, Jilagaladindi, F-3555.

Diagnostic features : D VI + I, 9-10; A I, 9; P 20-21; LS 28-30; Ltr 7-8; preD 12-13. Depth 5.0-6.0, head 4.0 in SL. Some short barbels along rami of lower jaw. Head scaled above, between and behind eyes. C longer than head. Greenish above, pale below; upper base of C with a large black blotch surrounded by yellow; fins black.

Distribution : Indo-west Pacific.

224. *Parapocryptes rictuosus* (Valenciennes)

1837. *Apocryptes rictuosus* Valenciennes, *Hist. nat. Poiss.*, **12** : 151 (India).

1991. *Parapocryptes rictuosus* : Talwar and Jhingran, *Inland Fishes of India*, **2** : 957.

Material examined : 1 ex., 56 mm, 15-02-99, Pallithummulapalem, F-3097; 1 ex., 61 mm, 19-02-99, Krishna estuary, N of Light House, F-3151; 1 ex., 67 mm, 13-02-99, Kannur bridge, F-3183; 1 ex., 85 mm, 11-01-2000, Gollalamoda, F-3223; 4 ex., 55-64 mm, 05-01-2000, Kannur bridge, F-3361.

Diagnostic features : D VI + I, 23-26; A I, 24-28; P 20; LS ± 75 . Depth 10-12 in SL; eyes 6-7 in head. Maxilla extends well beyond eye. Both D continuous at bases. Greyish, lighter below; dark ill-defined oblique bands from back to half way the flanks; inner side of mouth with dark spots.

Distribution : India-east coast.

225. *Parapocryptes serperaster* (Richardson)

1846. *Apocryptes serperaster* Richardson, *Rep. Br. Ass. Advmt. Sci.*, **15** : 206 (Macao, China).

1991. *Parapocryptes serperaster* : Talwar and Jhingran, *Inland Fishes of India*, **2** : 957.

Material examined : 1 ex., 80 mm, 17-09-98, Kannur, F-2876; 1 ex., 88 mm, 23-09-98, confluence, Sorlagandi, F-2979; 1 ex., 67 mm, 19-02-99, Krishna estuary, N of Light House, F-3150; 1 ex., 67 mm, 11-01-2000, Gollalmanda, F-3252; 1 ex., 57 mm, 13-12-2000, Pallithummulapalem, F-3515.

Diagnostic features : D VI + I, 26-27; A I, 25-26; P 20-21; LS 65-76. Depth 6.0-8.5 in SL. First and 2nd D not connected by membrane, separate; C lanceolate. Head, cheek and opercle scaled. Greenish above, whitish below; 5-6 irregular bands from back to half way on the sides.

Distribution : India, Myanmar, Thailand, China.

226. *Periophthalmus koelreuteri* (Pallas)

1770. *Gobius koelreuteri* Pallas, *Spicilegia (zool.)*, **8** : 8, pl. 2, figs. 1-3 (no locality).

1991. *Periophthalmus koelreuteri* : Talwar and Jhingran, *Inland Fishes of India*, **2** : 965.

Material examined : 2 ex., 40-50 mm, 09-10-96, Bhavanipur, nr. Kamavericheruvu, F-2243; 1 ex., 53 mm, 19-09-97, Palakaitippa, F-2478; 2 ex., 33-48 mm, 12-12-2000, Kannur bridge, F-3473; 1 ex., 55 mm, 13-12-2000, Pallithummulapalem, F-3520.

Diagnostic features : D X-XV + I, 11-12; A I, 11-12; P 14-15; LS 70-90. Head 3.3 in SL; eyes contiguous, 4.0 in head. Both D separate; inner ray of V united at base by a narrow membrane, deeply emarginate; basal membrane of V moderate to weak. Brownish, lighter below, with white spots; 1st D with a dark brown sub-marginal band and short stripes below, bordered with white; A white.

Distribution : Indo-west Pacific.

227. *Periophthalmus pearsi* Eggert

1935. *Periophthalmus pearsi* Eggert, *Zool. Jahrb. Jena Syst.*, **67** : 57, pl. 3, fig. 10 (Port Canning, West Bengal).

Material examined : 1 ex., 39 mm, 11-10-96, Pulleru mouth, Pedapatnam, F-2251; 4 ex., 36-46 mm, 11-02-97, Kannur, river mouth, F-2354; 2 ex., 34-44 mm, 07-02-98, Pedakannur, F-2620; 3 ex., 40-43 mm, 08-02-98, Peda-kannur, F-2673; 1 ex., 37 mm, 13-02-99, Kannur bridge, F-3182.

Diagnostic features : D VIII-X, I, 11-12; A I, 11-12; P i, 12-13; LS 66-77. Head 3.8 in SL. V emarginate, totally united; basal membrane well developed. Brownish; head with irregular dark spots. First D dark grey; 2nd D with 2 longitudinal black bands; A diaphanous; C blackish in middle.

Distribution : India-West Bengal; Bangladesh and Myanmar.

Remarks : This report of *P. pearsi* extends its range of distribution southward to Krishna estuary along east coast of India. But the recent authors consider this species as a junior synonym of *P. novemradiatus* (Hamilton).

228. *Pseudapocryptes lanceolatus* (Bloch and Schneider)

1801. *Eleotris lanceolatus* Bloch and Schneider, *Syst. Ichthyol.*, : 67, pl. 15 (Tranquebar).

1991. *Pseudapocryptes lanceolatus* : Talwar and Jhingran, *Inland Fishes of India*, 2 : 958.

Material examined : 3 ex., 80-100 mm, 09-10-96, Bhavanipur, nr. Kamavericheruvu, F-2242; 4 ex., 82-110 mm, 11-10-96, Pulleru mouth, Pedapatnam, F-2247; 6 ex., 76-113 mm, 10-10-96, Kannur, F-2280; 1 ex., 102 mm, 15-10-96, Lankavenitippa, F-2302; 1 ex., 135 mm, 12-10-96, Karuwaka mangroves, Pallithummulapalem, F-2324; 1 ex., 150 mm, 12-02-97, Pallithummulapalem, F-2367; 3 ex., 85-138 mm, 08-09-97, Kannur bridge, F-2527; 2 ex., 80-81 mm, 10-09-97, Palli-thummulapalem, F-2549; 2 ex., 103-113 mm, 07-09-97, Kannur, river mouth, F-2565; 2 ex., 96-105 mm, 12-09-97, Kannur, F-2586; 9 ex., 77-106 mm, 18-09-98, Palli-thummulapalem, F-2880; 1 ex., 128 mm, 15-02-99, Pallithummulapalem, F-3096; 2 ex., 95-96 mm, 04-01-2000, Kannur, F-3329; 2 ex., 92-95 mm, 12-12-2000, Kannur bridge, F-3468; 9 ex., 56-120 mm, 13-12-2000, Pallithummulapalem, F-3508; 3 ex., 114-117 mm, 11-12-2000, Kannur, river mouth, F-3593.

