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# A systematic study on genus *Metapenaeus* wood-mason, 1891 with special reference to extended distribution of four species from Indian water

**Angsuman Chanda**

**Abstract**
Genus *Metapenaeus* is a largest group of penaeid prawn found in Indian water. It was M. J. George (1979) who tried to study the genus in a comprehensive manner along with other genus under family Penaeidae. In his contribution he listed 11 species under the genus. Out of his enlisted 11 species *Metapenaeus burkenroadi* Kubo, 1954 is synonymised with *Metapenaeus moyebi* (Kishinouye, 1896**)** by Miquel (1982). Later on *Metapenaeus elegans* De Man, 1907 was recorded by Silas and Muthu (1974) from Andaman Sea; *Metapenaeus intermedius* (Kishinouye, 1900) recorded by Johnson (1976) also from Andaman Sea and *Metapenaeus eboracensis* Dall, 1957 was recently reported by Chanda (2014) from India. Though the former two are still valid species but these were not placed in the list of George (1979). As such the studied genus contain a total of 14 species in Indian water. The present study is an attempt to revise the up-to-date taxonomic status, distribution, diagnosis and key to the species found in Indian water.

**Keywords:** Systematics, Metapenaeus, Revised, Key, Species, Diagnosis, Distribution

## 1. Introduction
Among a variety of edible decapod crustaceans, prawns contribute largely to the fishery wealth of many nations. Exploitation of prawn resource from the seas around each country is playing increasingly significant role in furthering their national economy. In recent years, in spite of some ecological hazards, the demand for prawns and prawn products has increased so much that every country is making efforts to utilize hitherto unknown but usable stocks and expansion of prawn fisheries and industries near coast line is rightly being given the maximum encouragement in the development programme of each nation. Shrimps and Prawns of various kinds have certainly been a source of protein for human consumptions from very early times. Within historical times reference is made to prawn in ancient Chinese and Japanese literature [1]. In Indian literature, the earliest known penaeid prawn was *Penaeus monodon*, described by Fabricius in 1798. In 1814 the Penaeoidea was recognized as a taxonomic group by Rafinesque – Schmaltz. Since then, the literature on many aspects of the systematics and biology of this group has grown enormously because of their commercial importance. *Metapenaeus* is the second commercially important genus after *Penaeus* having a good number of commercially important species under family *Penaeidae* found in Indian water.

## 2. Materials and methods
The present study is mainly based on the specimens collected by the author from commercial trawler catch of different fish landing centers throughout Indian coastline. In addition to this penaeid prawns preserved in the National Collection of the Zoological Survey of India, Kolkata, India; Central Marine Fishery Research Institute, Cochin, Kerala and its regional stations at Mandapam, Tamil Nadu.
The materials preserved in rectified spirit (90%) and body parts of taxonomic importance have been dissected and studied under a stereoscopic binocular microscope. The detailed synonymies have been furnished to the genera and species and also their diagnosis, distribution, taxonomic remarks have been furnished. The genera and species are arranged

alphabetically for convenience. In addition, an attempt has been made to include a comprehensive coverage of the references in the Reference section. For all citations of taxon author's name and year of publication has been given.

## 3. Results and Discussions

The genus Metapenaeus was created by Wood-Mason [1] with *Penaeus affinis* Milne Edwards, 1837 as type from Kerala coast, West coast of India. Genus *Mangalura* was created by Miers [3] with *Mangalura dobsoni* as type from Mangalore coast, West Coast of India. Nobili [4] transferred the species to *Metapenaeus* Wood-Mason (1891). *Metapenaeus* has been placed on the official list of Generic Names in Zoology, International Commission on Zoological Nomenclature, 1969, Opinion 864, Name No. 1829, bull. Zool. Nom., 25(4/5): 140. "Ruled under the plenary powers to be given precedence over *Mangalura* Miers, 1878". A brief history of the genus with special reference to Indian contributions are given below.

1878 *Penaeus* Miers, Proc. Zool. Soc. London: 301.

1878 *Mangalura* Miers, Proc. Zool. Soc. London: 303;

1891 *Metapenaeus* Wood-Mason, Ann. Mag. nat. Hist., 8(6): 271; George, 1969a, Bull. Cent. Mar. Fish. Res. Inst. No. 14: 5-48; 1969b, Bull. Cont. Mar. Fish. Res. Inst., No. 14: 77-126; 1970, FAO Fish. Rep., (57)4: 1335-1357; 1972, Indian J. Mar. Sci., 1: 89-92; 1980, J. Bombay Nat. Hist. Soc., 76: 297-304; George and Suseclan, 1982, Proc. Symp. Coastal Aquaculture, 1: 273-284; Silas and Muthu, 1974, J. mar. Biol. Ass. India, 6(2): 645-648; Paulinose and Vengayil, 1987, J. Indian Soc. Coastal Agric. Res., 5(2): 431-436; Dall *et al*., 1990, Adv. Mar. Biol., 27: 79.

1901 *Peneus (Metapeneus)* Alcock, Descr. Cat. Indian deep-sea Crust.,: 14.

1905 *Metapeneus* Alcock, Ann. Mag. nat. Hist., 16(7): 516;

1906, Cat. Indian Dec. Crust., 3(1): 16.

### 3.1 Type Species

*Penaeus affinis* Milne Edwards, 1837, Hist. Nat. Crust., 2: 416.

### 3.2 Type Locality

Kerala Coast, Southwest Coast of India.

