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Fauna of Brahmani-Baitarani Estuarine Complex, Odisha, Bay of Bengal w.s.r. to Ichthyofauna and Crustaceans

D. V. RAO
SHIBANANDA RATH

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FAUNA OF BRAHMANI-BAITARANI ESTUARINE COMPLEX, ODISHA, BAY OF BENGAL w.s.r. TO ICHTHYOFAUNA AND CRUSTACEANS

D.V. RAO and SHIBANANDA RATH*

Zoological Survey of India, Freshwater Bioligy Regional Centre, Hyderabad - 500020

**Zoological Survey of India, M-Block, New Alipore, Kolkata - 700051*

Edited by the Director, Zoological Survey of India, Kolkata

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INTRODUCTION

The state of Odisha has a coastline of 480 km and is one of the most dynamic coastal environments in India due to its extensive network of large rivers with their deltaic and complex estuarine systems. The coastline stretches from the marshy areas bordering Ichhapuram in Andhra Pradesh towards south to Udaypur village bordering West Bengal in the north and passing through the districts of Ganjam, Jagatsinghpur, Kendrapara, Puri, Bhadrak and Balasore. The Subarnarekha, Budhabalanga, Brahmani, Baitarani, Mahanadi, Devi, Kadua, Kushabhadra, Hansua, Rushikulya, Bahuda etc. are some of the riverine systems shaped in to extensive estuarine complexes drains into Bay of Bengal. After Mahanadi, the Brahmani-Baitarani estuarine system is the second largest system comprising mangrove forests, rivers, creeks, back water, accreted land and mud flats. The biologically rich Bhitarkanika mangrove ecosystem formed by the rich alluvial deposits of Brahmani, Baitarani and the Dhamra River systems. The entire mangrove system was declared as Bhitarkanika Sanctuary vide notification No.6958/FF AH Dtd. 22.04.1975 which was over an area of 650 km^2. About 145 km^2 has been notified as Bhitarkanika National Park vide Notification No.19686/F & E dated 16.9.1998 of Forests & Environment Department, Govt. of Odisha. A Dhamra port has been consructed by the State Govt. of Odisha close to Baitarani extuarine complex located at approximately 20°50' N and 86°58' E on Bay of Bengal, north of Dhamra river and is about 13 km away from the world famous turtle nesting beaches of the Gahirmatha Marine Sanctuary. The entire area is characterized by alluvial silt deposits due to regular tidal inundation and high detritus content. The most common mangrove trees found in the mudflats and along the banks of estuaries are *Avicennia alba, A. marina. A officinalis, Excoecaria agallocha, Heritiera fomes, Rhizophora mucronata, Heritiera littorali* etc. Other than the rich potential of fish and crustacean fauna, the noteworthy herpetofauna of the area are a variety of brackish water snakes, the brackish water frog *Fejervarya cancrivora*, saltwater crocodile *Crocodilus porosus* (Fig. 134) and large number of wetland birds. The dolphins, *Orcaella brevirostris, Stenella attenuata, Delphinus delphis* and *Neophocaena phocaenoides* are the common mammals found in the Dhamra region near the river mouth, off the port site and south to Gahirmatha coast. The horseshoe crab, *Tachypleus gigas* (Muller) (Fig. 135) is frequently encountered along the mudflats and coastal muddy areas of the estuarine belt.

Brahmani-Baitarani Estuary

The Brahmani and Baitarani rivers formed an extensive systems and ultimately joinerd the Bay of Bengal (Fig.2). The Brahmani is the second largest river in Odisha. The two rivers, the Sankh and the Koel, originated from the Chhotanagpur Plateau and join at Vedavyasa near Rourkela in Sundargarh district of Odisha and formed as a major river Brahmani. It flows through Sundargarh, Keonjhar, Dhenkanal, Cuttack

and Jajpur districts of the coastal plains and opens into Bay of Bengal at Dhamra (Bhadrak Dist.). It is over 790 km long having not less than 40 major tributaries of which Sankha, Chandrinalla, Rukura, Badjore, Kaunishnalla, Kalanalla, Usthalinalla, Chudakhainallah, Chilanti river, Tikira, Bangaru river, Nigra river, Barha, Daunri, Kelua river, Birupa, Hansua, Koel, Suidihi, Champalijore, Kuradihi, Amrudi, Mankada, Ambahari, Samakoi, Gambhiria, Raijore, Indrajeet, Ramiala, Kharasuan, Daudi etc. are the important branches.

The Baitarani river originates from the Gonasika in the Guptaganga hills of Keonjhar district. The river traverses a distance of approx 360 kms and joins the Bay of Bengal. There are over 60 large and small tributaries on either side of the river. The major tributaries of the river are Kangira, Ardei, Khairi, Bhandan, Kanjhari, Sita, Kusei and Salandi. The Salandi, a long tributary originates from the Meghasani hills of the Similipal in Keonjhar district traverse a distance of over 144 km and joins the Dhamra. The river Dhamra is formed by the union of the Brahmani and Baitrani rivers. Near the mouth area, the river split for 8 kms of its length by an Island known as Kalibhanjadiha. The river discharges huge quantity of water into the sea through two distinct river channels, a north and a southern channel, which are further separated by an island in the sea known as Udabali or Kanika Sands. The extensive mudflats of the estuary are important breeding and spawning grounds for the kingcrab or horseshoe crab species *Tachypleus gigas* and *Carcinoscorpius rotundicauda*, renowned globally as a species of great importance and threatened in many parts of its range.

Several faunal diversity and hydrographic studies have been made on major branches of the estuarine system of Mahanadi, Subarnrekha etc. The studies made on physico-chemical characteristics and some faunal studies on the estuarine ecosystem of Mahanadi by David (1953), Rao (1964), Shetty (1963), Shetty et al. (1965), Thakur (1970), Jayaram and Majumdar (1976), Upadhyay (1988), Venkaetswarlu et al. (1993a, 1993b, 1993c, 1993d, 1993e), Deb (1998) are notable. Later Vekateswarlu et al. (1998) made detailed studies on fish fauna of the estuarine part of Paradeep and Astaranga. The information on the scientific data, its biological diversity, ecological significance, etc. on the Brahmani-Bitarani estuarine complex is very little or almost nil except a project report released by an NGO, Greenpeace India (2007). The Greenpeace, India studied the impact of Dhamra port on the biodiversity and ecology of Dhamra area. About 63 species of fish, 89 species of birds including wetland and terrestrial, 8 species of amphibians and 18 species of molluscs were reported from Dhamara mouth and near by areas by Greenpeace, India. The Crab-eating Frog, *Fejervarya cancrivora* is an exciting discovery made by Greenpeace as this species hitherto has been only recorded from the Andaman & Nicobar Islands in India, and in Southeast Asia. Keeping in view of the interesting faunal discoveries and paucity of information on the faunal diversity of the estuarine system of Brahmani-Baitarani rivers, a study has been taken

up by the authors with special reference to ichthyofaunl and crustacean diversity. The present study on the Brahmani-Baitarani estuarine system revealed the occurrence of 126 species of fish under 89 genera belongs to 48 families, 26 species of prawns under 11 genera belongs to 4 families, 22 species of crabs under 14 genera belongs to 8 families and 39 species of wetland and wetland dependent birds recorded during field observations around estuarine belt. For each species, the diagnostic features, material examined and distribution in India and elsewhere is given. Over 140 colour photographs of faunal elements are appended for easy identification in the field. A check list of fish species recorded from Chilika Lake, Mahanadi estuary and Rushikulya along with Brahmani-Baitarani estuary has been provided at the end. The impact of the developmental activities around the estuarine areas and the relevant conservation measures needed are discussed.

MATERIALS AND METHODS

Random faunal sampling was done at several points of the entire belt of Brahmani-Baitarani estuarine system (Fig.1) for a period of two years from March 2008 to March 2010. The fish and crustacean samples were collected at the fish landing jetties and also by engaging local fishermen operating cast nets and shore seines. Crabs specimens are also collected by handpicking, by using hand nets etc. along the coasts. Over 419 specimens of fish samles, 786 specimens of prawns (both penaeid and non-penaeid) and 341 specimens of crabs were collected during the study period inaddition to other faunal groups like molluscs, polychaetes etc. The study was also supported with photo documentation of various localities of the area. Nikon-D90 camera with 100 mm macro lens was used for taking photographs of the specimens immediately after collection of samples. Fishes were identified following Talwar and Kacker (1984), Talwar and Jhingran (1991), and Bianchi (1985), crustaceans following George, (1969), Selvakumar and Ajmal Khan, (1993), Bairagi, (1995), Bhadra, (1995), Ghosh, (1995) and Reddy, (1995a, 1995b), Jayachandran, (2001), Dev Roy and Bhadra, (2001), Dev Roy and Bhadra, (2005), Srivastava, (2005) and Dev Roy and Nandi, (2007) and by consulting other relevant literatures.

The faunal samples preserved in 4% formaldehyde solution, registered, labelled and deposited with the National Zoological Collections of the Estuarine Biology Regional Centre, Zoological Survey of India, Gopalpur, Orissa. All the material examined for the present study was collected by the authors. The length of fish specimes is given for total length and abbreviation L denotes the total length of prawn and L and W denotes carapace length and widthg the crafly. All the measurements are in mm.

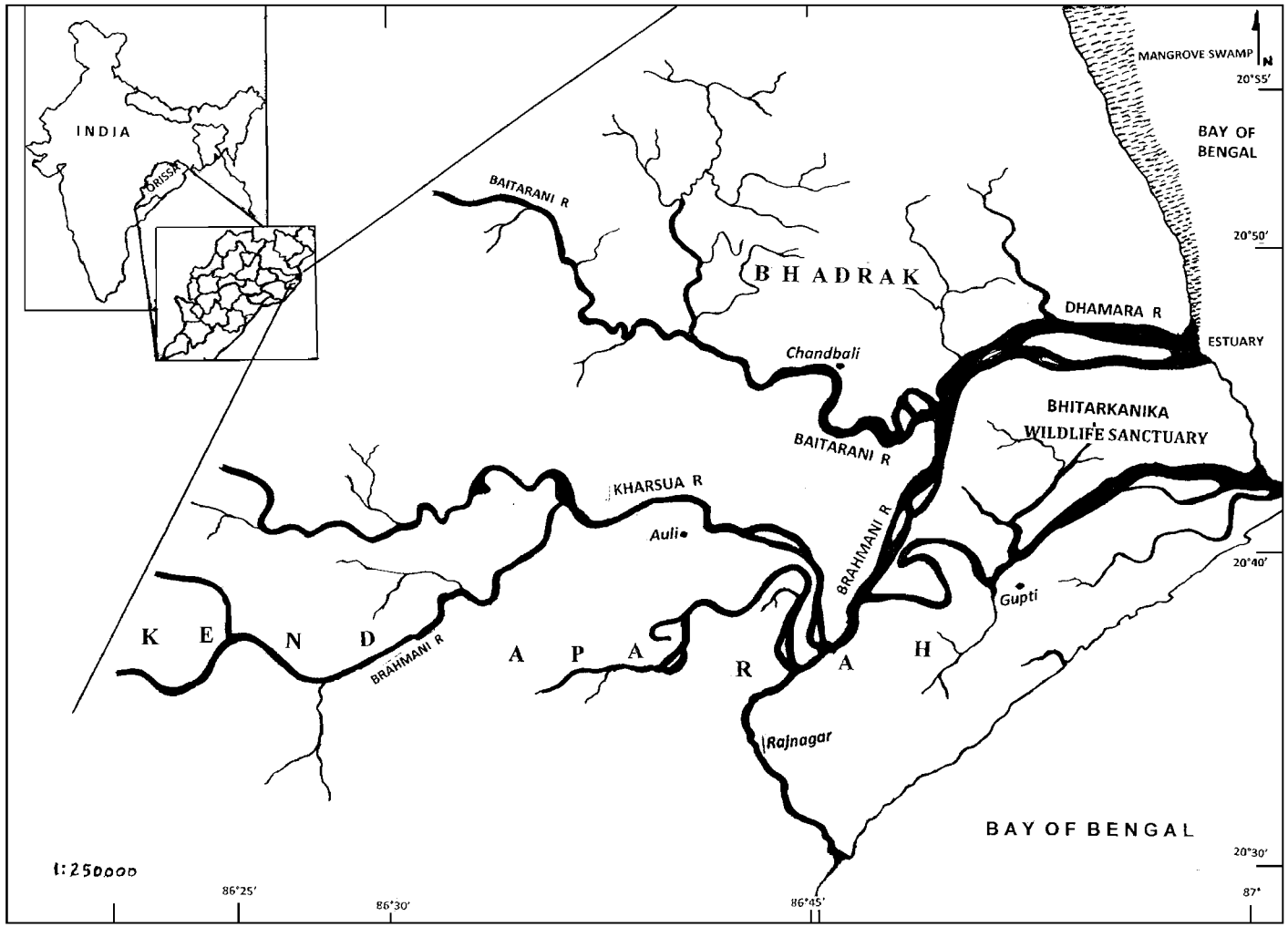

Fig. 1. Map of Brahmani-Baitarani Estuarine Complex, Orissa

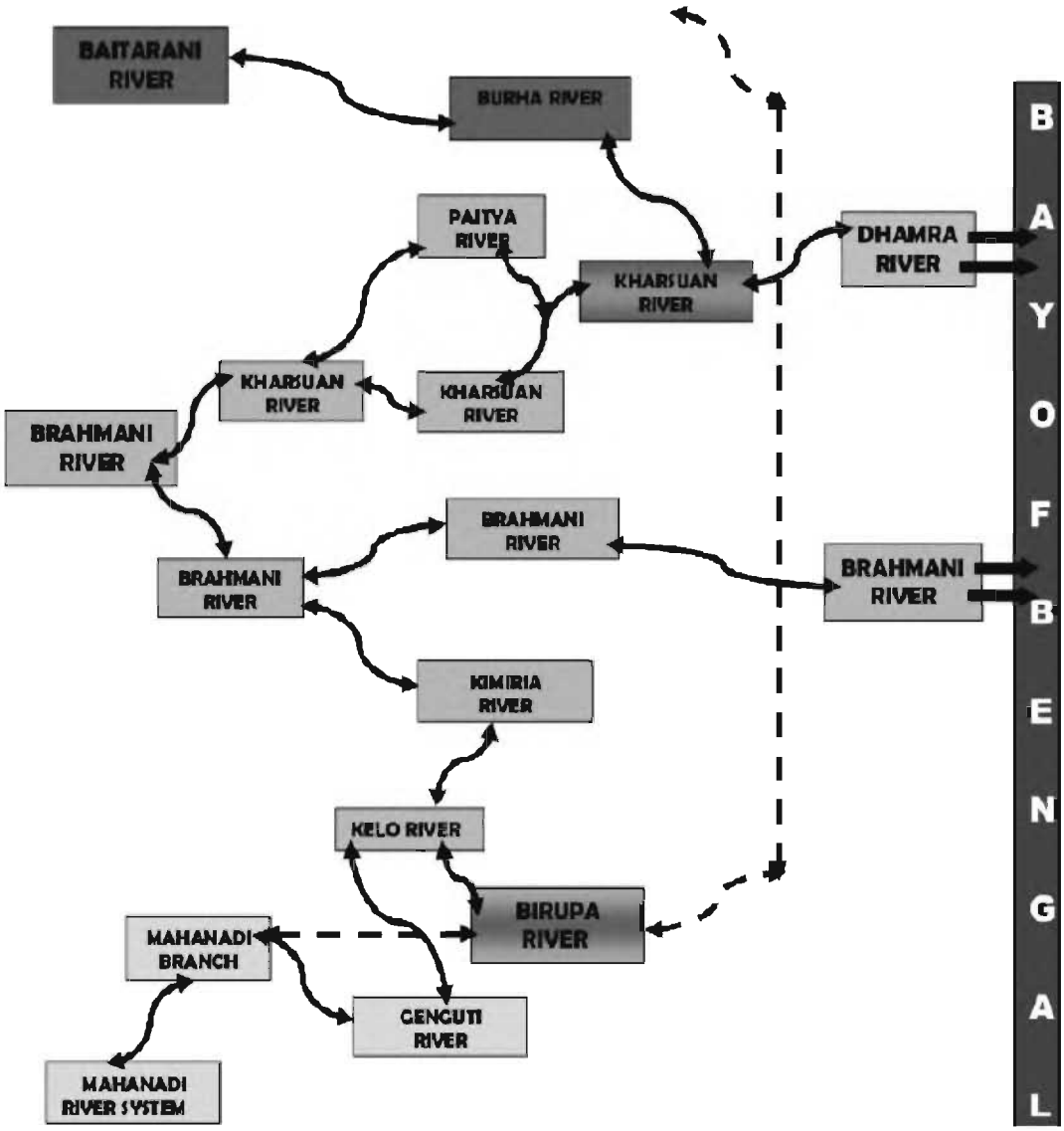

Fig. 2. Brahmani-Baitarani River system

Ichthyofauna

SYSTEMATIC ACCOUNT

Phylum CHORDATA
Subphylum VERTEBRATA
Class ELASMOBRANCHII
Order RAJIFORMES
Family DASYATIDAE

1. *Gymnura poecilura* (Shaw, 1804)
(Long-tailed butterfly ray)

1804. *Raja poecilura* Shaw, *Gen. Zool.*, **5:** 291.

1984. *Gymnura poecilura* : Talwar and Kacker, Commercial Sea Fishes of India: 107.

Material examined: 1 ex., 130 mm, 29.02.2010, Regd. No. F/6712.

Diagnostic features: Disc broad, snout broadly obtuse; no tentacle on spiracle; tail whip-like without cutaneous folds, nearly as long as length of disc; no serrate spine on tail. Dorsal surface of disc brown, ventral side white; tail whitish with broad blackish rings.

Distribution: India: East and west coats. *Elsewhere* : Widespread in Indo-west Pacific.

Remarks: Inhabits coastal awters and enters estuaries. Juveniles caught regularly from the estuary.

2. *Himantura marginata* (Blyth, 1861)
(Blackedge whipray)

1861. *Trygon marginatus* Blyth, *J. Asiat. Soc. Bengal*, **29:** 38.

1984. *Dasyatis marginatus* : Talwar and Kacker, *Commercial Sea Fishes of India* : 96.

Material examined: 1 ex., 84 mm, 28.03.2008, Regd. No.F/6765; 1 ex., 90 mm, 27.02.2010, Regd. No. F/6758; 1 ex., 85 mm, 28.02.2010, Regd. No.F/6743.

Diagnostic features: Disc broader than long; spiracles large and nearly twice eye; tail whip-like, 2.3 times length of disc, without cutaneous folds, one large serrated caudal spine present; head and centre of back with rounded denticles; tail with denticles intermixed with stellate spines. Body grey above, white below; tail blackish.

Distribution: India: East and west coasts. *Elsewhere* : Sri Lanka and Myanmar.

Remarks: Inhabits shallow coastal waters and estuaries. Minor commercial value.

3. *Himantura walga* (Muller & Henle, 1841) (Fig.3) (Dwarf whipray)

1841. *Trygon walga* Muller and Henle, *Syst. Boschr. Plagiost,*: 159, pl. 51, fig. 1.

1984. *Himantura walga* : Talwar and Kacker, *Commercial Sea Fishes of India* : 100.

Material examined: 1 ex., 123 mm, 28.03.2008, Regd. No.F/6766; 1 ex., 155 mm, 26.02.2010, Regd. No.F/6768; 3 exs., 100 to 150 mm, 27.02.2010, Regd. No.F/6767.

Diagnostic features: Body sub-circular, as broad as long; eyes 3.3. in interorbital; tail slightly lobger than disc length with 1 or 2 large serrated spines, no cutaneous folds; small tubercles on mid-dorsal surface and interorbital; series of small spines between to base ot of tail and caudal spine. Body dull grey above white below.

Distribution: India: East and west coasts. *Elsewhere* : Red Sea, Sri Lanka, Thailand, Malyasia, Indonesia, Pilippines and to China.

Remarks: Inhabits coastal waters and enter estuaries. Caught in small quantities.

Class ACTINOPTERYGII
Order CLUPEIFORMES
Family CLUPEIDAE

4. ***Amblygaster clupeoides*** Bleeker, 1849
(Bleeker's smoothbelly sardine)

1849. *Amblygaster clupeoides* Bleeker, J. Ind. Arch, **3:** 73.

1984. *Sardinella clupeoides* : Talwar and Kacker, *Commercial Sea Fishes of India* : 140, fig. 48.

1985. *Amblygaster clupeoides* : Whitehead, *FAO Fish. Synop.*, (125) Vol. **7**: 86.

Material examined: 1 ex., 118 mm, 14.12.2008, Regd. No.F/6784.

Diagnostic features: Body elongate and slender, belly rather round, scutes not prominent; 26 to 31 gillrakers on lower arm of first arch; perdorsal scales are in single longitudinal series; alar scales on caudalfin present. Body green above, silvery below without spots on flanks.

Distribution: India: Bay of Bengal. *Elsewhere* : Sri Lanka, through the East Indies and to the Philippines.

Remarks: Inhabits coastal marine waters, enters estuaries also. Fairly common in fish catches.

5. ***Amblygaster leiogaster*** Valenciennes, 1847
(Smoothbelly sardinella)

1847. *Sardinella leiogaster* Valenciennes, *Hist. nat. poiss.*, **20:** 270.

1984. *Sardinell leiogaster* : Talwar and Kacker, *Commercial Sea Fishes of India* : 146, fig. 53.

1985. *Amblygaster leiogaster* : Whitehead, *FAO Fish. Synop.*, (125) Vol. 7: 87.

Material examined: 2 exs., 117 & 128 mm, 03.04.2008, Regd. No. F/6773; 1 ex., 120 mm, 03.04.2008, Regd. No.F/6772.

Diagnostic features: Body moderately slender, belly rounded and scutes not prominent; gillrakers 26 to 31 on lower arm of first arch; predorsal median ridge covered by a single longitudinal series of scales; alar scales on caudal fin present. Body blue-green above, silvery below; no spots on flanks.

Distribution: India: East and west coasts. *Elsewhere*: East coast of Africa to Western Australia.

Remarks: Inhabits coastal waters and enters estuaries.

6. ***Anodontostoma chacunda*** (Hamilton, 1822) (Fig. 4)
(Chacunda gizzard shad)

1822. *Clupanodon chacunda* Hamilton, Fishes of Ganges: 246.

1984. *Anodontostoma chacunda* : Talwar and Kacker, *Commercial Sea Fishes of India* : 170, fig. 66.

Material examined: 1 ex., 103 mm, 03.04.2008, Regd. No.F/5797; 4 exs., 86 to 111 mm, 18.12.2008, Regd. No.F/6302; 1 ex., 115 mm, 25.06.2008, Regd. No.F/7201.

Diagnostic features: Body deep, belly scuted, mouth slightly inferior, second supra-maxilla splint-like, lower gill-rakers 54 to 95 and fine, last dorsal fin ray not filamentous, hind edges of scales toothed; a single median series of pre-dorsal scales; a large black spot behind gill opening.

Distribution: India: East and west coasts and A & N Islands. Indo-West Pacific: Persian Gulf, Andaman Sea to Gulf of Thailand, Indonesia, Viet Nam, and Philippines, south to northern Australia, the Caroline Islands and New Caledonia.

Remarks: Shallow inshore waters and estuaries. Commercially important fish.

7. ***Escualosa thoracata*** (Valenciennes, 1847) (Fig. 5)
(White sardine)

1847. *Kowala thoracata* Valenciennes, *Hist. nat. Poiss.*, **20:** 363.

1984. *Escualosa thoracata* : Talwar and Kacker, *Commercial Sea Fishes of India* : 133, fig. 45.

Material examined: 4 exs., 100 to 110 mm, 19.12.2008; Regd. No.F/6800; 2 exs., 102 and 105 mm, 20.12.2008, Regd. No.F/6301; 3 exs., 95 to 107 mm, 03.04.2008, Regd. No.F/6774.

Diagnostic features: Belly sharply keeled, with 17 to 19 pre-pelvic and 10 to 12 post-pelvic scutes; mouth terminal; second supra-maxilla rectangular; ventral fin with 7 rays. Body whitish with silvery lateral stripe.

Distribution: India: East and west coasts. *Elsewhere* : Pakistan, Sri Lanka, Indo-Malaya Archipelago to Queensland.

Remarks: Shallow coastal waters and enter estuaries. Commercially important fish.

8. ***Nematalosa nasus*** (Bloch, 1795) (Fig. 6)
(Bloch's gizzard shad)

1795. *Clupea nasus* Bloch, *Nat. ausland. Fische,* (9): 116, pl. 429, fig.1.

1984. *Nematalosa nasus* : Talwar and Kacker, *Commercial Sea Fishes of India* : 172, fig. 67.

1985. *Nematalosa nasus* : Whitehead, *FAO Fish. Synop.,* (125) Vol. 7:248.

Material examined: 4 exs., 125 to 135 mm, 27.02.2009, Regd. No. F/6212.

Diagnostic features: Body deep, depth 34 to 41% of standard length, belly with 17 to 20 pre-pelvic and 9 to 13 post-pelvic scutes; the 3rd infra-orbital bone immediately above it; mouth inferior; supra-orbital grooves absent; last dorsal fin ray filamentous; pectoral axillary scale present; pre-dorsal scales paired. A drak spot behind gill opening, dark longitudinal streaks along upper scale rows on the body.

Distribution: India: East and west coasts. *Elsewhere*: Indo-West Pacific: Gulf of Aden, Persian Gulf, Sri Lanka, Thailand, Philippines, China and Japan.

Remarks: Inhabits marine and brackish waters. Enters estuaries. Commercially important fish.

9. ***Sardinella fimbriata*** (Valenciennes, 1847)
(Fringescale sardinella)

1847. *Spratella fimbriata* Valenciennes, *Hist. nat. Poiss.*, **20**: 359, p l.601.

1984. *Sardinella fimbriata* : Talwar and Kacker, *Commercial Sea Fishes of India* : 142, fig. 50.

1985. *Sardinella fimbriata* : Whitehead, *FAO Fish. Synop.,* (125) Vol. 7: 98.

Material examined: 1 ex., 190 mm, 14.12.2008, Regd. No. F/6299.

Diagnostic features: Body moderately deep, depth 25 to 34% of standard length; belly with keeled scutes, 17 or 18 pre-pelvic and 12 to 14 post-pelvic; 54 to 82 gill rakers on lower arm of first arch; predorsal median ridge covered by adjacent sides of two longitudinal series of scales. Body blue-gree and flanks silvery.

Distribution: India: East and west coasts. *Elsewhere* : Indo-Malayan Archipelago to the Philippines and New Guinea.

Remarks: Inhabits shallow coastal waters and enters estuaries. Commercially important fish.

10. ***Sardinella melanura*** (Cuvier, 1829)
(Blacktip sardinella)

1829. *Clupea melanura* Cuvier, *Regne anim.*, **2**: 318.

1984. *Sardinella melanura* : Talwar and Kacker, *Commercial Sea Fishes of India*: 148, fig. 54.

1985. *Sardinella melanura* : Whitehead, *FAO Fish. Synop.*, (125) Vol. 7: 108.

Material examined: 2 ex., 117 & 128 mm, 03.04.2008, Regd. No.F/6773.

Diagnostic features: Body compressed, its depth 30% of standard length; belly strongly keeled with 16 or 17 pre-pelvic and 12 or 13 post-pelvic scutes; 38 to 74 gillrakers on lower arm of first arch; ventral fin with 8 rays; predorsal median ridge covered by adjacent sides of two longitudinal series of scales. Body blue-gree and flanks silvery; tip of caudal fin jet black.

Distribution: India: East and west coasts and A & N islands. *Elsewhere* : Widely distributed in Indo-West Pacific.

Remarks: Inhabits coastal marine waters and enters estuaries.

Family PRESTIGASTERIDAE

11. ***Ilisha megaloptera*** (Swainson, 1839)
(Bigeye ilisha)

1839. *Platygaster megaloptera* Swainson, *Natural History of Animals*, **2**: 294.

1984. *Ilisha megaloptera* : Talwar and Kacker, *Commercial Sea Fishes of India* : 154, fig. 57.

Material examined: 1 ex., 220 mm, 28.03.2008, Regd. No.F/5819; 1 ex., 225 mm, 03.04.2008, Regd. No. F/6769.

Diagnostic features: Body rather dep, belly with 19 to 23 prepelvic and 8 to 12 post pelvic scutes; eyes large, lowcr jaw strongly projecting; lower gillrakers 18 to 23; anal fin with 38 to 53 rays. Body dark grey above, silvery on sides.

Distribution: India: East and west coasts including Andaman Islands. *Elsewhere* : Indian coasts to Thailand and Java Sea.

Remarks: Occurs inshore waters, estuaries and rivers. Commercially important fish.

12. ***Ilisha melastoma*** (Schneider, 1801)
(Indian Ilisha)

1801. *Clupea melastoma* Schneider, *Syst. Ichth. Bloch* : 427.

1984. *Ilisha melastoma* : Talwar and Kacker, *Commercial Sea Fishes of India* : 156, fig. 58.

Material examined: 1 ex., 223 mm, 28.03.2008, Regd. No.F/5820; 2 exs., 125 and 200 mm, 14.12.2008, Regd. No. F/6300; 1 ex., 230 mm, 03.04.2008, Regd. No. F/6770.

Diagnostic features: Body compressed and moderately deep; head large, lower jaw strongly projecting; belly with sharp scutes, 17 to 21 pre-pelvic and 6 to 10 post-pelvic; 21 to 25 gillrakers on lower arm of first arch. Body blue-green above, silvery on sides.

Distribution: India: East and west coasts and Lakshadweep. *Elsewhere* : Red Sea, Pakistan, Sri Lanka, Indonesia to Hong Kong and Australia.

Remarks: Shallow coastal waters and common in estuaries. Commercially important fish.

13. ***Opisthopterus tardoor***e (Cuvier, 1829)
(Tardoore)

1829. *Pristigaster tardoore* Cucier, *Regne animal*, (2nd ed.), **2**: 381.

1984. *Opisthopterus tardoore* : Talwar and Kacker, *Commercial Sea Fishes of India* : 158, fig. 59.

1985. *Opisthopterus tardoore* : Whitehead, *FAO Fish. Synop.*, (125) Vol. **7**: 294.

Material examined : 1 ex., 162 mm, 14.12.2008, Regd. No. F/6789.

Diagnostic features: Body strongly compressed and concave in front; mouth obliquely upward, lower jaw projecting; 22 to 28 gill rakers on lower arm of 1st arch; belly scuted with 29 to 35; dorsal fin short, its origin behind mid point of body; anal fin very long with 51 to 63 rays; ventral fins absent. Body blue green, flanks silvery.

Distribution: India: Southern east and west coasts. *Elsewhere* : Gulf of Oman, Myanmar, Singapore, Java and Sumatra.

Remarks: Inhabits marine waters and enters estuaries. Taken commercially in small quantities.

14. ***Pellona ditchela*** Valencinnes, 1847 (Fig. 7)
(Indian Pellona)

1847. *Pellona ditchela* Valenciennes, *Hist. nat. poiss.*, **20**: 314.

1984. *Pellona ditchela* : Talwar and Kacker, *Commercial Sea Fishes of India*: 159, fig. 60.

1985. *Pellona ditchela* : Whitehead, *FAO Fish. Synop.*, (125) Vol. 7: 281.

Material examined: 1 ex., 90 mm, 03.03.2010, Regd. No. F/6726.

Diagnostic features: Body moderately deep, belly with 18 or 19 pre-pelvic and 8 or 9 post-pelvic scutes; lower jaw projecting, eyes large; 22 to 27 gill rakers on lower arm of first arch; dorsal fin origin near midpoint of body; anl fin long with 34 to 42 rays, its origin slightly behind dorsal fin base. Body bluish-brown, flanks silvery.

Distribution: India: Esat and west coasts and A & N Islands. *Elsewhere*: Widespread in Indo-West Pacific.

Remarks: Inhabits coastal waters, enters mangrove swamps, estuaries and even rivers.

15. ***Raconda russeliana*** Gray, 1831 (Fig. 8)
(Raconda)

1831. *Raconda russeliana* Gray, *Zool. Miscellany*, **1**: 9.

1984. *Raconda russeliana*: Talwar and Kacker, *Commercial Sea Fishes of India*: 161, fig. 61.

1985. *Raconda russeliana*: Whitehead, *FAO Fish. Synop.*, (125) Vol. 7: 303.

Material examined: 1 ex., 186 mm, 25.06.2008, Regd. No. F/7190.

Diagnostic features: Body elongate with strongly convex lower profile, dorsal profile of head concave; mouth pointing obliquely upwards; belly with sharp keels; no dorsal and ventral fins, anal fin long with 81 to 93 rays; 23 to 27 gillrakers on lower arm of first arch. Body blue-green, flanks silvery; a drak spot behind gill opening.

Distribution: India: Bay of Bengal. *Elsewhere*: Myanmar, Singapore and Java Sea.

Remarks: Inhabits coastal marine waters and common in estuaries.

Family ENGRAULIDAE

16. ***Coilia neglecta*** Whitehead, 1968
(Whitehead's grenadaier anchovy)

1968. *Coilia neglecta* Whitehead, *J. mar. biol. Ass., India*, **9**(1): 33.

1984. *Coilia neglecta*: Talwar and Kacker, *Commercial Sea Fishes of India*: 176, fig. 69.

Material examined: 1 ex., 130 mm 28.03.2008, Regd. No.F/5823; 2 exs., 160 & 190 mm, 28.03.2008, Regd. No.F/6760; 1 ex., 166 mm, 25.06.2008, Reg.No. F/7191; 2 exs., 170 and 186 mm, 29.03.2008, Regd. No.F/5826; 3 exs., 125 to 202 mm, 27.02.2010, Regd. No.F/6756; 6 exs., 160 to 196 mm, 28.02.2010, Regd. No.F/6735; 4 exs., 155 to 192 mm, 29.02.2010, Regd. No.F/6699; 2 exs., 110 & 175 mm, 03.03.2010, Regd. No.F/6724.

Diagnostic features: Body compressed, deepest under dorsal fin origin; belly rounded under pectoral fin base; belly keled with 6 to 9 pre-pelvic and 7 to 11 post pelvic scutes; pectoral fin with 6 free filaments; ventral fin with 7 rays; 22 to 27 gillrakers on lower arm of first arch. Body light brown; anal fin with black border.

Distribution: India: East and west coasts. *Elsewhere*: Pakistan to the Andaman Sea, Singapore and Thailand.

Remarks: Inhabits shallow coasts and estuaries. Only minor fishery value.

17. ***Coilia ramcarati*** (Hamilton, 1822) (Fig. 9)
(Tapertail anchovy)

1822. *Coilia ramcarati* Hamilton, *Fishes of Ganges*: 233.

1984. *Coilia ramcarati*: Talwar and Kacker, *Commercial Sea Fishes of India*: 177, fig. 70.

Material examined: 1 ex., 157 mm, 30.03.2008, Regd. No. F/5818; 3 exs., 168 to 198 mm, 31.03.2008, Regd. No.F/5808; 1 ex., 160 mm, 03.04.2008, Regd. No. F/5796; 1 ex., 168 mm, 19.12.2008, Regd. No. F/6804; 1 ex., 183 mm, 20.12.2008, Regd. No. F/6294; 3 exs., 120 to 139 mm, 28.02.2010, Regd. No. F/6736; 2 exs., 148 mm, 29.02.2010, Regd. No. F/6700.