Diagnostic features : D V + I, 30-31; A I, 28-29; P 16-19; LS ± 200 . Depth 7.0, head 5.5 in SL; eyes 6-7 in head. Teeth in jaws uniserial, pointed. C pointed, longer than head. Dull greenish or brownish-grey above; brown markings on back and cheek; 2nd D spotted; C barred.

Distribution : India, Indonesia, to China, Japan.

Remarks : Recent authors consider this species as a junior synonym of *P. elongatus* (Bloch).

229. *Stigmatogobius sadanundio* (Hamilton)

1822. *Gobius sadanundio* Hamilton, *Fishes of Ganges* : 52, 366 (Ganges estuary near Calcutta).

1991. *Stigmatogobius sadanundio* : Talwar and Jhingran, *Inland Fishes of India*, 2 : 949.

Material examined : 2 ex., 46-53 mm, 12-10-96, Karuwaka mangroves, Pallithummulapalem, F-2333; 1 ex., 35 mm, 10-02-97, Jilagaladindi, F-2455; 1 ex., 38 mm, 14-02-99, Kannur bridge, F-3064; 1 ex., 44 mm, 13-02-99, Kannur bridge, F-3178; 6 ex., 32-39 mm, 12-12-2000, Kannur bridge, F-3469; 3 ex., 38-44 mm, 13-12-2000, Palli-thummulapalem, F-3512.

Diagnostic features : D VI + I, 7; A I, 8; P 17-18; LS 27-30; Ltr 8-9; preD 8-9. Depth 3.7-4.0, head 4.3-5.0 in SL; eye 3.0-4.0 in head. Lower jaw prominent; teeth in upper jaw in several rows, outer row little enlarged; inner row of lower jaw enlarged with a canine on each side of symphysis and caninoid teeth laterally. Foremost scale behind eye enlarged. Olive; several black spots in 1 or 2 rows on flanks; 1st D with a faint blotch between 3rd and 6th spines; 2nd D and A with few dark spots; C with small black spots in 3-4 transverse rows.

Distribution : India, Bangladesh, Sri Lanka, and Indo-Australian Archipelago.

230. *Yongeichthys criniger* (Valenciennes)

1837. *Gobius criniger* Valenciennes, *Hist. nat. Poiss.*, 12 : 82 (not known).

1992. *Yongeichthys criniger* : Remadevi, *Rec. zool. Surv. India*, 90(1-4) : 173.

Material examined : 1 ex., 56 mm, 12-10-96, Karuwaka mangroves, Pallithummulapalem, F-2334; 1 ex., 48 mm, 15-09-97, Lanka-venitippa, F-2574; 1 ex., 40 mm, 16-09-98, Kannur, river mouth, F-2844; 1 ex., 52 mm, 23-09-98 confluence, Sorlagandi, F-2982; 2 ex., 53-55 mm, 04-01-2000, Kannur, F-3330; 2 ex., 60-61 mm, 05-01-2000, Kannur bridge, F-3359; 2 ex., 57-62 mm, 12-12-2000, Kannur bridge, F-3470; 5 ex., 61-68 mm, 11-12-2000, Kannur, river mouth, F-3595.

Diagnostic features : D VI + I, 9; A I, 9; P 17-19; LS 30-32; Ltr 11-12. Depth 4.0-5.0, head 3.3-3.6 in SL; eyes 3.0-3.6 in head. Mucous canals in 4-5 longitudinal rows over cheek. Second and 3rd ray of 1st D longest, filiform; C obtusely rounded, shorter than head. Head naked above behind eyes; scales cycloid on nape, ctenoid on body; cheek and opercle naked. Olivaceous to orange-green above; head and dorsal side with irregular blackish spots; 3 large blackish spots, one below 1st D, 2nd below 2nd D and the 3rd at middle of C base; 1st D with 3 rows and 2nd D with 4 rows of blackish spots; median fins bordered black; C spotted.

Distribution : Indo-Pacific.

231. *Brachyamblyopus urolepis* (Bleeker)

1852. *Amblyopus urolepis* Bleeker, *Natuurk. Tijdschr. Ned.-Indie*, 3 : 581 (Palembang, Sumatra).

1991. *Brachyamblyopus urolepis* : Talwar and Jhingran, *Inland Fishes of India*, 2 : 982.

Material examined : 1 ex., 62 mm, 16-10-96, Yelchettutippa, F-2229; 1 ex., 78 mm, 23-09-98, confluence, Sorlagandi, F-2976; 1 ex., 70 mm, 24-09-98, Sorlagandi, near Light House, F-3001.

Diagnostic features : D VI, 32-33; A I, 33; P 17-18; V I, 5. No barbels. Teeth on upper jaw biserial, in lower jaw multiserial; no canines. Scales only on post-anal part of body. Yellowish-green; flanks and belly speckled with brown spots.

Distribution : India and Indonesia.

232. *Taenioides anguillaris* (Linnaeus)

1758. *Gobius anguillaris* Linnaeus, *Syst. Nat.*, (ed. 10) 1 : 264 (China).

1991. *Taenioides anguillaris* : Talwar and Jhingran, *Inland Fishes of India*, 2 : 984.

Material examined : 2 ex., 125-128 mm, 11-10-96, Pulleru mouth, Pedapatnam, F-2250; 1 ex., 63 mm, 12-02-99, Channel mouth, Kannur, F-3051.

Diagnostic features : D VI, 41-46; A I, 39-44; P 15-16. Depth 13-15, head 6.5-7.5 in SL; pre-anal distance less than 40% of SL. Barbels 3 pairs; upper jaw with 6 or 7 canines and lower jaw with 4 or 5 canines on each side. D, A and C confluent. Body scaleless. Yellow; D and A yellow; C pink.

Distribution : India, through Indonesia, to China.

233. *Taenioides buchanani* (Day)

1873. *Amblyopus buchanani* Day, *Proc. zool. Soc. Lond.*, : 110 (Calcutta and Moulmein).

1991. *Taenioides buchanani* : Talwar and Jhingran, *Inland Fishes of India*, 2 : 985.

Material examined : 3 ex., 76-140 mm, 19-02-99, Krishna estuary, N of Light House, F-3144; 1 ex., 110 mm, 13-02-99, Kannur bridge, F-3174; 1 ex., 238 mm, 11-01-2000, Gollalmanda, F-3241; 1 ex., 185 mm, 13-12-2000, Pallithummulapalem, F-3507.

Diagnostic features : D VI, 42; A I, 35-36; P 18-19. Depth 10, head 6 in SL; pre-anal distance more than 40% of SL. Barbels 3 pairs; about 5 canines on each side of jaws. D, A and C confluent. Scales rudimentary. Brownish-olive above, pinkish below; vertical fins black; P and V yellow.

Distribution : East coast of India and Myanmar.

234. *Trypauchen vagina* (Bloch & Schneider)

1801. *Gobius vagina* Bloch and Schneider, *Syst. Ichthyol.* : 73 (Tranquebar).

1991. *Trypauchen vagina* : Talwar and Jhingran, *Inland Fishes of India*, 2 : 988.