### 3.3 Diagnosis of the Genus

Body pubescent or glabrous; rostrum dorsally toothed; carapace with blunt orbital spine, antennal and hepatic spines prominent, pterygostomian spine absent; gastroorbital carina absent; postocular sulcus deep; orbit antenna, cervical and hepatic sulcus prominent, accompanied by ventral carina, hepatic sulcus anterior to hepatic spine, hepatic carina descends vertically from spine; branchiocardiac carina developed variably in different species, sometimes indistinct; transverse and longitudinal suture absent; sixth abdominal somite with single long or interrupted cicatrices; telson lacking subapical fixed spine, has movable sometimes minute, numerous posterolateral spines present; antennule lacking parapeneid spine, flagella moderate, slender, shorter than carapace; basial spine present on first, second and third pereopod; in some species ischial spine present on first pereopod; fifth pereopod modified in male; ischium usually bearing distolateral keel shaped structure, merus containing proximal notch followed by a distal conspicuous knob or spiniform process; exopod lacking on fifth pereopod, this is the most unique character of the genus; petasma symmetrical, semi closed, depressed, median lobes usually produced into curved, hood like, or convoluted distal projections; sclerotized lateral lobes produced distally in spoutlike obliquely or fully lateral projections and with ventrolateral recurved, flaplike to complex medial process; appendix masculina longer than wide, narrow basally, expanded distally and convex ventrally; thelycum closed, with paired lateral plate on sternite XIV often continuous across sternite, usually more or less enveloping posterior end of elongate median protuberance of sternite XIII.

### 3.4 Remarks

George [5] presented a comprehensive key to 11 species of *Metapenaeus*, considering material and data then available to him from Indian water. The present study reveals that there are 14 species of *Metapenaeus* in Indian region. The following key refers to adult criteria only.

## 4. Key to the species found in India

1. Anterior thecal plate present on sternite XIII ……..…….…….. 2

---- Anterior thecal plate absent on sternite XIII …….…….……..…...…… *M. stebbingi* Nobili, 1904.

2. Rostrum short, not exceeding second segment of antennular peduncle; epigastric tooth close to penultimate tooth on rostrum ...……...… 3

---- Rostrum moderate, exceeding second segment of antennular peduncle; epigastric tooth conspicuously separated from penultimate tooth on rostrum …….…...…. 4

3. Rostrum very short, not exceeding first segment of antennular peduncle; telson without lateral movable spine; body pubescent; distomedian projection of petasma with a minute filament on distomedian margin …….. *M. lysanasa* (De Man, 1888)

---- Rostrum exceeding first segment of antennular peduncle; telson with two pairs of lateral movable spine; body smooth; distomedian projection of petasma with a long, slender apical filament on either side ……*M. brevicornis* (Milne Edwards, 1837).

4. Entire body pubescent …….….....5

---- Pubescence restricted on some regions of carapace and abdomen ……8

5. Branchiocardiac carina mostly indistinct, when distinct not continuous with the hepatic spine; anterior thecal narrow, distolateral projection of petasma, bearing, a short filament on both ventral and dorsal sides …….……..*M. dobsoni* (Miers, 1878).

---- Branchiocardiac carina always distinct and continuous with hepatic spine; anterior thecal broad, distolateral projection of petasma without, filament ……6

6. Distomedian projection of petasma crescent-shaped; anterior plate of thelycum wide posteriorly, deeply grooved longitudinally..... .....*M. affinis* (Milne Edwards, 1837).

---- Distomedian projection of petasma convoluted and swollen; anterior plate of thelycum narrow, long and deeply grooved……7

7. Antennular flagella unequal, upper one longer; distomedian projection of petasma bisected into two bulbiform structure; lateral plate of thelycum with strongly raised lateral margins forming two longitudinal crests……*M. monoceros* (Fabricius, 1798)

---- Antennular flagella equal; distomedian projection of the lobe bisected anteriorly into two conical structure tip of which with a small pore through which a fine needle can be inserted; lateral plate of thelycum with strongly raised lateral margins, curving inward like two flap of collar ……..…….*M. ensis* (DeHaan, 1844).

8. Adrostral sulcus extending posteriorly up to the level of epigastric tooth…….……9

---- Adrostral sulcus extending posteriorly beyond epigastric tooth …….....10

9. Branchiocardiac carina distinct up to half the length of carapace there after indistinct up to hepatic spine; telson without lateral movable spine, with a row of minute spines; no median boss on thelycum ……..*M. eboracensis* Dall, 1957

---- Branchiocardiac carina indistinct; telson with 3 pairs of movable lateral spines; thelycum with a median boss ……..*M. intermedius* (Kishinouye, 1900).

10. Postrostral carina ending near posterior margin of carapace; anterior plate of thelycum flask-shaped, its anterior margin with three apical tubercles; distomedian projection of petasma laminose…….*M. moyebi* (Kishinouye, 1896)

---- Postrostral carina ending before posterior margin of carapace; anterior plate of thelycum not flask-shaped, no tubercle on anterior margin; distomedian projection of petasma not laminose…….11

11. Branchiocardiac carina distinct, not reaching hepatic spine; thecal plate on sternite XIV posteriorly bound by a pair of anteromedially curved transverse protuberances ……..……*M. krishnatrii* Silas and Muthu, 1976

---- Branchiocardiac carina reaching hepatic spine; no transverse protuberance at posterior border of thecal plate on sternite XIV…….……...…….12

12. Anterior plate of the thelycum narrow posteriorly and wider anteriorly; distomedian projection of median lobe of petasma petaloid …….....*M. elegans* DeMan, 1907.

---- Anterior plate of thelycum broader posteriorly and narrow anteriorly; distomedian projection of median lobe of petasma crescent-shaped or slender ……13

13. Distomedian projection of median lobe of petasma crescent-shaped, placed transversely, its distal end broad; posterior extension of anterior median plate on sternite XIII not bounded laterally by a plate on either side …...*M. kutchensis* George, George and Rao, 1963.

---- Distomedian projection of median lobe of petasma slender, directed anterolaterally with distal end broad and trilobed; posterior extension of anterior median plate on sternite XIII bounded laterally by a pair of oval flat plate on either side ……*M. alcocki* George and Rao, 1966.