Diagnostic featutres: Body compressed and elongate; belly keeled with 5 pre-pelvic and 10 or 11 post-pelvic scutes; maxilla tip pointed; pectoral fin with 6 or 7 filamentous rays; ventral fin with 9 or 10 rays; 29 to 30 gillrakers on lower arm of first arch. Body golden-brown; fins hyaline.

Distribution: India: Bay of Bengal and Andaman Sea south of Rangoon.

Remarks: Inhabits estuaries and coastal waters. Minor commercial value.

18. ***Coilia reynaldi*** Valenciennes, 1848 (Fig.10)
(Korua grenadaier anchovy)

1848. *Coilia reynaldi* Valenciennes, *Hist. nat. Poiss.*, **21**: 81.

1984. *Coilia reynaldi*: Talwar and Kacker, *Commercial Sea Fishes of India*: 178, fig. 71.

Material examined: 2 exs., 95 and 135 mm, 18.12.2008, Regd. No.F/6293; 5 exs., 106 to 123 mm, 28.03.2008, Regd. No.F/5908; 4 exs., 111 to 12 mm, 28.03.2008, Regd. No.F/5816; 2 exs., 120 and 106 mm, 29.03.2008, Regd. No.F/5827; 2 exs., 100 and 117 mm, 03.04.2008, Regd. No.F/5798; 1 ex., 113 mm, 14.12.2008, Regd. No.F/6791; 5 exs., 100 to 115 mm, 19.12.2008, Regd. No.F/6803.

Diagnostic features: Body compressed and elongate; belly keeled with 6 to 9 pre-pelvic and 7 to 11 post-pelvic scutes; 28 to 36 gillrakers on lower arm of first arch; pectoral fin with 10 to 14 free filaments; ventral fin with 7 rays. Body greenish, flanks golden yellow, abdomen pale yellow.

Distribution: India: East and west coasts. *Elsewhere*: Myanmar.

Remarks: Inhabits shallow coastal waters and estuaries. Minor commercial value.

19. ***Setipinna phasa*** (Hamilton, 1822) (Fig. 11)
(Gangetic anchovy)

1822. *Clupea phasa* Hamilton, *Fishes of Ganges*: 240, 382.

1984. *Setipinna Phasa* : Talwar and Kacker, Commercial Sea Fishes of India: 180, fig. 72.

Material examined: 1 ex., 220 mm, 03.04.2008, Regd. No.F/5801; 1 ex., 190 mm, 16.12.2008, Regd. No. F/6296; 1 ex., 270 mm, 19.12.2008, Regd. No. F/6295.

Diagnostic features: Body compressed, abdomen strongly keeled with 15 pre-pelvic and 6 or 7 post-pelvic scutes; maxilla short, just reaching to gill opening; anal fin with

69 to 81 rays; 18 or 19 gillrakers on lower arm of first arch; first ray of pectoral fin filamentous. Body grey above, flanks silvery.

Distribution: India: Bay of Bengal. *Elsewheer*: Bangladesh and Myanmar.

Remarks: Inhabits fresh and brackish water systems. Commercially important fish.

20. ***Setipinna taty*** (Valenciennes, 1848) (Fig. 12)
(Hairfin anchovy)

1848. *Engraulis taty* Valenciennes, *Hist. nat. Poiss.*, **21**: 60.

1984. *Setipinna taty*: Talwar and Kacker, *Commercial Sea Fishes of India*: 181, fig. 73.

Material examined: 1 ex., 155 mm, 29.03.2008, Regd. No. F/5828; 1 ex., 127 mm, 30.03.2008, Regd. No. F/5810; 1 ex., 125 mm, 28.02.2010, Regd. No. F/6741; 2 exs., 130 & 164 mm, 29.02.2010, Regd. No. F/6705.

Diagnostic features: Body fusiform and compressed, abdomen strongly keeled with 20 to 29 pre-pelvic and 10 to 13 post-pelvic scutes; maxilla short, just reaching to gill opening; anal fin with 48 to 58 rays; 18 to 21 gillrakers on lower arm of first arch; first ray of pectoral fin filamentous. Body brown or bluish above, flanks silvery.

Distribution: India: Bay of Bengal. *Elsewhere*: Sri Lanka, Thailand, south to Java and southern Kalimantan.

Remarks: Inhabits coastal waters and estuaries. Minor fishery value.

21. ***Setipinna tenuifilis*** Valenciennes, 1848
(Godavari anchovy)

1848. *Setipinna tenuifilis* Valenciennes, *Hist. nat. Poiss.*, **21**: 62.

1984. *Setipinna tenuifilis*: Talwar and Kacker, *Commercial Sea Fishes of India*: 182, fig. 74.

Material examined: 4 exs., 118 mm, 28.03.2008, Regd. No.F/5907; 1 ex., 122 mm 28.03.2008, Regd. No.F/5817; 2 exs., 125 & 138 mm, 25.06.2008, Regd. No.F/7189; 1 ex., 158 mm, 14.12.2008, Regd. No.F/6790; 3 exs., 115 to 142 mm, 29.02.2010, Regd. No.F/6701.

Diagnostic features: Body fusiform and compressed, abdomen strongly keeled with 17 to 21 pre-pelvic and 6 or 7 post-pelvic scutes; maxilla short, just reaching to gill opening; anal fin with 48 to 58 rays; 13 or 14 gillrakers on lower arm of first arch; first ray of pectoral fin filamentous. Body greenish above, flanks silvery with golden hue.

Distribution: India: Bay of Bengal, including the Andaman Islands. Elsewhere: Northern coast of Australia, Arafura Sea, Gulf of Papua, Sarawak, presumably the

Philippines and Hong Kong; China from Taiwan north to Yellow Sea and southern part of Sea of Japan.

Remarks: Inhabits coastal waters, but also entering estuaries. Minor commercial value.

22. ***Stolephorus commersonnii*** Lacepede, 1803 (Fig. 13)
(Commerson's anchovy)

1803. *Stolephorus commersonii* Lacepede, *Hist. nat. Poiss.*, **5**: 381, 382, p l.12, fig. 1.

1984. *Stolephorus commersonii*: Talwar and Kacker, *Commercial Sea Fishes of India*: 188, fig. 78.

Material examined: 1ex., 105 mm, Kollidam Bridge 15.09.2008, Regd. No. F/7023.

Diagnosis: Body fusiform, belly rounded with 1 to 4 scutes between pectoral and ventral fins; snout pointed; maxilla long, its tip reaching to or beyond posterior border of pre-operculum; 21 to 35 gillrakers on the lower arm of first arch. Body whitish with silvery stripe along flanks.

Distribution: East Africa, from Gulf of Aden to Zanzibar, northern Madagascar and Mauritius, coasts of India, eastward to Hong Kong and Papua New Guinea.

Remarks: Occurs in coastal waters and estuaries. Minor commercial value.

23. ***Thryssa gautamiensis*** Babu Rao, 1971
(Gautama thryssa)

1971. *Thryssa gautamiensis* Babu Rao, *Copeia* 1971 (no. 3): 479-483.

1977. *Thryssa gautamiensis*: Babu Rao, *Mar. Res. Indones.*, **19**: 149-176.

1988. *Thryssa gautamiensis*: Whitehead, Nelson and Wongratana, *FAO Species catalogue. Clupeoid fishes of the world* Vol. 7. Part 2-Engraulididae: 431.

Material examined: 2 exs., 114 and 130 mm, 03.04.2008, Regd. No. F/5901.

Diagnostic features: Body fusiform, depth 3.6 to 4.5 in standard length; belly rounded with 25 to 27 scutes between pectoral and ventral fins; snout pointed; maxilla short not reaching to slightly beyond gill cover; tip of snout at about level of upper rim of eye;. 18 to 26 gillrakers on lower arm of first arch; anal fin with 38 to 43 rays. Body silvery, ventral side whitish, dark blotch behind gill opening.

Distribution: India: East coast (Andhra and Orissa) . Elsewhere: Possibly also Myanmar.

Remarks: Shallow coastal waters and estuaries, enters freshwater. Subsistence fisheries.

24. ***Thryssa hamiltonii*** Gray, 1835 (Fig. 14)
(Hamilton's thryssa)

1835. *Thryssa hamiltonii* Gray, *Illust. Ind. Zool., Hardwicke*, **2**: pl. 92.

1984. *Thryssa hamiltonii*: Talwar and Kacker, *Commercial Sea Fishes of India*: 198, fig. 86.

Material examined: 1 ex., 196 mm, 28.03.2008, Regd. No.F/6761; 2 exs., 216 and 224 mm, 31.03.2008, Regd. No. F/5807; 1 ex., 163 mm, 03.04.2008, Regd. No. F/5802; 1 ex., 248 mm, 14.12.2008, Regd. No. F/6298.

Diagnostic features: Body fusiform and compressed, belly with 15 to 20 pre-pelvic and 9 to 12 post-pelvic scutes; snout bluntly rounded; maxilla short, reaching little beyond gill opening, not to pectoral fin base; 11 to 15 gillrakers on lower arm of first arch. Body brown, flanks silvery; a dark venulose area on shoulder.

Distribution: India: East and west coasts and Andaman Islands. *Elsewhere*: Pakistan, Sri Lanka, through the East Indies to North Queensland and Hong Kong.

Remarks: Inhabits shallow coastal waters and enters estuaries. Commercially important species.

25. ***Thryssa kammalensoides*** Wongratana, 1983
(Godavari thryssa)

1983. *Thryssa kammalensoides* Wongratana, *Japanese Journal of Ichthyology*, **29** (4): 385-407.

1984. *Thryssa kammalensis*: Talwar and Kacker, *Commercial Sea Fishes of India*: 199, fig. 87.

1991. *Thryssa kammalensoides*: Talwar and Kacker, *Inland Fishes of India and adjacent countries*, 1: 145.

Material examined: 1 ex., 138 mm, 30.03.2008, Regd. No. F/5811; 1 ex., 123 and 130 mm, 03.04.2008, Regd. No. F/5902.

Diagnostic features: Body fusiform and compressed, belly with 16 to 18 pre-pelvic and 10 or 11 post-pelvic scutes; snout bluntly rounded; maxilla short, reaching little beyond gill opening, not to pectoral fin base; 27 to 29 gillrakers on lower arm of first arch, serrae on lower gill rakers not clumped. Body brown, flanks silvery; a dark venulose area on shoulder, extending to area behind upper part of gill opening.

Distribution: India: East and west coasts. *Elsewhere*: East Indies.

Remarks: Inhabits estuaries. Subsistence fishery.

26. ***Thryssa malabarica*** (Bloch, 1795) (Fig. 15)
(Malabar thryssa)

1795. *Clupea malabarica* Bloch, *Nat. ausland. Fische.*, **9**: 115, pl. 432.

1984. *Thryssa malabarica*: Talwar and Kacker, *Commercial Sea Fishes of India*: 200, fig. 88.

Material examined: 1 ex., 195 mm, 03.04.2008, Regd. No.F/5799.

Diagnostic featurtes: Body fusiform and compressed, belly with 14 to 17 pre-pelvic and 8 to 10 post-pelvic scutes; snout bluntly rounded; maxilla short, reaching little beyond gill opening, not to pectoral fin base; 17 to 19 gillrakers on lower arm of first arch. Body brown, flanks silvery; a dark venulose area on shoulder.

Distribution: India: East and west coasts. *Elsewhere*: Pakistan.

Remarks: Inhabits inshore waters and entering estuaries. Minor commercial value.

27. ***Thryssa mystax*** (Schneider, 1801) (Fig. 16)
(Moustaced thryssa)

1801. *Clupea mystax* Schneider, Syst. Ichth., Bloch: 426, pl.83.

1984. *Thryssa mystax*: Talwar and Kacker, *Commercial Sea Fishes of India*: 201, fig. 89.

Material examined :1 ex., 164 mm, 03.03.2010, Regd. No. F/6725.

Diagnostic featurtes: Body fusiform and compressed, belly with 16 to 20 pre-pelvic and 8 to 13 post-pelvic scutes; snout bluntly rounded; maxilla long, reaching to or beyond pectoral fin base; 13 to 16 gillrakers on lower arm of first arch. Body brown, flanks silvery; a dark venulose area on shoulder, gill cavity light orange.

Distribution: India: East and west coasts. *Elsewhere*: Sri Lanka to East Indies.

Remarks: Inhabits shallow coastal waters and enters estuaries.

28. ***Thryssa purava*** (Hamilton, 1822)
(Gangetic anchovy)

1822. *Clupea* purava Hamilton, *Fishes of Ganges*: 238.

1984. *Thryssa purava*: Talwar and Kacker, *Commercial Sea Fishes of India*: 202, fig. 90.

Material examined: 1 ex., 199 mm, 03.04.2008, Regd. No. F/5800; 3 exs., 105 to 170 mm, 19.12.2008, Regd. No. F/6799.

Diagnostic features: Body fusiform and compressed, belly with 15 to 17 pre-pelvic and 9 to 12 post-pelvic scutes; snout bluntly rounded; maxilla long, reaching to or beyond pectoral fin base; 17 to 21 gillrakers on lower arm of first arch. Body brown, flanks silvery; a dark venulose area on shoulder, gill cavity light orange.

Distribution: India: Bay of Bengal. *Elsewhere*: Possibly also Myanmar.

Remarks: Inhabits shallow coastal waters and estuaries. Minor fishery value.

Order BELONIFORMES
Family BELONIDAE
29. ***Strongylura strongylura*** Van Hasselt, 1823 (Fig. 17)
(Round-tail needlefish)

1823. *Belone strongylura* van Hasselt, *Alg. Konst. en Letterbode*, **1**: 130.

1984. *Strongylura strongylura*: Talwar and Kacker, *Commercial Sea Fishes of India*: 322, fig. 131.

2000. *Strongylura strongylura*: Rao et al., *Rec. zool. Surv. India, Occ. Paper* No. **178**: 89.

Material examined: 2 exs., 252 & 342 mm, 28.02.2010, Regd. No. F/6731; 4 exs., 220 to 310 mm, 29.02.2010, Regd. No. F/6698.

Diagnostic features: Body elongate and the jaws greatly elongated; origin of dorsal fin above 4th ray of anal fin; dorsal fin with 12 to 14 rays and anal fin with 15 to 18 rays; caudal fin rounded. Body bluish-green above with a silvery lateral stripe which becomes wide posteriorly where it is bordered by a dark stripe; a prominent black spot at base of caudal fin.

Distribution: India: East and west coasts. *Elsewhere*: Widespread in tropical Indo-West Pacific.

Remarks: Inhabits marine waters, enters estuaries. Taken commercially in small quantities.

Order CYPRINIFORMES

Family CYPRINIDAE

30. ***Puntius sophore*** (Hamilton, 1822) (Fig. 18)

(Pool barb)

1822. *Cyprinus sophore* Hamilton, *Fishes of Ganges*: 310, 383, pl. 19, fig. 86.

1991. *Puntius sophore* Talwar and Jhingran, *Inland fishes of India and adjacent countries*, **1**: 541.

1999. *Puntius sophore*: Menon, *Rec. zool. Surv. India, Occ. Paper*, No. 175: 101.

Material examined: 1ex., 72 mm, 18.12.2008, Regd. No. F/6279.

Diagnostic features: Body short and moderately elongate; head short, mouth obtuse; no barbels around mouth; dorsal spine strong, osseous and smooth; lateral line incomplete with 19 to 23 scales. Body silvery, gill cover shot with gold and red; two black blotches on body, one on 22 to 24th scales of lateral line and the second at the base of 3rd to 5th rays of dorsal.

Distribution: India: Throughout. *Elsewhere*: Pakistan, Nepal, Bangladesh, Myanmar and Yunnan, China, Bhutan and Afghanistan.

Remarks: Inhabits rivers, streams and ponds, also enters low saline waters close to estuaries. Aquarium pet.

Order ANGUILLIFORMES

Family MURAENESOCIDAE

31. ***Muraenesox bagio*** (Hamilton, 1822)

(Common pike conger)

1822. *Muraena bagio* Hamilton, *Fishes of Ganges*: 364.

1984. *Muraenesox bagio*: Talwar and Kacker, *Commercial Sea Fishes of India*: 238, fig. 100.

Material examined: 1 ex., 480 mm, 26.02.2010, Regd. No. F/6718.

Diagnostic features: Body elongate and compressed, abdomen rounded; head long, snout pointed, cleft extending to beyond posterior margin of eye; eyes small, covered with skin; lips thick; dorsal and anal fins cnfluent with caudal; dorsal fin inserted above gill openings, much eleveated; 47 to 59 dorsal rays before a vertical through anus; 33 to 39 lateral line pores before anus.

Distribution: India: Throughout. *Elsewhere*: East Africa to the Philippines and Japan, south to New Guinea, the Arafura Sea, Australia, New Caledonia and Fiji.

Remarks: Found in coastal waters and estuaries.

Family OPHICHTHIDAE

32. ***Pisodonophis cancrivorus*** (Richardson, 1848)

(Longfin snake-eel)

1848. *Ophisurus cancrivorus* Richardson, *Voy. Erebus and Terror, Fish.,*: 97, pl. 50, figs. 6-9.

1991. *Pisodonophis cancrivorus*: Talwar and Jhingran, *Inland fishes of India and adjacent countries*, 1: 87.

Material examined: 1ex., 112 mm, 16.12.2008, Regd. No.F/6303; 1 ex., 277 mm, 19.12.2008, Regd. No. F/6304; 1 ex., 420 mm, 27.02.2010, Regd. No. F/6759.

Diagnostic features: Body long, elongate and snake-like; head short and compresed, snout obtuse; anterior nostril tubular, posterior nostril along lower edge of lip; teeth molariform, multiserial on jaws, intermaxillary and vomer; eyes small and lateral in position; dorsal fin low, commencing more or less above base of pectoral fin; tip of tail stiff and finless; lateral line inconspicuous. Variable from grey to black or brown, dorsal fin with broad dark edge.

Distribution: India: Ganga and its tributaries and odisha. *Elsewhere*: Red Sea and East Africa to French Polynesia, north to the Ogasawara Islands, south to Australia.

Remarks: Found in marine, estuaries and rivers. Minor fishery value.

Order SILURIFORMES

Family ARIIDAE

33. ***Arius arius*** (Hamilton, 1822) (Fig. 19)

(Hamilton's catfish)

1822. *Pimelodus arius* Hamilton, *Fishes of Ganges*: 170, 376.

1984. *Arius arius*: Talwar and Kacker, *Commercial Sea Fishes of India*: 258, fig. 104a.

Material examined: 1 ex., 224 mm, 28.03.2008, Regd. No. F/5910; 1 ex., 213 mm, 28.02.2010, Regd. No. F/6813.

Diagnostic features: Body robust, head depressed, snout blunt and rounded; median

frontanelle groove on top of head shallow, not reaching base of supra-occipital process; three pairs of barbels around mouth; tip of dorsal spine prolonged into a filament; adipose fin small. Body silvery steel along back, dorsal and pectoral fin margins dusky, adipose dorsal with black spot.

Distribution: India: East and south-west coast. *Elsewhere*: Pakistan, Bangladesh and Myanmar to Singapore and South China Sea.

Remarks: Inhabits near shores, estuaries, tidal rivers and brackish waters. Commercially important fish.

34. ***Arius caelatus*** Valenciennes, 1840
(Engraved catfish)

1840. *Arius caelatus* Valenciennes, *Hist. nat. poiss.*, **13**: 66.

1984. *Arius caelatus*: Talwar and Kacker, *Commercial Sea Fishes of India*: 259, fig. 105.

Material examined: 2 exs., 158 & 220 mm, 26.06.2008, Regd. No. F/7194.

Diagnostic features: Body robust, head profile concave at nape; three pairs of barbels, the maxillary barbels extending to end of pectoral fin; median frontanelle groove on top of head broad, not reaching base of supra-occipital process; head shield strongly rugose and granulated; tip of dorsal spine prolonged into a filament; adipose fin rather large. Body bluish black with metallic luster, below whitish; adipose dorsal entirely black or with broad blotch.

Distribution: India: East and west coasts. *Elsewhere*: Pakistan, Sri Lanka to Indo-Australian Archipelago, but not Philippines and Australia.

Remarks: Inhabits coastal waters and estuaries. Commercially important catfish.

35. ***Arius dussumieri*** Valenciennes, 1840
(Dussumier's Catfish)

1840. *Arius dussumieri* Valenciennes, *Hist. nat. poiss.*, **13**: 84.

1984. *Arius dussumieri*: Talwar and Kacker, *Commercial Sea Fishes of India*: 239, fig. 105.

Material examined: 2 exs., 62 & 142 mm, 10.12.2008, Regd. No. F/6796.

Diagnostic features: Body elongate and head depressed; three pairs well developed barbels around mouth; basal plate before dorsal fin narrow and 'S'-shaped; head shield granulated above; pectoral fin spine shorter than dorsal spine. Body bluish black, lighter on sides; adipose fin with black spot.

Distribution: India: East and west coasts. *Elsewhere*: Medagascar, Pakistan, Sri Lanka and Bangladesh.

Remarks: Inhabits shallow coastal waters and estuaries. Common in fish catches.

36. ***Arius jella*** Day, 1877 (Fig. 20)
(Small-eye catfish)

1877. *Arius jella* Day, *Fishes of India*: 467, pl. 106, fig. 3.

1984. *Arius jella*: Talwar and Kacker, *Commercial Sea Fishes of India*: 263, fig. 106.

Material examined: 3 exs., 168 to 243 mm, 26.06.2008, Regd. No. F/7194a.

Diagnostic features: Body elongate, head depressed; three pairs of barbels around mouth; median frontenelle on head broad and flat, reaching to base of supra-occipital process; pectoral fin spine longer than dorsal spine; anal fin with 14 to 16 rays. Body silvery grey, white on sides and below, fins grey, adipose fin with black blotch.

Distribution: India: East coast of India. *Elsewhere*: Sri Lanka and Burma.

Remarks: Inhabits coastal waters and estuaries. Most common fish of estuaries in Odisha.

37. ***Arius maculatus*** (Thunberg, 1792) (Fig. 21)
(Spotted catfish)

1792. *Silurus maculatus* Thunberg, *Kongl. Vet. Akad. Nya. Handl. Stockholm*, **13**: 31, pl.1, fig. 2.

1984. *Arius maculatus*: Talwar and Kacker, *Commercial Sea Fishes of India*: 264, fig. 107.

Material examined: 1ex., 195 mm, 13.12.2008, Regd. No.F/6288; 1 ex., 140 mm, 28.02.2010, Regd. No. F/7159.

Diagnostic features: Body elongate, head pointed, eyes small; three pairs of barbels around mouth, maxillary barbels reaching to base of pectoral fin; head shield rugose, median frontenelle groove on head deep and long, running from a short distance behind tip of snout; tip of dorsal fin filamentous. Body bluish brown, sides grey, belly whitish with dusky spots; all fins black tipped; adipose dorsal blackish.

Distribution: India: East and west coasts. *Elsewhere*: Pakistan, Sri Lanka to Indo-Australian Archipelago.

Remarks: Inhabits coastal waters and estuaries. Commercially important fish.

38. ***Osteogeniosus militaris*** (Linnaeus, 1758) (Fig. 22)
(Soldier catfish)

1758. *Silurus militaris* Linnaeus, *Systema Naturae*, ed. 10, **1**: 305.

1984. *Osteogeniosus militaris*: Talwar and Kacker, *Commercial Sea Fishes of India*: 275, fig. 113.

Material examined: 2 exs., 180 & 195 mm, 14.12.2008, Regd. No.F/6793; 1ex., 106 mm, 19.12.2008, Regd. No.F/6285; 1 ex., 105, 28.02.2010, Regd. No.F/7160.

Diagnostic features: Body elongate, head strongly compressed; only one pair of very

stiff and bony maxillary barbels slightly longer than head are present; head shield smooth. Head and back dark blue with silvery reflections, fins minutely spotted with black; tips of dorsal and adipose fins dark blue.

Distribution: India: East and west coasts. *Elsewhere*: Bangladesh, Myanmar, Singapore, Malacca, Indonesia, and Malaysia. Recorded from Pakistan.

Remarks: Inhabits coastal waters, estuaries and river mouths. Minor fishery value.

Family BAGIRIDAE

39. ***Sperata aor*** (Hamilton, 1822) (Fig. 23)

(Long-whisker catfish)

1822. *Pimelodus aor* Hamilton, *Fishes of Gamnges*: 205, 379, pl. 20, fig. 68.

1991. *Aorichthys aor*: Talwar and Jhingran, *Inland Fishes of India and Adjacent countries*, **2**: 547, fig. 178.

Material examined: 1ex., 280 mm, 13.12.2008, Regd. No. F/6290.

Diagnostic features: Body elongate, mouth terminal; snout broad and spatulate; median longitudinal groove on head reaches base of occipital process; four pairs of barbels around mouth, the maxillary pair reach beyond caudal end; base of adipose fin equal to or sligfhtly more than the base of rayed dorsal. Body bluish above, white on abdomen; fins yellowish, tinted grey; a black spot on adipose fin present.

Distribution: India: Throughout. *Elsewhere*: Pakistan, India, Nepal, Bangladesh and Myanmar.

Remarks: Inhabits fresh and brackishwaters. Commercially important fish.

40. ***Mystus bleekeri*** (Day, 1877) (Fig. 24)

(Day's mystus)

1877. *Macrones bleekeri* Day, *Fishes of India*: 451, pl. 101, fig. 1.

1991. *Mystus bleekeri*: Talwar and Jhingran, *Inland Fishes of India and Adjacent countries*, **2**: 558, fig. 183.

Material examined: 7 exs., 47 to 55 mm, 22.06.2008, Regd. No. F/7177; 1 ex., 106 mm, 23.06.2008, Regd. No. F/7197; 3 exs., 75 to 78 mm, 16.12.2008, Regd. No. F/6286.

Diagnostic features: Body elongate and naked; snout obtuse; dorsal surface of head, opercle, occipital bone are granulated; median longitudinal groove shallow, reaches to base of occipital process; four pairs of barbels, the maxillary pair reaches to anal fin; adipose fin originated just behind rayed dorsal, its base twice the length of head; caudal fin forked, its upper lobe longer. Body brownish-grey with two light longitudinal bands above and below lateral line; a dark shoulder spot on shoulder.

Distribution: India: Punjab, West Bengal, Assam, Ganges system, Odisha and other

southern states. *Elsewhere*: Pakistan, Bangladesh, Nepal, Myanmar and Indonesia. Also Bhutan.

Remarks: Found in lakes, tanks, rivers, canals and enters estuaries. Commercially important fish.

41. ***Mystus cavasius*** (Hamilton, 1822) (Fig. 25)
(Gangetic mystus)

1822. *Pimelodus cavasius* Hamilton. *Fishes of Ganges*: 203, 379, pl. 11, fig. 67.

1991. *Mystus cavasius*: Talwar and Jhingran, *Inland Fishes of India and Adjacent countries*, **2**: 559, fig. 184.

Material examined: 1ex., 120 mm, 13.12.2008, Regd. No. F/6291; 1ex., 93 and 112 mm, 16.12.2008, Regd. No. F/6287a.

Diagnostic features: Body elongate and naked; snout obtuse; median longitudinal groove wide, reaches to base of occipital process; four pairs of barbels, the maxillary pair reaches beyond caudal fin; adipose fin originated just behind rayed dorsal, its base nearly three times longer to the base of dorsal; caudal fin forked, its upper lobe longer and pointed. A black spot on the basal bone of dorsal fin; a bluish band along lateral line.

Distribution: India: Throughout. *Elsewhere*: Pakistan, Sri Lanka, Nepal, Bangladesh, Myanmar and Thailand.

Remarks: Inhabits freshwater and low saline areas of estuaries. Common commercial fish.

42. ***Mystus gulio*** (Hamilton, 1822)
(Long whiskers catfish)

1822. *Pimelodus gulio* Hamilton, *Fishes of Ganges*: 201, 379, pl. 23.

1991. *Mystus gulio*: Talwar and Jhingran, *Inland Fishes of India and Adjacent countries*, **2**: 560, fig. 185.

Material examined: 2 exs., 118 and 143 mm, 28.03.2008, Regd. No. F/5909; 1 ex., 92 mm, 14.12.2008, Regd. No. F/6781; 5 exs., 110 to 136 mm, 26.02.2010, Regd. No. F/7163; 3 exs., 90 to 105 mm, 03.03.2010, Regd. No. F/7165.

Diagnostic features: Body elongate and naked; snout obtuse; median longitudinal groove short, extending slightly beyond posterior border of orbit; adipose dorsal base shorter than anal fin base; nasal barbel shorter than head. Body bluish black on back, dull white below; outer half of fins black; maxillary barbels black.

Distribution: India: East and west coasts. *Elsewhere*: Countries bordering the eastern Indian Ocean, from India to Indonesia and Viet Nam. Reported from Pakistan.

Remarks: Inhabits fresh, brackish waters and enters estuaries.

43. ***Mystus vittatus*** (Bloch, 1797)
(Striped dwarf catfish)

1797. *Silurus vittatus* Bloch, *Ichthyol. Hist.* Nat., 11: 40, pl. 371, fig. 2.

1991. *Mystus vittatus*: Talwar and Jhingran, *Inland Fishes of India and Adjacent countries*, **2**: 573, fig. 190.

Material examined: 1ex., 55 mm, 18.12.2008, Regd. No. F/6289.

Diagnostic features: Body elongate and naked; snout obtuse; median longitudinal groove does not reaches to base of occipital process; four pairs of barbels, the maxillary pair reaches slightly beyond ventral fins; base of adipose fin is almost equal to the interdorsal space, caudal fin forked. Body golden with dark bluish shoulder spot; a broad black longitudinal band along and on either sie of lateral line, another band below and above these bands.

Distribution: India: Throughout. *Elsewhere*: Pakistan, Sri Lanka, Nepal, Bangladesh, Myanmar and Thailand.

Remarks: Inhabits freshwater also enters estuaries and brackishwaters. Commercially important fish.

Family SILURIDAE

44. ***Ompok bimaculatus*** (Bloch, 1797) (Fig. 26)
(Butter catfish)

1797. *Silurus bimaculatus* Bloch, Ichthyol. *Hist. nat. des.Poiss.*, 11: 17, pl. 367.

1991. *Ompok bimaculatus*: Talwar and Jhingran, *Inland Fishes of India and Adjacent countries*, **2**: 582, 194.

Material examined: 1ex., 122 mm, 13.12.2008, Regd. No. F/6281; 1ex., 264 mm, 16.12.2008, Regd. No. F/6282.

Diagnostic features: Body elongate and compressed, abdomen rounded; head small and depressed; snout bluntly rounded, cleft of mouth not extending to front border of eye; two pairs of barbels, one pair each maxillary and mandibular, the mandibular pair very small or rudimentary; maxillary barbels longer than head; dorsal fin inserted above last half of pectoral fin; adipose dorsal fin absent; ventral fin rays eight, not reaching anal fin origin.

Distribution: India: Throughout. *Elsewhere*: Afghanistan, Pakistan, Sri Lanka, Bangladesh, Maynmar, Thailand, China, Sumatra and Java.

Remarks: Inhabits rivers and enters estuaries occasionally. Commercially important fish.

45. ***Wallagu attu*** (Schneider, 1801) (Fig. 27)
(Wallago)

1801. *Silurus attu* Schneider, *Syst. Ichth.*: 378, pl. 75.

1991. *Wallagu attu*: Talwar and Jhingran, *Inland Fishes of India and Adjacent countries*, **2**: 590.

Material examined: 1ex., 286 mm, 13.12.2008, Regd. No. F/6280.

Diagnostic features: Body elongate, compressed, abdomen rounded; head large and depressed; mouth sub-terminal and oblique; two pairs of barbels, one pair each maxillary and mandibular, maxillary barbels extending to anterior margin of anal fin; dorsal fin small, inserted above half of pectoral fin with 5 rays, no spine; adipose dorsal abent; anal fin long with 72 to 96 rays, free from caudal fin; caudal fin forked with rounded lobes; lateral line well developed. Body silvery grey.

Distribution: India: Throughout. *Elsewhere*: Pakistan, Sri Lanka, Nepal, Bangladesh, Maynmar, Thailand, Vietnam, Malay Peninsula, Sumatra and Java.

Remarks: Inhabits rivers and enter estuaries. Commercially important fish.

Family SCHILBEIDAE

46. ***Ailia coila*** (Hamilton, 1822) (Fig. 28)

(Gangetic ailia)

1822. *Malapterurus coila* Hamilton, *Fishes of Ganges*: 158, 375.

1991. *Ailia coila*: Talwar and Jhingran, *Inland Fishes of India and Adjacent countries*, **2**: 593.

Material examined: 1ex., 115 mm, 16.12.2008, Regd. No. F/6284.

Diagnostic features: Body short and compressed; head short and depressed, snout overhanging; four pairs of barbels around mouth: one each of maxillary, nasal and two of mandibular, all are longer than head; rayed dorsal fin absent, adipose fin short, anal fin long with 58 to 75 rays; caudal fin forked. Body sivery to dull brown without any black blotch on caudal fin base or side of body.

Distribution: India: Rivers of Noth India and Odisha. *Elsewherer*: Pakistan, Bangladesh and Nepal.

Remarks: Inhabits rivers and enter low saline waters of estuaries. Commercially important fish.

47. ***Silonia silondia*** (Hamilton, 1822) (Fig. 29)

(Silond catfish)

1822. *Pimelodus silondia* Hamilton, *Fishes of Ganges*: 160, 375, pl. 7, fig. 50.

1991. *Silonia silondia*: Talwar and Jhingran, *Inland Fishes of India and Adjacent countries*, **2**: 612.

Material examined: 1 ex., 170 mm, 21.06.2008, Regd. No. F/7180; 1ex., 176 mm, 16.12.2008, Regd. No. F/6283.

Diagnostic features: Body elongate and compressed; head moderate and compressed, snout obtusely rounded; mouth obliquely directed upwards; enlarged canine teeth on jaws, project outside mouth opening; two pairs of barbels, the maxillary pair minute

and not extending beyond orbit, the mandibulars vestigial; dorsal fin inserted above half of pectoral fin, adipose dorsal short; pectoral fin with 11 to 13 rays and a strong serrated spine; lateral line complete and indistinct. Body silvery.

Distribution: India: Indo-Gangetic and Odisha. Elsewhere: Pakistan, Bangladesh, Nepal and probably Myanmar.

Remarks: Inhabits rivers and estuaries. Commercially important fish.

Family PLOTOSSIDAE

48. ***Plotosus canius*** Hamilton, 1822 (Fig. 30)

(Canine catfish-eel)

1822. *Plotosus canius* Hamilton, *Fishes of Ganges*: 142, 374, pl. 15, fig. 444.

1991. *Plotosus canius*: Talwar and Kacker. *Commercial Sea Fishes of India* : 278, fig. 114.

Material examined: 1 ex., 220 mm, 25.06.2008, Regd. No. F/7185; 1ex., 228 mm, 18.12.2008, Regd. No. F/6291; 1ex., 168 mm, 28.02.2010, Regd. No. F/6744.

Diagnostic features: Body elongate, depth 6.5 to 10.5 in standard length; lips thick and papillated; four pairs of barbels around mouth; maxillary barbels extending to base of pectorals; anal fin with 106 to 131 rays; caudal fin pointed and confluent with dorsal and anal fins. Body dark olive green, below creamy buff.