Material examined : 1 ex., 106 mm, 18-10-96, Nachukunta, F-2268; 9 ex., 90-116 mm, 12-10-96, Pallithummulapalem, F-2307; 7 ex., 68-127 mm, 08-09-97, Kannur bridge, F-2531; 1 ex., 147 mm, 12-02-98, Jilagala-dindi, F-2793; 5 ex., 57-80 mm, 16-09-98, Kannur, river mouth, F-2845; 1 ex., 104 mm, 21-09-98, Kamavericheruvu, F-2943; 4 ex., 75-103 mm, 23-09-98, Sorlagandi, confluence, F-2977; 2 ex., 73-78 mm, 24-09-98, Sorlagandi, nr. Light House, F-3002; 2 ex., 67-70 mm, 15-02-99, Pallithummula-palem, F-3095; 1 ex., 75 mm, 17-02-99, Hamsaldivi, F-3122; 5 ex., 78-125 mm, 19-02-99, Krishna estuary, N of Light House, F-3141; 2 ex., 91-97 mm, 06-01-2000, Palli-thummulapalem, F-3189; 1 ex., 140 mm, 11-01-2000, Gollalamoda, F-3203; 1 ex., 116 mm, 11-01-2000, Gollalmanda, F-3237; 1 ex., 105 mm, 07-01-2000, Pallithummula-palem, F-3256; 1 ex., 110 mm, 04-01-2000, Kannur, F-3327; 7 ex., 46-117 mm, 13-12-2000, Pallithummulapalem, F-3522.

Diagnostic features : D VI, 39-47; A I, 40-46; P 15-17; LS 80-100. Head naked; eyes minute; teeth in jaws pointed, outer row enlarged and caninoid. D and A confluent with C. V completely united forming a funnel-shaped disc. Pinkish-white.

Distribution : Indo-west Pacific.

235. *Kurtus indicus* Bloch

1786. *Kurtus indicus* Bloch, *Naturges. ausland. Fische*, (2) : 122 (India).

Material examined : 1 ex., 85 mm, 21-02-99, creek near sea, Lankavenitippa, F-3068.

Diagnostic features : D V, 12-13; A II, 31-32; P 21; V I, 5. Body compressed, back elevated; operculum thin; pre-operculum angle with 4 spines. Scales small, cycloid. Males with a prominent hook on occiput. Silvery shot with blue or lilac, with fine dots on back and a round black spot behind occiput.

Distribution : India, to Borneo, China.

236. *Siganus canaliculatus* (Park)

1797. *Chaetodon canaliculatus* Park, *Trans. Linn. Soc. Lond.*, 3 : 33 (Sumatra).

1984. *Siganus canaliculatus* : Talwar and Kacker, *Comm, Sea Fish. India* : 775.

Material examined : 1 ex., 32 mm, 13-02-99, Kannur bridge, F-3171.

Diagnostic features : D XIII, 10; A VII, 9. Depth 2.4-2.8 in SL. Head profile slightly concave above eye; anterior nostril with a small dark flap. A sharp, forward-projecting spine

before D; last spine of D shortest; C truncate in young, forked in adults. Scale rows between LL and base of 4th or 5th D spine 21-27. Back light brown or greenish, belly silvery; a large dark brown blotch behind upper part of gill opening; numerous pale bluish spots on back and sides.

Distribution : Indo-west Pacific.

237. *Siganus javus* (Linnaeus)

1766. *Teuthis javus* Linnaeus, *Syst. Nat.*, (ed. 12) 1 : 507 (Java).

1984. *Siganus javus* : Talwar and Kacker, *Comm. Sea Fish. India* : 776.

Material examined : 1 ex., 70 mm, 16-09-98, Kannur, river mouth, F-2851.

Diagnostic features : D XIII, 10; A VII, 9. Depth 2.0-2.3 in SL. A sharp, forward projecting spine before D; last spine of D much longer than 1st spine; soft D and A high angular. Head profile slightly concave above eye; anterior nostril with a small triangular flap, reaching half way to posterior nostril. Scale rows between LL and middle of D base 30-35. C truncate in young, emarginate in adults. Back greenish brown, silvery below; numerous small grey spots on head and upper flanks, becoming pale elongate undulating lines on flanks and belly; D and A orange-yellow.

Distribution : Arabian Gulf, Pakistan, India, through Indonesia, to the Philippines and to New Hebrides.

238. *Eupleurogrammus glossodon* (Bleeker)

1860. *Trichiurus glossodon* Bleeker, *Acta Soc. Sci. Indo-Neerl.*, 8 : 38 (Java, Sumatra, Singapore, Bitang, Borneo).

1984. *Eupleurogrammus glossodon* : Talwar and Kacker, *Comm. Sea Fish. India* : 783.

Material examined : 1 ex., 223 mm, 15-02-98, Lankavenitippa, F-2718; 1 ex., 350 mm, 17-02-99, Hamsaldivi, F-3115.

Diagnostic features : D III, 123-131; A reduced to separate spines; A origin below 31st-37th D ray; V reduced to wing-like structure; C absent. Body silvery-white.

Distribution : India and the East Indies.

239. *Eupleurogrammus muticus* (Gray)

1831. *Trichiurus muticus* Gray, *Zool. Misc.*, 1 : 10 (India).

1984. *Eupleurogrammus muticus* : Talwar and Kacker, *Comm. Sea Fish. India* : 784.

Material examined : 1 ex., 270 mm, 16-10-96, Yelchettutippa, F-2211; 1 ex., 350 mm, 11-02-98, Jilagaladindi, F-2776; 1 ex., 346 mm, 25-09-98, Lankavenitippa, F-3018.

Diagnostic features : D III, 139-147; A reduced to separate spines, buried in flesh in larger specimens; A origin below 38th-43rd soft D ray; V reduced to wing-like structures; P as long as snout; C absent. Steely-blue, with metallic reflections.

Distribution : Persian Gulf, through India, Indonesia, to China.

240. *Lepturacanthus savala* (Cuvier)

1829. *Trichiurus savala* Cuvier, *Regne Animal.*, (2nd ed.) 2 : 219 ("Merdes Indies"= Bombay and Malabar).

1984. *Lepturacanthus savala* : Talwar and Kacker, *Comm. Sea Fish. India* : 786.

Material examined : 1 ex., 217 mm, 19-09-98, Pallithummulapalem, F-2915; 1 ex., 413 mm, 15-02-99, Pallithummulapalem, F-3089; 2 ex., 340-357 mm, 13-12-2000, Pallithummulapalem, F-3539; 1 ex., 475 mm, 10-12-2000, Jilagaladindi, F-3571.

Diagnostic features : D III, 110-120; A 70-75, reduced to separate spines; P I, 10, spine not serrated; lower GR 4-9; V and C absent. Eyes 7-9 in head. Steely-blue, with metallic reflections.

Distribution : India, eastward to west Pacific.

241. *Trichiurus gangeticus* Gupta

1966. *Trichiurus gangeticus* Gupta, *Proc. zool. Soc. Calcutta*, 19 : 169 (Hooghly estuary, West Bengal).