**4.1 *Metapenaeus affinis* (H. Milne Edwards, 1837)**

*M. affinis* was originally described as *Penaeus affinis* by H. Milne Edwards [6] from Malabar coast, South-West coast of India. A brief history of the species with special reference to Indian contributions are given below.

1837 *Penaeus affinis* H. Milne Edwards, Hist. Nat. Crust., 2: 416.

1906 *Metapeneus affinis* Alcock, Cat. Indian Dec. Crust. Coll. Indian Mus. Part III. Mac. Fas. I: 1- 55.

1934 *Metapenaeus affinis* Burkenroad, Bull. Bing. Oceanogr. Coll., 4(7): 1-109; Menon, 1956, Proc. Indo-Pacif. Fish. Counc., 6(3): 345-347; George, 1967, FAO World Sci. Conf. Biol. Cult. Shr. Prawns, Mexico, 12-24;

1969, Cent. Mar. Fish. Res. Inst. Bull. No. 14:5-48; 1979, Contribution to Marine Science, dedicated to Dr. C.V. Kurian: 21-59; Muthu, 1971, Indian J. Fish. 15: 145-154; Silas & Muthu, 1976, J. mar. biol. Ass. India, 18(1):78-90.

**4.1.1 Type Species**

*Penaeus affinis* H. Milne Edwards, 1837, Hist. Nat. Crust., 2:416.

**4.1.2 Type Locality**

Côte de Malabar (now Kerala), South-West Coast of India.

**4.1.3 Material Examined**

1 female (170 mm), ZSI. Reg. No. C4911/2, Subhas port, Gujarat, 10.12.92 H.C. Ghosh and Party; 1 male (27 mm), ZSI.Reg. No. C4781/2, Kakdwip Central Fishery, Kakdwip, 24 pags(s), 16.2.1989, N.C. Nandi and Party; 2 male (70-90 mm) and 1 female (98 mm), ZSI. Reg. No. C4791/2, Choprti, Girjaon, Maharashtra 29.8.1996, A. Chanda; 1 male (56 mm) and 2 female (78-93 mm), ZSI. Reg. No. C4803/2, Palk Bay, Tamil Nadu, 8.8.1997, A. Chanda; 3 male (40-50 mm) and 1 female (60 mm), ZSI, Reg.No. C4917/2, Chilka Lake, Orissa, 25.2.1975, G. Ramakrishna; 1 female (83 mm), ZSI. Reg. No. C4935/2, Petkilla Port, Ratnagiri, Maharashtra, 2.9.1996, A. Chanda.

**4.1.4 Diagnosis of the species**

Entire body pubescent; rostrum long, slender, extend upto tip of antennular peduncle, slightly uptilted tip, armed dorsally with 8-11+1 teeth; epigastric tooth conspicuously separated from penultimate rostral tooth; post rostral carina extend upto the posterior margin of carapace, adrostral carina ending

in between first and second antennal tooth; adrostral sulcus extending beyond epigastric tooth, antennal, cervical and hepatic carina prominent, branchiocardiac carina distinct, reaching hepatic spine, hepatic carina slopes anteroventrally below pterygostomian angle, dorsal carination start from posterior one third of fourth somite ending at posterior margin of sixth somite; sixth and fifth somite with a long cicatrix; telson with very minute spines; antennular flagella equal, shorter than carapace; distomedian projection of petasma crescent-shaped, transversely placed on distolateral projection, partly concealing them; distolateral projections directed anterolaterally; anterior plate of thelycum deeply grooved longitudinally, considerably wide posteriorly; posterior transverse plate on sternite XIV with 2 anterolateral rounded projections partly covering median lateral plates; impregnated female occasionally with white irregular conjoined pads on thelycum.

**4.1.5 Distribution**
India: West Bengal, Orissa, Andhra Pradesh, Tamil Nadu, east coast and Kerala, Goa, Maharashtra, Gujarat, West Coast of India i.e. entire coast of India & Andaman Sea.

Elsewhere**:** Parsian Gulf, Arabian Sea from Gulf of Oman; Sri Lanka; Malaysia; Singapore; Borneo; Thailand; Gulf of Tonkin; South China Sea; Philippines; Hong Kong; Taiwan; New Guinea; Hawaii.

**4.2 *Metapenaeus alcocki* George and Rao, 1966**
The species was described by George and Rao [7] from Gulf of Kutch, North-West coast of India. A brief history of the species with special reference to Indian contributions are given below.

1966 *Metapenaeus alcocki* George and Rao, J. mar. biol. Ass. India, 8(1):146-152; Deshmuk, 1975 Indian J. Fish., George, 1980, J. Bombay nat. Hist. Soc., 76:297-304, Rao, 1983, Indian J. Fish., 30(1):124-134.

**4.2.1 Type Species**
*Metapenaeus alcocki* George and Rao, 1966, J. mar. biol. Ass. India, 8(1):146-151.

**4.2.2 Type Locality**
Gulf of Kutch, North – West Coast of India ($22^{0}28^{/}$ N, $70^{0}03^{/}$E).

**4.2.3 Material Examined**
1 male (76 mm) and 2 females (78-90 mm), ZSI. Reg. No. C4909/2, Subhas Port, Gujarat, 10.12.1992, H.C. Ghosh and party; 1 male (97 mm), CMFRI. No. 90, Gulf of Kutch (Allotype), 16.4.1963, M.J. George.