Distribution: India : East and west coasts. *Elsewhere*: Pakistan, Sri Lanka, Bangladesh, Indo-Australian Archipelago and to New Guinea.

Remarks: Inhabits brackishwaters and estuaries. Commercuially important cat fish.

49. ***Plotosus lineatus*** Thunberg, 1791 (Fig. 31)

(Striped catfish-eel)

1822. *Plotosus lineatus* Thunberg, *K. Vetensk. Akad. Nya Handl.*, **12**: 190.

1991. *Plotosus lineatus*: Talwar and Kacker. *Commercial Sea Fishes of India* : 277, fig. 115.

Material examined: 1 ex., 168 mm, 28.02.2010, Regd. No.F/7744.

Diagnostic features: Body oblong, depth 6.5 to 10.5 in standard length; four pairs of barbels around mouth, maxillary barbels extending to base of pectorals; anal fin with 58 to 82 raya; caudal fin pointed and confluent with dorsal and anal fins. Body brown with 2 or 3 pale lateral bands, ventral fins black edged.

Distribution: India: East and west coasts and A & N Islands. *Elsewhere*: Widespread in Indo-West Pacific.

Remarks: Inhabits coastal waters and estuaries. Good aquarium pets.

Family SISORIDAE

50. ***Gagata gagata*** (Hamilton, 1822.)

1822. *Pimelodus gagata* Hamilton, *Fishes of Ganges*: 197, 379, pl. 39, fig. 65.

1991. *Gagata gagata*: Talwar and Jhingran, *Inland Fishes of India and Adjacent countries*, **2**: 638.

1999. *Gagata gagata*: Menon, *Rec. zool. Surv. India, Occ. Paper* No. **175**: 236.

Material examined: 5 exs., 50 to 92 mm, 19.12.2008, Regd. No. F/6802.

Diagnostic features: Body short and compressed; mouth ventral and transverse; eyes large and dorsal in position; median longitudinal groove on head extends to end of supraoccipital process; four pairs of barbels, maxillary barbels with oseus bases , lying in a groove anteriorly; rayed dorsal inserted above half of pectoral fin; adipose dorsal present; caudal fin forked. Distal portion of all fins black except caudal fin.

Distribution: India: River systems of Uttar Pradesh, West Bengal and Odisha. *Elsewhere*: Bangladesh and Myanmar.

Remarks: Inhabits freshwater rivers and estuaries. Good food fish.

Family PANGASIDAE

51. ***Pangasisus pangasius*** (Hamilton, 1822) (Fig. 32)

(Yellow-tail catfish)

1822. *Pimelodus pangasius* Hamilton, *Fishes of Ganges*: 163, 376, l.33, fig.52.

1991. *Pangasius pangasius*: Talwar and Jhingran, *Inland Fishes of India and Adjacent countries*, **2**: 613.

1999. *Pangasius pangasius*: Menon, *Rec. zool. Surv. India, Occ. Paper* No. 175: 230.

Material examined: 2 exs., 150 mm, 10.12.2008, Regd. No. F/6794; 1 ex., 143 mm, 19.12.2008, Regd. No. F/6801; 3 exs., 140 to 152 mm, 20.12.2008, Regd. No. F/6807.

Diagnostic features: Body elongate and compressed, abdomen rounded; snout prominent, bluntly pointed; upper jaw slightly longer; two pairs of small barbels, each maxillary and mandibular pairs; soft dorsal and adipose fins present; pectoral fin with 9 to 12 rays and strong serrated spine; anal fin long with 32 to 34 rays; gillrakers 23 to 28; caudal fin forked. Body silvery-white.

Distribution: India: Throughout. *Elsewhere*: Myanmar, Malay Peninsula, Java and Thailand.

Remarks: Inhabits freshwater, common estuaries. Good food fish.

Order AULOPIFORMES

Family SYNODONTIDAE

52. ***Harpadon nehereus*** (Hamilton, 1822) (Fig. 33)

(Bombay-duck)

1822. *Osmerus nehereus* Hamilton, *Fishes of Ganges*: 209.

1991. *Harpadon nehereus*: Talwar and Kacker. *Commercial Sea Fishes of India* : 291, fig. 119.

Material examined: 5 exs., 83 to 106 mm, 28.03.2008, Regd. No. F/5905; 2 exs., 94 and 286 mm, 28.03.2008, Regd. No. F/5831; 5 exs., 83 to 106 mm, 28.03.2008, Regd. No. F/5905; 1 ex., 155 mm, 31.03.2008, Regd. No. F/5832; 1 ex., 168 mm, 28.03.20081, Regd. No. F/6763; 1 ex., 126 mm, 29.02.2010, Regd. No. F/6714.

Diagnostic featutres: Body elongate and soft; eyes small and covered by adipose membrane; mouth very wide with slender recurved teeth; lower jaw longer than upper; small adipose fin present; pectoral fins long reaching beyond level of ventral fin origin; ventral fins very long. Body uniformly light grey.

Distribution: India: East and west coasts. *Elsewhere*: Indo-West Pacific.

Remarks: Inhabit coastal waters and enter estuaries. Commercially important fish.

Order GADIFORMES

Family BREGMACEROCTIDAE

53. ***Bregmaceros macclellandi*** Thompson, 1840 (Fig. 34)

(Indian cod)

1840. *Bregmaceros macclellandi* Thompson, *Magazine of Natural History*, **4**: 184.

1986. *Bregmaceros macclellandi*: Smith and Heemstra, *Smith's Sea Fishes*: 330, fig. 92.2.

1991. *Bregmaceros macclellandi*: Talwar and Kacker. *Commercial Sea Fishes of India* : 294, fig. 120.

Material examined: 5 exs., 60 and 78 mm, 28.03.2008, Regd. No. F/5911.

Diagnostic features: Moderately elongate and compressed, head small; 1 st dorsal fin a single long ray extending to 2nd dorsal fin; second dorsal and anal fins long with large notch in middle; ventral fins attached to throat with three outer rays long and filamentous. Body brown above, silvery below, minutely dotted with brown, dorsal fin blackish.

Distribution: India: East and west coasts. *Elsewhere*: Indo-West Pacific.

Remarks: Inhabits marine waters occasionally enters mouth of estuaries. Minor fishery value.

Order CYPRINODONTIFORMES

Family APLOCHEILIDAE

54. ***Aplocheilus panchax*** (Hamilton, 1822)

(Blue panchax)

1822. *Esox panchax* Hamilton, *Fishes of Ganges*: 211, 380, pl. 3, fig. 69.

1991. *Aplocheilus panchax*: Talwar and Jhingran, *Inland Fishes of India and Adjacent countries*, **2**: 752 fig. 241.

1999. *Aplocheilus panchax*: Menon, *Rec. zool. Surv. India, Occ. Paper* No. **175**: 2690.

2000. *Aplocheilus panchax*: Rao et al., *Rec. zool. Surv. India, Occ. Paper* No. **178**: 91.

Material examined: 1ex., 49 mm, 20.12.2008, Regd. No. F/6278.

Diagnostic features: Body sloghtly elongate, head and nape broad and depressed; abdomen rounded; snout spatulate; cleft of mouth not extending to front border of eye; eye diameter equal to interorbital width; barbels absent; dorsal fin inserted above posetrior end of anal fin; lateral line absent, lateral scale series 30 to 34; caudal fin rounded. Upper part of body greenish, ventral side dull white; fins light yellow; a black blotch at base dorsla fin; margin of anal fin reddish.

Distribution: India: Northern states up to Odisha and A & N Islands. Elsewhere: Pakistan, Bangladesh, Myanmar, Thailand and Indo-Malayan Archipelago.

Remarks : Shallow fresh water bodies and close to estuaries. Larvivorus fish. Live fish used for mosquito control.

Order SCORPAENIFORMES

Family PLATYCEPHALIDAE

55. ***Platycephalus indicus*** (Linnaeus, 1758) (Fig. 35)

(Indian flathead)

1758. *Callionymus indicus* Linnaeus, *Systema Naturae*, (ed.10), : 250.

1984. *Platycephalus indicus*: Talwar and Kacker, *Commercial Sea Fishes of India*: 340.

2000. *Platycephalus indicus*: Rao *et al., Rec. zool. Surv. India, Occ. Paper* No. **178**: 120.

Material examined:1 ex. 223 mm, 25.06.2008, Regd. No. F/7183; 1ex., 264 mm, 14.12.2008, Regd. No. F/6292; 2exs., 101 and 184 mm, 30.03.2008, Regd. No. F/5814; 1 ex., 226 mm, 31.03.2008, Regd. No. F/5833; 1 ex., 210 mm, 27.02.2010, Regd. No. F/6757; 2 exs., 150 and 174 mm, 28.02.2010, Regd. No. F/6742; 1 ex., 240 mm, 29.02.2010, Regd. No. F/6704.

Disgnostic features: Body compressed; top of head with weak low ridges and low spines; lateral line scales 118 to 134 bearing no spines. Body brown above, spotted with reddish brown, dorsal fin with indistinct spots; pectoral and pelvic fins strongly spotted; caudal fin yellow with white-edged oblique bands across upper and lower lobes.

Distribution: India: East and west coasts, Andaman and Nicobar Islands and Lakshadweep. *Elsewhere*: Red Sea and East Africa to the Philippines, north to southern Japan and Korea, south to northern Australia. Introduced into the eastern Mediterranean Sea.

Remarks: Inhabits bottoms of coastal waters. Frequently found in estuaries, juveniles in freshwater. A good food fish. Having less commercial value.

Family MUGILIDAE

56. ***Mugil cephalus*** Linnaeus, 1758 (Fig. 58)

(Flathead grey mullet)

1758. *Mugil cephalus* Linnaeus, *Systema Naturae*, (ed.10), **1**: 316.

1984. *Mugil cephalus*: Talwar and Kacker, *Commercial Sea Fishes of India*: 726, fig. 294.

Material examined: 3 ex., 120 to 150 mm, 01.04.2008, Regd. No. F/5815; 1 ex., 138 mm, 03.04.2008, Regd. No. F/5805.

Diagnostic features: Body robust, head broad and flattened on top, its length 27 to 29% in standard length; adipose eye lid well developed, covering most part of the eye; pre-orbital slender, filling only half the space between the lip and eye; pectoral fins with long axillary scale; scales in lateral series 38 to 42. Body olive-green above, silvery on sides and fading to white ventrally; 6-7 indistinct longitudinal brown bars along flanks; a dark purple blotch at base of pectoral fin.

Distribution: India: East and west coasts. *Elsewhere*: Widespread in tropical, subtropical and temperate zones of all seas.

Remarks: Inhabits shallow coastal waters. Most common species of estuaries and extending into freshwater. Commercially important species.

57. ***Liza parsia*** (Hamilton, 1982) (Fig. 59)

(Gold-spot mullet)

1982. *Mugil parsia* Hamilton, *Fishes of Ganges*: 215, pl. 17, fig. 71.

1984. *Liza parsia*: Talwar and Kacker, *Commercial Sea Fishes of India*: 721.

Material examined: 1 ex., 120 mm, 21.06.2008, Regd. No. F/7178; 1 ex., 140 mm, 25.06.2008, No. F/7204; 2 exs., 120 & 215mm, 26.02.2010, Regd. No. F/7164.

Diagnostic features: Body slender, head moderately wide, its length 23 to 26% in standard length; adipose eyelid covers most of posterior part of iris; back not keeled in front of first dorsal fin; pre-orbital fills space between lip and eye; pectoral fins with no axillary scales; scales in lateral series 31 to 36. Body greenish above with a golden spot on upper portion of operculum.

Distribution: India: East and west coasts and A & N Islands. *Elsewhere*: Pakistan and Sri Lanka.

Remarks: Common mullet of estuaries, enters freshwater. Commercial species.

58. ***Liza macroleplis*** (Smith, 1846)

(Borneo-mullet)

1846. *Mugil macrolepis* Smith, *Illust. Zool. S.Africa*, **4**: pl. 28, fig. 2.

1984. *Liza macrolepis*: Talwar and Kacker, *Commercial Sea Fishes of India*: 720.

Material examined: 1 ex., 110 mm, 20.12.2008, Regd. No. F/6264.

Diagnostic features: Body robust, head 26 to 28% in standard length; adipose eye lid a rim around eye; pactoral fin without axillary scale; ventral fins reaching vertical behind base of 4th spine of dorsal fin; lateral scale series 28 to 33, transverse scale rows 13. Body dark greenish, silvery on sides and belly.

Distribution: India: East and west coasts. *Elsewhere*: Wide spread in tropical Indo-West Pacific.

Remarks: Inhabits marine, brackish and freshwaters. Most important commercial mugil.

59. ***Liza tade*** (Forsskal, 1775)
(Tade grey mullet)

1775. *Mugil crenilabis* tade Forsskal, *Descript Animalia*: 74.

1984. *Liza tade*: Talwar and Kacker, *Commercial Sea Fishes of India*: 723, fig. 292.

Material examined: 1 ex., 136 mm, 20.12.2008, Regd.No. F/6265.

Diagnostic features: Body slender, head much depressed, its length 19 to 25% in standard length; adipose eye lid covers most of iris; pectoral fin with no axillary scale; scales in lateral series 31 to 33, transverse scale rows 11. Body pale olive above, silvery below; 5 to 7 indistinct longitudinal lines on sides.

Distribution: India: East and west coasts. *Elsewhere*: Red Sea, Pakistan, Sri Lanka, Bangladesh to East Indies and to China and Marianus.

Remarks: Inhabits shallow coastal waters and enter estuaries. Commercially important fish.

60. ***Rhinomugil corsula*** (Hamilton, 1822) (Fig. 60)
(Corsula mullet)

1822. *Mugil corsula* Hamilton, *Fishes of Ganges*: 221, pl. 9, fig, 97.

1984. *Rhinomugil corsula*: Talwar and Kacker, *Commercial Sea Fishes of India*: 728.

Material examined: 1 ex., 160 mm, 03.04.2008, Regd. No. F/5804; 3 exs., 123 to135 mm, 16.12.2008, Regd.No. F/6263.

Diagnostic features: Body stout, head moderate, concave between eyes, the eyes projecting above this level; no adipose eyelids; mouth ventral in position; anterior nostrils at level of eye centre; lateral scalle series 48 to 52; caudal fin slightly emarginate. Body olive-brown dorsally, silvery on flanks and belly; fins with golden tinge.

Distribution: India: East and west coasts. *Elsewhere*: Bangladesh and Myanmar.

Remarks: Inhabits rivers and estuaries. Commercial and aquaculture value.

61. ***Valamugil buchanani*** (Bleeker, 1853)

1853. *Mugil buchanani* Bleeker, *Verh. Bat. Gen.*, **25**: 99.

1984. *Valamugil buchanani*: Talwar and Kacker, *Commercial Sea Fishes of India*: 729.

Material examined: 1 ex., 155 mm, 25.06.2008, Regd.No. F/7184; 4 exs., 80 to 95 mm, 03.03.2010, Regd.No. F/7170.

Diagnostic features: Body robust, head flattened dorsally; adipose tissue a rim around eye; pectoral fin just reaches vertical from origin of first dorsal fin, equal to head length; long pectoral axillary scale present; scales in lateral series 32 to 35. Body greenish above, silvery on sides and belly; dark spot at base of pectoral fin; cadal fin bluish; pectoral and ventral fins yellowish.

Distribution: India: East and west coasts. *Elsewhere*: Widespread in Indo-West Pacific.

Remarks: Inhabits shallow coastal waters and estuaries.

Order PERCIFORMES
Family CENTROPOMIDAE
62. ***Lates calcarifer*** (Bloch, 1790) (Fig. 36)
(Gaint seaperch)

1790. *Holocentrus calcarifer* Bloch, *Nat. Ausland Fische*, **4**: 100, pl. 244.

1984. *Lates calcarifer*: Talwar and Kacker, *Commercial Sea Fishes of India*: 356, fig. 140.

2000. *Lates calcarifer*: Rao et al., *Rec. zool. Surv. India, Occ. Paper* No. **178**: 121.

Materila examined: 1 ex., 80 mm, 22.06.2008, Regd. No. F/7176; 1 ex., 110 mm, 23.06.2008, Regd. No. F/7196.

Diagnostic features: Body elongate with a deep caudal peduncle; head pointed with concave dorsal profile; operculum with a small spine, serrated flap above origin of lateral line, lower edge of pre-operculum with 3 or 4 spines; mouth large and slightly oblique, maxilla extending behind eye; deep notch between spinous and soft portions of dorsal fin; caudal fin rounded. Body olive-brown with silvery sides; eyes bright pink.

Distribution: India: East and west coasts and A & N Islands. *Elsewhere*: Widespread in Indo-Pacific.

Remarks: Inhabits coastal waters and estuaries. Good food fish. Important commercial fish.

Family AMBASSIDAE

63. ***Ambassis ambassis*** (Lacepede,1802) (Fig. 37)

(Commerson's glassy perchlet)

1802. *Centropomus ambassis* Lacepede, *Hist. nat. Poiss.*, **4**: 276.

1828. *Ambassis commersoni* Cuvier, *Hist. nat. Poiss.*, 3: 176, pl. 25.

1984. *Ambassis commersoni*: Talwar and Kacker, *Commercial Sea Fishes of India*: 361, fig. 141.

2003. *Ambassis ambassis*: Anderson and Heemstra, *Cybium*, 27(3): 201, fig. 2..

Material examined: 1 ex., 115 mm, 03.04.2008, Regd. No. F/5803; 1 ex., 100 mm, 10.12.2008, Regd. No. F/6795; 1 ex., 85 mm, 19.12.2008, Regd. No. F/6806.

Diagnostic features: Body oblong and compressed; supra-orbital ridge smooth, terminating posteriorly in a backwardly directed spine, inter-operculum smooth; 20 to 22 gillrakers on lower arm of first arch; one row of scales on cheek, lateral line continuous, or little interrupted. Body silvery with purplish reflections; a bright silvery lateral band present.

Distribution: India: East and West coasts and A & N Islands. *Elsewhere*: Indo-west Pacific.

Remarks: Inhabits shallow coastal waters and enters estuaries. Minor commercial value.

64. ***Parambassis ranga*** (Hamilton, 1822) (Fig. 38)

(Indian Glassy fish)

1822. *Chanda ranga* Hamilton, *Fishes of Ganges*: 113, 371, pl. 16, fig. 18.

1999. *Parambassis ranga*, Jayaram, *Freshwater fishes of India Region*: 370, fig. 194.

Material examined: 3exs., 101 to 142 mm, 30.03.2008, Regd. No. F/5815a.

Diagnostic features: Body compressed; mouth large and oblique; snout pointed; eye diameter 11.3 to 11.8 in standard length; the ridge and edge of pre-orbital serrated; 21 to 25 gillrakers on lower arm of first arch. Body silvery white; closely set dots form a drak mark on the shoulder.

Distribution: India: East and west coasts. *Elsewhere*: Pakistan, Bangladesh, Myanmar and Malaysia.

Remarks: Inhabits coastal waters and estuarires. Enters freshwater rivers.

Family TERAPONIDAE

65. ***Terapon jarbua*** Forsskal, 1775 (Fig. 39)

(Jarbua terapon)

1775. *Sciaena jarbua* Forsskal, *Descript Animalium*: 50.

1984. *Terapon jarbua*: Talwar and Kacker, *Commercial Sea Fishes of India*: 406, fig. 156.

Material examined: 1 ex., 155 mm, 14.12.2008, Regd. No. F/6271; 1 ex., 95 mm, 26.02.2010, Regd. No. F/6715; 1 ex., 84 mm, 28.02.2010, Regd. No. F/6739; 1 ex., 116 mm, 03.03.2010, Regd. No. F/6719.

Diagnostic features: Body moderately deep; 12 to 15 gill rakers on lower arm of first arch; lateral line with 75 to 100 scales; body with three or four longitudinal downwardly curved dark or blackish stripes; caudal fin with three oblique or horizontal dark stripes, the tips dark.

Distribution: India: East and west coasts, A & N Islands and Lakshadweep. *Elsewhere*: Red Sea and East Africa to Samoa, north to southern Japan, south to the Arafura Sea, Australia, and Lord Howe Island.

Remarks: Shallow coastal waters, frequently enters estuaries and upstream into freshwater. Minor commercial value. Good aquarium pet.

Family SILLAGINIDAE

66. ***Sillaginopsis panijus*** (Hamilton, 1822) (Fig. 40)

(Gangetic whiting)

1822. *Cheilodipterus panijus* Hamilton, *Fishes of Ganges*: 56, 367.

1984. *Sillaginopsis panijus*: Talwar and Kacker, *Commercial Sea Fishes of India*: 422.

Material examined: 1 ex., 210 and 232 mm, 28.03.2008, Regd. No. F/5825; 1 ex., 230 mm, 14.12.2008, Regd. No. F/6259; 1 ex., 230 mm, 14.12.2008, Regd. No. F/6259; 3 exs., 85 to 145 mm, 16.12.2008, Regd. No. F/6260; 1 ex., 178 mm, 20.12.2008, Regd. No. F/6258; 5 exs., 100 to 184 mm, 27.02.2010, Regd. No. F/6752; 3 exs., 142 to 172 mm, 28.02.2010, Regd. No. F/6729; 2 exs., 146 & 170 mm, 29.02.2010, Regd. No. F/6706.

Diagnostic features: Body elongate, head and snout greatly depressed; two dorsal fins: the first dorsal with 10 spines, the second spine long and filamentous, second fin with 26 or 27 rays; anal fin with 24 to 26 soft rays. Body greenish-yellow, lower sides whitish.

Distribution: India: East and south-west coasts. *Elsewhere*: Myanmar, southward to Malaysia.

Remarks: Inhabits shallow marine waters and estuaries. Commercially important fish.

67. ***Sillago sihama*** (Forsskal, 1775) (Fig. 41)

(Silver sillago)

1775. *Atherina sihama* Forsskal, *Descript Animalia* : 70.

1984. *Sillago sihama*: Talwar and Kacker, *Commercial Sea Fishes of India*: 425, fig. 164.

Material examined: 1 ex., 100 mm, 14.12.2008, Regd. No. F/6792.

Diagnostic features: Body elongate, mouth small, snout pointed; anal fin with 21 to 23 rays; lateral line with 62 to 72 scales. Body light brown, flanks and belly whitish; both dorsal and caudal fins dusky, other fins pale.

Distribution: India: East and west coasts and A & N Islands. *Elsewhere*: Red Sea, South Africa to Japan and south to Australia. Reported from New Caledonia. Mediterranean Sea: Turkey.

Remarks: Shallow marine coastal waters and estuaries. Also enters fresh water. Commercially important fish.

68. ***Sillago vincenti*** Mc Kay, 1980 (Fig. 42)
(Vincent's sillago)

1980. *Sillago vincenti* Mc Kay, *J. mar. biol. Asso. India*, **18**(2): 378, fig. 1.

1991. *Sillago vincenti*: Talwar and Jhingran, *Inland Fishes of India and Adjacent countries*, **2**: 819.

Material examined: 1 ex., 158 mm, 14.12.2008, Regd. No. F/6261.

Diagnostic features: Body elongate, mouth small, snout pointed; anal fin with 22 to 24 rays; lateral line with 70 to 74 scales. Body uniform pale tan, second dorsal fin with black spots.

Distribution: India: East and west coasts. *Elsewhere*: Nil.

Remarks: Inhabits coastal waters and estuaries. Minor commercial value.

Family CARANGIDAE

69. ***Alepes djedaba*** (Forsskal, 1775)
(Djedaba crevalle)

1775. *Scomber djedaba* Forsskal, *Descript. Animalia.*: 56.

1984. *Alepes djedaba*: Talwar and Kacker, *Commercial Sea Fishes of India*: 438, fig. 168.

Material examined: 2 exs., 73 and 98 mm, 28.03.2008, Regd. No. F/5913; 1 ex., 150 mm, 25.06.2008, Regd. No. F/7193.

Diagnostic features: Body compressed and oblong, dorsal and ventral profiles evenly convex; 27 to 31 gillrakers on lower arm of first arch; lateral line strongly arched anteriorly to below 2nd to 4th soft dorsal ray, 33 to 51 scutes. Body bluish above silvery below, a distinct dusky blotch on upper edge of operculum.

Distribution: India: East and west coasts and A & Islands. *Elsewhere*: Red Sea and East Africa to the Hawaiian Islands, north to Japan, south to Australia.

Remarks: Inhabits shallow coastal waters and estuaries. Commercially important fish.

70. ***Scomberoides commersonianus*** Lacepede, 1802 (Fig. 43)
(Talang queenfish)

1802. *Scomberoides commersonianus* Lacepede, *Hist. nat. Poiss.*, **2**: 50.

1984. *Scomberoides commersonianus*: Talwar and Kacker, *Commercial Sea Fishes of India*: 475, fig. 183.

Material examined: 1 ex., 186 and 264 mm, 14.12.2008, Regd. No. F/6277.

Diagnostic features: Body compressed and elongate with a blunt snout, maxilla extending well beyond posterior margin of eys; 8 to 15 gillrakers on first arch; no scutes on lateral line. Body dusky green above, silvery on sides and below; 5 to 8 large oval blotches above or touching lateral line; soft dorsal evenly dusky.

Distribution: Indo-West Pacific: Red Sea, east coast of Africa, India, Sri Lanka and Indo-Australian Archipelago.

Remarks: Continental shelf and frequently enters estuaries. Commercially important fish.

71. ***Scomberoides lysan*** (Forsskal, 1775)
(Doubledotterd queenfish)

1775. *Scomber lysan*, Forsskal, *Descript Animalium*: 54.

1984. *Scomberoides lysan*: Talwar and Kacker, *Commercial Sea Fishes of India*: 477.

Material examined: 2 exs., 88 & 100 mm, 28.02.2010, Regd. No. F/6812.

Diagnostic features: Body compressed and elongate; snout pointed; maxilla extends to or slightly beyond rear margin of eye; no scutes on body; posterior soft dorsal and anal of semi-detached finlets; 21 to 27 gillrakers on first arch. Body with double series of 6 to 8 dusky roundish blotches above and below lateral line; tip of second dorsal fin heavily pigmented.

Distribution: India: East and west coasts and A & N Islands. *Elsewhere*: Red Sea and East Africa to Hawaii, the Marquesas and the Tuamoto Islands, north to southern Japan, south to New South Wales and Rapa.

Remarks: Inhabits marine waters, frequently enter estuaries. Commercially important fish.

Family LEIOGNATHIDAE

72. ***Leiognathus equulus*** (Forsskal, 1775) (Fig. 44)
(Common ponyfish)

1775. *Scomber equulus* Forsskal, *Descript. Animalium*: 75.

1984. *Leiognathus brevirostris*: Talwar and Kacker, *Commercial Sea Fishes of India*: 510, fig. 198.

Material examined: 5 1ex., 122 mm, 14.12.2008, Regd. No. F/6273.

Diagnostic features: Body deep and compressed, back strongly arched; mouth pointing downwards when protracted, head naked; ventral fins reaching to anal fin origin. Body silvery with faint narrow vertical lines on back; a small brown saddle on caudal peduncle; pectoral fin axil dusky; anal fin yellowish.

Distribution: India: East and west coasts. *Elsewhere*: Red Sea, Persian Gulf and East Africa to Fiji, north to the Ryukyu Islands, south to Australia.

Remarks: Inhabits brackish and marine waters. Juveniles are commonly found in mangroves, estuaries and tidal creeks, entering the lower reaches of freshwater streams also. Important food fish. Minor commercial value.

73. ***Secutor insidiator*** (Bloch, 1787) (Fig. 45)
(Pugnose ponyfish)

1787. *Zeus insidiator* Bloch, *Nat. ausland. Fische*, 3: 41, pl. 192, figs. 2 & 3.

1984. *Secutor insidiator*: Talwar and Kacker, *Commercial Sea Fishes of India*: 518, fig. 204.

Material examined: 1 ex., 88 mm, 14.12.2008, Regd. No. F/6787; 1 ex., 56 mm, 29.02.2010, Regd. No. F/6711.

Diagnostic features: Body oval and compressed, more slender, its depth 2.0 to 2.3 times in standard length; mouth pointing upwards when protracted; maxilla tip reaching well below level of lower margin of eye; lateral line ending before end of dorsal fin. Body silvery with blue spots on back, forming vertical bands, lower flanks with small dark spots; tip of dorsal fin black with yellow band below; pectoral axil yellow with black dots.

Distribution: India: East and west coasts. *Elsewhere*: Red Sea, Persian Gulf and East Africa to Australia, New Caledonia and Tahiti.

Remarks: Shallow coastal waters, near the bottom. Enters brackish waters and estuaries. Common commercial fish.

74. ***Secutor ruconius*** (Hamilton, 1822)
(Deep pugnose ponyfish)

1822. *Chanda ruconius* Hamilton, *Fishes of Ganghes*: 106, 371, pl.12.

1984. *Secutor ruconius*: Talwar and Kacker, *Commercial Sea Fishes of India*: 519, fig. 205.

Material examined: 1 ex., 224 mm, 28.03.2008, Regd. No. F/5914.

Diagnostic features: Body deep, its depth 1.5 to 1.8 in standard length; mouth pointing upward when protracted; maxilla tip reaching to about level of lower margin of eye; lateral line ending below middle of soft dorsal fin. Body silvery with blue spots on

upper half; tip of dorsal fin black, with a yellow band below; pectoral axil black, a dark line from angle of mouth to chin.

Distribution: India: East and west coasts. *Elsewhere*: Widespread in Indo-West Pacific.

Remarks: Inhabits shallow marine waters, enters brackish waters. Frequently caught by seine nets.

Family LUTJANIDAE

75. ***Lutjanus johnii*** (Bloch, 1792) (Fig. 46)

(John's snapper)

1792. *Anthias johnii* Bloch, *Nat. ausland. Fische*, **6**: 1113, 318.

1984. *Lutjanus johnii*: Talwar and Kacker, *Commercial Sea Fishes of India*: 541, fig. 212.

2000. *Lutjanus johnii*: Rao *et al.*, *Rec. zool. Surv. India, Occ. Paper* No. **178**: 184.

Material examined: 2 exs., 90 & 115 mm, 28.02.2010, Regd. No. F/6737; 1 ex., 126 mm, 03.03.2010, Regd. No. F/6721.

Diagnostic features: Body moderately deep with head profile slightly concave; no inter-opercular knob; longitudinal scale rows above lateral line parallel to it, and those below are horizontal. Body bronze-red or silvery with distinct dark spots on each scale forming longitudinal lines; a large black blotch may present above lateral line at the level of spinous and soft dorsal fins.

Distribution: India: East and west coasts and A & N Islands. *Elsewhere*: East Africa to Fiji, north to the Ryukyu Islands, south to Australia.

Remarks: Shallow marine and brackish waters; juveniles found in mangroves and estuaries. Minor fishery value.

Family GERREIDAE

76. ***Gerres erythrourus*** Bloch, 1791

(Deepbody mojarra)

1791. *Sparus erythrourus* Bloch, *Nat. Ausland. Fische.*, v: 142.

1984. *Gerres abbreviatus*: Talwar and Kacker, *Commercial Sea Fishes of India*: 579, fig. 227.

1984. *Gerres erythrourus*: Talwar and Kacker, *Commercial Sea Fishes of India*: 580.

2000. *Gerres abbreviatus*: Rao et al., *Rec. zool. Surv. India, Occ. Paper* No. **178**: 194.

2003. *Gerres arythrourus*: Allen and Adrim, *Zool. Stud.*, **42**(1): 39.

Material examined: 1 ex., 88 mm, 25.06.2008, Regd. No. F/7188.

Diagnostic features: Body elongate, its depth 2.0 to 2.3 in standard length, forming a sharp angle at dorsal fin origin; mouth protractile; the second spine of spinous dorsal long but not filamentous; six scale rows between lateral lin and dorsal fin origin.Body

silvery with indistinct lines along the scale rows on dorsal side; pectoral, ventral and anal fins yellow.

Distribution: India: East and west coasts. *Elsewhere*: Indo-West Pacific.

Remarks: Inhabits coastal wters and estuaries.

77. ***Gerres limbatus*** Cuvier, 1830 (Fig. 47)
(Black-tipped majorra)

1830. *Gerres limbatus* Cuvier, *Hist. nat. Poiss.*, **6**: 476.

1984. *Gerres limbatus*: Talwar and Kacker, *Commercial Sea Fishes of India*: 582.

Material examined: 1 ex., 130 mm, 30.03.2008, Regd. No. F/5812.

Diagnostic features: Body oblong, its depth 2.3 to 2.7 in standard length; lateral line with 33 to 39 scales; four scale rows between lateral lin and dorsal fin origin. Body silvery with 3 faint vertical bands below dorsal fin; dorsal fin margin dusky.

Distribution: India: East and west coasts. *Elsewhere*: Sri Lanka to southeast Asia and the South China Sea.

Remarks: Inhabits shallow coastal waters and estuaries. Minor commercial value.

Family HAEMULIDAE

78. ***Pomadasys kaakan*** (Cuvier) (Fig. 48)
(Javelin grunter)

1830. *Pristipoma kaakan* Cuvier, *Hist. nat. Poiss.*, **5**: 244.

1986. *Pomadasys kaakan*: Smith and Mc Kay, *In: Smith's Sea Fishes*: 569, fig. 179.13.

2000. *Pomadasys kaakan*: Rao *et al.*, *Rec. zool. Surv. India, Occ. Paper* No. **178**: 199.

Material examined: 2 exs., 90 & 95 mm, 25.06.2008, Regd. No. F/7203 & 7187; 1 ex., 103 mm, 03.03.2010, Regd. No. F/6720.

Diagnostic features: Body oblong, head 2.6 to 2.7 in standard length; dorsal and anal fin spines strong; caudal fin slightly emarginated. Body silvery with broken vertical bars, round spots on lower half of dorsal fin; black blotch on opercle.

Distribution: India: East and west coast and A & Islands. *Elsewhere*: East coast of Africa to Sri Lanka and to Queensland.

Remarks: Inhabits coastal waters and enter estuaries.

79. ***Pomadasys hasta*** (Bloch, 1790)

1790. *Lutjanus hasta* Bloch, *Nat. ausland Fische*, **4**: 109, pl. 246, fig. 1.

1984. *Pomadasys hasta*: Talwar and Kacker, *Commercial Sea Fishes of India*: 596, fig. 233.

Material examined: 2 exs., 76 & 123 mm, 28.02.2010, Regd. No. F/6737a.

Diagnostic features: Body oblong and compressed; depth 2.5 to 2.8 in standard length; 2nd anal fin spine stout and longer than third; caudal fin truncate; lateral line with 45 to 52 scales. Body silvery-grey with 4 to 5 faint longitudinal dark grey lines along lateral line.

Distribution: India: East and west coasts. *Elsewhere*: Indo-Pacificc.

Remarks: Inhabits coastal marine waters and estuaries. Good food fish. Fished in small scale.

Family SPARIDAE

80. ***Acanthopagrus berda*** (Forsskal, 1775)

1775. *Sparus berda* Forsskal, *Descript Animal*: 32.

1984. *Acanthopagrus berda*: Talwar and Kacker, *Commercial Sea Fishes of India*: 626, fig. 245.