Material examined : 1 ex., 430 mm, 11-02-98, Jilagaladindi, F-2775.

Diagnostic features : D IV, 116-129; A 85, reduced to minute spinules; P I, 10-11, spine serrated. Body ribbon-like, tapering. Upper jaw with 2-3 pairs and lower jaw with one pair of barbed fangs. Bright white.

Distribution : Indo-west Pacific.

242. *Trichiurus lepturus* Linnaeus

1758. *Trichiurus lepturus* Linnaeus (*partim*) (ex Artedi), *Syst. Nat.*, (ed. 10) 1 : 246 (South Carolina).

Material examined : 1 ex., 510 mm, 11-02-98, Jilagaladindi, F-2774; 1 ex., 380 mm, 08-01-00, Manganapudi, F-3286; 2 ex., 240-350 mm, 11-12-00, Kannur, river mouth, F-3603.

Diagnostic features : D III, 130-135; A 100-105, reduced to minute spinules; P I, 11-13, spine not serrated; V and C absent. Eyes 5-7 in head; fangs on jaws with barbs. Steely-blue.

Distribution : Circum-global, in tropical and warm temperate waters.

/243. *Rastrelliger kanagurta* (Cuvier).

1817. *Scomber kanagurta* Cuvier, *Regne Animal.*, 2 : 313 (Vizagapatnam).

1984. *Rastrelliger kanagurta* : Talwar and Kacker, *Comm. Sea Fish. India* : 807.

Material examined : 1 ex., 148 mm, 15-10-96, Lankavenitippa, F-2305; 1 ex., 185 mm, 13-02-97, Chentakalumundi, F-2433; 1 ex., 150 mm, 25-09-98, Lankavenitippa, F-3010; 1 ex., 135 mm, 08-01-2000, Manganapudi, F-3287.

Diagnostic features : D IX-XI + I, 11 + 5 finlets; A I, 11 + 5 finlets; P 19-20; GR (15-22) + (30-46). Depth at margin of gill cover 4.0-4.8 in SL; head longer than greatest body depth. Back blue/green, flanks silvery with a golden tint; 2 rows of small, dark spots on sides of D base; narrow dark longitudinal bands on upper part of body and a black spot on body near lower margin of P.

Distribution : Indo-Pacific.

244. *Scomberomorus guttatus* (Bloch & Schneider)

1801. *Scomber guttatus* Bloch and Schneider, *Syst. Ichthyol.*, : 23, pl. 5 (Tranquebar).

1984. *Scomberomorus guttatus* : Talwar and Kacker, *Comm. Sea Fish. India* : 813.

Material examined : 1 ex., 121 mm, 17-09-98, Kannur, F-2866.

Diagnostic features : D XV-XVIII + 18-24 + 7-10 finlets; A 19-23 + 7-10 finlets; GR (1-2) + (7-12); LL with many fine branches anteriorly, almost straight to below middle of C peduncle. Blue on back, silvery on sides; about 3 irregular rows of dark round spots, smaller than eye, along flanks; spinous D dark up to 8th spine.

Distribution : Persian Gulf, through India, Indonesia, to Japan.

245. *Pampus argenteus* (Euphrasen)

1758. *Stromateus argenteus* Euphrasen, *Kongl. Vetén. Acad. Handl. Stockholm*, 9 : 49 ("Castellum Chinese Bocca Tigris dictum").

1984. *Pampus argenteus* : Talwar and Kacker, *Comm. Sea Fish. India* : 837.

Material examined : 1 ex., 79 mm, 11-02-98, Jilagaladindi, F-2740; 1 ex., 73 mm, 17-09-98, Kannur, F-2863; 2 ex., 71-74 mm, 19-09-98, Pallithummulapalem, F-2902; 1 ex., 73 mm, 21-09-98, Kamavericheruvu, F-2941.

Diagnostic features : D 38-43; A 34-43; D and A preceded by 5-10 very low blade-like spines; both the fins falcate; C forked, lower lobe longer. Grey on back, shading to silvery white below.

Distribution : Persian Gulf, through India, Indonesia, to Japan.

246. *Pampus chinensis* (Euphrasen)

1758. *Stromateus chinensis* Euphrasen, *Kongl. Vetén. Acad. Handl. Stockholm*, **9** : 53 ("Castellum Chinese Bocca Tigris dictum").

1984. *Pampus chinensis* : Talwar and Kacker, *Comm. Sea Fish. India* : 838.

Material examined : 2 ex., 93-102 mm, 11-02-98, Jilagaladindi, F-2739.

Diagnostic features : D 43-50; A 39-42; no spines ahead of median fins; fins never falcate, posterior border almost vertical; C emarginated in young, slightly forked in adults. Grey-brown on back, shading to silvery-white below.

Distribution : Pakistan, India, through Indonesia, to China.

247. *Colisa fasciatus* (Schneider)

1801. *Trichogaster fasciatus* Schneider, *Syst. Ichthyol.*, : 164, pl. 36 (Tranquebar).

1991. *Colisa fasciatus* : Talwar and Jhingran, *Inland Fishes of India*, **2** : 1006.

Material examined : 1 ex., 60 mm, 07-02-98, Pedakannur, F-2615.

Diagnostic features : D XV-XVII, 9-14; A XV-XVIII, 14-19; P 9-10; LS 29-31. Pre-orbital serrate in young. A scaly at base only. Greenish with orange or bluish bars descending obliquely. Vertical fins with alternate dark and pale spots or bars. A often with red margin.

Distribution : Pakistan, India, Nepal, Bangladesh, and Myanmar. Inhabits ponds, rivers and estuaries.

248. *Channa marulius* (Hamilton)

1822. *Ophiocephalus marulius* Hamilton, *Fishes of Ganges* : 65, 367, pl. 17, fig. 19 (Gangetic Provinces).

1991. *Channa marulius* : Talwar and Jhingran, *Inland Fishes of India*, **2** : 1017.

Material examined : 1 ex., 125 mm, 17-10-96, Yedurumundi, F-2231.

Diagnostic features : D 45-55; A 28-36; P 16-18; V 6; preD 16; LS 60-70; 10 scale-rows between pre-opercular angle and hind border of orbit. Five or 6 dark oval blotches on flank; distinct white spots scattered on body and fins; a distinct pale-edged ocellus at upper base of C. Juveniles with an orange band from eye to middle of C.

Distribution : Pakistan, Sri Lanka, India, Nepal, Bangladesh, Myanmar, Thailand and China.

249. *Channa orientalis* Bloch & Schneider

1801. *Channa orientalis* Bloch and Schneider, *Syst. Ichthyol.*, : 496, pl. 90, fig. 2 (India).

Material examined : 1 ex., 46 mm, 13-02-99, Kannur bridge, F-3175.

Diagnostic features : D 32-37; A 20-23; P 14-15; V 6; preD 12; LS 40-50; 4-5 scale-rows between pre-opercular angle and hind border of orbit. Green dorsally; pale ventrally with faint bluish or reddish tinge. A row of dark oblique bands along sides. P with distinct alternating blue and orange bands. Young with a large ocellus on last 5 rays of D.