**4.2.4 Diagnosis of the species**
Body pubescence restricted on some region of carapace and abdomen, branchiocardiac region glabrous, frontal, gastric and dorsal part of cardiac region of carapace pubescent; abdomen irregularly setose; rostrum straight, slightly uptilted at tip, extending beyond antennular peduncle, armed with 8-9+1 dorsal teeth; adrostral carina extend behind penultimate tooth and sulcus behind epigastric tooth; post rostral carina ends before posterior margin of carapace; gastro-frontal sulcus absent, post ocular sulcus prominent, hepatic sulcus prominent and descend with pterygostomian one; cervical sulcus straight and transverse, branchiocardiac carina distinct and continuous to hepatic spine; antennal and hepatic spine prominent; antennular flagella subequal, dorsal one longer; ischium of first pereopod with a sharp spine, basis of first, second and third with a strong spine; dorsal carination of abdomen begin from fourth somite ending in a sharp spine at posterior end of sixth somite; telson with minute spines on lateral margin; distomedian projection like a parallelogram directed anterolaterally overlying on distolateral projection of lateral lobe of petasma; anterior plate of thelycum on sternite XIII tongue like with a deep median longitudinal groove, median boss oval; posterior plate on sternite XIV glabrous, posteriorly curved inward and medially grooved.

**4.2.5 Distribution**
India: Gulf of Kutch to Porbandar, Gujarat, Goa, West coast.
Elsewhere: Nil.

**4.3 *Metapenaeus brevicornis* (Milne Edwards, 1837)**
*M. brevicornis* was originally described as *Penaeus brevicornis* by Milne Edwards [6] from Ganjam, Orissa, east coast of India. A brief history of the species with special reference to Indian contributions are given below.

1837 *Penaeus brevicornis* H. Milne Edwards, Hist. Nat. Crust. T. II., Paris: 417.

1906 *Metapeneus brevicornis* Alcock, Cat. Indian Deca. Crust. Fas.I: 1-55.

1934 *Metapenaeus brevicornis* Burkenroad, Bull. Bingham. Oceanogr. Coll., 4(7):1-109; Menon, 1956, Proc. Indo-Pacif. Fish. Counc. 6(3):345-347; George, 1969, Bull. Cent. Mar. Fish. Res. Int. No. 14:5-48; 1979, contribution to Marine Science, dedicated to Dr. C.V. Kurian: 21-59; 1970, FAO Fish. Rep., (57)4:1559-1573; Muthu, 1971. Indian J. Fish., 15:145-154; Silas & Muthu, 1976, J. mar. biol. Ass. India, 18(1):78-90; Paulinose and Vengayil, 1987, J. Indian Soc. Coastal Agric. Res., 5(2):431-436.

**4.3.1 Type Species**
*Penaeus brevicornis* Milne Edwards, 1837, Hist. Nat. Crust, comp. L'Anatomic, physio. Class. Animaux, Paris, 2: 532.

**4.3.2 Type Locality**
Ganjam, Orissa Coast, India.

**4.3.3 Material Examined**
3 males (50-70 mm), ZSI, Reg. No. C4912/2, Subhas Port, Porbandar, Gujarat, 10.12.1992, H.C. Ghosh and Party; 6 males (76-80 mm), ZSI, Reg. No. C4836/2, Lawsom's Bay Vishakapatnnam, Andhra Pradesh, 14.9.1995, A. Chanda; 1 male (50 mm) and 2 females (60-70 mm), ZSI. Reg. No. C4866/2, Narsapur, West Godavari, 20.3.1997, Andhra Pradesh; 1 male (75 mm) and 1 female (78 mm), ZSI. Reg. No. C4876/2, New Digha, West Bengal, 23.2.1995. A. Chanda; 5 females (80-120 mm) and 1 male (92 mm), ZSI, Reg. No. C4766/2, Mungergudi, Machlipattanam, Andhra Pradesh, 7.9.1995, A. Chanda; 2 females (70-75 mm), ZSI. Reg. No. C4778/2, Freserganj, Bakkhali, 24 Pargana South, West Bengal, 14.11.1990, N.C. Nandi and Party; 32 males (55-70 mm) and 1 female (72 mm), ZSI. Reg. No. C4784/2, Kakdwip Central Fisheries, 24 Pargana(s), 16.2.1989, N.C. Nandi and Party; 3 males (75-120 mm), ZSI. Reg. No. C4787/2, Girgano, Choprti, Maharashtra, 29.8.1996,A. Chanda; 1 male (75 mm), ZSI. Reg. No. C4830/2,

Ramakrishna Beach, Visakhapattnam, Andhra Pradesh, 15.9.1995, A. Chanda; 2 males (63-70 mm) and 2 females (72-86 mm), ZSI. Reg. No. C4933/2, F.C.L. Mumbai, Maharashtra, 1.9.1996, A. Chanda; 5 females (80-120 mm) and 1 male (85 mm), ZSI. Reg. No. C4766/2, Mechlipattanam Andhra Pradesh, 7.9.1995, A. Chanda.

**4.3.4 Diagnosis of the Species**

Body smooth, devoid of hair; rostrum short, not exceeding second segment of antennular peduncle, armed with 5+1 dorsal teeth only; epigastric tooth considerably close to penultimate tooth; more than 2/3 of distal part devoid of teeth, straight, post rostral carina distinct ending before posterior border of carapace; adrostral carina and sulcus reaching upto the level between first and second rostral tooth; branchiocardiac carina feeble, not reaching middle of carapace, cervical sulcus very short, hepatic carina posteriorly indistinct but anteriorly distinct, descending towards pterygostomian angle; pterygostomian angle rounded, without spine; dorsal carination begins from posterior part of fourth somite, ending at terminal end of sixth somite with a short spine, sixth somite bears two ventrolateral short spine; telson armed with two lateral movable spine and numerous minute spines; antennular flagella subequal; a small ischial spine present on first pereopod; in adult male, merus of fifth pereopod with a proximal notch followed by a keel-shaped tubercle; in male each distomedian projection of median lobe of petasma with a long and slender apical filament; distolateral projection of lateral lobe of petasma directed anterolaterally, in female anterior plate of thelycum large, square; posterior plate boomerang-shaped enclosing two median boss; in impregnated females a pair white conjoined pads on thelycum present.