Material examined: 1 ex., 76 mm, 22.06.2008, Regd. No. F/7175; 2 exs., 88 & 94 mm, 26.06.2008, Regd. No. F/7208; 2 exs., 60 and 98 mm, 02.03.2009, Regd. No. F/6196.

Diagnostic features: Body deep and compressed, its depth less than 2.4 in standard length; 4 to 6 canine teeth in front of either jaw; six rows of scales on pre-operculum. Body dusky gray, silvery white below; pectoral fins yellow, soft dorsal, anal and ventral fins blackish.

Distribution: India: East and west coasts. *Elsewhere*: Wide spread in Indo-Pacific.

Remarks: Inhabits marine and estuarine waters. Minor commercial value.

Family SCIAENIDAE

81. ***Chrysochir aureus*** (Richardson, 1846) (Fig. 49)

(Reeve's croaker)

1846. *Otolithus aureus* Richardson, *Rep. Br.Ass.Advmt., Sci.*, **15**: 224.

1984. *Chrysochir aureus*: Talwar and Kacker, *Commercial Sea Fishes of India*: 631, fig. 248.

1995. *Chrysochir aureus*: Talwar, *Fauna of India: Sciaenidae*: 54, fig. 15.

Material examined: 1ex., 142 mm, 14.12.2008, Regd. No. F/6267.

Diagnostic features: Body slender, mouth horizontal and sub-terminal; maxilla extend to below hind margin of eye; two pairs of canines in the outer series of upper jaw; lateral line scales 48 to 51; gasbladder carrot-shaped with 24 to 28 pairs or arborescent appendages; caudal fin rhomboid with pointed tip. Body metallic blue, silvery below, pectoral fins yellow.

Distribution: India: Bay of Bengal. *Elsewhere*: Malay Penensula, Borneo and South China.

Remarks: Inhabits coastal waters and enter estuaries. Fairly common in catches.

82. ***Dendrophysa russelli*** (Cuvier, 1830) (Fig. 50)
(Goatee croaker)

1830. *Umbrina russelli* Cuvier, *Hist. nat. Poiss.*, **5**: 178.

1984. *Dendrophysa russelli*: Talwar and Kacker, *Commercial Sea Fishes of India*: 642, fig. 253.

1995. *Dendrophysa russelli*: Talwar, *Fauna of India: Sciaenidae*: 72, fig. 20.

Material examined: 1 ex., 113 mm, 25.06.2008, Regd. No. F/7186.

Diagnostic features: Body oblong, snout rounded and projecting slightly beyond tip of upper jaw; mouth ventral; a single tapering barbel on chin; no canine teeth in jaws; gas-bladder carrot shaped, with 15 to 17 pairs of arborescent appendages; caudal fin rhomboid. Body grey, shading to silvery white ventrally, a dark brown band on nape; opercle with a deep blue blotch; upper two-thirds of dorsal fin dusky.

Distribution: India: East and south-west coasts. *Elsewhere*: Sri Lanka to East Indies.

Remarks: Inhabits coastal marine waters and estuaries. Minor commercial value.

83. ***Johnius belangerii*** (Cuvier, 1830)
(Belangeri's croaker)

1830. *Corvina belangerii* Cuvier, *Hist. nat. Poiss.*, **5**: 120.

1984. *Johnius belangerii*: Talwar and Kacker, *Commercial Sea Fishes of India*: 647, fig. 255.

1995. *Johnius belangerii*: Talwar, *Fauna of India: Sciaenidae*: 103, fig. 31.

Material examined: 1 ex., 143 mm, 28.02.2010, Regd. No. F/7161.

Diagnostic features: Snout steeply rounded and slightly projecting; mouth inferior; 48 to 52 lateral line scales; dorsal fin deeply notched; caudal fin rhomboid; gasbladder with 11 to 14 arborescent appendages. Body bronzy with dark pingment; spinous dorsal black, anal and caudal fins also black sometimes; a dark blotch shows through gill cover.

Distribution: India: East and west coasts. *Elsewhere*: Pakistan, Sri Lanka, through East Indies, China, Japan and Australia.

Remarks: Inhabits coastal waters and estuarirs.

84. ***Johnius coitor*** (Hamilton, 1822) (Fig. 51)

1822. *Bola coitor* Hamilton, *Fishes of Ganges*: 75, 368, pl. 27, fig. 24.

1991. *Johnius coitor*: Talwar and Jhingran, *Inland Fishes of India and Adjacent countries*, **2**: 858.

1995. *Johnius coitor*: Talwar, *Fauna of India: Sciaenidae*: 99, fig. 29.

Material examined: 1 exs., 95 to 153 mm, 18.12.2008, Regd. No. F/6268.

Diagnostic features: Snout swollen and projecting well beyond lower jaw; mouth

inferior; 9 to 12 gillrakers on lower arm of first arch; lateral line scales 48 to 51; dorsal fin deeply notched; caudal fin acutely rhomboid. Body light golden yellow; spinous dorsal with black border.

Distribution: India: East coast. *Elsewhere*: Bangladesh, Myanmar southward to Singapore and Borneo, around Brunei to Australia.

Remarks: Inhabits marine waters, estuaries and rivers.

85. ***Nibea soldado*** (Lacepede, 1802) (Fig. 52)
(Soldier croaker)

1802. *Holocentrus soldado* Lacepede, *Hist. nat. Poiss.*, **4**: 344, 389.

1984. *Nibea soldado*: Talwar and Kacker, *Commercial Sea Fishes of India*: 259, fig. 264.

1995. *Nibea soldado*: Talwar, *Fauna of India: Sciaenidae*: 83, fig. 24.

Material examined: 1 exs., 200 mm, 13.12.2008, Regd. No. F/6269.

Diagnostic features: Body deep with well arched back; mouth terminal; depth 26.5 to 32.0 in standard length; no canine teeth; lateral line scales 48 to 50; dorsal fin deeply notched; second anal spine very strong, nearly half head length; ventral fin with small filament; caudal fin rhomboid; gasbladder carrot shaped with 20 to 22 pairs of lateral appendages. Body silvery with faint series of oblique stripes along scale rows; margin of soft dorsal dark.

Distribution: India: East and west coasts, *Elsewhere*: Sri Lanka, Malay peninsula to Queensland and Australia.

Remarks: Shallow coastal waters and estuaries. Common commercial fish.

86. ***Otolithoides biauritus*** (Cantor, 1850)
(Bronze croaker)

1850. *Otolithus biauritus* Cantor, *J. Asiat. Soc. Beng.*, **18**(2): 1039.

1984. *Otolithoides biauritus*: Talwar and Kacker, *Commercial Sea Fishes of India*: 661, fig. 265.

1995. *Otolithoides biauritus*: Talwar, *Fauna of India: Sciaenidae*: 25, fig. 5.

Material examined: 1 ex., 180 mm, 14.12.2008, Regd. No. F/6785.

Diagnostic features: Body slender with acute snout, mouth terminal, upper jaw reaching well beyond eye; body depth 18.8 to 20.8 in standard length; 10 to 11 gillrakers on lower arm of first arch; 50 to 60 lateral line scales; caudal fin acutely pointed; gasbladder carrot shaped with a pair of long tubular appendages. Head and back grey, sides silvery with golden tinge, lateral line golden yellow; fins pale orange except pectorals brownish with black axil spot.

Distribution: India: East and west coasts. Elsewhere: Pakistan, Sri Lanka, Myanmar, and Indo-Australian Archipelago.

Remarks: Inhabits coastal waters and enters estuaries. Important commercial fish.

87. ***Otolithoides pama*** (Hamilton, 1822)
(Pama croaker)

1822. *Bola pama* Hamilton, *Fishes of Ganges*: 79, 368, pl.32, fig. 26.

1995. *Pama pama*: Talwar, *Fauna of India: Sciaenidae*: 28, fig.6.

Material examined: 3 exs., 185 to 210 mm, 19.12.2008, Regd. No. F/6808; 1 ex., 154 mm, 28.02.2010, Regd. No. F/6810.

Diagnostic features: Body slender, snout conical, mouth large and upper jaw reaching well beyond eye; body depth 21.4 to 24.5 in standard length; 11 to 15 gillrakers on lower arm of first arch; 1 or 2 pairs of caniniform teeth in upper jaw and a pair of strong teeth at symphysis of lower jaw; 44 to 48 lateral line scales; caudal fin rhomboid; gasbladder carrot shaped with a pair of tubules. Body brownish on back, silvery-white ventrally, head with golden and purple tinge.

Distribution: India: East coast, Ganga, Brahmaputra and Mahanadi river systems. *Elsewhere*: Myanmar, Malay Peninsula and Sumatra.

Remarks: Inahbits rivers, estuaries and coastal waters.

88. ***Panna microdon*** (Bleeker, 1849) (Fig. 53)
(Panna croaker)

1849. *Otolithus microdon* Bleeker, *Verh. Batav. Genoot. Kunst. Wet.*, **22**(4): 10.

1984. *Pama microdon*: Talwar and Kacker, *Commercial Sea Fishes of India*: 666, fig. 268.

1995. *Pama microdon*: Talwar, *Fauna of India: Sciaenidae*: 31, fig. 7.

Material examined: 2 exs., 120 mm, 28.02.2010, Regd. No. F/7162.

Diagnostic features: Body slender, head cavernous, mouth large, upper jaw extending beyond hind margin of eye; body depth 19.8 to 26.0 in standard length; 10 to 12 gillrakers on lower arm of firsh arch; 92 to 95 lateral line scales; ventral fin with a short white filament; gasbladder carrot shaped with a pair of tubular appendages. Body browinish, lighter on flanks and belly; fins yellow, two-thirds of spinous dorsal dusky.

Distribution: India: East and wst coasts. *Elsewhere*: Sri Lanka, Myanmar, Malay Peninsula, Sumatra to South China Sea.

Remarks: Inhabits shallow coastal wters and enters estuaries.

89. ***Pennahia aenus*** (Bloch, 1794)
(Big-eye croaker)

1793. *Johnius aenus* Bloch, *Ausland nat. Fische.*, **7**: 135, pl. 357.

1850. *Otolithus macrophthalmus* Bleeker, *Verh. Batav. Genoot. Kunst. Wet.*, **23**: 16.

1984. *Pennahia macrophthalmus*: Talwar and Kacker, *Commercial Sea Fishes of India*: 669, fig. 270.

1995. *Pennahia macrophthalmus*: Talwar, *Fauna of India: Sciaenidae*: 37, fig. 9.

Material examined: 1 ex., 143 mm, 14.12.2008, Reg. No. F/6786.

Diagnostic features: Small and deep bodied fish, mouth large and terminal; lower jaw projecting when mouth is opening; body depth 28 to 32 in standard length; 8 to 11 gillrakers on lower arm of first arch; caudal fin truncate; 52 to 54 lateral line scales; gasbladder with 18 to 21 pairs of arborescent appendages. Body grey, flanks and belly silvery; upper part of spinous dorsal fin dusky; dusky blotch on pectoral fin axil.

Distribution: India: East and west coasts. Elsewhere: Pakistan, Sri Lanka, through East Indies to China and Philippines.

Remarks: Inhabits coastal waters and enters estuaries.

90. ***Pterotolithus maculatus*** (Kuhl & van Hasselt, 1830) (Fig. 54)
(Blotched tiger-toothed croaker)

1830. *Otolithus maculatus* Kuhl and van Hasselt in: Cuvier, *Hist. nat. Poiss.*, **5**: 64.

1984. *Pterotolithus maculatus*: Talwar and Kacker, *Commercial Sea Fishes of India*: 673, fig. 272.

1995. *Pennahia macrophthalmus*: Talwar, *Fauna of India: Sciaenidae*: 64, fig. 18.

Material examined: 2 exs., 217 and 238 mm, 14.12.2008, Regd. No. F/6266; 1 ex., 200 mm, 14.12.2008, Regd. No. F/6776.

Diagnostic features: Body slender, head profile low and horizontal; mouth large and strongly oblique, lower jaw srongly prjecting; a pair of strong canines at tip of each jaw; 9 to 12 gillrakers on lower arm of first arch; gasbladder with 37 to 53 pairs of arborescent appendages; caudal fin rhomboid. Body grey above, silvery on flanks and belly; 3 or 4 rows of black blotches on upper part of body; dorsal fin with black patches.

Distribution: India: Bay of Bengal. *Elsewhere*: Sri Lanka to Borneo.

Remarks: Inhabits shallow coastal waters and estuaries. Minor fishery value.

Family MULLIDAE

91. ***Upeneus sulphureus*** Cuvier, 1829 (Fig. 55)
(Yellow-goatfish)

1829. *Upeneus sulphureus* Cuvier, *Hist. nat. Poiss.*, **3**: 450.

1984. *Upeneus sulphureus*: Talwar and Kacker, *Commercial Sea Fishes of India*: 685, fig. 278.

Material examined: 1 ex., 110 mm, 14.12.2008, Regd. No. F/6783.

Diagnostic features: Body elongate with two thin barbels; 5 rows of scales between two dorsal fins; 12 vertical scale rows along upper part of caudal peduncle. Body and head reddish, back greenish and bellow yellow; 2 lemon yellow longitudinal bands along sides; dorsal fin with three horizontal stripes; no marks on anal and caudal fins.

Distribution: India: East and west coasts and A & N Islands. *Elsewhere*: East Africa to southeast Asia, north to China, south to northern Australia and Fiji.

Remarks: Inhabits marine and brackish waters. Common in estuaries. Only minor commercial value.

Family SCATOPHAGIDAE

92. ***Scatophagus argus*** (Linnaeus, 1766) (Fig. 56)

(Spotted butterfish)

1766. *Chaetodon argus* Linnaeus, *Systema Naturae*, ed. 12, **1**: 464.

1984. *Scatophagus argus*: Talwar and Kacker, *Commercial Sea Fishes of India*: 704, fig. 286.

Material examined: 2 exs., 60 mm, 25.06.2008, Regd. No. F/7200; 1 ex., 75 mm, 14.12.2008, Regd. No. F/6272.

Diagnostic features: Body deep and angular, compressed; head bluntly pointed and triangular; mouth small, not protrusible; dorsal fin notched, fin spines strong. Body greenish-grey with numerous irregular large round brown spots may extend on to dorsal fin; belly silvery.

Distribution: India: East and west coasts. *Elsewhere*: Kuwait to Fiji, Sri Lanka, through East Indies to China, southern Japan to New Caledonia. Reported from Samoa, Tonga, and the Society Islands.

Remarks: Inhabits freshwater; brackish and marine waters. Ornamental fish.

Family DREPANIDAE

93. ***Drepane longimana*** (Bloch & Schneider, 1801)

(Banded drepane)

1801. *Chaetodon longimanus* Bloch and Schneider, *Syst. Ichth.*, 229.

1984. *Drepane longimana*: Talwar and Kacker, *Commercial Sea Fishes of India*: 697.

Material examined: 1 ex., 72 mm, 14.12.2008, Regd. No. F/6788.

Diagnostic features: Body deep and strongly cmpressed; mouth protractile; fringe of 4 to 10 short cirri on chin; dorsal fin with 8 spines, the third spine longest. Body silvery with 4 to 9 vertical grey bars on upper half of sides.

Distribution: India: East and west coasts. *Elsewhere*: East coast of Africa, Red Sea to Japan, New Guinea and Samoa.

Remarks: Inhabits coastal waters and enters estuaries. Minor fishery value.

Family NANDIDAE

94. ***Nandus nandus*** (Hamilton, 1822) (Fig. 57)

(Gangetic leaffish)

1822. *Coius nandus* Hamilton, *Fishes of Ganges*: 96, 370, pl. 30, fig. 32.

1991. *Nandus nadus*: Talwar and Jhingran, *Inland Fishes of India and Adjacent countries*, **2**: 878, fig. 265.

Material examined: 1 ex., 95 mm, 13.12.2008, Regd. No. F/6262.

Diagnostic features: Body blong and compressed, head large, snout pointed; mouth terminal and srongly protractile; opercle with one spine; lateral line interrupted with 46 to 57 scales; caudal fin rounded. Body greenish brown wih black bands and blotches; narrow dark bands radiate from eye; soft dorsal, anal and caudal fins with bands of spots.

Distribution: India: Throughout. *Elsewhere*: Pakistan, Nepal, Bangladesh, Myanmar, and Thailand.

Remarks: Rivers, lakes, creeks, also enter low saline areas of estuaries. Commercially important fish.

Family SPHYRAENIDAE

95. ***Sphyraena barracuda*** (Walbaum, 1792) (Fig. 61)

(Great barracuda)

1792. *Esox barracuda* Walbaum, *Ichthyologie*, (3): 94.

1984. *Sphyraena barracuda*: Talwar and Kacker, *Commercial Sea Fishes of India*: 737, fig. 298.

Material examined: 1 ex., 380 mm, 03.04.2008, Regd. No. F/6775.

Diagnostic features: Body elongate, head large with pointed snout; edge of preoperculum rounded, no produced flap; no gill rakers; lateral line with 75 to 90 pored scales. Body steel grey above, silvery below with 18 to 20 inky blotches on posterior part of lower sides.

Distribution: India: East and west coasts. *Elsewhere*: Circum global.

Remarks: Inhabits marine waters and estuaries.

Family POLYNEMIDAE

96. ***Eleutheronema tetradactylum*** (Shaw, 1804) (Fig. 62)

(Four-finger threadfin)

1804. *Polynema tertadactylus* Shaw, *General Zoology*, **5**: 155.

1984. *Eleutheronema tetradactylum*: Talwar and Kacker, *Commercial Sea Fishes of India*: 745, fig. 304.

Material examined: 1 ex., 170 and 140 mm, 25.06.2008, Regd. No. F/7199 & 7182; 1 ex., 110 mm, 18.12.2008, Regd. No. F/6254; 1 ex., 135 mm, 27.02.2010, Regd. No. F/6748; 1 ex., 132 mm, 28.02.2010, Regd. No. F/6738.

Diagnostic features: Body elongate, snout projecting beyond mouth; pectoral fin with 4 free filamentous rays; caudal fin forked. Body silvery green above, yellowish white on sides; dorsal and caudal fins yellowish; anal and ventral fins orange.

Distribution: India: East and west coasts and A & Islands. *Elsewhere*: Pakistan, Sri Lanka, Bangladesh to East Indies and China to Philippines and Queensland.

Remarks: Inhabits marine, brackish and estuarine waters. Commercially important fish.

97. ***Polynemus dubius*** Bleeker, 1854
(Eastern Paradise threadfin)

1854. *Polynemus dubius* Bleeker, *Verh. Batav. Gen.*, **25**:

1916. *Polynemus longipectoralis*: Weber and de Beaufort, *Fishes Indi-Australian Archipelago*, **4**: 213.

1984. *Ploynemus longipectoralis*: Talwar and Jhingren, *Inland fishes of India and adjacent countries*, **2**: 912.

2002. *Polynemus longipectoralis*: Kapoor *et al.*, *Fish biodiversity of India*: 493.

2004. *Polynemus dubius*: Motomura, *Threadfins of the world. FAO Species Catalogue for Fishery Purposes.* No. **3**: 82, fig.138, pl.Vb.

Material examined: 2 exs., 65 and 172 mm, 29.03.2008, Regd. No. F/5829; 1 ex., 220 mm, 22.06.2008, Regd. No. F/7178; 3 exs., 130 to 154 mm, 27.02.2010, Regd. No. F/6755; 1 ex., 145 mm, 28.02.2010, Regd. No. F/6811.

Diagnostic features: Body elongate and slightly compressed; mouth projecting, upper lip absent; pectoral fin with 7 free filamentous rays, the two upper rays reaching far beyond caudal fin tip, but the third filament eaching only to tip of caudal fin; caudal fin deeply forked, the upper lobe longer. Body golden, with a shade of grey along back; fins greyish.

Distribution: India: East and west coasts. *Elsewhere*: Malay Peninsula, Sumatra and Kalimantan.

Remarks: Shallow coastal waters and estuaries, also enters rivers. Commercially important fish.

98. ***Polynemus paradiseus*** Linnaeus, 1758 (Fig. 63)
(Paradise threadfin)

1758. *Ploynemus paradiseus* Linnaeus, *Systema Naturae*, ed.10, **1**: 317.

1984. *Ploynemus paradiseus*: Talwar and Kacker, *Commercial Sea Fishes of India*: 911.

Material examined: 1 ex., 170 mm, 14.12.2008, Regd. No. F/6255; 1 ex., 204 mm, 16.12.2008, Regd. No. F/6257; 2 exs., 198 and 203 mm, 19.12.2008, Regd. No. F/6256; 1 ex., 190 mm, 20.12.2008, Regd. No. F/6253.

Diagnostic features: Body eongate and slightly compressed; lower 7 pectoral fin rays free and filamentous, upper three filamentous rays extending far beyond caudal fin tip; caudal fin forked, the upper lobe longer. Body golden with a shade of grey along back.

Distribution: India: East and west coasts. Elsewhere: Indian coasts to Thailand.

Remarks: Inhabits marine waters and estuaries, enter freshwater also. Commercially important fish.

Family KURTIDAE

99. ***Kurtus indicus*** Bloch, (Fig. 64)

(Indian humphead)

1786. *Kurtus indicus* Bloch, *Nat. ausland Fische.*, (**2**): 122.

1984. *Kurtus indicus*: Talwar and Kacker, *Commercial Sea Fishes of India*: 761, fig. 311.

1991. *Kurtus indicus*: Talwar and Jhingran, *Inland Fishes of India and Adjacent countries*, **2**: 990.

Material examined: 1 ex., 96 mm, 28.03.2008, Regd. No. F/5912.

Diagnostic features: Body compressed, back elevated; preoperculum with 4 spines at its angle, operculum paper-like; dorsal fin with 5 rudimentary spines preceded by a recumbent spine directed anteriorly; scales very small, head naked except opercle and preopercle; males with a prominent hook on occiput. Body silvery with steel blue, back with fine black dots.

Distribution: India: East and west coasts. *Elsewhere*: China, Indonesia and the Indo-Malay region.

Remarks: Inhabits coastal waters and frequently enters estuaries. Minor commercial value.

Family TRICHIURIDAE

100. ***Eupleurogrammus muticus*** (Gray, 1831)

(Gray's ribbonfish)

1831. *Trichiurus muticus* Gray, *Zool. Misc.*, **1**; 10.

1984. *Eupleurogrammus muticus*: Talwar and Kacker, *Commercial Sea Fishes of India*: 784, fig. 318.

Material examined: 4 exs., 215 to 293 mm, 28.03.2008, Regd. No. F/5906.

Diagnostic features: Body very elongate and ribbon-like, tapering to point; mouth large with fang-like teeth;lateral line gently sloping from upper angle of perculum to

tip of tail; dorsal fin 139 to 147 rays; anal fin origin below 38th to 43rd soft rays of dorsal fin; anal fin rays reduced to separate spines, almost burried in flesh; ventral fins reduced to a wing like structures; no caudal fin. Body steel blue.

Distribution: India: East and west coasts. *Elsewhere*: Persian Gulf, Sri Lanka, Malaysia, Indonesia, Gulf of Thailand, China and southern Korean Peninsula.

Remarks: Inhabits coastal waters and estuaries. Commercially important fish.

101. ***Lepturacanthus savala*** (Cuvier, 1829) (Fig. 65)
(Small-headed ribbonfish)

1829. *Trichiurus savala* Cuvier, *Regne. Animal.*, **2**: 219.

1984. *Lepturacanthus savala*: Talwar and Kacker, *Commercial Sea Fishes of India*: 784, fig. 318.

Material examined: 3 exs., 220 to 320 mm, 28.03.2008, Regd. No. F/6764; 4 exs., 342 mm, 31.03.2008, Regd. No. F/5809; 1 ex., 390 mm, 14.12.2008, Regd. No. F/6780; 1 ex., 390 m, 28.02.2010, Regd. No. F/6733; 1 ex., 410 mm, 29.02.2010, , Regd. No. F/6713.

Diagnostic features: Body elongate and ribbon-like and tapering to a point; lateral line abruptly descending from upper angle of oprculum and running along lower half of body; dorsal fin with 110 to 117 rays; anal fin reduced to a series of visible spines; ventral and caudal fins absent. Body steel-blue with metallic reflections.

Distribution: India: East and west coasts. Elsewhere: Sri Lanka to Southeast Asia, north to China, and south to New Guinea and northern Australia.

Remarks: Inhabits coastal waters and often enters estuaries. Commercially important fish.

Family STROMATEIDAE

102. ***Pampus argenteus*** (Euphrasen, 1788) (Fig. 66)
(Silver pomfret)

1788. *Stromateus argenteus* Euphrasen, Kongal. Vetensk. *Acad. Handl. Stockholm*, **9**: 49.

1984. *Pampus argenteus*: Talwar and Kacker, *Commercial Sea Fishes of India*: 837, fig. 344.

Material examined: 1 ex., 83 mm (Young), 28.03.2008, Regd. No. F/5903; 1 ex., 104 mm 28.03.2008, Regd. No. F/5821.

Diagnostic features: Body very deep and compressed; eyes with feeble adipose lid; single dorsal fin; dorsal and anal fins falcate and preceded by a series of 5 to 10 blade-like spines; no ventral fins; caudal fin deeply forked, the lower lobe longer. Body grey, silvery, white ventrally; dorsal, anal and caudal fins with dark edges.

Distribution: India: East and west coasts. *Elsewhere*: Persian Gulf to Indonesia, north to Japan.

Remarks: Inhabits coastal muddy bottoms and estuaries. Commercially important fish.

103. ***Pampus chinensis*** (Euphrasen, 1788) (fig. 67)
(Chinese pomfret)

1788. *Stromateus chinensis* Euphrasen, *Kongal. Vetensk. Acad. Handl. Stockholm*, **9**: 53, fig. 9.

1984. *Pampus chinensis*: Talwar and Kacker, *Commercial Sea Fishes of India*: 838, fig. 345.

Material examined: 1 ex., 85 mm (Young), 28.03.2008, Regd. No. F/5904; 1 ex., 90 mm 28.03.2008, Regd. No. F/5822; 4 exs., 63 to 116 mm, 29.02.2010, Regd. No. F/6707.

Diagnostic features: Body very deep and compressed; eyes with feeble adipose lid; single dorsal fin; dorsal and anal fins not falcate, no spines before median fins; no ventral fins; caudal fin forked, emarginate in young. Body grey, silvery white ventrally; find dusky.

Distribution: India: East and west coasts. *Elsewhere*: Persian Gulf to eastern Indonesia, north to Japan.

Remarks: Inhabits shallow coastal muddy bottoms and estuaries. Commercially important fish.

Order: BATRACHOIDIFORMES
Family BATRACHOIDIDAE
104. ***Allenbatrachus grunnien***s (Linnaeus, 1758) (Fig. 68)
(Gangetic toad fish)

1758. *Cottus grunniens* Linnaeus, *Ststema Naturae* (ed.10), **1**: 1209.

1970. *Halophryne gangene*: Nagabushanan and Rao, *J. Bombay nat. Hist. Soc.*, **67**: 339.

1991. *Batrichthys grunniens*: Talwar and Jhingran, *Inland Fishes of India and Adjacent countries*, **2**: 727.

Material examined: 1 ex., 120 mm, 26.06.2008, Regd. No. F/7206; 1 ex., 90 mm, 14.12.2008, Regd. No. F/6809; 1 ex., 280 mm, 19.12.2008, Regd. No. F/6797.

Diagnostic features: Body elongate and compressed posteriorly, head and anterior part of body depressed; mouth large; eyes superior; head with tentacles; longitudinal rows of small, paired tentacles along back and belly; gill-openings a vertical slit before base of pectoral; no pectoral axillary pocket; spinous dorsal fin covered by thick skin; ventral fin with one spine and two soft rays. Body reddish brown, marbled darker.

Distribution: India: East coast of India. Elsewhere: Myanmar, Singapore and Philippines.

Remarks: Inhabits coastal marine waters and estuaries.

Family GOBIIDAE

105. ***Glossogobius giuris*** (Hamilton, 1822) (Fig. 69)

(Tank goby)

1822. *Gobius giuris* Hamilton, *Fishes of Ganges* : 51, pl. 33, fig. 15.

1986. *Glossogobius giuris*: Hoese, In : *Smith's Sea Fishes*: 790, fig. 240. 44.

2000. *Glossogobius giuris*: Rao et al., *Rec. zool. Surv. India, Occ. Paper* No. **178**: 301.

Material examined: 1 ex., 120 mm, 26.06.2008, Regd. No. F/7195.

Diagnostic features: Snout elongate, head depressed, gill opening from below rear of pre-opercle to below eye; ventral fins form a disc; pre-dorsal scales 15 to 19 reaching to eye; lateral scale series 29 to 33. Body pale with small spots forming longitudinal stripes, sides with 5 or 6 large dark blotches.

Distribution: India: East and west coasts including A & N Islands. *Elsewhere*: Red Sea, east coast of Africa to south China.

Remarks: Inhabits primarily freshwater, most common in estuaries also found along coastal waters. Aquarium pet.

106. ***Caragobius urolepis*** (Bleeker, 1852)

(Scaleless worm goby)

1852. *Amblyopus urolepis* Bleeker, *Nat. Tijdschr. Ned.-Indie*, **3**: 581.

1991. *Brachyamblyopus urolepis*: Talwar and Jhingran, *Inland Fishes of India and Adjacent countries*, **2**: 982.

2002. *Brachyamblyopus urolepis*: Kapoor et al., *Fish biodiversity of India*: 598.

2003. *Caragobius urolepis*: Murdy and Shibukawa, *Zootaxa*, **301**: 1-12.

Material examined: 1 ex., 74 & 200 mm, 25.06.2008, Regd. No. F/7192 & 7205.

Diagnostic features: Body elongate, eel-like and compressed; head sub-cylindrical; eyes small; mouth oblique; teeth on lower jaw multiserial, upper jaw biserial; no barbels on chin; scales developed on caudal part only; pectoral fins short and rounded; dorsal and anal fins confluent with caudal; caudal fin pointed and long. Body yellowish-green; flanks and belly speckled with brown spots; eyes black.

Distribution: India: Throughout including A & N Islands. *Elsewhere*: Indonesia, Thailand, Philippines, Australia, Papua New Guin and Ryukyu Islands.

Remarks: Inhabits rivers and estuaries. No comercial value.

107. ***Taenioides anguillaris*** (Linnaeus, 1758) (Fig. 70)

(Eel worm goby)

1758. *Gobius anguillaris* Linnaeus, *Systema Naturae*, ed.10, **1**: 264.

1991. *Taenioides anguillaris*: Talwar and Jhingran, *Inland Fishes of India and Adjacent countries*, **2**: 984.

Material examined: 3 ex., 72 to134 mm, 19.12.2008, Regd. No. F/6276.

Diagnostic features: Body very elongate and compressed; head sub-cylindrical; eyes minute; mouth vertical; chin with three pairs of small barbels; upper jaw with 6 or 7 and lower jaw with 4 or 5 canine teeth on each side; dorsal fin with 32 or 33 rays; dorsal and anal fin confluent with caudal fin; caudal fin pointed. Body and vertical fins yellowish; caudal fin pinkish.

Distribution: India: Throughout. *Elsewhere*: Malaysia, Indonesia, Papua New Guinea and China.

Remarks: Inhabits shallow coastal waters, rivers and estuaries. Trash fish.

108. ***Taenioides buchanai*** (Day, 1873) (Fig. 71)
(Burmese gobyeel)

1873. *Amblyopus buchanani* Day, *Proc. Zool. Soc., Lond.* : 110.

1991. *Taenioides buchanani*: Talwar and Jhingran, *Inland Fishes of India and Adjacent countries*, **2**: 985.

Material examined: 1 ex., 300 mm, 03.04.2008, Regd. No. F/6771; 1 ex., 112 mm, 19.12.2008, Regd. No. F/6275; 1 ex., 234 mm, 29.02.2010, Regd. No. F/6710; 1 ex., 283 mm, 03.03.2010, Regd. No. F/6722.

Diagnostic features: Body long and sub-cylindrical; lower jaw prominent, eyes small and distinct; posterior nostrils opens just before eyes, the anterior tubular nostrils close to the front edge of snout; a minute pair of barbels below the symphysis of lower jaw, and still a small pair behind them; 5 canines on each side of jaw; caudal fin elongate and poined. Body olive brown, reddish inferiorly; pectoral and ventral fins yellowish; dorsal and anal fins blackish.

Distribution: India: East coast. *Elsewhere*: Myanmar. Reported from Bangladesh.

Remarks: Inhabits rivers and estuaries. Trash fish.

109. ***Taenioides cirratus*** (Blyth, 1860)
(Bearded worm goby)

1860. *Amblyopus cirratus* Blyth, *J. Asiat. Soc. Beng.*, **29**: 147.

1991. *Taenioides cirratus*: Talwar and Jhingran, *Inland Fishes of India and Adjacent countries*, **2**: 985.

2000. *Taenioides cirratus*: Rao *et al., Rec. zool. Surv. India, Occ. Paper* No. **178**: 311.

Material examined: 1 ex., 157 mm, 19.12.2008, Regd. No. F/6274; 3 exs., 190 to 340 mm, 26.06.2008, Regd. No. F/7207; 1 ex., 142 mm, 27.02.2010, Regd. No. F/6753.

Diagnostic features: Body elongate and sub-cylindrical; a row of three short barbels on each side of chin; upper jaw with 5 and lower jaw with 4 canine teeth on each side; dorsal and anal fins separatede from caudal by a deep notch; pectoral fins small, caudal fin rhomboidal. Body uniform grey.

Distribution: India: East and west coasts icluding A & N Islands. *Elsewhere*: East Africa to Japan, South Korea, Bangladesh, New Guinea and New Caledonia.

Remarks: Inhabits coastal waters, estuaries and rivers. Trashfish.

110. ***Trypauchen vagina*** (Bloch & Schneider, 1801)
(Burrowing gobyeel)

1801. *Gobius vagina* Bloch and Schneider, *Syst. Ichth.*, : 73.

1991. *Trypauchen vagina*: Talwar and Jhingran, *Inland Fishes of India and Adjacent countries*, **2**: 988.

2006. *Trypauchen vagina* Murdy, *Zootaxa*, **1343**: 61; fig. 1-5; tab. 1-2.

Material examined: 1 ex., 137 mm, 27.02.210; Regd. No. F/6746; 1 ex., 139 mm, 27.02.2010, Regd. No. F/6754; 2 exs., 40 & 125 mm, 28.02.2010, Regd. No. F/6732; 2 exs., 124 mm, 29.02.2010, Regd. No. F/6709.

Diagnostic features: Body elongate, eel-like and compresed; head compressed with a bony median crest on occiput; mouth oblique with strongly caninoid teeth, eyes minute; ventral fins small and completely united, forming a funnel-shaped disc; dorsal and anal fins confluent with caudal; caudal fin small and poined; body scales small. Body pinky-white; eyes blackish; fin margins grey.

Distribution: India: East and west coasts. *Elsewherer*: Malay Archipelago to China; the Philippines; New Caledonia. Reported from South Africa.

Remarks: Inhabits coastal waters and estuaries.

111. ***Stigmatogobius sadanundio*** (Hamilton, 1822) (Fig. 72)

1822. *Gobius sadanundio* Hamilton, *Fishes of Ganges*: 52, 366.

2000. *Stigmatogobius sadanundio*: Rao *et al.*, *Rec. zool. Surv. India, Occ. Paper* No. **178**: 311.