Distribution : Afghanistan, Iran, Pakistan, India, Sri Lanka, Nepal, Bangladesh, Myanmar, and Indonesia.

250. *Channa punctatus* (Bloch)

1793. *Ophiocephalus punctatus* Bloch, *Naturges. ausland. Fische*, (7) : 139, pl. 358 (Rivers and Lakes of Coromandel Coast).

1991. *Channa punctatus* : Talwar and Jhingran, *Inland Fishes of India*, 2 : 1020.

Material examined : 1 ex., 125 mm, 12-02-97, Pallithummulapalem, F-2394; 4 ex., 53-67 mm, 08-09-97, Kannur bridge, F-2524; 3 ex., 64-108 mm, 10-02-98, Jilagaladindi, F-2738.

Diagnostic features : D 28-33; A 20-23; P 15-18; V 6; pre D 12; LS 40-50; 5 scale-rows between pre-opercular angle and hind border of orbit. Eyes 7.0-8.5 in head. V about 75% of P length. Black to light green on back and flanks; white to pale yellow ventrally, sometimes with reddish tinge; several dark blotches on flanks.

Distribution : Afghanistan, Pakistan, India, Sri Lanka, Nepal, Bangladesh, Myanmar, and Yunan (China). Inhabits freshwater ponds and tanks.

251. *Mastacembelus armatus* (Lacepede)

1800. *Macrognathus armatus* Lacepede, *Hist. nat. Poiss.*, 2 : 286 (locality not known).

1991. *Mastacembelus armatus* : Talwar and Jhingran, *Inland Fishes of India*, 2 : 1031.

Material examined : 1 ex., 180 mm, 17-10-97, Yedurumundi, F-2232; 1 ex., 400 mm, 17-12-2000, Puligada, F-3565.

Diagnostic features : D XXXII-XL, 64-92; A III, 64-90; P 21-27; C 14-17. Rim of anterior tubular nostril with 2 finger-like projections and 2 broad-based flaps. D and A broadly joined to C. Rich brown, with zigzag lines. Often a black band through eye continued in an undulating course along upper half of sides; a row of black spots along base of soft D and short black bands near D spines.

Distribution : Pakistan, India, Sri Lanka, Nepal, Bangladesh, Myanmar, through Thailand and Malaya, to southern China.

252. *Psettodes erumei* (Schneider)

1801. *Pleuronectes erumei* Schneider, *Syst. Ichthyol.* : 150 ("Tranquebaricum", India).

1984. *Psettodes erumei* : Talwar and Kacker, *Comm. Sea Fish. India* : 842.

Material examined : 1 ex., 105 mm, 10-12-2000, Jilagaladindi, F-3553.

Diagnostic features : D IX-XI, 38-45; A I, 33-42; P 14-16; LL 68-75; GR absent, gill arches toothed. Depth 2.3-2.5, head 3.2-3.6 in SL. Jaws with large canines in 2 or 3 rows, some teeth barbed. Eyed side brownish; young with broad dark cross bars.

Distribution : Indo-west Pacific.

253. *Pseudorhombus arsius* (Hamilton)

1822. *Pleuronectes arsius* Hamilton, *Fishes of Ganges* : 128 (Ganges estuary below Calcutta).

1984. *Pseudorhombus arsius* : Talwar and Kacker, *Comm. Sea Fish. India* : 851.

Material examined : 1 ex., 92 mm, 16-10-96, Yelchettutippa, F-2212; 1 ex., 44 mm, 11-10-96, Pulleru mouth, nr. Pedapatnam, F-2255; 1 ex., 172 mm, 16-02-97, Yesupuram, F-2382; 1 ex., 44 mm, 16-09-97, Eakhetulutippa, F-2541; 1 ex., 59 mm, 07-09-97, Kannur, river mouth, F-2567; 1 ex., 41 mm, 17-09-97, Krishna R mouth, nr. Light House, F-2598; 1 ex., 132 mm, 17-02-99, Hamsaldivi, F-3117; 1 ex., 100 mm, 10-01-2000, Sorlagandi, F-3200; 4 ex., 105-142 mm, 13-01-2000, Nachukunta, F-3309.

Diagnostic features : D 72-80; A 56-61; P 11-12; lower GR 9-13, lanceolate. Teeth strong, widely set canines; 6-13 teeth on blind side of lower jaw. Scales cycloid on blind side. Brownish on ocular side, with dusky spots and blotches; a distinct larger blotch on anterior end of straight part of LL and a smaller one half way to C base; median fins with scattered dark spots.

Distribution : Indo-west Pacific.

254. *Pseudorhombus elevatus* Ogilby

1912. *Pseudorhombus elevatus* Ogilby, *Mem. Queensland Mus.*, 1 : 45 (Queensland, Australia).

Material examined : 2 ex., 35-56 mm, 07-02-98, Pedakannur, F-2621.

Diagnostic features : D 69-70; A 52-53; lower GR 11-15, lanceolate. Depth 1.8-2.0 in SL. Teeth small, 23-32 on blind side of lower jaw. D origin above anterior nostril of blind side. Scales ctenoid on eyed side and cycloid on blind side. Ocular side pale brown, with numerous faint blotches arranged in 5 irregular rows; 3 large distinct blotches along straight part of LL.

Distribution : Red Sea, through India, to north-eastern coast of Australia.

255. *Euryglossa orientalis* (Bloch & Schneider)

1801. *Pleuronectes orientalis* Bloch and Schneider, *Syst. Ichthyol.*, : 157 (Tranquebar).

1991. *Euryglossa orientalis* : Talwar and Jhingran, *Inland Fishes of India*, 2 : 1047.

Material examined : 1 ex., 133 mm, 12-10-96, Karuwaka mangroves, Pallithummulapalem, F-2313; 1 ex., 135 mm, 16-02-97, Lankaveni-tippa, F-2409; 1 ex., 82 mm, 18-09-97, Yedurumundi, F-2489.

Diagnostic features : D 62-67; A 47-57; P 7; V 5; C 18-20. Scales on head and nape of same size as other parts; head scales on blind side modified into cutaneous sensory process. Ocular side brownish with cloudy indistinct patches; tinged yellow on blind side; vertical fins darker; outer half of P black.

Distribution : Red Sea, through India, Indonesia, to China and Australia.

256. *Synaptura commersoniana* (Lacepede)

1802. *Pleuronectes commersonianus* Lacepede, *Hist. nat. Poiss.*, 3 : pl. 12, fig. 2 (Mauritius).

1984. *Synaptura commersoniana* : Talwar and Kacker, *Comm. Sea Fish. India* : 867.

Material examined : 1 ex., 133 mm, 14-02-99, Kannur bridge, F-3058.

Diagnostic features : D 72-81; A 57-68; D and A continuous with C. Anterior part of snout with a bony process. Scales ctenoid on eyed side and cycloid on blind side; scale on head and nape of eyed side larger than those on body; scales on blind side of head modified into cutaneous sensory process. Grey or brown on eyed side; D, A and C dusky towards edges with a white margin.