**4.3.5 Remarks**

White conjoined pads on the thelycum of impregnated females as observed in present study has also been reported by George [5]. There is some confusion regarding the number of spines on telson has been discussed by Chanda [8] and come to conclusion that the number is variable.

**4.3.6 Distribution**

India: Gujarat, Maharashtra, Goa, Karnataka, Kerala, West Coast and Andhra Pradesh, Orissa, West Bengal, East coast; Andaman sea.

Elsewhere: Pakistan; Malaysia; Singapore; Indonesia; Borneo; Thailand; Vietnam.

**4.4 *Metapenaeus dobsoni* (Miers, 1878)**

*M. dobsoni* was originally described as *Mangalura dobsoni* by Miers [3] from Mangalore, Karnataka, West Coast of India. A brief history of the species with special reference to Indian contributions are given below.

1878 *Mangalura dobsoni* Miers, Proc. Zool. Soc. Lond., 1878: 302.

1903 *Metapenaeus dobsoni* Nobili, Bull. Mus. Zool. Anat. Comp., 18 (447): 1-32; Menon, 1956, Proc. Indo-Pacific, Fish. Counc., 6(3): 345-347; George, 1969, Bull, Cent. Mar. Fish. Res. Inst. No. 14: 5-48; 1979, Contribution to Marine Science, dedicated to Dr. C.U. Kurian: 21-59; Muthu, 1971, Indian J. Fish., 15: 145-154; Pathan and Jalihal, 1997, J. Bombay Nat: Hist. Soc., 94(3): 496-514.

1906 *Metapeneus dobsoni* Alcock, Cat. Indian Dee. Crust. Coll. Indian Mus. Part-III. Mac. Fas. I:57.

1915 *Penaeopsis dobsoni* Kemp. Mem. Indian Mus., 5: 201-325; Panikkar, 1937, J. Bombay. Nat. Hist. Soc., 39(2):343-353.

1942 *Metapenaeus dobsoni choprai* Nataraj, Curr. Sci., 11(12):468–469.

**4.4.1 Type Species**

*Mangalura dobsoni* Miers, 1878. Proc. Zool. Soc. London, 1878: 302.

**4.4.2 Type Locality**

Mangalore, Karnataka, West Coast of India.

**4.4.3 Material Examined**

3 males (30 – 92 mm) and 8 females (30 –100 ml), ZSI Reg. No. C4895/2, Pulicot Lake (South), Chennai, 26.5.1995, A. Chanda; 1 male (70 mm), ZSI. Reg. No. C4844/2, Muthukuru, F.L.C., Nellore, Andhra Survey, 1.9.1995, T. Roy and Party; 1 male (70 mm) and 3 females (70-80 mm), ZSI. Reg. No. C4848/2, Kaligiri Reservoir, Andhra Pradesh, 30.8.1995, A. Chanda; 1 male (45 mm.) and 1 female (65 mm.), ZSI. Reg. No. C4788/2, Girgoan, Chowpati, Maharashtra, 29.8.1996, A. Chanda; 1 male (48 mm) and 2 females (55 – 66 mm), ZSI. Reg. No. C4792/2, Pulicot Lake, Andhra Pradesh, 26.8.95, A. Chanda; 3 males (46-75 mm) and 3 females (57-81 mm), ZSI. Reg. No. C4810/2, Chennai F.L.C., Tamil Nadu, 26.8.1995, A. Chanda, 5 males (40-46 mm) and 6 females (40-50 mm), ZSI. Reg. No. C4922/2, Puri Coast, Orissa 11.2.1975, K.K. Tiwari, 5 males (48-50 mm) and 3 females (49-60 mm), ZSI. Reg. No. C4923/2, Puri, Orissa, 8.2.1975, K.K. Tiwari, 1 female (95 mm), ZSI-Reg. No. C4942/2, Mirkarwarda, Maharashtra coast, 2.9.1996, A. Chanda.

**4.4.4 Diagnosis of the species**

Entire body pubescent; rostrum long, extending upto tip of antennular peduncle, sigmoidal, distal one-third toothless, sharply pointed at tip, armed with 7-9+1 dorsal teeth; epigastric tooth conspicuously separated from penultimate tooth. Post-rostral carina ending almost near posterior margin of carapace; adrostral carina and sulcus extend beyond epigastric tooth; branchiocrdiac carina feeble, not reaching hepatic spine; branchiocardiac sulcus distinct, postocular sulcus oblique, cervical sulcus shallow, hepatic sulcus and carina slope downwards and anteroventrally but above pterygostomian angle; hepatic spine and antennular spine small, antennal carina short, dorsal carina starts from fourth somite ending in a short straight spine at the mid-posterior margin of sixth somite, chelate pereopod weak, absence of spine on the ischium of first pereopod is the most distinctive character of the species; in adult male, basial spine of third pereopod with a long barb projecting beyond slender merus; merus of fifth pereopod with two triangular teeth; fifth pereopod of adult female reduced to coxa and basis; antennular flagella subequal, ventral one longer; telson armed only with row of small lateral spine; distomedian projection of median lobe of petasma with a short filament on ventral and another on dorsal surface; distolateral

projections directed forward; anterior part of petasma looks like a flowering bud; anterior plate of thelycum on sternite XIII, tongue-like and grooved longitudinally, posterior part is narrower than anterior, posterior part of anterior plate partially ensheathed in a horse-shoe-like process formed by the lateral plate on sternite XIV; thelycum in impregnated females is covered by a pair of white triangular conjoined pad.