Material examined: 3 exs., 55 to 58 mm, 19.12.2008, Regd. No. F/6805; 1 ex., 62 mm, 28.02.2010, Regd. No. F/6745.

Diagnostic features: Small fishes, head sub-cylindrical; lower jaw prominent; interorbital broader than eye diameter; interobital and post-orbital pores, preopercular pores; 8 to 10 preorbital scales, reaching behind eyes; 25 to 28 lateral scale series; caudal fin rounded. Body olive green with black spots in two rows on sides; a black blotch between 3rd and 6th dorsal spines.

Distribution: India: East and west coasts including A & Islands. *Elsewhere*: Sri Lanka, Bangladesh, Indonesia to the Philippines.

Remarks: Inhabits coastal waters and estuaries.

Family ELEOTRIDAE

112. ***Butis butis*** (Hamilton, 1822) (Fig. 73)

(Duckbill sleeper)

1822. *Cheilodipterus butis* Hamilton, *Fishes of Ganges*: 57, 367.

1984. *Butis butis*: Talwar and Kacker, *Commercial Sea Fishes of India*: 973, fig. 280.

1986. *Butis butis*: Hoese, In : *Smith's Sea Fishes*: 808, fig. 241.1.

2000. *Butis butis*: Rao *et al., Rec. zool. Surv. India, Occ. Paper* No. **178**: 291.

Material examined: 1 ex., 102 mm, 20.12.2008, Regd. No. F/6270.

Diagnostic features: Body depth 5.0 to 6.0 in standard length; head depressed, with bony serrations above each eye; head, cheeks and opercle scaled; maxilla extends up to below front edge of eye; lateral scale series 28 to 30, predorsal scales 20 to 25; caudal fin emarginate. Body dark with longitudinal lines; caudal fin dark with a light margin dorsally; base of pectoral fin with 1 or 2 black spots.

Distribution: India: East and west coasts and A & N Islands. *Elsewhere*: East Africa to Fiji.

Remarks: Primarily inhabits brackishwaters and estuaries. Trash fish.

Family OSPHRONEMIDAE

113. ***Trichogaster fasciata*** Bloch & Schneider, 1801

(Banded gourami)

1801. *Trichogaster fasciata* Bloch and Schneider, *Syst. Ichth.*, : 164, pl. 36.

1999. *Polyacanthus fasciatus*: Menon, *Rec. zool. Surv. India, Occ. Paper* No. **165:** 297.

1999. *Colisa fasciatus*: Jayaram, *Freshwater fishes of Indian Region*: 442.

Material examined: 2 exs., 60 mm, 23.06.2008, Regd. No.F/7198.

Diagnostic features: Body elevated and compressed; mouth upturned; single dorsal fin with 15 to 18 spines, anal fin with 15 to 22 spines; soft part of dorsal and anal fins slightly produced; ventral fin in the form of single elongate filiform ray with rudimentary spine; caudal fin cut square. Body with 14 or more oblique bands.

Distribution: India: Throughout. *Elsewhere*: Pakistan, Nepal, Bangladesh and Myanmar.

Remarks: Inhabits freshwater rivers, lakes and estuaries.

Family CHANNIDAE

114. ***Channa punctata*** (Bloch & Schneider, 1801)

(Spotted snakehead)

1801. *Ophiocephalus punctatus* Bloch and Schneider, *Syst. Ichth.*, : 296, pl. 90, fig. 2.

1991. *Channa punctatus*: Talwar and Jhingran, *Inland Fishes of India and Adjacent countries*, **2**: 1020.

2000. *Channa punctatus*: Rao *et al.*, *Rec. zool. Surv. India, Occ. Paper* No. **178**: 327.

Material examined: 1 ex., 153 mm, 22.06.2008, Regd. No. F/7174.

Diagnostic features: Body elongate, sub-cylindrical anteriorly; head large, depressed with plate like scales; 4 or 5 scals between orbit and angle of preopercle; 12 or 13 predorsal scales; dorsal fin long, inserted above pectorals; caudal fin rounded; ventral fins more than half length of pectoral fins. Upper side of body and flanks dark green, ventral side pale yellow; several dark blotches on sides; pectoral fins plain, no spots or bands.

Distribution: India: Throughout including A & N Islands. *Elsewhere*: Afghanistan, Pakistan, Sri Lanka, Nepal, Bangladesh, Myanmar, China and Polynesia.

Remarks: Inhabits fresh water and also enters estuaries of low salinity areas.

115. ***Channa striata*** (Bloch, 1785) (Fig. 74)

(Striped snakehead)

1785. *Ophiocephalus striatus* Bloch, *Ichthyologiae, Berlin*: 359.

1999. *Channa striata*, Jayaram, *Freshwater fishes of India Region*: 446.

Material examined: 2 exs., 169 mm, 23.06.2008, Regd. No. F/7199a.

Diagnostic features: Body subcylidrical; head large, depressed with plate like scales; 18 to 20 predorsal scales; lateral line with 58 to 60 scals; a row of 9 scales between orbit and angle of pre-opercle. Body greyish dorsally, yellowish white sides and belly; cheeks and lower surface of mouth spotted with gray or black; transverse narrow bands of black descend from sides to the abdomen; fins greyish.

Distribution: India: Throughout. *Elsewhere*: Pakistan, Sri Lanka, Bangladesh to China, Philippines and Thailand.

Remarks: Inhabits fresh and brackish waters. Most common murrel of Odisha. Important food fish.

Order PLEURONECTIFORMES

Family SOLEIDAE

116. ***Brachirus orientalis*** (Bloch & Schneider, 1801) (Fig. 75)

(Oriental sole)

1801. *Pleuronectes orientalis* Bloch and Schneider, *Syst. Ichthyol.*: 157.

1984. *Brachirus orientalis*: Talwar and Kacker, *Commercial Sea Fishes of India*: 861, fig. 355.

2002. *Brachirus orientalis* : Kapoor *et al.*, *Fish biodiversity of India*: 676.

Material examined: 1ex., 78 mm, 16.12.2008, Regd. No. F/6305; 2 exs., 95 to 120 mm, 19.12.2008, Regd. No. F/6306; 3 exs., 143 to 193 mm, 27.02.2010, Regd. No. F/6749; 1 ex., 230 mm, 29.02.2010, Regd. No. F/6702

Diagnostic features: Body oblong and leaf-like, mouth small, its cleft extending to below middle of eye; lower lip feebly fringed; pectoral fins well developed; ventral fins united basally; scals ctenoid on both sides; dorsal and anal fins confluent with caudal. Body brown with indistinct patches on eye side, tinged yellow on blind side; right pectoral fin black.

Distribution: India: East and west coasts. *Elsewhere*: Red Sea and Persian Gulf, Sri Lanka, eastward through the Malay Peninsula and to China and northern Australia.

Remarks: Shallow coastal waters and estuaries. Minor commercial value.

117. ***Synaptura commersonnii*** (Lacepede, 1802)
(Commerson's sole)

1802. *Pleuronectes commersonianus* Lacepede, *Hist. nat. Poiss.*, **3**: pl. 12, fig. 2.

1984. *Synaptura commersoniana*: Talwar and Kacker, *Commercial Sea Fishes of India*: 867, fig. 357.

Material examined: 1 ex., 110 mm, 14.12.2008, Regd. No. F/6779; 1 ex., 185 mm, 27.02.2010, Regd. No. F/6750; 1 ex., 235 mm, 29.02.2010, Regd. No. F/6703.

Diagnostic features: Body flat and elongate, broad anteriorly and tapering posteriorly; anterior part of snout with bony process; lower lip fringed; pectoral and ventral fins present; ventral fins connected to anal fin; scales ctenoid on both sides; scales on head and nape of ocular side larger than those on body; no tentacle between the nostrils. Body grey-brown on ocular side; dorsal and anal fin with white margin; right pectoral fin dusky.

Distribution: India: East and west coasts: *Elsewhere*: Widely distributed in Indo-West Pacific.

Remarks: Inhabits coastal waters and estuaries. Minor fishery value.

Family CYNOGLOSSIDAE

118. ***Cynoglossus arel*** (Schneider, 1801)
(Large-scale tongue-sole)

1801. *Pleuronectes arel* Schneider, *Syst. Ichth. Bloch,*: 159.

1984. *Cynoglossus arel*: Talwar and Kacker, *Commercial Sea Fishes of India*: 873, fig. 359.

Material examined: 4 exs., 185 to 235 mm, 14.12.2008, Regd. No. F/6777; 1 ex., 330 mm, 27.02.2010, Regd. No. F/6751; 1 ex., 352 mm, 03.03.2010, Regd. No. F/6728.

Diagnostic features: Body flat and elongate; anterior nosrils tubular in front of lower eye; rostral hook short; two lateral lines on ocular side; median lateral line with 56 to 70 scales, 7 to 9 scales between two lateral lines; no lateral line on blind side; scales ctenoid on ocular side, cycloid on blind side. Body uniform brown with a dark patch on gill cover; blind side white.

Distribution: India: East and west coasts. *Elsewhere*: Persian Gulf to East Indies, the Philiipines and Taiwan.

Remarks: Inhabits coastal waters and estuaries. Minor fishery value.

119. ***Cynoglossus bilineatus*** (Lacepede, 1802)
(Four-lined tongue-sole)

1802. *Achirus bilineatus* Lacepede, *Hist. nat. Poiss.*, **4**: 659, 663.

1984. *Cynoglossus bilinaetus*: Talwar and Kacker, *Commercial Sea Fishes of India*: 874, fig. 360.

Material examined: 1 ex., 236 mm, 28.02.2010, Regd. No. F/6740; 1 ex., 182 mm, 03.03.2010, Regd. No. F/6727.

Diagnostic features: Body elongate and flat; anterior nosrils tubular in front of lower eye; snout rounded, rostral hook small; two lateral lines on ocular side; median lateral line with 88 to 96 scales, 13 to 16 scales between two lateral lines; two lateral lines on blind side; scales ctenoid on ocular side, cycloid on blind side. Body brown with a irregular dark blotch on gill cover; blind side white.

Distribution: India: East and west coasts. *Elsewhere*: Pakistan to New Guinea, Queensland, Taiwan and Japan.

Remarks: Inhabits coastal waters and estuaries. Minor fishery value.

120. ***Cynoglossus lingua*** Hamilton, 1822
(Long tongue-sole)

1822. *Cynoglossus lingua* Hamilton, *Fishes of Ganges*: 32.

1984. *Cynoglossus lingua*: Talwar and Kacker, *Commercial Sea Fishes of India*: 880, fig. 365.

Material examined: 1 ex., 155 mm, 30.03.2008, Regd. No.F/5813; 1 ex., 180 mm, 19.12.2008, Regd. No. F/6798; 1 ex., 340 mm, 26.02.2010, Regd. No. F/6717; 1 ex., 320 mm, 29.02.2010, Regd. No. F/6716.

Diagnostic features: Bogy flat and very elongate; snout obtusely pointed; anterior nosrils tubular in front of lower eye; snout obtusely pointed, rostral hook short; two lateral lines on ocular side; median lateral line with 90 to 100 scales, 11 or 12 scales between two lateral lines; no lateral line on blind side; scales ctenoid on ocular side,

cycloid on blind side. Body reddish brown with irregular brownish black patches, dark black patch on gill cover; blind side white.

Distribution: India: East and west coasts. *Elsewhere*: Red Sea, Pakistan, to the Malay Archipelago including Thailand, Viet Nam, the Philippines and Indonesia.

Remarks: Inhabits shallow coastal waters and estuaries. Minor commercial value.

121. ***Cynoglossus puncticeps*** (Richardson, 1846) (Fig. 76)
(Speckled tounge-sole)

1846. *Plagusia puncticeps* Richardson, *Rep. Br. Assoc. Adv. Sci.*: 280.

1984. *Plagusia puncticeps* : Talwar and Kacker, *Commercial Sea Fishes of India*: 882, fig. 367.

Material examined: 3 exs., 60 to 78 mm, 19.12.2008, Regd. No. F/6307; 2 exs., 80 mm, 27.02.2010, Regd. No. F/6747.

Diagnostic features: Bogy flat and elongate; snout obtusely pointed; anterior nosrils tubular in front of lower eye; snout obtusely pointed, rostral hook short; two lateral lines on ocular side; medin lateral line with 78 to 99 scales, 15 or 19 scales between lateral lines. Body yellowish brown with distinct irregular dark brown blotches, often foming irregular cross-bars; blind side white.

Distribution: India: East and west coasts. *Elsewhere*: Through East Indies to Philippines and Taiwan and south to Australia.

Remarks: Inhabits shallow coastal waters and estuaries. No commercial value.

122. ***Paraplagusia bilineat***a (Bloch, 1787) (Fig. 77)
(Doubl lined tonguesole)

1787. *Pleuronectes bilineata* Bloch, *Nat. ausland. Fische*, **3**: 29, pl. 188.

1984. *Paraplagusia bilineata* : Talwar and Kacker, *Commercial Sea Fishes of India*: 885, fig. 368.

Material examined: 2 exs., 142 and 150 mm, 28.03.2008, Regd. No. F/5830; 1 ex., 214 mm, 14.12.2008, Regd. No. F/6308.

Diagnostic features: Body long and flat; dorsal and anal fins confluent with caudal fin; snout rounded, rostral hook long, extending beyond lower eye; two or three lateral lines on ocular side, no lateral line on blind side; scales ctenoid on both sides; 16 to 19 scales between upper and middle lateral lines; dorsal fin with 110 to 114 rays. Body brownish with spotted or marbled with dark patches; blind side tinged with yellow.

Distribution: India: East and west coasts. *Elsewhere*: Red Sea and east coast of Africa to the Philippines, north to southern Japan, south to New Guinea and northeastern Australia.

Remarks: Inhabits shallow coastal waters and estuaries. Minor commercial value.

123. ***Paraplagusia blochii*** (Bleeker, 1851)
(Blotche's tongue-sole)

1851. *Plagusia blochii* Bleeker, *Nat. Tijdschr. Ned.-Indie.*, **1**: 411.

1984. *Paraplagusia blochii* : Talwar and Kacker, *Commercial Sea Fishes of India*: 886.

Material examined: 1 ex., 176 mm, 28.03.2008, Regd. No. F/5824; 1 ex., 169 mm, 14.12.2008, Regd. No. F/6778.

Diagnostic features: Body long and flat; dorsal and anal fins confluent with caudal fin; snout rounded, rostral hook short, not extending beyond posterior part of lower eye; two lateral lines on ocular side, no lateral line on blind side; scales ctenoid on both sides; 13 to 15 scales between upper and middle lateral lines; dorsal fin with 77 to 94 rays. Body brownish, blind side tinged with yellow.

Distribution: India: East and west coasts. *Elsewhere*: Southern Oman to Papua New Guinea, north to Taiwan and Japan.

Remarks: Inhabits marine and estuarine waters. Minor commercial value.

Order TETRADONTIFORMES
Family TETRAODONTIDAE
124. ***Chelonodon patoca*** (Hamilton, 1822) (Fig. 78)
(Marbled puffer)

1822. *Tetrodon patoca* Hamilton, *Fishes of Ganges*: 7.

1986. *Chelonodon patoca*: Smith and Heemstra, *Smith's Sea fishes* : 901.

1991. *Chelonodon patoca*: Talwar and Jhingran, *Inland Fishes of India and Adjacent countries*, **2**: 1057.

2000. *Chelonodon patoca*: Rao *et al.*, *Rec. zool. Surv. India, Occ. Paper* No. **178**: 350.

Material examined: 2 exs., 135 & 170 mm, 21.06.2008, Regd. No. F/7179.

Diagnostic features: Body robust, spinules on back from behind inter-orbital to dorsal fin, on throat and abdomen; nasal organ a depression with a low rim and flap; gill openings not reaching below middle of pectoral base; caudal fin slightly rounded. Body brownish grey on back with large round to ovate white spots, ventral part white, a broad yellow streak along lower side; three narrow dark bars on back.

Distribution: India: East and west coasts and A & N Islands. *Elsewhere*: East Africa to Admiral islands, north to China and south to northern Australia.

Remarks: Inhabits coastal waters and estuaries. Also enters rivers. Trash fish.

125. ***Lagocephalus lunaris*** (Bloch & Schneider, 1801) (Fig. 79)
(Moontail blaasop)

1801. *Tetrodon lunaris* Bloch and Schneider, *Syst. Ichth.*,: 505.

1986. *Lagocephalus lunaris*: Smith and Heemstra, *Smith's Sea fishes*, : 901.

1991. *Lagocephalus lunaris*: Talwar and Jhingran, *Inland Fishes of India and Adjacent countries*, **2**: 1058.

Material examined: 1 ex., 142 and 238 mm, 14.12.2008, Regd. No. F/6310; 3 exs., 84 to 174 mm, 28.02.2010, Regd. No. F/6734; 1 ex., 140 mm, 29.02.2010, Regd. No. F/6708; 1 ex., 116 mm, 03.03.2010, Regd. No. F/6723.

Diagnostic features: Body elongate, depth 2.9 to 3.4 in standard length; interorbital space shorter than snout; nasal organ coverd by a small sac with two nostrils; dorsal and anal fins pointed; snout, sides and caudal peduncle smooth; spinules on dorsal surface of body extend from nostrils to dorsal origin; caudal fin emarginate. Dorsal surface of head and body greenish, sides silvery white.

Distribution: India: East and west coasts and A & N Islands. *Elswhere*: Red Sea and Persian Gulf to South Africa, Sri Lanka to Japan and Australia.

Remarks: Inhabits shallow coastal waters and estuaries. Aquarium pet. Recently added to the commercial fish list of Odisha.

126. ***Takifugu oblongus*** (Bloch, 1786) (Fig. 80)
(Lattice blaasop)

1786. *Tetrodon oblongus* Bloch, Nat. ausland. Fische, (2): **6**, pl. 146, fig. 1.

1991. *Takifugu oblongus*: Talwar and Jhingran, *Inland Fishes of India and Adjacent countries*, **2**: 1059.

Material examined: 1 ex., 198 mm, 28.03.2008, Regd. No. F/6762; 1 ex., 78 mm, 25.06.2008, Regd. No. F/7202; 1 ex., 196 mm, 14.12.2008, Regd. No. F/6309; 1 ex., 142 mm, 14.12.2008, Regd. No. F/6782; 2 exs., 134 & 186, 28.02.2010, Regd. No. F/6730.

Diagnostic features: interorbital space longer than snout; nasal organ coverd by a small sac with two nostrils; two lateral lines, lower along the ventrolateral part of peduncle on a low skin ridge; belly, top of head and anterior part of back with spinules; caudal fin truncate. Body brownish above with pale spots, yellowish below; narrow dark bars on sides.

Distribution: India: East and west coasts. Elsewhere: South Africa to Indonesia, north to Japan, south to Australia.

Remarks: Inhabits shallow coastal waters and estuaries. Trash fish.

Crustacean fauna

Phylum CRUSTACEA
Class MALACOSTRACA
Order DECAPODA
Suborder DENDROBRANCHIATA
Family PENAEIDAE

1. ***Penaeus (Penaeus) monodon*** Fabricius, 1798 (Fig. 81)

1798. *Penaeus monodon* Fabricius, *Srpp. Ent. Sqst. Hafniae Copenhagen.* 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.* CAS in Mar. biol, Ann. Univ., Parangipettai, India: 36, pt. 29, fig. 4.

2009. *Penaeus (penaeus) monodon*, Rath & Dev Roy, *Estuarine Ecosystem Series* **5**: *Fauna of Krishna Estuary Prawns (Crustacea : Decapoda)* : 85.

Material examined: 9 exs., Chandbali, 22-06-2008, CR-6367; 6 exs., 1 ex., Chandbali, 22-06-2008, CR-6397; Chandbali, 23-06-2008, CR-5982; 1 ex., Aradi, 25-06-2008, CR-6394; 4 exs., Aradi, 26-06-2008, CR-6402; 1 ex., Chandbali, 10-12-2008, CR-7222; 3 exs., Iswarpur, 16-12-2008, CR-7212; 3 exs., Baradia, 19-12-2008, CR-7234.

Mesurements : L- 48.0 - 165.0

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

Remarks: Because of heavy commercial value and continious harvesting the size and its quantity is gradually declining in many places.

2. ***Penaeus (Penaeus) semisulactus*** De Haan, 1844 (Fig.82)

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) semisulacatus*: Paulpandian & Ramasamy, *Guide to the Prawns of Portonove.* CAS in Mar. biol., Ann. Univ, Parangipettai. India: 36 pt. 29, fig. 4.

2009. *Penaeus (Penaeus) semisulacatus*: Rath & Dev Roy, *Estuarine Ecosystem Series* **5**: *Fauna of Krishna Estuary Prawns (Crustacea : Decapoda)* : 85.

Material examined: 1 ex., Chandbali, 03-04-2008, CR-5858.

Mesurements : L- 80.0

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 Pereiopod 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 and concave, posterior process convex and partly inserted between lateral plates.

Distribution: India: East and West coasts. *Elsewhere*: Sri Lanka, Japan, East Africa, Red Sea, Western Madagascar, Mauritius, Philippines, New Guinea, Northern Australia, Korea and Eastern Mediterranean.

Remarks: The common species found along with *Penaeus (Penaeus) monodon* catch. Also commercuially important prawn.

3. ***Penaeus (Fenneropenaeus) indicus*** (H.Milne Edwards, 1837) (Fig. 83)

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.

2009. *Penacus (fenneropenaeus) indicus*: Rath & Dev Roy, *Estuarine Ecosystem Series* **5**: *Fauna of Krishna Estuary Prawns (Crustacea : Decapoda)* : 86.

Material examined: 3 exs, Chandbali, 29-03-2008, CR-6119; 4 ex., Chandbali, 03-04-2008, CR-5859; 1 ex., Chandbali, 23-06-2008, CR-5981; 3 exs., Dhamara, 25-06-2008, CR-6392; 2 exs., Khalakhali, 27-02-2010, CR-7271; 1 ex., Chandinipal, 28-02-2010, CR-7299; 1 ex., New Dhamara, 03-03-2010, CR-6392.

Mesurements : L- 77.0 - 147.0

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 and poserior process vestigial type.

Distribution: India: East and West coasts, Andaman and Nicobar Island, Laksadweep. Elsewhere: Sri Lanka, China, East African coast, Madagascar, Red Sea, Philippines and Northern Australia.

Remarks: It is a common estuarine prawn found almost in all estuaries of India. As it attains a good size it has also got good commercial value.

4. ***Penaeus (Fenneropenaeus) merguiensis*** De Man, 1888 (Fig. 84)

1888. *Penaeus merguiensis*, De man, *J.Linn.Soc.Lond. (zool)*, **22** (140): 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.

2009. *Penaeus (fenneropenaeus) merguiensis*: Rath & Dev Roy, *Estuarine Ecosystem Series* **5**: *Fauna of Krishna Estuary Prawns* (Crustacea : Decapoda) : 87.

Material examined: 3 exs., Dhamara, 25-06-2008, CR-6393; 4 exs., Urabali, 25-06-2008, CR-6441; 2 exs., Ali, 14-12-2008, CR-7240.

Mesurements : L- 90.0 - 170.0

Diagnosis: Carapace smooth, hair less. Rostrum very high forming a crest and 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. *Elsewhere*- Sri Lanka, Northen eastern coast of Arabian Sea, Philippines, Gulf of Oman, New Caledonia and Australia.

Remarks: *P. merguiensis* and *P. indicus* looks similar externally. In a lot it is difficult to differentiate both particularly in the juvenile stages but *P. merguiensis* found in small quantities comparison to the previous species, but both has got a good commercial value.

5. ***Penaeus (Marsupenaeus) japonicus*** Bate, 1888 (Fig. 85)

1888. *Penaeus canaliculalies* 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.

2009. *Penaeus (Marsupenaeus) japonicus*: Rath & Dev Roy, *Estuarine Ecosystem Series* **5**: *Fauna of Krishna Estuary Prawns* (Crustacea : Decapoda) : 88.

Material examined: 1 ex., Ali,14-12-2008, CR-724; 1 ex., Chandinipal, 28-02-2010, CR-7295.

Mesurements : L- 123.0 - 125.0

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

Remarks: Its occurrence is rare in many estuaries of India. It also externally looks alike P. monodon in size and colour particularly in the juvenile stage. Usually found along the P. japonicus in commercial catches.

6. ***Parapenaeopsis scuptilis*** (Heller, 1862) (Fig. 86)

1862. *Penaeus scuptilis* Heller, *Verh. Zool. Bot. Ges. Wien.* **12**: 528

1969. *Parapenaeopsis scuptilis*: George, *Bull. Cent. Mar. Fish. Res. Inst.*, **14**: 35

1995. *Parapenaeopsis scuptilis*: Reddy, *Zool.Surv.India,Estuarine Ecosystem Series*, part 2, *Hugli matla Estuary Prawns & Shriups (Crustaces : Decapoda)* : 297.

2009. *Parapenaeopsis scuptilis*: Rath & Dev Roy, *Estuarine Ecosystem Series* **5**: *Fauna of Krishna Estuary Prawns (Crustacea : Decapoda)* : 95.

Material examined: 19 ex., Dhamara, 28-03-2008, CR-5834; 1 ex., Balakati, 17-12-2008, CR-6931; 3 exs., Baradia, 19-12-2008, CR-7231; 1 ex., Ali, 14-12-2008, CR-6239; 1 ex., Balakati, 13-12-2008, CR-7255; 2 exs., Dhamara, 29-03-2009, CR-6198; 16 ex., New Dhamara, 29-02-2010, CR-6494; 5 exs., Talachua, 29-02-2010, CR-6501; 9 exs., Khalakhali, 27-02-2010, CR-7275; 12 exs., Chandinipal, 28-02-2010, CR-7297; 2 exs., Kananali, 26-02-2010, CR-7306; 4 exs., New Dhamara, 03-03-2010, CR-6504; 15 exs., Dhrubapalipur, 27-10-2010, CR-6429;

Mesurements: L- 55.0 - 190.0

Diagnosis: Body smooth. Rostrum strong and a little upwards directed; dorsally armed with 7-9 teeth, distal half is spine. Epipodites on first and second periopod. 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. *Elsewhere*: Pakistan, China, Japan, Indonesia, Philippines and New Guinea.

Remarks: This species is very common in all estuaries of Odisha in comparison to Andhra Pradesh. It has got very good commercial value in Odisha.

7. ***Parapenaeopsis hardwickii*** (Miers, 1878) (Fig. 87)

1878. *Penaeus hardwickii* Miers, 1878, *Proc. Zool. Soc. Lond.*, 300, 306

1969. *Parapenaeopsis scuptilis*: George, *Bull. Cent. Mar. Fish. Res. Inst.*, **14**: 35

1995. *Parapenaeopsis scuptilis*: Reddy, *Zool.Surv.India,Estuarine Ecosystem Series*, part 2 *Hugli - matla Estuary Prawns & Shrimps (Crustaces : Decapoda)* : 297.

2009. *Parapenaeopsis scuptilis*: Rath & Dev Roy, *Estuarine Ecosystem Series* **5**: *Fauna of Krishna Estuary Prawns (Crustacea : Decapoda)* : 95.

Material examined: 3 exs., New Dhamara, 29-02-2010, CR-6493; 2 exs., Chandinipal, 01-03-2010, CR-7246.

Mesurements: L- 75-120

Diagnosis: Body smooth. Rostrum strong and a little upwards directed, dorsally armed with 7-9 teeth, distal half of which is toothless. Antennal spine large, the carina reaching ½ distance between spine and hepatic spine. Epipodites present on 1st & 2nd Pereiopod. Petasma with lateral plates compressed to form a tube like structure with paired apical spout, which directed antero - laterally. Thelycum with anterior plate distally rounded and broadly articulated with posterior plate. The posterior plate bears a tuft of hairs.

Distribution: India: East and West coast. *Elsewhere*: Pakistan, China, Japan, Indonesia, Philippines, and New Guinea.

Remarks: As it attains a good size got good export value. Commercially important prawn.

8. ***Metapenaeopsis toloensis*** Hall, 1962 (Fig. 88)

1961. *Metapenaeopsis toloensis* Hall, *Fish. Publ. Colon Off* (U.K.), **17** : 33.

2009. *Metapenaeopsis toloensis*: Rath & Dev Roy, *Estuarine Ecosystem Series* **5**: *Fauna of Krishna Estuary Prawns (Crustacea : Decapoda)* : 94.

Material examined: 1 ex., Chandinipal, 28-02-2010, CR-7289.

Mesurements: L- 80

Diagnosis: Body densely pubescent. Rostrum strong and a little upwards directed, dorsally armed with 8-9 dorsal teeth, reaching end of 2nd antennular peduncle. Penultimate tooth in the level with orbital margin of carapace. Stridulating organ consists of small ridges in a curved band on posterior part of carapace. Petasma asymmetrical with right distoventral projection bearing a small apical process, left distoventral projection broadly swollen and with a disto - median and lateral process. Thelycal plate subquadrate with rounded corners, inermadiate plate trapezoidal and coxal plate of 4th Pereiopods about as large as thelycal plate.

Distribution: India: East and West coast. *Elsewhere*: Pakistan, China, Japan, Indonesia, Philippines, and New Guinea.

Remarks: Commercial species, but rarely available in the estuaries of Odisha.

9. ***Trachypenaeus granulosus*** (Haswell, 1879) (Fig. 89)

1879. *Trachypenaeus granulosus* Haswell, *Proc. Linn. Soc.* N.S.W., **4** : 41

1991. *Trachypenaeus granulosus* : Paulpandian & Ramasamy, *Guide to the Prawns of Portonovo.* CAS, in Mar. biol., Ann Univ., Parangipettai, India : 37, pt. 30, fig. 1.

Material examined : 2 ex., Chandinipal, 28-02-2010, DVR, CR-7290.

Mesurements : L- 75-87

Diagnosis: Body densely pubescent. Rostrum strong and a little upwards directed, dorsally armed with 9-10 teeth, reaching distal half of 2nd antennular peduncle. Pterigostomian angle blunt. Telson armed with a pair of movable spines and spinules. Epipode present on the 3rd Pereiopod. Petasma with very broad distolateral projections. Thelycum flat slightly concave with a posterior rounded projection, posterior plate excavate on either side of median convexity.

Distribution: India: East and West coast. *Elsewhere*: Pakistan, China, Japan, Indonesia, Philippines, and New Guinea.

Remarks: Its occurence in the estuaries of India seems to be very less as far as Odisha is concered. It is first time recorded from the Odisha estuary.

10. ***Metapenaeus monoceros*** (Fabricius, 1798) (Fig. 90)

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

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

1998. *Metapenaeus conoceros*: Deb, *Estuarine Ecosystem Series* **3**: *Mahanadi Estuary Crust,* : 137.

2009. *Metapenaeus conoceros*: Rath & Dev Roy, *Zool. Surv. India. Estuarine Ecosystem Series* **5**: *Fauna of Krishna Estuary Prawns* (Crustacea : Decapoda) : 89.

Material examined : 6 exs., Dhamara, 28-03-2008, CR-5838; 3 exs., Baradia, 21-06-2008, CR-6437; 35 exs., Similia, 22-06-2008, CR-6375; 32 exs., Chandbali, 23-06-2008, CR-5983; 1 ex., Dhamara, 25-06-2008, CR-6395; 30 exs., Aradi, 26-06-2008, CR-6400; 11 exs., Chandbali, 30-07-2008, CR-5857; 1 ex., Chandbali, 10-12-2008, CR-7223; 3 exs., Balakati, 13-12-2008, CR-7254; 2 exs., Ali, 13-12-2008, CR-7244; 18 exs., Iswarpur, 16-12-2008, CR-7209; 1 ex., New Dhamara, 16-12-2008, CR-72464 exs., Balakati, 17-12-2008, CR-6935; 13 exs., Baradia, 19-12-2008, CR-7229; 1 ex., Dhrubapalipur, 27-02-2010, CR-6435; 6 exs., Khalakhali, 27-02-2010, CR-7272; 2 exs., Chandinipal, 28-02-2010, CR-7301; 2 exs., New Dhamara, 29-02-2010, CR-6495; 2 exs., Talachua, 29-02-2010, CR-6495.

Mesurements: L- 39.0 - 130.0

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 ends; lateral plates very small, egg shaped surrounded by large raised lateral margins.

Distribution: India: East and West coast. Elsewhere: Sri Lanka, South Africa, Malay Peninsula, Red Sea, Madagascar, Mauritius and Mediterranean.

Remarks: It is the most commonly occurring species of Indian estuaries. It has got good export value once it attains the adult size.

11. ***Metapenaeus dobsoni*** (Miers, 1878) (Fig. 91)

1878. *Penaeus dobsoni* Miers, *Proc. Zool. Soc. London* : 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; matla Estuary Prawns & Shriups (Crustaces: Decapoda)* : 294.

2009. *Metapenaeus dobsoni*: Rath & Dev Roy, *Estuarine Ecosystem* Series **5**: *Fauna of Krishna Estuary Prawns (Crustacea : Decapoda)* : 91.

Material examined: 3 exs., Dhamara, 28-03-2008, CR-5837; 10 exs., Chandbali, 03-04-2008, CR-5855; 16 exs., Chandbali, 23-06-2008, CR-5984; 9 exs., Chandbali, 22-06-2008, CR-6368; 1 ex., Similia, 22-06-2008, CR-6376; 1 ex., Chandbali, 22-06-2008, CR-6396; 9 exs., Aradli, 26-06-2008, CR-6399; 11 exs., Iswarpur, 16-12-2008, CR-7210; 2 exs., Balakati, 17-12-2008, CR-6934; 18 exs., Dhrubapalipur, 19-12-2008, CR-7231; 2 exs.,

Khalakhali, 27-02-2010, CR-7273; 10 exs., Dhrubapalipur, 27-02-2010, CR-6432; 1 ex., Chandinipal, 28-02-2010, CR-7291; 1 ex., Chandbali, 28-02-2010, CR-7302; 7 exs., Talachua, 29-02-2010, CR-6498.

Mesurements : L- 43.0 - 115.0

Diagnosis: Body pubscent 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. Elsewhere: Sri Lanka, Gulf of Thailand, Philippines and Indonesia.

Remarks: This species is also abundantly present in all estuaries of India. Its catch is very high but unfortunately large size adults catch is very less.

12. ***Metapenaeus brevicornis*** (H.Milne Edwards,1837) (Fig. 92)

1837. *Penaeus brevicornis* H. Milne Edwards, *Hist. Nat. Crust. Paris.*, **2** : 417.

1906. *Metapenaeus brevicornis*: Alcock, *Cat.Indian Decapod Crust*, pt. **3** (1) : 22.

1995. *Metapenaeus brevicornis*: Reddy, *Zool.Surv.India,Estuarine Ecosystem Series*, part 2 *Hugli - matla Estuary Prawns & Shrimps* (Crustaces : Decapoda) : 294.

2009. *Metapenaeus brevicornis*: Rath & Dev Roy, *Estuarine Ecosystem Series* **5**: *Fauna of Krishna Estuary Prawns (Crustacea : Decapoda)* : 92.

Material examined: 2 exs., Ali, 13-12-2008, CR-7243; 1 ex., Balakati, 13-12-2008, CR-7253; 3 exs., Baradia, 19-12-2008, CR-7233;4 exs., Chandinipal, 28-02-2010, CR-7298; 8 exs., New Dhamara, 29-02-2010, CR-6492; 3 exs., New Dhamara, 29-02-2010, CR-6541; 1 ex., New Dhamara, 03-03-2010, CR-6506; 4 exs., Khalakhali, 27-12-2010, CR-7274.