Distribution : Indo-west Pacific.

257. *Cynoglossus arel* (Schneider)

1801. *Pleuronectes arel* Schneider, *Syst. Ichth. Bloch* : 159 (Tranquebar).

1984. *Cynoglossus arel* : Talwar and Kacker, *Comm. Sea Fish. India* : 873.

Material examined : 1 ex., 207 mm, 12-10-96, Karuwaka mangroves, Pallithummulapalem, F-2314; 1 ex., 260 mm, 13-02-97, Chenta-kaluamundi, F-2432; 1 ex., 145 mm, 11-02-98, Jilagaladindi, F-2758; 5 ex., 140-210 mm, 11-02-98, Jilagaladindi, F-2777; 1 ex., 190 mm, 17-09-98, Kannur, F-2858; 1 ex., 124 mm, 20-09-98, Manganapudi, F-2934; 2 ex., 178-187 mm, creek near sea, Lankaveni-tippa, F-3080.

Diagnostic features : D 116-130; A 85-98; C 10; two LL on ocular side, median LL 56-70; 7-9 scale rows in between; no LL on blind side. Scales ctenoid on ocular side and cycloid on blind side. Ocular side uniform brown, with a dark patch on gill cover.

Distribution : Persian Gulf, through India, Indonesia, to the Philippines, Taiwan.

258. *Cynoglossus bilineatus* (Lacepede)

1802. *Achirus bilineatus* Lacepede, *Hist. nat. Poiss.*, 4 : 659, 663 (China, East Indies).

1984. *Cynoglossus bilineatus* : Talwar and Kacker, *Comm. Sea Fish. India* : 874.

Material examined : Not obtained by us.

Diagnostic features : D 107-113; A 80-88; C 12; two LL on ocular side, 13-16 scale rows in between; median LL 80-96; two LL on blind side. Scales ctenoid on ocular side, cycloid on blind side. Ocular side brown, with irregular dark blotch on operculum; blind side white.

Distribution : Pakistan, India, eastward to west Pacific.

Remarks : Included here following Jayaram (1995).

259. *Cynoglossus lida* (Bleeker)

1851. *Plagusia lida* Bleeker, *Nat. Tijdschr. Ned.-Indie*, 1 : 413 (Batavia).

1984. *Cynoglossus lida* : Talwar and Kacker, *Comm. Sea Fish. India* : 879.

Material examined : Not obtained by us.

Diagnostic features : D 99-108; A 77-85; C 10; two LL on ocular side, 12-15 scale rows in between; median LL 72-90; no LL on blind side. Scales ctenoid on both sides. Snout broadly rounded; angle of mouth extending to below posterior half of lower eye; distinctly nearer to gill opening than to tip of snout. Ocular side brownish.

Distribution : Pakistan, India, to west Pacific.

Remarks : Included here following Jayaram (1995).

260. *Cynoglossus lingua* Hamilton

1822. *Cynoglossus lingua* Hamilton, *Fishes of Ganges* : 32 (Gangetic estuary).

Material examined : 1 ex., 73 mm, 18-10-96, Nachukunta, F-2267; 1 ex., 215 mm, 16-02-97, Yesupuram, F-2381; 1 ex., 250 mm, 16-02-97, Lankavenitippa, F-2408; 1 ex., 187 mm, 13-12-2000, Pallithummulapalem, F-3499; 1 ex., 270 mm, 20-12-2000, Nachukunta, F-3550.

Diagnostic features : D 126-138; A 97-114; C 10; two LL on ocular side, 11-12 scale rows in between; median LL 90-100; no LL on blind side. Snout obtusely pointed, angle of mouth reaching well beyond lower eye, much nearer to gill opening than to snout tip. Scales ctenoid on ocular side and cycloid on blind side. Ocular side reddish-brown, often with irregular brown patches.

Distribution : Coasts of India, to Indonesia, and the Philippines.

261. *Cynoglossus macrostomus* Norman

1928. *Cynoglossus macrostomus* Norman, *Rec. Indian Mus.*, 30(2) : 204, fig. 20 (Hooghly estuary near Calcutta).

Material examined : 1 ex., 98 mm, 11-02-98, Jilagaladindi, F-2759; 1 ex., 106 mm, 12-02-98, Jilagaladindi, F-2794; 1 ex., 95 mm, 21-09-98, Kamavericheruvu, F-2949.

Diagnostic features : D 100-106; A 78-84; C 10. Two LL on ocular side, 14-16 scale-rows in between; median LL 80-92; no LL on blind side. Snout obtusely pointed; angle of mouth reaching well beyond lower eye, nearer to tip of snout than to gill opening. Scales ctenoid on both sides. Ocular side, light brown with dark brown mottling forming diffuse, irregular cross-bands; D and A grey-black.

Distribution : Coasts of India.

262. *Cynoglossus punticeps* (Richardson)

1846. *Plagusia punticeps* Richardson, *Rep. Br. Ass. Advmt. Sci.*, **15** : 280 (China).

1991. *Cynoglossus punticeps* : Talwar and Jhingran, *Inland Fishes of India*, **2** : 1043.

Material examined : 4 ex., 79-107 mm, 12-10-96, Karuwaka mangroves, Pallithummulapalem, F-2317; 1 ex., 65 mm, 11-02-97, Kannur, river mouth, F-2356; 1 ex., 55 mm, 12-02-97, Pallithummulapalem, F-2372; 4 ex., 79-107 mm, 08-09-97, Kannur bridge, F-2521; 1 ex., 95 mm, 16-09-98, Kannur, river mouth, F-2838; 1 ex., 75 mm, 26-09-98, Sangameswara, F-3032; 3 ex., 58-90 mm, 19-02-99, Krishna estuary, N of Light House, F-3147; 9 ex., 56-89 mm, 13-02-99, Kannur bridge, F-3170; 1 ex., 69 mm, 11-01-2000, Gollalamoda, F-3220; 4 ex., 45-100 mm, 04-01-2000, Kannur, F-3325; 5 ex., 82-88 mm, 05-01-2000, Kannur, F-3351; 1 ex., 75 mm, 14-12-2000, Pallithum-mulapalem, F-3378; 10 ex., 48-112 mm, 12-12-2000, Kannur bridge, F-3443; 3 ex., 82-97 mm, 13-12-2000, Pallithummulapalem, F-3500; 1 ex., 59 mm, 11-12-2000, Kannur, river mouth, F-3604.

Diagnostic features : D 90-100; A 72-78; C 10. Two LL on ocular side, 16-19 scale-rows in between; median LL 78-99; no LL on blind side. Snout rounded or obtusely pointed; angle of mouth not reaching beyond lower eye, slightly nearer to tip of snout than to gill opening; eyes not contiguous. Scales ctenoid on both sides. Ocular side yellow-brown with very distinct irregular dark brown patches, often forming irregular cross bars; some rays of D and A dashed with dark brown.

Distribution : Pakistan, India, through Indonesia, the Philippines, Taiwan and Australia.

263. *Cynoglossus semifasciatus* Day

1876. *Cynoglossus semifasciatus* Day, *Fishes of India*, (2) : 346, pl. 97, fig. 5 (Madras).