**4.4.5 Distribution**
India: Orissa, Andhra Pradesh, Tamil Nadu, East coast of India; Kerala, Karnataka, Goa, Maharashtra, West coast of India; Andaman Sea.

Elsewhere: Sri Lanka; Malaysia; Thailand; Indonesia; Philippines; New Guinea.

**4.5 *Metapenaeus eboracensis* Dall, 1957**
*M. eboracensis* was described by Dall [9] from Australian water. It was first recorded from Indian water by Chanda [10]. A brief history of records of the species are given below.

1957 *Metapenaeus eboracensis* Dall. Aust. J. Mar. Freshw. Res. 8(2):136-231; Racek, 1959, Res. Bull State Fish. N.S.W., 6:1-56; Racek and Dall, 1956, Verh. K. Ned. Akad. Wet. Afd. Nat., 56 (2,3): 1-119; Grey *et al*., 1983, A Guide to the Australian Penaeid prawn, Department of Primary Production of the Northern Territory; Chanda, 2014, J. Ento. Zool. Study (in press).

**4.5.1 Type Species**
*Metapenaeus eboracensis* Dall, 1957, Aust. J. Mar. Freshw. Res., 8(2): 136-231.

**4.5.2 Type Locality**
Mouth of Norman River, Gulf of Carpentaria, Australia.

**4.5.3 Material Examined**
1 female (71 mm), ZSI. Reg. No. C4771/2, Muthukuru F.L.C., Nellore, Andhra Pradesh, 1.9.1995, T. Roy and Party.

**4.5.4 Diagnosis of the species**
Pubescence restricted to some parts of the body in patches; rostrum sigmoidal, armed with dorsal 7+1 dorsal teeth; epigastric tooth conspicuously separated from penultimate tooth, distal one-third portion toothless, upwardly tilted; adrostral carina and sulcus reaching little behind epigastric tooth; post-rostral carina ending near posterior margin of carapace; branchiocardiac carina and sulcus feeble carina not touching hepatic spine; postocular sulcus oblique, cervical and hepatic sulcus and carina distinct, hepatic sulcus horizontal posteriorly, anteriorly turning anteroventrally; antennal spine strong, hepatic spine week, pterygostomian spine absent; atennular flagella subequal, ventral one longer, fifth pereopod slender, chela strong and slender, dorsal carina starts from fourth somite and ends in a short, straight spine at the mid posterior margin of sixth somite; telson straight with pointed tip and armed with lateral row of very small spine; thelycum with anterior plate on sternite XIII, a small flat, leaf-like structure, anterior part abruptly pointed, supported laterally by coaxial plate from fourth pereopod; posterior plate on sternite XIV rounded in shape but its anterior two third deeply cleft.

**4.5.5 Remarks**
The species is quite similar to *M. dobsoni*, but it could be easily distinguished from that by the posterior part of hepatic sulcus which is horizontal. Strong slender chela, strong antennal spine and leaf like anterior thecal plate.

**4.5.6 Distribution**
India: Muthukuru, Nellore, Andhra Pradesh, east coast of India.

Elsewhere: New Guinea; Northern Territory; Queensland; Australia.

**4.6 *Metapenaeus elegans* De Man, 1907**
*M. elegans* was described by DeMan [11] from Menado, Celebes during “Siboga Expedition”. The species was first recorded from India by Silas and Muthu [12]. A brief history of the species with special reference to Indian contributions are given below.

1907 *Metapenaeus elegans* DeMan, Notes Leyden Mus., 29(2):130; Silas and Muthu, 1974, J. Mar. Biol. Ass. India, 18(1):78-90. Johnson, 1976, J. mar. biol. Ass. India, 18(1):1-54.

**4.6.1 Type species**
*Metapenaeus elegans* De Man, 1907, Notes Leyden Mus., 29(2): 130.

**4.6.2 Type Locality**
Menado, Celebes.

**4.6.3 Material Examined**
15 males (30-58 mm) and 16 females (30-60 mm), ZSI Reg. No. C4892/2, Mypadu, Nellore, Andhra Pradesh, 31.8.1995, A. Chanda.

**4.6.4 Diagnosis of the species**
Body pubescence restricted to dorsal portion of carapace and first abdominal segment, sometimes body smooth; rostrum long extend beyond antennular peduncle, tip slightly uptilted, armed with 9-12+1 dorsal teeth only; no toothless portion on rostrum; post rostral carina not reaching posterior margin of carapace; adrostral carina ending in between penultimate and second rostral tooth and sulcus behind epigastric tooth; epigastric tooth conspicuously separated from penultimate tooth; antennal and hepatic spine prominent; postocular sulcus oblique, cervical sulcus marked; hepatic sulcus descend vertically and then turn towards pterygostomian angle; pterygostonian angle blunt; branchiocardiac carina prominent and jointed with hepatic spine; ischium of first pereopod with sharp spine; in adult males merus of fifth followed by a keeled tubercle; telson without movable spine, has minute lateral row of spines; antennular flagella equal; distomedian projection of median lobe of petasma petaloid with a longitudinal groove at median portion, directed anterolaterally over distolateral projection of lateral lobe; anterior plate of thelycum tongue-like, narrow posteriorly and wide anteriorly, a longitudinal groove on mid posterior part of anterior plate, guarded by two kidney shaped median boss; lateral margin of posterior plate on sternite XIV raised and curved inward like ear flap.

**4.6.5 Remarks**
All materials examined confer well with the description and

illustrations of Hall [13, 14] except in presence of sharp ischial spine on first pereopod as reported also by Silas and Muthu [15]. Previously it was reported only from Andaman Sea, India. Present study records it from Andhra Pradesh as such it is the first record from main land, India.

**4.6.6 Distribution**
India: Andaman Sea; Andhra Pradesh, east coast of India.
Elsewhere: Sri Lanka; Malaysia; Borneo; Thailand; Philippines; New Guinea; Fiji; Wallis and Futuna Island.