Mesurements: L- 60.0 - 160.0

Diagnosis: Body almost hairless and little tomentose. Rostrum bearing 5-7 teeth dorsally and toothless on little less than its distal half, reaching from proximal margin of second, to distal margin of third antenular article. Telson armed with spinules. A small ischial spine on 1st Pereiopod. In adult male, merus of 5th Pereiopod with a proximal notch followed a keel shaped tubercle. Distomedian projections of petasma with a long and slender apical filament. Thelycum with large square and grooved shaped anterior plate and boomerang shaped lateral plate.

Distribution: India: East and West coast. *Elsewhere*: Pakistan, Malayasia, Thailand, Indonesia to about East Borneo

Remarks: Adult specimens of this species mainly found towards confluence area having more salinity and the juveniles are mainly found in the fresh water or estuarine area having less salinity.

13. ***Metapenaeus lysianassa*** (de Man, 1888) (Fig. 93)

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. *Estearine Ecosystem series,* part 2. *Hugli Matla Estuary*: 295.

2009. *Metapenaeus lysianassa*: Rath & Dev Roy, *Estuarine Ecosystem Series,* **5**: *Fauna of Krishna Estuary Prawns (Crustacea : Decapoda)* : 92.

Material examined: 4 exs., Chandbali, 03-04-2008, CR-5856; 5 exs., Aradi, 20-06-2008, CR-6398; 1 ex., Chandbali, 23-06-2008, CR-5985; 3 exs., Iswarpur, 16-12-2008, CR-7211; 2 exs., Balakati, 17-12-2008, CR-6933; 4 exs., Baradia, 19-12-2008, CR-7232; 3 exs., Dhrubapalipur, 27-02-2010, CR-6431; 5 exs., Talachua, 29-02-2010, CR-6499.

Mesurements: L- 50.0 - 87.0

Diagnosis: Body pubscent. 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. [Estuaries of Orissa: Baitarani & Salandi; Nuanai]. *Elsewhere*: Sri Lanka, Gulf of Tonkin, Indonesia, Archipelago and Borneo.

Remarks: This species represents in good numbers along the other *Metapenaeus* species in catches, and almost all are in the juvenile stage and very few really attains adult size.

14. ***Metapenaeus affinis*** (H. Milne Edwards,1837) (Fig. 94)

1837. *Penaeus affines* H. Milne Edwards, *Hist. Nat. Crust. Paris.* **2** : 416.

1906. *Metapenaeus affines*: Alcock, *Cat.Indian Decapod Crust.* pt. 3 (1) : 20.

1995. *Metapenaeus affinis*: Reddy, *Zool.Surv.India,Estuarine Ecosystem Series,* part **2** *Hugli- matla Estuary Prawns & Shriups (Crustaces : Decapoda)* : 293.

2009. *Metapenaeus affinis*: Rath & Dev Roy, *Estuarine Ecosystem Series* **5**: *Fauna of Krishna Estuary Prawns (Crustacea : Decapoda)* : 93.

Material examined: 3 exs., Similia, 22-06-2008, CR-6376; 2 exs., Aradi, 26-06-2008, CR-6401; 2 exs., Balakati, 17-12-2008, CR-6932; 1 ex., New Dhamara, 29-02-2010, CR-6491; 1 ex., New Dhamara, 03-03-2010, CR-6505.

Mesurements: L- 60.0 - 120.0

Diagnosis: Body pubescent and tomentose. Rostrum bearing 9-10 teeth dorsally, reaching almost to third antenular 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 transversly cut into unequal segments.

Distribution: India: East and West coast. *Elsewhere*: Sri Lanka, Gulf of Oman, Arabian Sea, Philippines and Taiwan Island.

Remarks: This species found in small numbers along with other catch of *Metapenaeus* species in the estuarine area.

15. ***Metapenaeus elegans*** De Man, 1907 (Fig. 95)

1837. *Penaeus affines* H. Milne Edwards, *Hist. Nat. Crust. Paris.* **2** : 416.

1906. *Metapenaeus affines*: Alcock, *Cat.Indian Decapod Crust* pt. 3 (1) : 20.

1995. *Metapenaeus affinis*: Reddy, *Zool.Surv.India,Estuarine Ecosystem Series,* part **2** *Hugli- matla Estuary Prawns & Shriups (Crustaces : Decapoda)* : 293.

2009. *Metapenaeus affinis*: Rath & Dev Roy, *Estuarine Ecosystem Series* **5**: *Fauna of Krishna Estuary Prawns (Crustacea : Decapoda)* : 93.

Material examined: 1 ex., Chandinipal, 28-02-2010, CR-7300; 1 ex., Kananali, 26-02-2010, CR-7305.

Mesurements : L- 80.0 - 120.0

Diagnosis: Dorsal surface of carapace is pubescence. Rostrum armed with 9-11 teeth on the dorsal margin. Rostrum straight and reaching almost end of 3rd antennular article. Posterior crest not reaching posterior margin of carapace. Adrostral crest reach well behind 2nd rostral teeth. Adrostral groove reach behind epigastric tooth Branchiocardiac ridge reaching posterior end of hepatic spine. Telson armed with spinules. In adult male 5th pereiopod with a proximal notch. Dismomedian projections of petasma leaf like with longitudinal groove. Anterior plate of thelycum tongue shaped.

Distribution: India: East and West coast. *Elsewhere*: Pakistan, Viet Nam, Indonesia..

Remarks: Externally this species looks similar to *Metapenaeus monoceros* particularly in the juvenile stage, even in the adult stage it is difficult to differentiate these species. Rarely found in small numbers.

Family SOLENOCERIDAE

16. ***Solenocera choprai*** Natraj, 1954 (Fig. 96)

1945. *Solenocera choprai* Natraj, *J. Asiat. Soc. Bengal (sci.)*, **11**(2): 91

1969. *Solenocera choprai*: George, *Bull. Cent. Mar.f ish. Res. Inst.*, **14**: 18.

2009. *Solenocera chopraii*: Rath & Dev Roy, *Estuarine Ecosystem Series* **5**: *Fauna of Krishna Estuary Prawns (Crustacea : Decapoda)* : 101.

Material examined: 1 ex., Dhamara, 18-06-2008, CR-5839; 1 ex., Chandinipal, 28-02-2010, CR-7290.

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. *Elsewhere:* Pakistan, China, Japan, East Africa, Red Sea, East coasts of Arabian Sea, Mozambique and Kenya.

Remarks: Found in small numbers in estuarine areas of India.

17. ***Solenocera crassicornis*** (H. Milne Edwards, 1837) (Fig. 97)

1837. *Penaeus crassicornis* H. Milne Edwards, *Hist. Nat.Crust.* 2: 418

1991. *Solenocera crassicornis*: Paulpandian & Ramasamy, *Guide to the Prawns of Portonove.* CAS in Mar. biol., Ann. Univ, Parangipettai. India: 31 pt. 24.s

2009. *Solenocera crassicornis*: Rath & Dev Roy, *Estuarine Ecosystem Series* **5**: *Fauna of Krishna Estuary Prawns (Crustacea : Decapoda)* : 101.

Material examined: 19 ex., Chandinipal, 28-02-2010, CR-7293; 9 exs., New Dhamara, 29-02-2010, CR-6996; 2 exs., Talachua, 29-02-2010, CR-6500; 3exs., New Dhamara, 03-03-2010, CR-6503.

Mesurements: L- 70.0 - 114.0

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. *Elsewhere*: Pakistan, Bangladesh, China, Japan, New Guinea and North East coasts of Arabian Sea.

Remarks: A marine species but found near mouth areas of estuaries.

Suborder PLEOCYEMATA
Infraorder CARIDAE
Family PALAEMONIDAE

18. ***Macrobrachium malcolmsonii*** (H. Milne Edwards, 1844) (Fig. 98)

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: Decapoda:* 380.

2009. *Macrobrachium malcolmsonii*: Rath & Dev Roy, *Estuarine Ecosystem Series* **5**: *Fauna of Krishna Estuary Prawns (Crustacea : Decapoda)* : 98.

Material examined: 4 ex., Aradi, 26-06-2008, CR-6404.

Mesurements: L- 90.0 - 142.0

Diagnosis: Body symmetrical. Rostrum is strong and long reaching end of antennal scale, form a small crest like structure, dorsally armed with 7-11 teeth out of which 3 placed behind orbital margin and 1-2 sub-distal teeth also present, rest are evenly placed. Hepatic spine situated at a lower level that antennal spine. Sharp telson tip over-reaching the postero-lateral spines.

Distribution: India: South-West coast, Kerala. *Elsewhere*: Pakistan, Sri Lanka, China, East coast of Africa, Madagascar, Philippines and New Caledonia.

Remarks: This species was found to occur in small quantity in this estuary.

19. ***Macrobrachium equidens*** (Dana,1852) (Fig. 99)

1852. *Palaemon equidens* Dana, *Proc.Acad.Nat.Sci.Philad.*, **6**: 26

1950. *Macrobrachium equidens*: Holthusis, *Siboga Exped.*, **39** (a-9): 162

1995. *Macrobrachium equidens*: Reddy, *Zool. Surv. India, Estuarine Ecosystem Series,* part 2 *Hugli - matla Estuary Prawns & Shriups (Crustaces: Decapoda)* : 310.

2009. *Macrobrachium malcolmsonii*: Rath & Dev Roy, *Estuarine Ecosystem Series* **5**: *Fauna of Krishna Estuary Prawns (Crustacea : Decapoda)* : 99.

Material examined : 1 ex., Chandbali, 03-04-2008, CR-5860; 4 exs., Chandbali, 23-06-2008, CR-5986; 6 exs., Baradia, 21-06-2008, CR-6438; 3 exs., Aradi, 26-06-2008, CR-6406; 11 exs., Chandbali, 10-12-2008, CR-7219; 2 ex., Ali, 13-12-2008, CR-7245; 30 exs., Iswarpur, 16-12-2008, CR-7217; 4 exs., Balakati, 17-12-2008, CR-6930; 13 exs., Baradia, 19-12-2008, CR-7236; 1 ex., Khalakhali, 27-02-2010, CR-7278.

Mesurements: L- 42.0 - 106.0

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. *Elsewhere*: Pakistan, Sri Lanka, China, East coast of Africa, Madagascar, Philippines and New Caledonia.

Remarks: As far as Palaemonid catch of estuaries is concerned it seems to be very common in all estuaries of India.

20. ***Macrobrachium rude*** (Heller, 1862) (Fig. 100)

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.

2009. *Macrobrachium rude*: Rath & Dev Roy, *Estuarine Ecosystem Series* **5**: *Fauna of Krishna Estuary Prawns (Crustacea : Decapoda)* : 100.

Material examined : 2 ex., Aradi, 26-06-2008, DVR, CR-6405

Mesurements : L- 72.0 - 86.0

Diagnosis: Body bulky, carapace swollen with very large head. Rostrum almost straight reaching the antennal scale, dorsally 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 pairs of spines dorsally. Apex of fingers acute and hooked. Hepatic spine situated at lower level than antennal spine.

Distribution: India: North-East coast. *Elsewhere*: Sri Lanka, Bangladesh, Natal East coast Africa, Madagascar and South Somalia.

Remarks: This species inhabits both riverine and estuarine systems.

21. ***Macrobrachium mirabile*** (Kemp, 1917) (Fig. 101)

1917. *Palaemon mirabilis* Kemp, *Rec. Indian Mus.*, **XIII**: 227

1950. *Macrobrachium mirabile*: Holthuis, *Siboga Expd.*, **39**(a-9) : 174

1969. *Macrobrachium mirabile*: George, *Bull. Cent. Mar. Fish. Res. Inst.*, **14** : 41

1995. *Macrobrachium mirabile*: Reddy, *Zool.Surv.India,Estuarine Ecosystem Series*, part **2** *Hugli - matla Estuary Prawns & Shriups (Crustaces : Decapoda)* : 311.

2000. *Macrobrachium mirabile*: Jayachandran, *Palaemonid Prawns Biodiversity, Taxonomy, Biology and Management*, Oxford & IBH : 145.

Material examined: 1 ex., Balakati, 13-12-2008, CR-7258; 4 exs., Dhrubapalipur, 27-02-2010, CR-6430; 5 exs., Iswarpur, 16-12-2008, CR-7216; 1 ex., Baradia, 19-12-2008, CR-7238; 2 exs., Khalakhali, 27-02-2010, CR-7279.

Mesurements: L- 40.0-60.0

Diagnosis: Rostrum very short, not reaching end of antennular peduncle, begins as a strong carina in the middle of the carapace. Upper border sharply ascends to a point over the eye then drops to apex which gives a hill like appearance dorsally armed with 14-16 teeth, posterior 4-5 teeth placed behind orbital margin; ventral margin with 1 tooth. Small setae present between the teeth. Carapace with antennal and hepatic spine of which hepatic spine situated just behind and a little below the antennal spine. Dorsal margin of telson with 2 pairs of spines .Tip of the telson over-reaching two sets of postero-lateral spine of which inner pair is longer and movable.

Distribution: India: North-Eastern part of India. *Elsewhere*: Myanmar, Siam and E. Borneo.

Remarks: This species is a purely estuarie species and its most characteristic feature is its rostrum shape which gives a spiny hump like appearance.

22. *Macrobrachium rosenbergii* (De Man, 1879) (Fig. 102)

1878. *Palaemon rosenbergii* De man, *Notes Leyden Mus.* **1**: 167

1950. *Macrobrachium rosenbergii*: Holthuis, *Siboga Expd.,*: 111

1998. *Macrobrachium rosenbergii*: Deb, *Zool.Surv.India: Estuarine Ecosystem Series* **3**: *Mahanadi Estuary*: 134.

2009. *Macrobrachium rosenbergii*: Rath & Dev Roy, *Estuarine Ecosystem Series* **5**: *Fauna of Krishna Estuary Prawns (Crustacea : Decapoda)* : 99.

Material examined : 1 ex., Haripur, 23-06-2008, CR-6441; 2 exs., Chandbali, 10-12-2008, CR-7220; 1 ex., Balakati, 13-12-2008, CR-7257; 15 exs., Iswarpur, 16-12-2008, CR-7215; 1 2 exs., New Dhamara, 16-12-2008, CR-7247; ex., Baradia, 19-12-2008, CR-7237.

Mesurements : L- 62.0-140.0

Diagnosis: Large adult size more than 5 inches long, bulky and swollen anteriorly. Rostrum long and slender extending beyond the antennal scale, dorsally armed 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. *Elsewhere* : Pakistan, Sri Lanka, China, Philippines, New Guinea and Mauritius.

Remarks: This species occurr very rarely. Although this is a fresh water species but also found in brackish water having low pH.

23. ***Exopalaemon styliferus*** (H. Milne Edwards, 1840) (Fig. 103)

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

2009. *Exapalaemon styliferus*: Jayachandran, *Palaemonid Prawns Biodiversity, Taxonomy, Biology and Management,* Oxford & IBH : 25.

Material examined : 2 exs., Aradi, 26-06-2008, CR-6403; 2 exs., Dhubapalipur, 27-02-2010, CR-6433; 3 exs., Dhamara, 28-03-2008, CR-5835; 5 es., Ali, 13-12-2008, CR-7242; 12 exs., Balakati, 13-12-2008, , CR-7256; 1 ex., Iswarpur, 16-12-2008, CR-7214; 23 exs., Baradia, 19-12-2008, CR-7227; 3 exs., Kananali, 26-02-2010, CR-7303; 7 exs., Khalakhali, 27-02-2010, 13 exs., Chandinipal, 28-02-2010, CR-7294; 7 exs., Talachua, 29-02-2010, CR-6497.

Mesurements : L- 63.0 - 118.0

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 Pereiopods about 1/ 3rd as long as propodus.

Distribution: India: Southern India. *Elsewhere*: Pakistan, Arabian Sea, Thailand, Borneo and Indonesia

Remarks: This species closely resemble *N. tenuipes* but differentiated by the presence of Branchiostegal groove.

24. ***Nematopalaemon tenuipes*** (Henderson, 1893). (Fig. 104)

1891. *Leander tenuipes,* Henderson, *Trans.Linn.Soc. Lond.*, (Zool.), (2) **5**: 440.

2001. *Nematopalaemon tenuipes*: Jayachandran, *Palaemonid Prawns Biodiversity, Taxonomy, Biology and Management.* Oxford & IBH : 194.

2009. *Nematopalaemon tenuipes*: Rath & Dev Roy, *Estuarine Ecosystem Series* **5**: *Fauna of Krishna Estuary Prawns (Crustacea : Decapoda)* : 97.

Material examined : 1 ex., Baradia, 21-06-2008, CR-6439; 10 exs., Iswarpur, 16-12-2008, CR-7213;5 exs., Balakati, 17-12-2008, CR-6929; 5 exs., Baradia, 19-12-2008, CR-7228; 1 ex., Khalakhali, 27-02-2010, CR-7277; 5 exs., Dhrubapalipur, 27-02-2010, CR-6434; 1 ex., New Dhamara, 03-03-2010, CR-6508.

Mesurements: L- 33.0 - 100.0

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 up-ward; 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. *Elsewhere*: Pakistan, Africa, Somalia, Arabian Sea, Viet Nam, Philippines and New Guinea.

Remarks: This species has interesting long thread like dactyls of the last 3 periopods which gives spider like appearance.

25. ***Leptocarpus fluminicola*** (Kemp, 1917) (Fig. 105)

1917. *Leander fluminicola* Kemp, *Rec. Indian Mus.*, XIII: 223

2000. *Leptocarpus fluminicola*: Jayachandran, *Palaemonid Prawns Biodiversity, Taxonomy, Biology and Management.* Oxford & IBH : 145.

Material examined: 4 exs., Chandbali, 10-12-2008, CR-7221; 12 exs., Aradi, 19-12-2008, CR-7235.

Mesurements: L- 36.0 - 49.0

Diagnosis: Rostrum moderately long, slightly extending forward to antennal scale and strongly up-turned. Upper margin with 8-9 teeth of which 2-3 teeth present near the tip , one tooth present post orbital and 3-5 teeth present in the lower margin. Carapace with distinct branchiostegal groove and antennal spine. Abdomen glarous. Telson slender, dorsal surface with 2 pairs of spines. First chelate legs slender reaching beyond antennular peduncle. Second pereiopods and non-chelate legs are slender.Uropodal exopod with accessory spine

Distribution: India: Throughout. *Elsewhere*: Myanmar.

Remarks: This species is fresh water but also found in brakish water areas.

Family HIPPOLYTIDAE

26. ***Hippolysmata (Exhippolysmata) ensirostris*** (Kemp, 1914) (Fig. 106)

1917. *Hippolysmata ensirostris* Kemp, *Rec. Indian Mus.*, **10**(2): 118

1947. *Hippolysmata (Exhippolysmata) ensirostris*: Holthuis, *Siboga Expd.*, **39**(a-8) : 74

1983. *Exhippolysmata ensirostris*: *FAO Species Identification Sheets, Fishing Area,* 51 (W. Indian Ocean) : Family Hippolytidae.

Material examined: 20 exs., Dhamara, 28-03-2008, CR-5836.

Mesurements: L- 48.0 - 69.0

Diagnosis: Carapace a little pitted. Rostrum longer than carapace and dorsal margin with a elevated crest almost with 10-12 teeth very closely set and rest 3-4 teeth present on dorsal margin at wider interval. Ventral margin with10-15 equidistant teeth . Antennal and Pterygostomian spines are present on the carapace. Pleura of 5th segment sharply pointed. 2nd pair of pereiopods with small pincers.

Distribution: India : Southern India. *Elsewhere* : Pakistan, Arabian Sea, Thailand, Borneo and Indonesia.

Remarks: This species is very much marine in nature among the other representatives of this family this is the only species having economic importance.

Crabs

Section OXYSTOMATA
Infraorder BRACHYURA
Section EUBRACHYURA
Family MATUTIDAE

1. ***Ashtoret lunaris*** (Forskål, 1775)

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 State Fauna Series,* **5**: *Fauna of Andhra Pradesh* (Part 5) : 382 : pl. 1, fig. 2.

Material examined: 4 exs., Dhamara, 29-03-2008, CR-6195; 4 exs., Dhamara, 29-03-2008, CR-6195; 1 ex., Nayatapu, 02-04-2008, CR-6311; 3 exs., New Dhamara, 29-02-2010, CR-6509; 1 ex., New Dhamara, 03-03-2010, CR-6520; 4 exs., Dhrubapalipur, 27-03-2010, CR-6466.

Mesurements: L- 13.0-45.0 W- 13.0-47.0

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: Odisha, Andhra Pradesh. *Elsewhere*: Aden, Red Sea, Singapore, Malaysia, Philippines, Indonesia, New Guinea and Australia.

Remarks: Normally this is a marine species but found in large numbers during summer in the estuarine area when water level is less and salinity is very high and particularly inhabits the sandy areas.

2. ***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. State Fauna Series,* **3** : *Fauna of West Bengal* part 10: 365.

Material examined: 1 ex., Amarnagar, 28-03-2008, CR-5975; 5 exs., Dhamara, 28-03-2008, CR-6347; 4 exs., Dhamara, 29-03-2008, CR-5899; 7 exs., Khalakhali, 27-02-2010, CR-6455; 3 exs., Talachua, 29-02-2010, CR-6554; 4 exs., Ali, 12-10-2010, CR-6911.

Mesurements: L- 17.0-40.0 W- 19.0-41.0

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, Odisha, Tamil Nadu, West Bengal, Maharastra. *Elsewhere*: Pakistan, Myanmar, Thailand, Java, China, Japan and Ausralia.

Remarks: This species is more common in the estuary and its distribution is also very wide.

Super family DOROPPO

Family DORIPPIDAE

Subfamily Dorippinae

3. ***Neodorippe callida Fabricius***, 1798 (Fig. 107)

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, State Fauna Series,* **5**: *Fauna of Andhra Pradesh* (Part 5) : 376.

Material examined: 3 exs., Dhrubapalipur, 27-02-2010, CR-6465; 1 ex., Talachua, 29-02-2010, CR-6553.

Mesurements: L- 10.0-12.0 W- 09.0-11.0

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

Distribution: India: Odisha, Andhra Pradesh, Tamil Nadu and Maharashtra. *Elsewhere*: Red Sea, Pakistan, Myanmar, Thailand, Philippines, China and Indonesia.

Remarks: This species is very common along both the coasts of India but its collection is difficult because of its colour and appearance which matches the surrounding.

Super family PILUMNOIDAE
Family GALENIDAE
Subfamily GALENINAE

4. ***Galene bispinosa*** (Herbst, 1801) (Fig. 108)

1783. *Cancer bispinosus* Herbst, *Versuch. Naturgesch. Krabben Krebse*, **1**(2) : 144, pl. 6, fig. 45.

1898. *Galene bispinosa*: Alcock, *J. Asiat. Soc. Bengal*, **67**(2) : 136.

2005. *Galene bispinosa*: Dev Roy and Bhadra , *Zool. Surv. India, State Fauna Series*, **5**: *Fauna of Andhra Pradesh* (Part 5) : 459.

Material examined: 1 ex., Talachua, 29. 02. 2010, CR-6562.

Mesurements: L- 46.0 W- 61.0

Diagnosis: Carapace broader than long and look like pentagonal in shape and convex. Almost smooth except the border area which is little bit rough, regions are indistinct. Front bilobed and quadridentate. Anterolateral margin quadrilobate with last two spine-like. Chelipeds are very massive and un equal.Upper border of arm with two strong teeth at its distal end, inner corner of wrist with 2 obtuse teeth. Carpus, propodus and dactylus of legs are plumose.

Distribution: India: Odisha, Andhra Pradesh, Tamil Nadu and Maharashtra. *Elsewhere*: Tenasserim, Hong Kong, South China, Taiwan and Australia.

Remarks: Only one large female of the above species indicates its presence in Odisha coast, although it is not very common.

Section BRACHYRHYNCHA
Family PORTUNIDAE
Subfamily PORTUNINAE

5. ***Scylla serrata*** (Forskål, 1775) (Fig. 109)

1775. *Cancer serratus* Forskål, *Desc. Anim.* : 90

1998. *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 State Fauna Series*, **5:** *Fauna of Andhra Pradesh* (Part 5): 420.

Material examined : 3 exs., Dhamara, 30-03-2008, CR-5900; 1 ex., Nayatapu, 02-04-2008, CR-6312; 4 exs., Baradia, 21-06-2008, CR-6483; 2 exs., Chandbali, 22-06-2008, CR-6478; 17 exs., Similia, 22-06-2008, CR-6481; 1 ex., Aradi, 26-06-2008, CR-6489; 7 exs., Dhamara, 28-06-2008, CR-6137; 1 ex., Iswarpur, 14-12-2008, CR-72243 exs., Baradia, 19-12-2008, CR-6876; 2 exs., Dhamara, 30-03-2009, CR-6197; 2 exs., Kananali, 26-02-2010, CR-5514; 2 exs., Talachua, 29-02-2010, CR-6555.

Mesurements: L- 14.0-62.0 W- 20.0-90.0

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, Odisha, Tamil Nadu, West Bengal, Goa, Maharastra, Karnataka, Gujarat and Andaman and Nicobar Islands. *Elsewhere*: Africa, Red Sea, Pakistan, Mergui, Mynmar, Formosa, Japan, Australia, Tahiti, Auckland.

Remarks : This is the most common edible crabs of this area but due to indescriminate harvesting only juveniles were collected during sampling.

6. *Scylla tranquebarica* (Fabricius, 1798)

1798. *Portunus tranquebaricus* Fabricius, *Ent. Syst. Suppl.*, : 366.

1998. *Scylla tranquebarica*: Keenan, Davie and Mann, *Raffles Bull. Zool.*, **46**(1) : 230, fig. 7B, 8B, 9B, 11

2005. *Scylla tranquebarica*: Dev Roy and Bhadra, *Zool. Surv. India State Fauna Series*, **5**: *Fauna of Andhra Pradesh* (Part 5) : 421.

Material examined : 2 exs., Dhrubapalipur, 27-02-2010, CR-6462.

Mesurements: L- 15.0-17.0 W- 22.0-24.0

Diagnosis: Almost similar characters as *Scylla serrata* except frontal lobe is low in comparison to *Scylla serrata* with rounded 4 projections or lobes. Antero-lateral teeth broad, outer margin convex. Polygonal patterning present strongly in last 2 pairs of legs.

Distribution: India:Andhra Pradesh, Odisha, Tamil Nadu, *Elsewhere*: Pakistan, Malaysia, Singapore and Philippines.

Remarks: This is a common species of estuarirs.

7. *Portunus pelagius* (Linnaeus, 1758) (Fig. 110)

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: 3 exs., Chandinipal, 28-02-2010, CR-7281; 1 ex., Talachua, 29-02-2010, CR-6556; 1 ex., Dhamara, 28-03-2008, CR-634; 1 ex., New Dhamara, 03-03-2010, CR-6516;

Mesurements: L- 21.0-52.0 W- 42.0-90.0

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 and massive but unequal; arm with three large acute spines on the anterior and one on the posterior border.

Distribution: India: Andhra Pradesh, Odisha, Tamil Nadu, West Bengal, Gujarat, Karnataka, Kerala, Maharashtra, Andamans. *Elsewhere*: 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: This is very widely distributed and common species available in both the coasts of India.

8. ***Portunus sanguinolentus*** (Herbst, 1796) (Fig. 111)

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: 1 ex., Dhamara, 28-03-2008, CR-5876; 1 ex., Dhamara, 28-03-2008, CR-6346; 3 exs., Nayatapu, 02-04-2008, CR-6313; 5 exs., Ali, 19-12-2008, CR-6908; 1 ex., New Dhamara, 29-02-2010, CR-6510; 1 ex., New Dhamara, 03-03-2010, CR-6517; 6 exs., Chandinipal, 28-02-2010, CR-7281.

Mesurements: L- 07.0-44.0 W- 11.0-85.0

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, Odisha, Tamil Nadu, West Bengal, Karnataka, Kerala and Nicobars. *Elsewhere*: East coast of Africa, Red Sea, Persian Gulf, Pakistan, Sri Lanka, Hongkong, Phillippine, Taiwan, Japan, Australia, New Zealand and Hawaii.

Remarks: This is widely distributed and very common species available in both the coasts of India.

Subfamily THALAMITINAE

9. ***Charybdis (Charybdis) feriatus*** (Linnaeus, 1758) (Fig. 112)

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, State Fauna Series*, **5**: *Fauna of Andhra Pradesh (Part 5)*: 432.

Material examined: 2 exs., Dhamara, 28-03-2008, CR-6196 ; 4 exs., Khalakhali, 27-02-2010, CR-6456; 4 exs., New Dhamara, 29-02-2010, CR-651; 3 exs., Talachua, 29-02-2010, CR-6557; 1 ex., Chandinipal, 28-02-2010, CR-7287.

Mesurements: L-18.0-54.0 W- 24.0-75.0

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 has a ridge but not a tooth.

Distribution: India: Andhra Pradesh, Odisha, Tamil Nadu, West Bengal, Gujarat, Kerala, Maharastra and Andaman and Nicobar Islands. *Elsewhere*: East coast of Africa, Madagascar, Pakistan, Singapore, Hongkong , Formosa, Nagasaki and Australia.

Remarks: As this species attains a good size hence considered for commercial purpose available throughout the Indo-Pacific, and this species is very common in east coast of India.

10. ***Charybdis (Charybdis) helleri*** (A. Milne Edwards, 1867)

1867. *Goniosoma helleri* A.Milne Edwards, *Annls. soc. Ent. Fr. ser.* **4, 7** : 282.

1899. *Charybdis (Goniosoma) merguiensis*: Alcock, *J. Asiat. Soc. Bengal*, **68** (2) : 55.

1995. *Charybdis merguiensis*: Bhadra, *Zool. Surv. Ind. Estuarine Ecosystem Series.* Part 2. *Hugli-Matla Estuary* : 249-262.

2005. *Charybdis (Charybdis) helleri*: Dev Roy and Bhadra, *Zool. Surv. India State Fauna Series*, **5**: *Fauna of Andhra Pradesh* (Part 5): 433, pl. 2, fig. 5.

Material examined: 1 ex., Talachua, 29-02-2010, CR-6559; 2 exs., Amarnagar, 28-03-2008, CR-5973; 2 exs., Khalakhali, 27-02-2010, CR-6457; 2 exs., Dhamara, 29-03-2008, CR-5945.

Mesurements: L- 12.0-36.0 W- 27.0-50.0

Diagnosis: Carapace broad and convex, surface covered with minute hairs, transverse granular ridges prominent at anterior half. Front cut inti 6 acute teeth, middle two rounded, laterals triangular. Antero-lateral border cut into 6 teeth - first 5 teeth directed anteriorly and the 6th antero-laterally. Chelipeds unequal; arm bearing 2 large and 1 small tooth; inner surface of wrist armed with a large spine at its inner angle, palm armed with 5 spines.

Distribution: India: Andhra Pradesh, Odisha, Tamil Nadu, West Bengal, Kerala and Andaman Islands. *Elsewhere*: Red Sea, Persian Gulf, Mediteranean, Sri Lanka, Mergui Archipelago, Malaya Peninsula, Singapore, Indonesia, Thailand, Hong Kong, Australia, China and Hawaii.

Remarks: This is a widely distributed species in Indo-Pacific its collection is less and specimen found almost juvenile.

11. ***Charybdis (Charybdis) affinis*** Dana, 1852 (Fig. 113)

1852. *Charybdis affinis* Dana, *Proc. Acad. Nat. Sci. Philad.*, **6** : 85 and *U.S. Explor. Exped. Crust.*, **13**(1) : 286, pl. 17, figs. 12a-c.

1961. *Charybdis (Goniosoma) affinis*: Alcock, *J. Asiat. Soc. Bengal*, **68** (2) : 56.

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

Material examined: 1 ex., Nayatapu, 02-04-2008, CR-6314; 7 exs., Talachua, 29-02-2010, CR-6558.

Mesurements: L- 31.0-38.0 W- 44.0-52.0

Diagnosis: Carapace and chelipeds pubescent, cardic regions of the carapace is having transverse ridges. Anterior border of arm bears 3 spines and anterior border of palm bears 5 spines. 6th abdominal segment curved.

Distribution: India: Andhra Pradesh, Odisha, Tamil Nadu, West Bengal, Kerala and Andaman Islands. *Elsewhere*: Red Sea, Persian Gulf, Mediteranean, Sri Lanka, Mergui Archipelago, Malaya Peninsula, Singapore, Indonesia, Thailand, Hong Kong, Australia, China and Hawaii.

Remarks: Although a common species found less in numbers along Odisha coast.

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

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 State Fauna Series,* **5**: *Fauna of Andhra Pradesh* (Part 5): 431.

Material examined: 5 exs., Amarnagar, 28-03-2008, CR-5974; 1 ex., Dhamara, 28-03-2008, CR-6348; 35 exs., Balakati, 27-02-2010, CR-6460; 1 ex., New Dhamara, 29-02-2010, CR-6513.

Mesurements: L- 08.0-17.0 W- 12.0-21.0

Diagnosis: Carapace nearly convex especially in its posterior half, its length about 2/3rd 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, Odisha, Tamil Nadu, West Bengal, Maharastra and Gujarat. *Elsewhere*: South Africa, Pakistan, Gulf of Thailand, Malaya Archipelago, Singapore, Indonesia, Phillippines, Hongkong, China, Japan and Australia.

Remarks: Very widely distributed and common species.

13. ***Charybdis (Charybdis) rostrata*** (A. Milne. Edwards, 1861) (Fig. 114)

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 State Fauna Series,* **5**: *Fauna of Andhra Pradesh* (Part 5): 435.

Material examined: 4 exs., New Dhamara, 29-02-2010, CR-6512.

Mesurements: L- 15.0-24.0 W- 19.0-21.0

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, Odisha, Tamil Nadu, West Bengal and Andamans. *Elsewhere*: Sri Lanka, Myanmar, Thailand and Indonesia.

Remarks: Rarely found along Odisha coast.

I4. ***Charybdis (Goniohellenus) vadorum*** Alcock, 1899

1899. *Charybdis (Goniohellenus) hoplites,* Alcock, *J. Asiat. Soc. Bengal,* **68** (2): 67.

1935. *Charybdis (Goniosoma) vadorum*: Chopra, *Rec. Indian Mus.*, **37**(4) : 493, pl. 9,fig. 2, text fig., 13a-d

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

Material examined : 8 exs., Dhrubapalipur, 27-02-2010, CR-6461.

Mesurements: L-10.0-16.0 W-12.0-19.0

Diagnosis: Regions of carapace distinct and aerolated, depressed, convexities of aerolation is prominent. Epibranchial regions tumid. Front cut in to 8 lobes, median lobe large and squarish and projecting a little beyond and separated from others by a notch. Anterolateral border cut in to 6 teeth. Posterior border of carapace is straight. Chelipeds un equal. Anterior border of arm with 2 large spines distally and a spinules proximally, Posterior border with a single spine and spine at the inner angle of wrist is larger one. Leg joints of last pair of legs fringed with hairs.

Distribution : India: Andhra Pradesh, Odisha, Tamil Nadu, West Bengal, *Elsewhere*: Arakan coast and Hong Kong.