Material examined : 2 ex., 92-110 mm, 12-10-96, Karuwaka mangroves, Pallithummulapalem, F-2318; 2 ex., 92-111 mm, 11-01-2000, Gollalamoda, F-3219; 2 ex., 84-92 mm, 11-01-2000, Gollalmanda, F-3249; 1 ex., 106 mm, 13-01-2000, Nachukunta, F-3305; 1 ex.,

116 mm, 12-12-2000, Kannur bridge, F-3442; 2 ex., 102-113 mm, 11-12-2000, Kannur, river mouth, F-3605.

Diagnostic features : D 99-107; A 75-83; C 10. Two LL on ocular side, 11-14 scale-rows in between; median LL 70-78; no LL on blind side. Snout rounded or obtusely pointed, about 27% of head length; angle of mouth extending little beyond vertical from fixed eye, nearer to tip of snout than to gill opening; inter-orbital space 1.8-2.5% of head length. Scales ctenoid on both sides. Ocular side, light brownish with a number of irregular vertical dark bands.

Distribution : East coast of India, Sri Lanka.

264. *Triacanthus biaculeatus* (Bloch)

1786. *Balistes biaculeatus* Bloch, *Naturges. ausland. Fische*, (2) : 19 (East Indies).

1991. *Triacanthus biaculeatus* : Talwar and Jhingran, *Inland Fishes of India*, 2 : 1051.

Material examined : 2 ex., 36-38 mm, 15-09-97, Lankavenitippa, F-2578; 2 ex., 49-52 mm, 18-02-98, Yesupuram, F-2703.

Diagnostic features : D V + 21-26; A 17-20; P 13-14; V I. Upper profile of snout straight to concave; post-orbital profile of head to D origin convex, concave over eyes. Second spine of D much less than half-length of 1st spine. Ventral surface of pelvis slightly tapered to a round posterior end. Anterior $\frac{3}{4}$ of spinous D membrane black, posterior $\frac{1}{4}$ yellow.

Distribution : Indo-west Pacific.

265. *Chelonodon fluviatilis* (Hamilton)

1822. *Tetrodon fluviatilis* Hamilton, *Fishes of Ganges* : 6, 362, pl. 30, fig. 1 (Ganges river).

1991. *Chelonodon fluviatilis* : Talwar and Jhingran, *Inland Fishes of India*, 2 : 1055.

Material examined : 3 ex., 60-67 mm, 12-10-96, Karuwaka mangroves, Pallithummulapalem, F-2312; 1 ex., 39 mm, 18-02-97, Krishna river mouth, F-2339; 7 ex., 28-79 mm, 11-02-97, Kannur, river mouth, F-2351; 1 ex., 30 mm, 12-02-97, Pallithummulapalem, F-2370; 1 ex., 60 mm, 19-09-97, Palakaitippa, F-2472; 2 ex., 65-75 mm, 18-09-97, Yeduru-mundi, F-2486; 1 ex., 100 mm, 16-09-98, Kannur, river mouth, F-2835; 1 ex., 100 mm, 23-09-98, confluence, Sorlagandi, F-2967; 1 ex., 72 mm, 24-09-98, Sorlagandi, near Light House, F-2985; 1 ex., 125 mm, 12-02-99, Channel mouth, Kannur, F-3041; 3 ex., 27-38 mm, 19-02-99, Krishna estuary, N of Light House, F-3137; 11 ex., 27-45 mm, 13-02-99, Kannur bridge, F-3164; 1 ex., 34 mm, 11-01-2000, Gollalamoda, F-3212; 1 ex., 76 mm, 07-01-2000, Pallithummulapalem, F-3259; 1 ex., 26 mm, 10-01-2000, River mouth, nr. Light House, Sorlagandi, F-3266; 2 ex., 60-110 mm, 13-02-2000, Nachukunta, F-3298; 1 ex., 28 mm, 09-01-2000, Kannur, F-3318; 4 ex., 30-112 mm, 05-01-2000, Kannur bridge, F-3345; 3 ex.,

43-95 mm, 11-12-2000, Kannur, river mouth, F-3390; 2 ex., 67-75 mm, 19-12-2000, River mouth, opp. Light House, Sorlagandi, F-3418; 5 ex., 23-82 mm, 12-12-2000, Kannur bridge, F-3448; 9 ex., 26-75 mm, 13-12-2000, Pallithummula-palem, F-3483.

Diagnostic features : D 14-16; A 12-15; P 22. Inter-orbital space broad and convex. Nasal organ cup-like, with 2 rounded lobes at its tip. Head and body thickly set with dermal spinules. Olive-green above, white or yellow below; 3-4 dark patches on back; anterior half of head variably coloured; sides with 5-28 rounded, mostly ocellated, dark spots; C with dark cross bands.

Distribution : India, Sri Lanka, eastward to Borneo. Inhabits fresh and low saline waters.

266. *Chelonodon patoca* (Hamilton)

1822. *Tetrodon patoca* Hamilton, *Fishes of Ganges* : 7, 362, pl. 18, fig. 2 (Estuaries of Ganges).

1991. *Chelonodon patoca* : Talwar and Jhingran, *Inland Fishes of India*, 2 : 1057.

Material examined : 2 ex., 44-48 mm, 11-02-97, Kannur, river mouth, F-2350; 1 ex., 54 mm, 13-02-97, Chentakalumundi, F-2431; 2 ex., 26-31 mm, 16-09-97, Eakhetulutippa, F-2540; 2 ex., 25-32 mm, 15-09-97, Lanka-venitippa, F-2575; 1 ex., 29 mm, 17-09-97, Krishna river mouth, near Light House, F-2596; 2 ex., 35-39 mm, 07-02-98, Pedakannur, F-2618; 1 ex., 41 mm, 08-02-98, Pedakannur, F-2671; 4 ex., 50-70 mm, 18-02-98, Yesupuram, F-2704; 1 ex., 70 mm, 12-02-99, Channel mouth, Kannur, F-3042; 1 ex., 40 mm, 06-01-2000, Pallithummula-palem, F-3188; 2 ex., 36-42 mm, 11-01-2000, Gollalamoda, F-3213; 1 ex., 44 mm, 04-01-2000, Kannur, F-3319; 4 ex., 30-60 mm, 11-12-2000, Kannur, river mouth, F-3391.

Diagnostic features : D 9-10; A 8-10; P 15-16. Inter-orbital space flat and broad. Nostril a round depression, surrounded by a low rim produced into a posterior and anterior flap. Body with a spiny patch on back, throat and belly; sides naked. Blackish above with numerous small round yellowish spots; flanks and belly silvery; juveniles often with 3-4 dark cross bands on back.

Distribution : Tropical Indo-west Pacific.

267. *Lagocephalus lunaris* (Bloch & Schneider)

1801. *Tetrodon lunaris* Bloch and Schneider, *Syst. Ichthyol.* : 505 (Malabar).

1991. *Lagocephalus lunaris* : Talwar and Jhingran, *Inland Fishes of India*, 2 : 1058.