**4.7 *Metapenaeus ensis* (De Haan, 1850)**
*M. ensis* was originally described as *Penaeus monoceros ensis* by De Haan [16] from North Japan sea. It was first recorded from India by Alcock [17] and named *Metapeneus ensis*. A brief history of the species with special reference to the Indian contributions are given below.

1850 *Penaeus monoceros ensis* De Haan, Crustacea. In: P.E. Siebold, Fauna Japonica (Leiden): 1-243.

1906 *Metapeneus ensis* Alcock, Cat. Indian Dec. Crust. Part-III. Mac. Fas.I: 1-55.

1958 *Metapenaeus ensis* Hall, Ann. Mag. nat. Hist.; 1 (13) 537-544; 1962, Fish. Muthu, 1965, J. mar. biol. Ass. India, 7(2): 465-468; George, 1969, Bull. Cent. Mar. Fish. Res. Inst., No. 14: 5-48; 1979, In Contribution to Marine Sciences, dedicated to Dr. C.V. Kurian, 21-59.

**4.7.1 Type Species**
*Penaeus monoceros ensis* De Haan, 1850, Crustacea. In: P.E. Siebold, Fauna Japonica (Leiden): 1-243.

**4.7.2 Type Locality**: North Japan sea.

**4.7.3 Material Examined**
1 male (50 mm.), ZSI. Reg. No. C4902/2, Bhavnagar, Ghogha Bandar, Gujarat, 19.12.92, H.C. Ghosh and Party; 1 male (51 mm), ZSI. Reg. No. C4910/2, Porbandar, Subhasport, Gujarat, 10.12.92, H.C. Ghosh and party; 2 females (60-70 mm), ZSI. Reg. No. C4882/2, F.L.C. Chennai, Tamil Nadu, 27.8.95, T. Roy and party; 2 females (65-70 mm), ZSI. Reg. No. C4806/2, F.L.C. Chennai, 26.8.95, A. Chanda; 1 female (53 mm), ZSI Reg. No. C4782/2, Kultala, 24 Parganas (S), 7.1.89, N.C. Nandi and party.

**4.7.4 Diagnosis of the species**
Entire body pubescent except carina; rostrum straight extending upto tip of antennular peduncle, armed dorsally with 8-11+1 teeth; tooth located throughout entire length of rostrum; epigastric tooth conspicuously separated from penultimate tooth; adrostral carina ending in between epigastric and penultimate tooth and sulcus just beyond epigastric; postrostral carina ending near posterior border of carapace; orbital spine minute; antennal and hepatic spine prominent, pterygostomian spine absent; antennal and branchiocardiac carina prominent, latter reaching hepatic spine; cervical sulcus and hepatic sulcus distinct; hepatic sulcus sloping downwards and anteriorly curving above pterygostomian angle, post ocular sulcus oblique; a small ischial spine present on first pereopod, in adult males merus of fifth pereopod with a proximal notch followed by a long, inwardly curved spiniform process and a row of tubercles; telson without movable spine armed only with a row of very minute lateral spines; distomedian projection of median lobe of petasma convoluted, broadly swollen, directed forward, conical in shape concealing almost entire distolateral projection of lateral lobe in ventral view; anterior plate of thelycum long, curved dorsally and deeply grooved longitudinally, base of the plate is guarded by two median boss; lateral wing of posterior plate on sternite XIV with strongly raised lateral margins forming posteriorly two inwardly curved coller like triangular projections.

**4.7.5 Remarks**
The species was first recorded from Indian water by Alcock [17]. He reported the species from Andaman sea, Bay of Bengal. During present study the species is recorded from Gujarat, West coast of India, Tamil Nadu, and Gangetic delta, Bay of Bengal for the first time.

**4.7.6 Distribution**
India: Gujarat, West coast, Tamil Nadu, Andhra Pradesh, Gangetic delta, Bay of Bengal, Andaman sea.
Elsewhere: Sri Lanka; Malacca straits; Malaysia; Indonesia; Borneo, Gulf of Tonkin; South China sea; Philippines; Hong Kong; Taiwan, Japan; New Guinea; Western Australia, Northern Territory Queensland, New South Wales, Australia; Wallis and Futuna Islands.

**4.8 *Metapenaeus intermedius* (Kishinouye, 1900)**
*M. intermedius* was originally described as *Penaeus intermedius* by Kishinouye [18] from Tosa Bay, Japan. It was first recorded from India by Johnson [19]. A brief history of the species with special reference to the Indian contributions are given below.

1900 *Penaeus intermedius* Kishinouye, J. Fish. Bur., Tokyo, 8:1-29.

1934 *Metapenaeus intermedius* Burkenroad, Bull. Bingham Oceanogr. Coll. 4(7):1-109; Johnson., 1976, J. mar. biol. Ass. India, 18(1):1–54.

**4.8.1 Type Species**
*Penaeus intermedius* Kishnouye, 1900, J. Fish. Bur. Tokyo, 8: 1-29.

**4.8.2 Type Locality**
Tosa Bay, Japan.

**4.8.3 Material Examined**
No specimen could be collected during the present study. The diagnosis of the species is mainly based on the literature.

**4.8.4 Diagnosis of the species**
Body irregularly pubescent; rostrum straight, armed with 8-10+1 extend upto or little beyond the tip of antennular peduncle; epigastric tooth conspicuously separated from penultimate tooth; post-rostral carina not extending upto posterior border of carapace; adrostral carina not exceeding epigastric tooth, adrostral sulcus ending just below the epigastric tooth; branchiocardiac carina indistinct or absent; hepatic and antennal spine prominent, orbital spine blunt; cervical and hepatic sulcus distinct, anterior part of hepatic sulcus curved anteroventrally towards pterygostomian angle; dorsal carination of abdomen start from posterior part of fourth sternite and end at mid posterior margin of sixth

somite in a sharp posteroventrally curved spine, short ischial spine present on first pereopod; telson armed with three pairs of lateral movable spine; petasma closely similar to that of *M. monoceros* but differs in the distomedian projection of median lobe which extends forwards as far as distolateral projection of lateral lobe; thelycum consists of a pair of ear-shaped lateral elevations lying anterolaterally at about middle of sternite XIV and a median base placed to posterior ridge of sternite XIII.