Remarks: Rarely found along Odisha coast.

Family SESARMIDAE

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

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. State Fauna Series*, **5**: *Fauna of Andhra Pradesh* (Part 5) : 490.

Material examined: 2 exs., Amarnagar, 28-03-2008, CR-5977.

Mesurements: L- 10.0-14.0 W- 13.0-18.0

Diagnosis: Carapace nearly two-thirds as long as broad, thick, surface smooth. Front bilobed, about 1/3rd of its greatest breadth. Lateral borders cut into 4 teeth, of which, first 2 large and most prominent, third one very small, fourth tooth hardly recognizable. Male chelipeds equal, dactylus not bearing any conspicuous lobe on its dentary edge. Anterior border of carpus and propodus of second and third pair of legs markedly tomentose.

Distribution: India: Andhra Pradesh, Odisha, West Bengal, Maharashtra. *Elsewhere*: Pakistan.

Remarks: Only two specimens were found during the present study, which shows its rare presence in Odisha coast.

Family VARUNIDAE

16. ***Varuna litterata*** (Fabricius, 1798) (Fig. 115)

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. State Fauna Series,* **5**: *Fauna of Andhra Pradesh* (Part 5) : 480.

Material examined : 3 exs., Baradia, 21-06-2008, CR-6485; 2 exs., Chandbali, 22-06-2008, CR-6479; 17 exs., Similia, 22-06-2008, CR-6480; 6 exs., Aradi, 26-06-2008, CR-6138; 12 exs., Aradi, 26-08-2008, CR-6490; 8 exs., Iswarpur, 16-12-2008, CR-722523 exs., Baradia, 19-12-2008, CR-6877; 2 exs., Ali, 19-12-2008, CR-69102 exs., Khalakhali, 27-02-2010, CR-6459; 3 exs., Dhrubapalipur, 27-02-2010, CR-6463; 3 exs., New Dhamara, 03-03-2010, CR-6519; 8 exs., Talachua, 29-02-2010, CR-6560.

Mesurements : L- 11.0-38.0 W- 13.0-42.0

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, adapted for swimming. Inner border of arm denticulate, inner corner of wrist with a large sharp spine.

Distribution: India: Andhra Pradesh, Odisha, Tamil Nadu, West Bengal, Kerala, Maharashtra. *Elsewhere*: Myanmar, Bangladesh, Phillipines, Hongkong, Japan, New Zealand, New Guinea, Singapore, Australia, East Africa.

Remarks: It is a very common estuarine crab found in all estuaries of Odisha.

17. ***Ptychognathus barbata*** (A. Milne Edwards, 1873) (Fig. 116)

1873. *Ptychognathus barbatus* A. Milne Edwards, *Nouv. Archs. Mus. Nat., Paris,* (N.S.), **9** : 316, pl .17, fig 4.

1900. *Ptychognathus barbatus*: Alcock, *J. Asiat. Soc. Bangal,* **69** (2) : 406

2005. *Ptychognathus barbatus*: Dev Roy and Bhadra, *Zool. Surv. India. State Fauna Series,* **5**: *Fauna of Andhra Pradesh* (Part 5): 481.

Material examined: 6 exs., Khalakhali, 27-02-2010, CR-6458 ; 6 ex., Dhrubapalipur, 27-02-2010, CR-6464 ; 1 ex., Talachua, 29-02-2010, CR-6561 ; 6 ex., Baradia, 19-02-2008, CR-6378 ; 5 ex., Iswarpur, 16-12-2008, CR-7226 ; 1 ex., Chandbali, 28-02-2010, CR-7292.

Mesurements: L- 10.0-26.0 W- 12.0-28.0

Diagnosis: This species resembles *Varuna litterata* (Fabr.) almost in all respect except few points which are different like regions of carapace not as distinct but look a little bit strong. Exopod of external maxillipeds are broader or as broad as ischium. Dactyli of legs compressed but not broadened.

Distribution: India: Andhra Pradesh, Odisha, *Elsewhere*: Myanmar and New Caledonia.

Remarks: No commercial value.

Superfamily OCYPODOIDAE
Family OCYPODIDAE
Subfamily OCYPODINAE

18. ***Ocypode macrocera*** H. Milne Edwards,1837 (Fig. 117)

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. State Fauna Series*, **5**: *Fauna of Andhra Pradesh* (Part 5) : 502.

Material examined: 8 exs., Nayatapu, 02-04-2008, CR-6315; 3 exs., Urabali, 25-06-2008, CR-6482; 5 exs., Dhamara, 25-06-2008, CR-648; 6 ex., Ali, 19-12-2008, CR-69091 ex., Kananali, 26-02-2010, CR-651.

Mesurements: L- 8.0-35.0 W- 12.0-41.0

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, Odisha, Tamil Nadu, West Bengal. *Elsewhere*: Myanmar, Gulf of Thailand.

Remarks: The bright red colouration is very common feature to identify the adult specimen. The large eye style gives such a look that it is commonly known as ghost crab.

Subfamily UCINAE

19. ***Uca lactea*** (de Haan 1835)

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 lcactea*: Crane, *Fiddler Crabs of the world* : *Ocypodidae* : *Genus Uca* : 300.

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

Material examined: 1 ex., Baradia, 21-06-2008, CR-6485.

Mesurements: L- 9.0 W- 12.0

Diagnosis: Carapace more or less quadrilateral in outline and the outer orbital angle project outwardly in a diagonal manner. Tip of fixed finger of large male cheliped is notched or truncate 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, Odisha, Karnataka, Kerala, raharashtra, Andaman & Nicobar Islands. *Elsewhere*: Japan, Africa, Madagascar, Mauritius, Red Sea, Persian Gulf, Singapore,Malaya Peninsula, Thailand, Indonesia, Phillipines, China, Australia, New Guinea, Pakistan.

Remarks: It is very common estuarine mud crab mostly found in riverine bank area. During first sun shine all the populations comes out for feeding on to the beaches.

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

1852. *Gelasimus triangularis* A. Milne Edwards, *Nouv. Archs. Mus.mat. 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: 2 exs., Baradia, 21-06-2008, CR-6486.

Mesurements: L- 7.0-7.5 W- 12.5-13.0

Diagnosis: Although the carapace is hexagonal it looks triangular in shape from a distance. Cheliped markedly unequal, the manus of larger cheliped yellow in colour. Antero-lateral angles of carapace is strongly acute. 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. *Elsewhere*: Myanmar, Australia, Malaysia.

Remarks: This species remains with the same population of *U. lactea*. As name indicates its shape is triangularish.

Family MACROPHTHALMIDAE
Subfamily MACROPTHALAMINAE

21. ***Macropthalamus (Mareotis) depressus*** Rüppel, 1830

1830. *Macropthalamus depressus* Rüppel, *Arch. Mus. Rio de janerio,* **12** : 117.

2000. *Macropthalamus (Mareotis) depressus*: Dev Roy and Das, *Rec. zool. Surv. India. Occ. Paper* No. **185** : 16, 133, pl. 5 figs. 3, 4 (Mangroves, Andaman Islands)

2009. *Macropthalamus (Mareotis) depressus*: Dev Roy, *Rec. zool. Surv.India. Occ. Paper* No. **289** : 145

Material examined: 1 ex., Dhamara, 25-06-2008, CR-6488.

Mesurements: L- 8.0 W- 11.0

Diagnosis: Carapace more outwardly in a diagonal manner. Tip of fixed finger of large male cheliped is notched or truncate 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, Odisha, Karnataka, Kerala, Maharashtra, Andaman & Nicobar Islands. *Elsewhere*: Widespread in Indo-West Pacific.

Remarks: Its occurance is rare in the estuarine areas.

22. ***Barytelphusa (Barytelphusa) cunicularis*** (West Wood, 1836) (Fig. 118)

1905. *Potamon (Potamonautes) jacquemontii* Rathbun, *Nouv. Arch. Du. Museum,* (4) **7** : 185, T. 6, pl. 16, fig. 1, 5.

1910. *Paratelphus (Barytelphusa) Jacquemontii* : Alcock, *Cat. Ind. Decap. Crust. Ind. Mus.,* **1**(2) ; 79, fig. 55

2009. *Barytelphusa (Barytelphusa) cunicularis*: Bott, *Abh. Senckenb. Natur. Ges.* No. 526 : 31.

Material examined: 4 exs., Balakati, 17-12-2008, CR-7218.

Mesurements: L- 24.0-40.0 W- 34.0-56.0

Diagnosis: Cervical grooves on flat carapace is very prominent broadly looks like V shaped, runs towards lateral epibranchial tooth. Epigastric and post orbital crests forms a bold ridge from mesogastric region to the lateral epibranchial tooth. In the external maxilipeds the exopodite is longer than ischium and also carries hairy flagellum.

Distribution: India: West Bengal, Odisha, Andhra Pradesh, Bihar, Karnataka, Kerala, Maharashtra, Tamil Nadu and Uttar Pradesh. *Elsewhere*: Sri Lanka.

Remarks: It is a fresh water species found in the estuarine area during high tide.

Wetland Avifauna

The avifauna of Odisha is rich as elsewhere in Indian sub-continent. As the state is bestowed with extensive riverine and etuarine habitats, the diversity of wetland birds are equally enriched. They are of great importance for their easthetic as well as economic importance.

Wetlands are important bird habitats, and they use them for breeding, nesting, rearing young, as a source of drinking water, for feeding, resting and shelter. The survival of wetland birds depends on the availability, depth, and quality of water; the food and shelter; and the presence or absence of predators. The value of a wetland to a specific bird species is affected by the presence of surface water or moist soils and the duration and timing of flooding. The Brahmani and Baitarani estuarine systems are the best grounds for many species of wetland birds. The list of 39 species of wetland and wetland dependent birds encountered during the study period is given below :

SYSTEMATIC LIST OF WETLAND AND WETLAND DEPENDENT BIRDS

Phylum VERTEBRATA

Class AVES

Order CICONIIFORMES

Family ARDEIDAE

1. *Ardeola grayii* (Sykes) (Indian Pond Heron) (Fig. 119)
2. *Ardea cinerea* Linnaeus (Grey Heron)
3. *Ardea alba alba* Linnaeus (Great White Heron) (Fig. 120)
4. *Bubulcus ibis coromandus* (Boddaert) (Cattle Egret)
5. *Egretta gularis schistacea* (Hemprich) (Indian reef heron)
6. *Egretta garzetta* (Linnaeus) (Little Egret) (Fig. 121)
7. *Egretta intermedia* (Intermediate Egret) (Fig. 122)
8. *Nycticorax nycticorax* (Linnaeus) (Night Heron)

Family CICONIIDAE

9. *Anastomus oscitans* (Asian Openbill)

Order PODICIPEDIFORMES

Family PODICIPEDIDAE

10. *Podiceps ruficollis* Salvadori (Little Grebe)

Order GRUIFORMES

Family RALLIDAE

11. *Amaurornis phoenicurus* (Boddaert) (White-breasted Water Hen)

Order PELICANIFORMES

Family PHALACROCORACIDAE

12. *Phalacrocorax niger* (Vieillot) (Little Cormorant) (Fig. 123)

Family THRESKIORNITHIDAE

13. *Threskiornis melanocephalus* (Latham) (Black-headed Ibis)

Order CHARADRIIFORMES

Family CHARADRIIDAE

14. *Charadrius mongolus* Wagler (Lesser Sand Plover)

15. *Charadrius hiaticula* (Lowe) (Common-ringed Plover)

16. *Charadrius leschenaultii* Lesson Greater Sand Plover

17. *Charadrius alexandrinus* Linnaeus (Kentish Plover)

18. *Charadrius dubius* Gmelin (Little-ringed Plover)

19. *Pluvialis dominica fulva* (Gmelin) (Pacific golden plover) (Fig. 124)

20. *Vanellus indicus indicus* (Boddaert) (Fig. 125)

21. *Numenius arquata orientalis* C.L.Brehm (Eastern Curlew)

22. *Numenius phaeopus phaeopus* (Linnaeus) (Whimbrel) (Fig. 126)

23. *Tringa totanus* (Linnaeus) (Common Redshank)

24. *Tringa hypoleucos* Linnaeus (Common Sandpiper) (Fig. 127)

25. *Calidris minutus* (Leisler) (Little Stint) (Fig. 128)

26. *Calidris subminutus* (Middendorff) (Long-toed Stint)

Family RECURVIROSTRIDAE

27. *Haematopus ostralegus* Linnaeus (Eurasian Oystercatcher)

Family LARIDAE

28. *Larus ridibundus* Linnaeus (Common Black-headed Gull)

29. *Sterna acuticauda* J.E. Gray (Black-bellied Tern)

30. *Sterna albiforns* Pallas (Little Tern) (Fig. 129)

31. *Sterna bengalensis* Lesser (Crested Tern)

32. *Rynchops albicollis* Swainson (Indian Skimmer)

Order CORACIIFORES

Family ALCEDINIDAE

33. *Alcedo atthis* Reichenbach (Common Kingfisher)

34. *Ceryle rudis leucomelanura* Reichenbach (Fig. 130)

35. *Halcyon pileata* (Boddaert) (Black-capped Kingfisher) (Fig. 131)

36. *Halcyon smyrnensis* (Linnaeus) (White-throated Kingfisher) (Fig. 132)

37. *Todirhamphus chloris* (Boddaert) (Collared Kingfisher)

Order PASSIREFORMES

Family PITTIDAE

38. *Pitta megahyncha* (Mangrove Pitta)

Order FALCONIFORMES

Family ACCIPITRIDAE

39. *Haliaeetus leucogaster* (Gmelin) (White-bellied Sea Eagle) (Fig. 133)

DISCUSSION

The Brahmani and Baitarani rivers formed an extensive system and ultimately joined the Bay of Bengal discharging huge quantity of water throughout. The luxurious mangroves along the coasts of estuarine and in the associated riverine ecosystems created extensive and vast mudflats, intrinsic creeks and tidal swamps. The world famous wetland belt Bhitarkanika mangroves are formed around the inner line of these rivers. This estuarine-mangrove wetland system harbours the highest diversity

of Indian mangrove flora, the largest known nesting site of the oliveridley sea-turtles in the world (the Gahirmatha Marine Sanctuary, is about 13 km away from the mouth of the Brahmani river), the biggest sanctuary for salt-water crocodiles in India, the largest known population of king cobra, mangrove and marsh snakes and one of the highest concentration of migratory waterfowls and other wetland birds. The entire mangrove belt of the Brahmani-Baitarani estuarine complex including Bhitarkanika National Park and Wildlife Sanctuary and Gahirmatha Marine Sanctuary approximately covering an area of over 170 km^2/area harbouring rich biodiversity.

The major estuarine systems of Odisha viz. Chilika Lake, Mahanadi, Rushikulya support large number of fish species. About 217 species of fish reported from the Chilika Lake by Rao (1995) and Rao (2009), 178 species from Mahanadi estuary by Venkateswarlu *et al.* (1998) and 29 species from Rushikulya estuary by Rao *et al.* (1992) (Table.-1). The present study on the Brahmani-Baitarani estuarine system revealed the occurrence of 126 species of fish under 89 genera belongs to 48 families. Like any other major estuaries, Brahmani-Baitarani estuarine system also support large number of fish species, inhabitants of marine, brackish and freshwater (Chart.-1.), mostly of euryhaline species comprising about 32% such as clupeids (*Anodontostoma chacunda, Pellona ditchela*), engraulids (*Coilia reynaldi, Setipinna tenuifilis*) eels (*Muraenesox bagio, Pisodonophis cancrivorus*), catfishes (*Arius dussumieri, Arius maculatus, Osteogeniosus militaris*), seaperches (*Lates calcarifer*), scienids (*Dendrophysa russelli, Johnius coitor, Otolithoides pama*) mullets, polynemids, some gobiids. About 39% of species are inhabitants of both marine and estuarine waters like flatfishes, tetraodontids, gobiids (*Taenioides spp., Trypauchen sp.*) ribbon fishes, carangids, silaginids, catfishes, clupeids and engraulids, 18% of the species like *Setipinna phasa, Puntius sophore, Mystus cavasius, M. vittatus, Ompok bimaculatus, Wallagu attu, Ailia coila, Silonia silondia, Gagata gagata, Pangasisus pangasius, Rhinomugil corsula, Channa* spp., etc are inhabitants of freshwater but tolerant to brackish environment, 7% of the species like *Pampus argenteus, Pennahia aenus, Otolithoides biauritus, Alepes djedaba, Himantura walga, Gymnura poecilura* are marine in nature but occasionally found in mouth areas while 2% of fish, *Sperata aor, Mystus bleekeri, Trichogaster fasciata,* are freshwater in nature but visit upstream of the estuary. The only species *Thryssa kammalensoides* is entirely brackish in nature. Of the total fish species recorded, 95 species are food fishes while rest of the species are considered to be the trash except few species like cat fishes, gruntres are of ornamental in nature. The fishes like mullets, barracudas, carangids, sciaenids, clupeids, catfishes, murrels etc. are commercially important and caught regularly from the estuarine belt (Chart.-2).

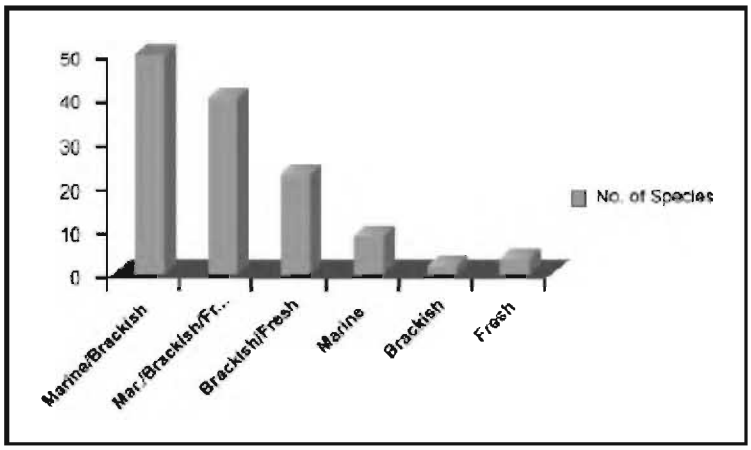

Chart 1. Habitat wise fish species in Brahmani-Baitarani estuary

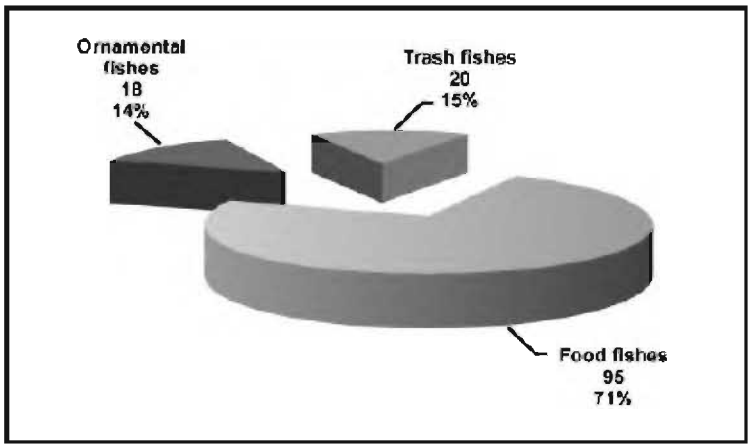

Chart 2. Category wise fishes in Brahmani-baitarani estuary

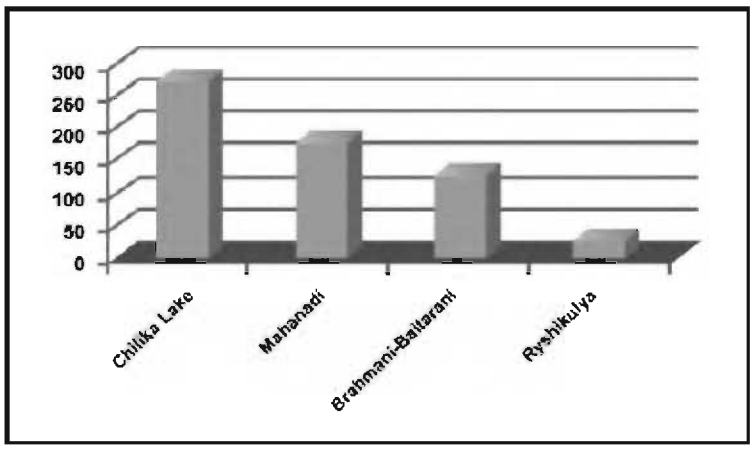

Chart. 3. Fish species diversity at various estuarine systems of Orissa

About 26 species of prawns under 11 genera belongs to 4 families and 22 species of crabs under 14 genera belongs to 8 families recorded during field observations around estuarine belt. The most common commercially important prawn species are *Penaeus (Penaeus) monodon, Penaeus (Penaeus) semisulactus, Penaeus (Fenneropenaeus) indicus, Parapenaeopsis scuptilis, Parapenaeopsis hardwickii, Metapenaeus monoceros, Metapenaeus dobsoni* and the crab species *Scylla serrata* and *Charybdis (Charybdis) feriatus.* It is found that these commercially important species the size of the individuals and quantity is gradually declining in many localities because of their indiscriminate and extensive harvesting compared to other species.

Among the terrestrial mammals Palm civet (*Paradoxurus hermaphroditus*), Jungle cat (*F. chaus*), Small Indian Civet cat (*Vivericula indica*), Jackal, mongoose, monitor lizards, wild boars etc. are common near the banks. According to the Forest Department, the marine mammals recorded from the nearby areas from Gahirmatha to Dhamara port are *Sousa chinensis, Orcaella brevirostris, Stenella attenuata, Delphinus delphis* and *Neophocaena phocaenoides.*

The extensive mudflats of these areas are appears to be important breeding and spawning grounds for the horseshoe crab or king crab, *Tachypleus gigas*(Muller) and *Carcinoscorpius rotundicauda* (Latreille). They play a very important role in bio-medical research, due to the presence of Lysate (Limulus Amoebocyte Lysate) in their blood which is used to test for bacterial toxins in pharmaceuticals and for bacterial diseases.

Every year large number of olive ridleys congregate along the sandy sores of Odisha, famous for nesting sites. One can witness large scale turtle mortalities (in multiple thousands) in Odisha. This is chiefly due to entangling in the fishing nets and trawls and propeller hits. The turtles thus die in the sea washed away to the shores due to the Northward winds. During the survey the team encountered many carcasses of turtles and dolphins.

The mudflats adjoining the river mouths and mangrove belts harbouring large numbers of wetland birds like Lesser Sand Plover, Kentish Plover, Little Stint, Curlew, Whimbrels, Sandpiper, Red Shank, Green Shank and Egrets and other birds like Black-shouldered Kite, Black Eagle, Brahminy Kite, Short-toed Serpent Eagles, kingfishers, Intermediate Egret, Cattle Egret, Little Egret, Pond Heron, Little Grey Heron etc. near the estuaries. About 39 species of wetland and wetland dependent birds recorded during the limited period of field observations. Small flocks of Indian Grey Hornbills are common along the adjoining forests of mangrove belts.

In recent times, the mangroves are facing threats of extinction due to anthropogenic and fast developmental activities around the Brahmani-Baitarani banks and along coastal belt of estuaries. The villagers settled around these areas are highly depending on the mangroves resources particularly by the communities in the periphery of the forest and adjoining areas. The lively hood options of the local people are limited

other than paddy cultivation and fishing. Because of this reason they depend mostly on the resource extraction from the mangroves and due to this more and more mangrove areas are being converted into cultivation fields. Moreover developmental activities all around the area such as encroachment and reclamation of land for agriculture and unsustainable aquaculture activities are also threaten the ecological balance of the Brahmani-Baitarani Mangrove Ecosystem. Despite the protected status of the mangrove belts and promulgation of a strong Maritime Act (1982) of the Government of Orissa and Orissa Marine Fishing Regulation Act (1982) and rules (1983) there are unabated developmental activities such as construction of Dhamara Port, establishments of Defence Research & Development Organization (DRDO), boat building yard and permitting operation of large number of mechanized fishing vessels in the area.

The information gathered from the villagers around the area revealed that over 80% of the people are aware of the protected status of the mangroves and its fauna and feels the responsibility of conservation of biodiversity of the area for their well being. Also majority of the people are in favour of the biggest Private-Public partnership venture, the Dhamara port, because of the lively hood options. Though people supported the Dhamara Port, its construction will have detrimental impact on the entire mangrove belt including Bhitarkanika National Park and Gahirmatha Marine Sanctuary, an abode of olive ridly turtles in future. Increased movement of mechanized fishing boats and heavy cargo liners in the Port area will prove destructive for the nesting sites of turtles, and the social impact of the population will slow down the integrity of the entire ecosystem in coming years. Turtles are known to be sensitive to noise (Samuel et al., 2005). The intensive port operations, movement of heavy cargo liners and fishing activities will certainly create heavy surface and subsurface water noise which may well prevent adult turtles to reach their nesting sites. The high noise levels are also known to deter the marine mammals for free movement in their jurisdiction. These aspects are to be taken into consideration while attempting any developmental activities in the area.

Suggested steps to minimize the damage of the mangrove belts and associated fauna

1. The stakeholders, who are the back bone of the conservation, must be involved for effective need based planning and implementation of all the developmental programs and for improving their socio-economic status.
2. Aforestation of Mangroves should be taken up extensively in and around forest blocks and already degraded coastal belts, which are under constant pressure due to excessive exploitation.
3. Information gathering network has to be developed to minimize the poaching of timber and wildlife products like snake and crocodile skins, turtle eggs and their carapaces, etc. with the help of locals.

4. Adequate number of enforcement staff with high frequency VHF gadgets, GPS sets, self defense equipment, binoculars and transport facilities must be increased.
5. Ensure proper checking of outgoing and incoming vehicles at various vantage points like Dhamara, Khola, Gupti and Chandbali etc.
6. Fishing regulations must be implemented strictly and monitored in and around protected areas.
7. Control on mechanized fishing in the coastal zone should be imposed and monitored by the State Fishery Department.
8. Environmental awareness is a powerful means for gaining support for conservation. Therefore, to make success the awareness programs at grass root level, valuable local knowledge and skills of the people must be fully utelised and interpretation centers are to be established widely.
9. A special task force for protection and conservation of Horseshoe crabs or King crabs along the coast must be created involving forest department, NGOs and local youth by the State on priority basis.
10. Strengthening and coordination among the fisheries, waterways, defense and other government departments is imperative.
11. The Maritime Act (1982) of the Government of Orissa and Orissa Marine Fishing Regulation Act (1982) and rules (1983), and Wildlife Protection Act (1972) must be implemented with letter and spirit.

SUMMARY

The Brahmani and Baitarani are an extensive river systems opening into Bay of Bengal near Dhamra, Bhadrak and Bhitarkanika near Kendraparah districts of Odisha respectively. Due to its extensive estuarine belt the faunal diversity is very high. The fishes, crustaceans and molluscs are the common elementsof the aquatic environment. About 126 species of fishes under 89 genera belongs to 48 families, 26 species of prawns under 11 genera belongs to 4 families, 22 species of crabs under 14 genera belongs to 8 families and 39 species of species of common wetland and wetland dependent birds are encountered during the study period of 2008 to 2010. Most of the fish species are highly tolerent to the salinity fluctuations. Other than the rich potential of fish and crustacean fauna, the noteworthy herpetofauna of the area are a variety of brackish water snakes, the brackish water frog *Fejervarya cancrivora*, saltwater crocodile *Crocodilus porosus*. The dolphins, *Orcaella brevirostris, Stenella attenuata, Delphinus delphis* and *Neophocaena phocaenoides* are the common mammals found in the

Dhamra region near the river mouth, off the port site and south to Gahirmatha coast. The extensive mudflats of the estuary are important breeding and spawning grounds for the king crab or horseshoe crab species *Tachypleus gigas* and *Carcinoscorpius rotundicauda*, renowned globally as a species of great importance and threatened in many parts of its range. Over 140 colour photographs of faunal elemnents of the Brahmani-Baitarani estuarine complex has been provided for easy identification in the field. The impact of the developmental activities around the estuarine areas and the relevant conservation measures needed are discussed.

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Table 1. Fish diversity in major estuaries of Odisha, including Chilika Lagoon. (The distribution of fishes in Chilika lagoon after Rao, 1995 and Rao, 2009; Mahanadi estuary after Venkateswarlu et al., 1998; Rushikulya estuary after Rao et al., 1992; Bahuda estuary after Misra, 2012).
(+ = **present; - = absent**).

Family/ Species	Estuary/ lake			
	Chilika	Mahanadi -Baitarani	Brahmani	Rushikulya
Family: **Dasyatidae**				
1. *Dasyatis zugei* (Müller & Henle)	-	+	-	-
2. *Gymnura poecilura* (Shaw)	-	-	+	-
3. *Himantura marginata* (Blyth)	+	-	+	-
4. *Himantura uarnak* (Gmelin)	+	-	-	-
5. *Himantura walga* (Müller & Henle)	-	+	+	-
6. *Pastinachus sephen* (Forsskål)	+	-	-	-
Family: **Myliobatidae**				
7. *Aetobatus flagellum* (Bloch & Schneider)	+	-	-	-
8. *Aetobatus narinari* (Euphrasen)	+	-	-	-
9. *Aetomylaeus nichofii* (Bloch & Schneider)	+	-	-	-
Family: **Rhynchobatidae**				
10. *Rhinchobatus djeddensis* (Forsskal)	+	-	-	-
Family: **Carcharhinidae**				
11. *Carcharhinus limbatus* (Müller & Henle)	+	-	-	-
12. *Carcharhinus melanopterus* (Quoy & Gaimard)	+	-	-	-
13. *Glyphis gangeticus* (Müller & Henle)	+	-	-	-
14. *Scoliodon laticaudus* Müller & Henle	+	-	-	-
Family: **Sphyrnidae**				
15. *Eusphyrna blochii* Cuvier)	+	-	-	-
Family: **Pristidae**				
16.*Pristis pectinata* Latham	+	-	-	-
Family: **Notopteridae**				
17. *Notopterus notopterus* (Pallas)	+	-	-	-
Family: **Elopidae**				
18. *Elops machnata* (Forsskål)	+	-	-	-
Family: **Megalopidae**				
19. *Megalops cyprinoides* (Broussonet)	+	-	-	-

Family: **Anguillidae**				
20. *Anguilla bengalensis* (Gray)	+	-	-	-
21. *Anguilla bicolour* McClleland	+	+	-	-
Family: **Moringuidae**				
22. *Monopterus hodgarti* (Chaudhuri)	-	+	-	-
23. *Moringua arundinacea* (McClelland)	-	+	-	-
24. *Moringua raitaborua* (Hamilton)	-	+	-	-
Family: **Muraenidae**				
25. *Lycodontis meleagris* (Shaw)	-	+	-	-
26. *Lycondontis tile* (Hamilton)	-	+	-	-
27. *Strophidon sathete* (Hamilton)	+	-	-	-
Family: **Ophichthidae**				
28. *Callechelys longipinnis* (Knar & Steidachner)	-	-	-	+
29. *Scolecenchelys macroptera* (Bleeker)	-	+	-	-
30. *Myrophis lepturus* Kotthaus	-	+	-	-
31.*Ophichthus apicalis* (Bennett)	-	+	-	-
32. *Pisodonophis boro* (Hamilton)	+	+	-	-
33. *Pisodonophis cancrivorus* (Richardson)	+	+	+	-
Family: **Congridae**				
34. *Uroconger lepturus* (Richardson)	-	+	-	-
Family: **Muraenesocidae**				
35. *Congresox talabonoides* (Bleeker)	+	-	-	-
36. *Muraenesox bagio* (Hamilton)	+	+	+	-
37. *Muraenesox cinereus* (Forsskål)	+	-	-	-
Family: **Notopteridae**				
38. *Notopterus notopterus* (Pallas)	+	-	-	-
Family: **Clupeidae**			-	
39. *Amblygaster sirm* (Walbaum)	+	-	-	-
40. *Amblygaster clupeoides* Bleeker	-	-	+	-
41. *Amblygaster leiogaster* Valenciennes	-	-	+	-
42. *Anodontostoma chacunda* (Hamilton)	+	+	+	-
43. *Corica soborna* Hamilton	+	-	-	-
44. *Dussumieria acuta* Valenciennes	-	+	-	-
45. *Escualosa thoracata* (Valenciennes)	+	+	+	-
46. *Hilsa kelee* (Cuvier)	+	-	-	-
47. *Nematalosa nasus* (Bloch)	+	-	+	-
48. *Ehirava fluviatilis* (Deraniyagala)	+	-	-	-
49. *Gonialosa manmina* (Hamilton)	+	-	-	-

50. *Gudusia chapra* (Hamilton)	+	-	-	-
51.*Tenualosa ilisha* (Hamilton)	+	+	-	+
52. *Tenualosa toli* (Valenciennes)	+	-	-	-
53. *Sardinella albella* (Hamilton)	-	+	-	-
54. *Sardinella dayi* Regan	-	+	-	-
55. *Sardinella fimbriata* (Valenciennes)	+	+	+	+
56. *Sardinella gibbosa* (Bleeker)	-	+	-	-
57. *Sardinella longiceps* Valenciennes	+	-	-	-
58. *Sardinella melanura* (Cuvier)	+	-	+	-
Family: **Pristigasteridae**				
59. *Ilisha elongata* (Bennett)	+	-	-	-
60. *Ilisha kampeni* (Weber and de Beaufort)	-	+	-	-
61. *Ilisha megaloptera* (Swainson)	-	+	+	-
62. *Ilisha melastoma* (Schneider)	+	+	+	-
63. *Nematalosa nasus* (Bloch)	+	-	-	-
64. *Opisthopterus tardoore* (Cuvier)	-	-	+	-
65. *Raconda russeliana* (Gray)	-	-	+	-
66. *Pellona ditchela* Valencinnes	-	-	+	-
Family: **Engraulididae**				
67. *Coilia neglecta* Whitehead	-	-	+	-
68. *Coilia ramcarati* (Hamilton)	-	-	+	-
69. *Coilia reynaldi* Valenciennes	-	-	+	-
70. *Setipinna phasa* (Hamilton)	-	-	+	-
71. *Setipinna taty* (Valenciennes,)	-	-	+	-
72. *Setipinna tenuifilis* Valenciennes	-	-	+	-
73. *Encrasicholina devisi* (Whitley)	-	+	-	-
74. *Encrasicholina heteroloba* (Rüppell)	-	+	-	-
75. *Stolephorus andhraensis* Babu Rao	-	+	-	-
76. *Stolephorus baganensis* Hardenberg	+	+	-	-
77. *Stolephorus commersonnii* Lacepède	+	+	+	+
78. *Stolephorus dubiosus* Wongratania	+	-	-	
79. *Stolephorus indicus* (van Hasselt)	+	+	-	+
80. *Stolephorus insularis* Hardenberg	-	+	-	-
81. *Stolephorus waitei* Jordan and Seale	-	+	-	-
82. *Thryssa dussumieri* (Valenciennes)	-	+	-	-
83.*Thryssa stenosoma* Wongratana	+	-	-	-
84. *Thryssa gautamiensis* Babu Rao	+	-	+	-
85. *Thryssa hamiltonii* (Gray)	+	-	+	-