Material examined : 1 ex., 40 mm, 10-10-96, Kannur, F-2286; 1 ex., 75 mm, 18-02-98, Yesupuram, F-2705; 3 ex., 53-57 mm, 23-09-98, confluence, Sorlagandi, F-2968; 3 ex., 30-34 mm, 19-02-99, Krishna estuary, N of Light House, F-3136; 1 ex., 67 mm, 11-12-2000,

Kannur, river mouth, F-3392; 2 ex., 47-75 mm, 19-12-2000, River mouth, opp. Light House, Sorlagandi, F-3417; 1 ex., 40 mm, 12-12-2000, Kannur bridge, F-3450; 1 ex., 63 mm, 13-12-2000, Pallithummulapalem, F-3484.

Diagnostic features : D 11-12; A 10-11; P 16-17. Spinules on back from nostrils to D; snout, sides and C peduncle smooth. Greenish-olive on back, sides and belly creamy white; a yellowish streak from eye to C.

Distribution : Indo-west Pacific.

268. *Lagocephalus spadiceus* (Richardson)

1845. *Tetrodon spadiceus* Richardson, *Voy. Sulphur. Ichth.*, : 123, pl. 58, figs. 4, 5 (Canton, China).

1991. *Lagocephalus spadiceus* : Talwar and Jhingran, *Inland Fishes of India*, 2 : 1059.

Material examined : 2 ex., 100-135 mm, 20-09-98, Manganapudi, F-2922; 1 ex., 74 mm, 12-12-2000, Kannur bridge, F-3449.

Diagnostic features : D 11-12; A 11-12; P 17. Spinules on dorsal surface of body extend only about half way from inter-orbital region to D. Greenish-olive above, flanks and belly whitish; posterior margin of C entirely white.

Distribution : Indo-west Pacific.

269. *Takifugu oblongus* (Bloch)

1786. *Tetrodon oblongus* Bloch, *Naturges. ausland. Fische*, (2) : 6, pl. 146, fig. 1 (Surate, East Indies).

1991. *Takifugu oblongus* : Talwar and Jhingran, *Inland Fishes of India*, 2 : 1059.

Material examined : 1 ex., 32 mm, 13-02-99, Kannur bridge, F-3165.

Diagnostic features : D 12-13; A 10-11; P 16. Nasal organ covered by a small sac with 2 nostrils. A inserted below front half of D. Anterior part of back including top of head and belly with spinules. Brownish above with pale spots; yellowish-white below; narrow dark bars on sides.

Distribution : Indo-west Pacific.

DISCUSSION

Our knowledge on ichthyofauna of the Krishna river system was restricted to 195 species (David, 1963; Jayaram, 1995), of which 135 species are freshwater forms and only 60 are known to inhabit estuarine region. The present study encompasses information on 269 species from the Krishna estuary.

Two species were not included here due to uncertainty of their identity. *Carangoides jordani* (Nichols), reported by Jayaram (1995), is not a valid species and probably refers to *C. ferdau* (Forsal). David (1963) reported *Awaous stamineus* (Valenciennes) from Godavari estuary and Jayaram (1995) included it for it is likely to be present in the estuary of Krishna. In the current parlance of nomenclature *A. stamineus* is not a valid species and there is a need to ascertain the status of Indian specimens.

David (1963) recorded *Labeo gonius* (Hamilton), a fresh water species, from the lower reaches of Krishna, but it could neither be collected by Jayaram (1995) nor by our survey parties. Jayaram (1995) noted that *Gudusia chapra* (Hamilton) is likely to occur in the Krishna estuary based on David (1963), who observed this species in lower reaches. Jayaram (1995) has stated as its occurrence in Krishna estuary is doubtful and need confirmation. Hence, both the species were not included in this account.

The Yedurumundi reservoir is a rain fed artificial impoundment connected to the Krishna estuary periodically and stocked with major carps such as *Catla catla* (Hamilton), *Labeo calbasu* (Hamilton), *L. rohita* (Hamilton) and *Cirrhinus mrigala* (Hamilton). These species are more likely to escape in to the estuary when low saline condition prevails. Presence of *Oreochromis mossambica* (Peters) in Krishna estuary indicates such escape from culture ponds to estuarine water.

Few other cyprinid species, viz., *Cirrhinus cirrhosus* (Bloch), *C. reba* (Hamilton), *Danio devario* (Hamilton), *Esomus danricus* (Hamilton), *Labeo boggut* (Sykes), *Puntius ticto* (Hamilton) are likely to occur in the estuarine region, as they were reported from Godavari estuary (Krishnan and Mishra, 2001) and also available in Krishna river (Jayaram, 1995) as well. Similarly, *Chanda nama* (Hamilton) and *Pseudambassis ranga* (Hamilton) of the family Ambassidae are likely to occur. Possibilities of occurrence of *Rita pavimentatus* (Valenciennes), reported from Krishna river as *Rita gogra* (Sykes), and *Pangasius pangasius* (Hamilton) cannot be ruled out.

Jayaram (1995) has doubted the presence of *Setipinna phasa* (Hamilton) in the Krishna estuary. The present report confirms the presence of both *S. phasa* and *S. tenuifilis* (Valenciennes) in Krishna estuary, where as Rao and Sharma (1987) has reported *S. taty* and *S. tenuifilis* only from the estuary.

It is interesting to note that not a single specimen of *Tenualosa ilisha* (Hamilton) was obtained by Jayaram (1995) and our survey parties during 1996-2000. As per the fishery reports, in the year 1984 this species was captured at Nagailanka as much as 800-900 kg per day. But catch is not always uniform and a peak was observed in five years gape. Stringent measures have to be taken to conserve this economically valuable species in the Krishna estuary.

Many species in this account have coastal marine habitat. Collections from Jilagaladindi might have included many such species. These may possibly occur in the estuarine water or may be stray specimens, but included here for they were found among the lots of estuarine collections made by survey parties. Noteworthy among them is *Acropoma japonicum* Gunther, which is rather a deep-water marine species.

The present work only provides base line information on the fishes of the Krishna estuary. The estuarine systems exhibit continuous changes thereby providing scope for the occurrence of more species than known at present.

SUMMARY

Information on the distribution of 269 species of fishes is presented in this paper based on collection of samples and integrating existing literature. The ichthyofaunal diversity known is reported as 269 species under 160 genera and 78 families for the Krishna estuary.

ACKNOWLEDGEMENTS

The author is thankful to the Dr. J.R.B. Alfred, Director, Zoological Survey of India, Kolkata, Dr. C.A.N. Rao and Dr. S.Z. Siddiqi, the Officers-in-Charge, Estuarine Biological Station, ZSI, Berhampur and Sri A.K. Singh, Officer-in-Charge, Spirit Building, ZSI, Kolkata for facilities. A deep sense of gratitude also extended to Dr. R.P. Barman, Officer-in-Charge, Marine Fish Section, ZSI, Kolkata for his encouragement and guidance. The author also thanks Dr. Sasmita Satapathy for assistance in correction of manuscript.

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