86. *Thryssa kammalenssoides* (Bleeker)	+	-	+	-
87. *Thryssa malabarica* (Bloch)	+	+	+	-
88. *Thryssa mystax* (Schneider)	+	+	+	-
89. *Thryssa ploybrachialis* (Wongratana)	+	-	-	-
90. *Thryssa purava* (Hamilton)	+	-	+	-
91. *Thryssa setirostris* (Broussonet)	-	+	-	-
92. *Thryssa vitrirostris* (Gilchrist & Thompson)	-	+	-	-
Family: **Chanidae**				
93. *Chanos chanos* (Forsskål)	+	-	-	-
Family: **Cyprinidae**				
94. *Amblypharyngodon mola* (Hamilton)	+	-	-	-
95. *Danio rerio* (Hamilton)	+	-	-	-
96. *Catla catla* (Hamilton)	+	-	-	-
97. *Cirrhinus cirhosus* (Bloch)	+	-	-	-
98. *Chela cachius* (Hamilton)	+	-	-	-
99. *Chela laubuca* (Hamilton)	+	-	-	-
100. *Cirrhinus mrigala* (Hamilton)	+	-	-	-
101. *Cirrhinus reba* (Hamilton)	+	-	-	-
102. *Crossocheilus latius latius* (Hamilton)	+	-	-	-
103. *Esomus danricus* (Hamilton)	+	-	-	-
104. *Labeo ariza* (Hamilton)	+	-	-	-
105. *Labeo boga* (Hamilton)	+	-	-	-
106. *Labeo calbasu* (Hamilton)	+	-	-	-
107. *Labeo gonius* (Hamilton)	+	-	-	-
108. *Labeo rohita* (Hamilton)	+	-	-	-
109. *Osteobrama cotio peninsularis* (Silas)	+	-	-	-
110. *Osteobrama vigorsii* (Skyes)	+	-	-	-
111. *Parluciosoma daniconius* (Hamilton)	+	-	-	-
112. *Puntius chola* ((Hamilton)	+	-	-	-
113. *Puntius sarana* (Hamilton)	+	-	-	-
114. *Puntius sophore* (Hamilton)	+	-	+	-
115. *Puntius ticto* (Hamilton)	+	-	-	-
116. *Puntius vittatus* Day	+	-	-	-
117. *Rasbora rasbora* (Hamilton)	+	-	-	-
118. *Rasbora daniconius* (Hamilton)	+	-	-	-
119. *Salmostoma bacaila* (Hamilton)	+	-	-	-
Family: **Cobitidae**				
120. *Lepidocephalichthys guntea* (Hamilton)	+	-	-	-

Family: **Bagridae**				
121. *Sperata seenghala* (Skyes)	+	-	-	-
122. *Sperata aor* (Hamilton)	-	-	+	-
123. *Mystus bleekeri* (Day)	-	-	+	-
124. *Mystus cavasius* (Hamilton)	+	-	+	-
125. *Mystus gulio* (Hamilton)	+	+	+	+
126. *Mystus vittatus* (Bloch)	+	+	+	-
Family: **Siluridae**				
127. *Ompok bimaculatus* (Bloch)	+	-	+	-
128. *Ompok pabda* (Hamilton)	+	-	-	-
129. *Wallago attu* (Schneider)	+	-	+	-
Family: **Schilbeidae**				
130. *Ailia coila* (Hamilton)	+	-	+	-
131. *Eutropiichthys vacha* (Hamilton)	+	-	-	-
132. *Silonia silondia* (Hamilton)	+	-	+	-
Family: **Pangasiidae**				
133. *Pangasius pangasius* (Hamilton)	+	-	+	-
Family: **Sisoridae**				
134. *Bagarius bagarius* (Hamilton)	+	-	-	-
135. *Gagata gagata* (Hamilton)	-	-	+	-
Family: **Clariidae**				
136. *Clarias batrachus* (Linnaeus)	+	-	-	-
Family: **Heteropneustidae**				
137. *Heteropneustes fossilis* (Bloch)	+	-	-	-
Family: **Ariidae**				
138. *Arius dussumieri* (Valenciennes)	-	-	+	-
139. *Arius arius* (Hamilton)	+	-	+	+
140. *Arius caelatus* (Valenciennes)	+	-	+	+
141. *Arius gagora* (Hamilton)	-	+	-	-
142. *Arius jella* Day -	-	+	-	
143. *Arius aculates* (Thunberg)	+	+	+	-
144. *Arius tennuispinis* Day	+	+	-	-
145. *Nemapteryx caelata* (Valenciennes)	+	-	-	-
146. *Osteogeneiosus militaris* (Linnaeus)	+	-	+	-
147. *Plicofollis tenuispinis* (Day)	+	+		
Family: **Plotosidae**				
148. *Plotosus canius* Hamilton	+	+	+	-
149. *Plotosus lineatus* (Thunberg)	+	-	+	-

Family: **Synodontidae**				
150. *Trachinocephalus myops* (Foster)	+	-	-	-
151. *Harpadon nehereus* (Hamilton)	-	-	+	-
Family: **Bregmacerotidae**				
152. *Bregmaceros mcclellandi* Thompson	-	+	+	-
Family: **Hemiramphidae**				
153. *Hemirhamphus far* (Forsskål)	-	+	-	-
154. *Hyporhamphus limbatus* (Valnciennes)	+	+	-	-
155. *Rhynchorhamphus malabaricus* Collettee	-	+	-	-
Family: **Belonidae**				
156. *Strongylura leiura* (Bleeker)	+	+	-	-
157. *Strongylura strongylura* (van Hasselt)	+	+	+	-
158. *Xenentodon cancila* (Hamilton)	+	-	-	-
Family: **Oryziidae**				
159. *Oryzias melastigma* (McClelland)	+	-	-	-
Family: **Aplocheilidae**				
160. *Aplocheilus panchax* (Hamilton)	+	-	+	-
Family: **Syngnathidae**				
161. *Hippocampus brachyrhynchus* Duncker	+	-	-	-
162. *Hippocampus fuscus* Ruppell	+	-	-	-
163. *Ichthyocampus carce* (Hamilton)	+	+	-	-
164. *Microphis cuncalus* (Hamilton)	-	+	-	-
165. *Microphis brachiurus* Bleeker				+
166. *Microphis deocata* (Hamilton)	-	+	-	-
Family: **Batrachoididae**				
167. *Allenbatrachus grunniens* (Linnaeus)	-	-	+	-
168. *Colletteichthys dussumieri* (Valenciennes)	-	+	-	-
Family: **Synbranchidae**				
169. *Ophisternon bengalense* (McClelland)	+	-	-	-
Family: **Scorpaenidae**				
170. *Pterois radiata* Cuvier	+	-	-	-
171. *Ablabys taenianotus* (Cuvier)	-	+	-	-
172. *Apistus carinatus* (Bloch & Schneider)	-	+	-	-
173. *Minous monodactylus* (Bloch & Schneider)	-	+	-	-
174. *Polycaulis uranoscopus* (Bloch & Schneider)	-	+	-	-
Family: **Tetrarogidae**				
175. *Tetraroga niger* (Cuvier)	+	-	-	-
Family: **Platycephalidae**				

176. *Grammoplites scaber* (Linnaeus)	-	+	-	-
177. *Kumococius rodericensis* (Cuvier)	-	+	-	-
178. *Platycephalus indicus* (Linnaeus)	+	+	+	+
Family: **Latidae**				
179. *Lates calcarifer* (Bloch)	+	+	+	-
Family: **Atherinidae**				
180. *Atherinomorus duodecimalis* (Valenciennes)	+	-	-	-
181. *Atherinomorus lacunosus* (Forster)				
Family: **Ambassidae**	+	-	-	-
182. *Ambassis ambassis* (Lacepède)	+	+	+	-
183. *Ambassis dussumieri* Cuvier	-	+	-	-
184. *Ambassis dayi* Bleeker	-	+	-	-
185. *Ambassis gymnocephalus* (Lacepède)	+	+	-	-
186. *Ambassis urotaenia* Bleeker	-	-	-	+
187. *Chanda nama* Hamilton	+	-	-	-
188. *Pseudambassis ranga* (Hamilton)	+	-	+	-
189. *Parambassis lala* (Hamilton)	+	-	-	-
Family: **Serranidae**				
190. *Epinephelus coioides* (Hamilton)	+	-	-	-
191. *Epinephelus malabaricus* (Schneider)	-	+	-	-
192. *Epinephelus tauvina* (Forsskål)	+	-	-	-
193. *Promicrops lanceolatus* (Bloch)	+	+	-	-
Family: **Teraponidae**				
194. *Pelates quadrilineatus* (Bloch)	+	-	-	-
195. *Terapon jarbua* (Forsskål)	+	+	+	+
196. *Terapon puta* Cuvier	+	-	-	-
197. *Terapon theraps* Cuvier	-	+	-	-
Family: **Sillaginidae**				
198. *Sillaginopsis panijus* (Hamilton)	+	+	+	-
199. *Sillago chondropus* (Bleeker)	-	+	-	-
200. *Sillago maculata* Quoy & Gaimard	-	+	-	-
201. *Sillago sihama* (Forsskål)	+	+	+	+
202. *Sillago vincenti* McKay	+	-	+	-
Family: **Rachycentridae**				
203. *Rachycentron canadus* (Linnaeus)	+	-	-	-
Family: **Echeneididae**				
204. *Echeneis naucrates* (Linnaeus)	+	-	-	-
Family: **Carangidae**				

205. *Alectis indica* (Rüppell)	+	+	-	-
206. *Alepes djedaba* (Forsskål)	+	+	+	-
207. *Atropus atropos* (Bloch & Schneider)	-	+	-	-
208. *Atule mate* (Cuvier)	+	-	-	-
209. *Carangoides malabaricus* (Bloch & Schn.)	-	+	-	-
210. *Carangoides praeustus* (Bennett)	+	-	-	-
211. *Caranx carangus* (Bloch)	+	-	-	+
212. *Caranx hippos* (Linnaeus)	+	-	-	-
213. *Caranx ignobilis* (Forsskål)	+	-	-	-
214. *Caranx melampygus* Cuvier	+	-	-	-
215. *Caranx para* Cuvier	-	+	-	-
216. *Caranx sexfasciatus* Quoy & Gaimard	+	-	-	-
217. *Megalaspis cordyla* (Linnaeus)	+	+	-	-
218. *Parastromateus niger* (Bloch)	+	-	-	-
219. *Selar crumenophthalmus* (Bloch)	+	-	-	-
220. *Scomberoides commersonianus* Lacepede	+	-	+	-
221. *Scomberoides lysan* (Forsskål)	+	+	+	-
222. *Scomberoides tala* (Cuvier)	+	+	-	-
223. *Trachinotus blochii* (Lacepede)	+	-	-	-
224. *Trachinotus mookalee* Cuvier	+	-	-	-
Family: **Apolectidae**				
225. *Apolectus niger* (Bloch)	+	-	-	-
Family: **Leiognathidae**				
226. *Gazza minuta* (Bloch)	+	+	-	-
227. *Leiognathus blochii* (Valenciennes)	+	+	-	-
228. *Leiognathus brevirostris* (Valenciennes)	-	+	-	-
229. *Leiognathus daura* (Cuvier)	+	-	-	-
230. *Leiognathus dussumieri* (Valenciennes)	+	-	-	-
231. *Leiognathus equulus* (Forsskål)	+	+	+	-
232. *Leiognathus jonesi* James	-	+	-	-
233. *Photopectoralis bindus* (Valenciennes)	-	+	-	-
234. *Secutor insidiator* (Bloch)	+	+	+	-
235. *Secutor ruconius* (Hamilton)	-	+	+	-
Family: **Lutjanidae**				
236. *Lutjanus argentimaculatus* (Forsskål)	+	-	-	-
237. *Lutjanus johnii* (Bloch)	+	+	+	+
238. *Lutjanus kasmira* (Forsskål)	+	-	-	-
239. *Lutjanus russelli* (Bleeker)	+	-	-	-

Family: **Lobotidae**				
240. *Datnioides quadrifasciatus* (Sevastianov)	+	-	-	-
Family: **Gerreidae**				
241. *Gerreomorpha setifer* (Hamilton)	+	-	-	-
242. *Gerres abbreviatus* Bleeker	+	-	-	-
243. *Gerres erythrourus* (Bloch)	-	-	+	-
244. *Gerres filamentosus* Cuvier	+	+	-	+
245. *Gerres limbatus* Cuvier	+	+	+	
246. *Gerres longirostris* (Lacepede)	+	-	-	-
247. *Gerres macracanthus* (Bleeker)	+	-	-	-
248. *Gerres oblongus* Cuvier	-	+	-	-
249. *Gerres oyena* (Frosskål)	+	-	-	-
250. *Gerres poieti* Cuvier	+	-	-	-
251. *Gerres setifer* (Hamilton)	+	-	-	-
Family: **Haemulidae**				
252. *Plectorhynchus niger* (Cuvier)	+	+	-	-
253. *Pomadasys argenteus* (Forsskål)	+	+	-	-
254. *Pomadasys hasta* (Bloch)	-	-	+	-
255. *Pomadasys kaakan* (Cuvier)	+	+	+	-
256. *Pomadasys maculatum* (Bloch)	-	+	-	-
Family: **Sparidae**				
257. *Acanthopagrus berda* (Forsskål)	+	-	+	-
258. *Acanthopagrus latus* (Houttuyn)	+	+	-	-
259. *Crenidens crenidens* (Forsskål)	+	-	-	-
260. *Rhabdosargus sarba* (Forsskål)	+	-	-	-
Family: **Monodactylidae**				
261. *Monodactylus argenteus* (Linnaeus)	+	-	-	-
Family: **Sciaenidae**				
262. *Chrysochir aureus* (Richrdson)	-	-	+	-
263. *Daysciaena albida* (Cuvier)	+	-	-	-
264. *Dendrophysa russelli* (Cuvier)	+	+	+	-
265. *Johnius amblycephalus* (Bleeker)	+	-	-	-
266. *Johnius belangerii* (Cuvier)	+	-	+	-
267. *Johnius carouna* (Cuvier)	-	+	-	-
268. *Johnius carutta* Bloch	-	+	-	-
269. *Johnius coitor* (Hamilton)	-	+	+	-
270. *Johnius macropterus* (Bleeker)	+	-	-	-
271. *Johnius volgeri* (Bleeker)	-	+	-	-

272. *Nibea soldado* (Lacepede)	-	-	+	-
273. *Otolithoides pama* (Hamilton)	+	-	+	-
274. *Otolithoides biauritus* (Cantor)	+	-	+	-
275. *Panna microdon* (Bleeker)	-	-	+	-
276. *Paranibea semiluctuosa* (Cuvier)	+	-	-	-
277. *Pennahia anea* (Bloch)	-	-	+	-
278. *Protonibea diacanthus* (Lacepède)	+	-	-	-
279. *Pterotolithus maculatus* (Kuhl & van Hasselt)	-	-	+	-
Family: **Mullidae**				
280. *Upeneus sulphurous* Cuvier	-	-	+	-
281. *Upeneus tragula* Richardson	-	+	-	+
282. *Upeneus vittatus* (Forsskål)	-	+	-	-
Family: **Nandidae**				
283. *Nandus nandus* (Hamilton)	+	-	+	-
Family: **Cichlidae**				
284. *Etroplus maculates* (Bloch)	+	-	-	-
285. *Etroplus suratensis* (Bloch)	+	-	-	-
286. Oreochromis mossambicus (Peters)	+	-	-	-
Family: **Anabantidae**				
287. *Anabas cobojius* (Hamilton)	+	-	-	-
288. *Anabas testudineus* (Bloch)	+	+	-	-
Family: **Osphronemidae**				
289. *Colisa lalia* (Hamilton)	+	-	-	-
289. *Colisa fasciata* (Bloch & Schneider)	+	-	-	-
Family: **Mastacembelidae**				
290. *Macrognathus aral* (Bloch & Schneider)	+	-	-	-
291. *Macrognathus pancalus* Hamilton	+	-	-	-
292. *Mastacembelus armatus* (Lacepède)	+	-	-	-
Family: **Drepanidae**				
293. *Drepane longimana* (Bloch & Sch.)	-	-	+	-
294. *Drepane punctata* (Linnaeus)	+	-	-	-
Family: **Scatophagidae**				
295. *Scatophagus argus* (Linnaeus)	+	+	+	+
Family: **Ephippidae**				
296. *Platax pinnatus* (Linnaeus)	-	+	-	-
Family: **Mugilidae**				
297. *Liza macrolepis* (Smith)	+	+	+	-
299. *Liza parsia* (Hamilton)	+	+	+	+

300. *Liza melinoptera* (Valenciennes)	+	-	-	-
301. *Liza subviridis* (Valenciennes)	+	+	-	-
302. *Liza tade* (Forsskal)	+	+	+	-
304. *Liza vaigiensis* (Quoy & Gaimard)	+	-	-	-
355. *Moolgarda seheli* (Forsskål)	+	+	-	+
306. *Mugil cephalus* Linnaeus	+	+	+	+
377. *Rhinomugil corsula* (Hamilton)	+	-	+	-
388. *Valamugil buchanani* (Bleeker)	-	+	+	-
309. *Valamugil cunnesius* (Valenciennes)	+	+	-	-
310. *Valamugil speigleri* (Bleeker)	+	+	-	+
Family **Sphyraenidae**				
311. *Sphyraena barracuda* (Edwards)	-	+	+	-
312. *Sphyraena obtusata* Cuvier	-	+	-	-
313. *Sphyraena putnamae* Jordan & Seale	+	-	-	-
314. *Sphyraena jello* (Cuvier)	+	-	-	-
Family: **Polynemidae**				
315. *Eleutheronema tetradactylum* (Shaw)	+	+	+	-
316. *Leptomelanosoma indicum* (Shaw)	+	-	-	-
317. *Polydactylus sextarius* (Bloch & Schneider)	+	+	-	-
318. *Polydactylus plebeius* (Broussonet)	+	+	-	-
319. *Polynemus dubius* Bleeker	-	-	+	-
320. *Polynemus paradiseus* Linnaeus	-	-	+	-
Family: **Kurtidae**				
321. *Kurtus indicus* Bloch	-	-	+	-
Family: **Uranoscopidae**				
322. *Ichthyoscopus inermis* Cuvier	-	+	-	-
Family: **Siganidae**				
323. *Siganus canaliculatus* (Park)	-	-	-	+
Family: **Blenniidae**				
324. *Omobranchus zebra* (Bleeker)	+	-	-	
Family: **Callionymidae**				
325. *Callionymus fluviatilis* Day	-	+	-	-
326. *Callionymus filamentosus* (Valenciennes)	-	-	-	-
327. *Callionymus sagitta* Pallas	-	+	-	+
Family: **Eleotrididae**				
328. *Butis butis* (Hamilton)	+	-	+	-
329. *Eleotris fusca* (Schneider)	+	+	-	-

330. *Prionobutis koilomatodon* (Bleeker)	-	+	-	-
331. *Taenioides buchanani* (Day)	+	-	-	-
Family: **Trichiuridae**				
332. *Eupleurogrammus glossodon* (Bleeker)	+	+	-	-
334. *Eupleurogrammus muticus* (Gray)	-	-	+	-
335. *Lepturacanthus pantului* (Gupta)	-	+	-	-
336. *Lepturacanthus savala* (Cuvier)	+	-	+	-
Family: **Scombridae**				
337. *Rastrelliger kanagurta* (Cuvier)	+	+	-	-
338. *Scomberomorus guttatus* (Bloch & Schneider)	-	+	-	-
339. *Scomberomorus lineolatus* (Cuvier)	+	-	-	-
Family: **Ariommidae**				
340. *Ariomma indica* (Day)	-	+	-	-
Family **Osphronemidae**				
341. *Trichogaster fasciata* Bloch & Schneider	-	-	+	-
Family: **Stromateidae**				
342. *Pampus argenteus* (Euphrasen)	-	-	+	-
343. *Pampus chinensis* (Euphrasen)	-	+	+	-
Family: **Channidae**				
344. *Channa marulius* (Hamilton)	+	-	-	-
345. *Channa punctata* (Bloch)	+	+	+	-
346. *Channa striata* (Bloch)	+	-	+	-
Family: **Gobiidae**				
347. *Acentrogobius caninus* (Valenciennes)	-	+	-	-
348. *Acentrogobius cyanomos* (Bleeker)	+	+	-	-
349. *Drombus globiceps* (Hora)	+	-	-	-
350. *Acentrogobius griseus* (Day)	+	-	-	-
351. *Amoya madraspatensis* (Day)	+	-	-	-
352. *Acentrogobius masoni* (Day)	+	-	-	-
353. *Acentrogobius viridipunctatus* (Valenciennes)	+	-	-	-

354. *Apocryptes bato* (Hamilton)	-	+	-	-
356. *Bathygobius fuscus* (Ruppell)	+	+	-	-
357. *Bathygobius ostreicola* (Chaudhuri)	+	-	-	-
358. *Boleophthalmus boddarti* (Pallas)	-	+	-	-
359. *Boleophthalmus sculptus* (Günther)	-	+	-	-
360. *Brachygobius nunus* (Hamilton)	+	-	-	-
361. *Caragobius urolepis* (Bleeker	-	-	+	-
362. *Favonigobius reichei* Bleeker	-	+	-	-
363. *Psammogobius biocellatus* (Valenciennes)	+	+	-	+
364. *Glossogobius giuris* (Hamilton)	+	+	+	+
365. *Glossogobius mas* (Hora)	+	-	-	-
666. *Gobiopterus chuno* (Hamilton)	+	-	-	-
367. *Oligolepis acutipennis* (Valenciennes)	+	+	-	-
368. *Oligolepis cylindriceps* (Hora)	+	-	-	-
369. *Oxyurichthys microlepis* (Bleeker)	+	+	-	+
370. *Oxyurichthys tentacularis* (Valenciennes)	+	+	-	-
371. *Parapocryptes macrolepis* (Bleeker)	-	+	-	-
372. *Parapocryptes rictuosus* (Valenciennes)	+	-	-	-
373. *Periophthalmodon schlosseri* (Pallas)	-	+	-	-
374. *Periophthalmus koelreuteri* (Pallas)	+	+	-	-
375. *Periophthalmus barbarous*(Linnaeus)	+	-	-	-
376. *Pseudapocryptes lanceolatus* (Bloch & Schenider)	+	+	-	-
377. *Pseudapocryptes elongates* (Cuvier)	+	-	-	-
378. *Pseudogobius javanicus* (Bleker)	+	-	-	-
379. *Scartelaos viridis* (Hamilton)	-	+	-	-
380. *Stigmatogobius javanicus* (Bleeker)	+	-	-	-
381. *Stigmatogobius minima* (Hora)	+	-	-	-
382. *Stigmatogobius sadanundio* (Hamilton)	-	-	+	-
383. *Taenioides anguillaris* (Linnaeus)	-	-	+	-
384. *Taenioides buchanani* (Day)	+	+	+	-

385. *Taenioides cirratus* (Blyth)	-	+	+	-
386. *Trypauchen vagina* (Bloch & Schn.)	+	+	+	-
Family: **Gobioididae**				
387. *Brachyamblyopus brachysoma* (Bleeker)	-	+	-	-
388. *Brachyamblyopus multiradiatus* (Hardenberg)	-	+	-	-
389. *Odontamblyopus rubicundus* (Hamilton)	-	+	-	-
Family: **Paralichthyidae**				
390. *Pseudorhombus arsius* (Hamilton)	+	-	-	-
391. *Pseudorhombus triocellatus* (Bloch & Schn.)	+	-	-	-
Family: **Bothidae**				
392. *Pseudorhombus arsius* (Hamilton)	+	+	-	-
393. *Pseudorhombus dupliciocellatus* Regan	-	+	-	-
Family: **Cynoglossidae**				-
394. *Cynoglossus arel* (Schneider)	-	-	+	-
395. *Cynoglossus bilineatus* (Lacepede)	-	+	+	-
396. *Cynoglossus lingua* Hamilton	+	+	+	-
397. *Cynoglossus itinus* (Snyder)	-	+	-	-
398. *Cynoglossus punticeps* (Richardson)	+	+	+	-
399. *Cynoglossus semifasciatus* Day	-	-	-	+
400. *Paraplagusia bilineata* (Bloch)	-	+	+	-
401. *Paraplagusia blochii* (Bleeker)	-	+	+	-
Family: **Soleidae**				
402. *Brachirus orientalis* (Bloch & Schneider)	+	+	+	-
403. *Brachirus orientalis* (Bloch & Schneider)	+	-	-	-
404. *Synaptura albomaculata* Kaup	-	+	-	-
405. *Synaptura commersonnii* (Lacepède)	-	+	+	-
406. *Solea elongata* Day	-	+	-	-
407. *Solea ovata* Richardson	+	+	-	-
Family: **Triacanthidae**				
408. *Triacanthus biaculeatus* (Bloch)	+	+	-	-

409. *Triacanthus brevirostris* Schlegel	-	+	-	-
Family: **Tetraodontidae**				
410. *Arothron reticularis* (Bloch & Schneider)	+	-	-	-
411. *Chelonodon patoca* (Hamilton)	+	-	+	+
412. *Lagocephalus lunaris* (Bloch & Schneider)	+	+	+	-
413. *Takifugu oblongus* (Bloch)	+	+	+	-
414. *Tetraodon cutcutia* Hamilton	+	-	-	-
415. *Chelonodon fluviatilis* Hamilton	+	+	-	-
Total number of species	**274**	**178**	**126**	**29**

PLATE-1

Fig. 3

Fig. 4

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Fig. 9

Fig. 10

Fig. 3. *Himantura walga,* **Fig. 4.** *Anodontostoma chacunda,* **Fig. 5.** *Escualosa thoracata,* **Fig. 6.** *Nematalosa nasus,* **Fig. 7.** *Pellona ditchela,* **Fig. 8.** *Rraconda russeliana,* **Fig. 9.** *Coilia ramcarati,* **Fig. 10.** *Coilia reynaldi*

PLATE-2

Fig. 11

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Fig. 18

Fig. 11. *Setipinna phasa,* **Fig. 12.** *Setipinna taty,* **Fig. 13.** *Stolephorus commersoni,* **Fig. 14.** *Thryssa hamltoni,* **Fig. 15.** *Thryssa malabarica,* **Fig. 16.** *Thryssa mystax,* **Fig. 17.** *Strongylura strongylura,* **Fig. 18.** *Puntius sophore*

PLATE-3

Fig. 19

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Fig. 26

Fig. 19. *Arius arius,* **Fig. 20.** *Arius jella,* Fig. 21. Arius maculatus,
Fig. 22. *Osteogeneiosus militaris,* **Fig. 23.** *Sperata aor,* **Fig. 24.** *Mystus blekeri,*
Fig. 25. *Mystus cavasius,* **Fig. 26.** *Ompok bimaculatus*

PLATE-4

Fig. 27

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Fig. 27. *Wallago attu,* **Fig. 28.** *Ailia coila,* **Fig. 29.** *Silonia silinida,* **Fig. 30.** *Plotosus canius,* **Fig. 31.** *Plotosus lineatus,* **Fig. 32.** *Pangasisus pangasisus,* **Fig. 33.** *Harpodon neherius,* **Fig. 34.** *Bregmaceros maccleliandi*

PLATE-5

Fig. 35

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Fig. 35. *Platycephalus indicus,* **Fig. 36.** *Lates calcarifer,* **Fig. 37.** *Ambassis ambassis,* **Fig. 38.** *Parambassis ranga,* **Fig. 39.** *Terapon jarbua,* **Fig. 40.** *Sillaginopsis panijus,* **Fig. 41.** *Sillago sihama,* **Fig. 42.** *Sillago vincenti*

PLATE-6

Fig. 43

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Fig. 43. *Scomberoides commersonianus,* **Fig. 44.** *Leiognathus equulus,*
Fig. 45. *Secutor insidiator,* **Fig. 46.** *Lutjanus johnii,* **Fig. 47.** *Gerres limbatus,*
Fig. 48. *Pomadasys kaakan,* **Fig. 49.** *Chrysochir aureus,* **Fig. 50.** *Dendrophysa russelli*

PLATE-7

Fig. 51

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Fig. 51. *Johnius coitor,* **Fig. 52.** *Nibea soldado,* **Fig. 53.** *Panna microdon,*
Fig. 54. *Pterotolithus maculatus,* **Fig. 55.** *Upeneus sulphureus,* **Fig. 56.** *Scatophagus argus,*
Fig. 57. *Nandus nandus,* **Fig. 58.** *Mugil cephalus*

PLATE-8

Fig. 59

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Fig. 59. *Liza parsia,* **Fig. 60.** *Rhinomugil corsula,* **Fig. 61.** *Sphyraena barracuda,*
Fig. 62. *Eleutherionema tetradactylum,* **Fig. 63.** *Polynemus paradiseus,* **Fig. 64.** *Kurtus indicus,*
Fig. 65. *Lepturacanthus savala,* **Fig. 66.** *Pampus argenteus*

PLATE-9

Fig. 67

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Fig. 74

Fig. 67. *Pampus chinensis,* **Fig. 68.** *Allenbatrachus grunniens,* **Fig. 69.** *Glossogobius giuris,*
Fig. 70. *Taenioides anguillaris,* **Fig. 71.** *Taenioides buchanani,*
Fig. 72. *Stigmatogobius sadanundio,* **Fig. 73.** *Butis butis,* **Fig. 74.** *Channa striata*

PLATE-10

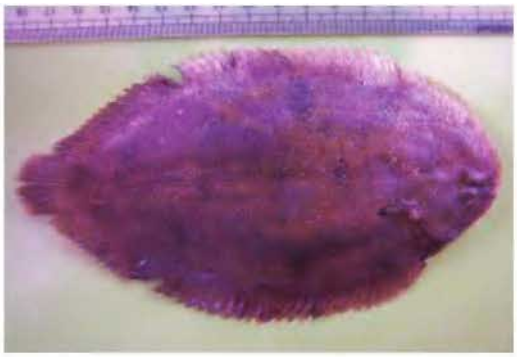

Fig. 75

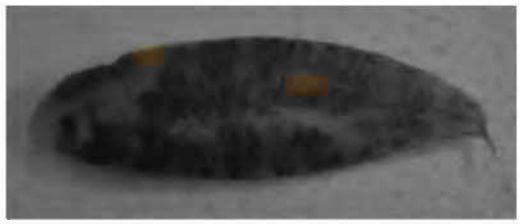

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Fig. 75. *Brachirus orientalis,* **Fig. 76.** *Cynoglossus puncticeps,* **Fig. 77.** *Paraplagusia bilineata,* **Fig. 78.** *Chelanodon patoca,* **Fig. 79.** *Lagocephalus lunaris,* **Fig. 80.** *Takifugu oblongus,* **Fig. 81.** *Penaeus monodon,* **Fig. 82.** *Penaeus semisulactus*

PLATE-11

Fig. 83

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Fig. 83. *Penaeus indicus,* **Fig. 84.** *Penaeus merguiensis,* **Fig. 85.** *Penaeus japonicus,*
Fig. 86. *Parapenaeopsis scuptilis,* **Fig. 87.** *Parapenaeopsis hardwickii,*
Fig. 88. *Metapenaeopsis toloensis,* **Fig. 89.** *Trachypenaeus granulosus,* **Fig. 90.** *Metapenaeus monoceros,*

PLATE-12

Fig. 91

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Fig. 91. *Metapenaeus dobsoni,* **Fig. 92.** *Metapenaeus brevicornis,* **Fig. 93.** *Metapenaeus lysianassa,* **Fig. 94.** *Metapenaeus affinis,* **Fig. 95.** *Metapenaeus elegans,* **Fig. 96.** *Solenocera choprai,* **Fig. 97.** *Tachypleus gigas-Horse shoe crab,* **Fig. 97.** *Solenocera crassicornis*

PLATE-13

Fig. 98

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Fig. 102

Fig. 103

Fig. 104

Fig. 105

Fig. 98. *Macrobrachium malcolmsonii,* **Fig. 99.** *Macrobrachium equidens,* **Fig. 100.** *Macrobrachium rude,* **Fig. 101.** *Macrobrachium mirabile,* **Fig. 102.** *Macrobrachium rosenbergii,* **Fig. 103.** *Exopalaemon styliferus,* **Fig. 104.** *Nematopalaemon tenuipes,* **Fig. 105.** *Leptocarpus fluminicola*

PLATE-14

Fig. 106

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Fig. 109

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Fig. 111

Fig. 112

Fig. 113

Fig. 106. *Hippolysmata ensirostris,* **Fig. 107.** *Neodorippe callida,* **Fig. 108.** *Galene bispinosa,* **Fig. 109.** *Scylla serrata,* **Fig. 110.** *Portunus pelagicus,* **Fig. 111.** *Portunus sanguinolentus,* **Fig. 112.** *Charybdis feriatus,* **Fig. 113.** *Charybdis affinis*

PLATE-15

Fig. 114

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Fig. 119

Fig. 120

Fig. 121

Fig. 114. *Charybdis rostrata,* **Fig. 115.** *Varuna litterata,* **Fig. 116.** *Ptychognathus barbata,* **Fig. 117.** *Ocypode macrocera,* **Fig. 118.** *Barytelphusa cunicularis,* **Fig. 119.** *Ardeola grayii*-indian pond heron, **Fig. 120.** *Ardea alba*-Large egret, **Fig. 121.** *Egretta garzetta*-Little egret

PLATE-16

Fig. 122

Fig. 123

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Fig. 128

Fig. 129

Fig. 122. *Egretta intermedia* -median egret, **Fig. 123.** *Phalacrocorax niger*-Cormorant, **Fig. 124.** *Pluvialis dominica fulva*-pacific golden plover, **Fig. 125.** *Vanellus indicus indicus*-Redwattled lapwing, **Fig. 126.** *Numenius phaeopus*-Whimbrel, **Fig. 127.** *Tringa hypoleucos*-Comm sandpiper, **Fig. 128.** *Calidris minutus* -little stint, **Fig. 129.** *Sterna albiforns*-Tern

PLATE-17

Fig. 130

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Fig. 136

Fig. 137

Fig. 130. *Ceryle rudis leucomelanura*-pied kingfisher, **Fig. 131.** *Halcyon pileata*-Black capped kingfisher, **Fig. 132.** *Halcyon smyrensis*-Whitebreasted kingfisher, **Fig. 133.** *Haliaeetus leucogaster*-Whitebellied sea eagle, **Fig.134.** *Crocodilus porosus*-Estuarine crocodile, **Fig.135.** *Tachypleus gigas*-Horse shoe crab, **Fig.136.** Mouth area of Baitarani estuary near Dhamara, **Fig.137.** Huge fleet of trawlers near Baitarani creek, Dhamra

PLATE-18

Fig. 138

Fig. 139

Fig. 140

Fig.138. Boat building yard, Dhamra Port,
Fig.139. Sampling along muddy coast of Baitarani,
Fig.140. Ocypode crabs on sandy coast, Dhamra

PLATE-19

Fig. 141

Fig. 142

Fig. 143

Fig.141. Sand dwelling Seaanemone on sandy coast,
Fig.142. Dead sea turtles along the Baitarani coast- a common sight near Dhamra Port,
Fig.143. Artisanal fishing in in Brahmani estuary

PLATE-20

Fig. 144

Fig. 145

Fig. 146

Fig.144. Mangrove belt along Dhamra coast,
Fig.145. Drying trash fish on the shores of Dhamara,
Fig.146. Dhamra Port in operation : A conflict between development and habitat destruction