**4.8.5 Distribution**
India: Andaman Islands.

Elsewhere: Singapore; Malaysia; Borneo, Gulf of Tonkin; South China Sea; Hong Kong; Taiwan; Japan.

**4.9 *Metapenaeus krishnatrii* Silas and Muthu, 1974**
*M. krishnatrii* was described by Silas and Muthu [12] from Anadaman sea. The species is known only from the type locality.

**4.9.1 Type species**
*Metapenaeus krishnatrii* Silas and Muthu, 1974, J. mar. biol. Ass. India, 16 (2): 645-648.

**4.9.2 Type Locality**
Corbyn's cove, Port Blair, Andamans.

**4.9.3 Material Examined**
No specimen were collected during present study. Diagnosis is mainly based on the study of the type material preserved in the International Collection of Zoological Survey of India, Reg. No. C2475/2.

**4.9.4 Diagnosis of the species**
Body irregularly pubescent; rostrum armed with 6-7+1 dorsal teeth, extending upto tip of antennular peduncle in females, slightly shorter in males, epigastric tooth conspicuously separated from penultimate rostral tooth; adrostral carina ending in between epigastric and penultimate tooth and sulcus extending little beyond epigastric tooth; postrostral carina not reaching posterior margin of carapace; postocular sulcus oblique; cervical carina straight, ascending obliquely behind hepatic spine; hepatic carina descending vertically then turning anteroventrally towards blunt pterygostomian angle; branchiocardiac sulcus distinct, branchiocardiac carina reaching hepatic spine; antennal and hepatic spine prominent; orbital tooth minute almost blunt; antennular flagella subequal; a sharp ischial spine on first and basial spine on first to third pereopod present; abdominal somite first to third without dorsal carina, two rows of parallel minute pits slightly diverging anteriorly present instead of carina on second and third somite, fourth segment with carina in posterior ¾, fifth and sixth segment strongly carinated ending in with a sharp tooth at mid posterior margin of sixth somite; telson without movable spine but with a row of minute lateral spines; distomedian lobe of petasma triangular; overlying distolateral projections of lateral lobe with a dorsal opening, apices bluntly triangular with median margins parallel to each other, projecting slightly beyond anterior border of distolateral projections; posterior margin projecting well beyond posterior border of distolateral projections in dorsal view; anterior plate of thelycum, tongue-like with deep longitudinal groove, posteriorly narrow, bound laterally by high lateral ridges which are parallel to each other; lateral lobes of the posterior plate on sternite XIV kidney-shaped, bound posteriorly by a pair of anteromedially curved transverse protuberances whose rounded median ends rise well the level of lateral plate, partly overlapping them; protuberances have prominent tufts of brush-like setae on lateral and posterior surface; median boss are present at the level of posterior border of sternite XIII.

**4.9.5 Distribution**
India: Till date the species is known from type locality only.

Elsewhere: No record.

**4.10 *Metapenaeus kutchensis* George, George and Rao, 1963**
*M. kutchensis* was described by George *et al*., [20] from Gulf of Kutch, W. coast of India. A brief history of the species with special reference to the Indian contributions are given below.

1963 *Metapenaeus kutchensis* George *et al*., J. mar. biol. Ass. India, 5(2): 284-288; Ramamurthy, 1967, Proc. Symp. Crustacea, 4: 1424-1436; Sarvaiya, 1981, Indian J. Fish., 25: 35-40; Rao, 1983, Indian J. Fish., 30(1):124-134.

**4.10.1 Type Species**
*Metapenaeus kutchensis* George *et al*., 1963, J. mar. biol. Ass. India, 5(2):284-288.

**4.10.2 Type Locality**
Gulf of Kutch, West coast of India.

**4.10.3 Material Examined**
3 females (92-103 mm), ZSI. Reg. No. C4907/2, Okha, Off Dalda Port, Gulf of Kutch, 30.11.1992, H.C. Ghosh and party.

**4.10.4 Diagnosis of the species**
Body irregularly pubescent; rostrum armed with 7-8+1 dorsal teeth, straight with a small crest, extending slightly beyond distal end of antennular peduncle; epigastric spine conspicuously separated from penultimate tooth; adrostral carina ending between epigastric tooth and penultimate tooth, adrostral sulcus beyond epigastric tooth; post-rostral carina ending in a glabrous expansion before posterior margin of carapace; carapace with strong antennal spine, hepatic spine; post-ocular sulcus oblique, orbital spine bluntly pointed, orbitoantennal sulcus distinct meeting the hepatic sulcus below hepatic spine; hepatic sulcus descend vertically, distal portion curves anteroventrally towards pterygostamian angle; cervical sulcus obliquely straight behind hepatic spine; branchiocardiac sulcus distinct, branchiocardiac carina meeting with hepatic spine; antennular flagella equal, stylocerite extending upto half basal segment; ischium of first pereopod with a spine, smaller than basial spine; merus of fifth pereopod of adult male with a shallow notch followed by an anterior small tooth; dorsal carina conspicuous only from fourth to sixth somite and terminate in a short spine; telson with very minute numerous dorsolateral spine; petasma quite similar to that of *M. affinis*, difference that distomedian lobes are more transversely placed with the proximal end narrow and distal end broad; anterior plate of thelycum tongue shaped, wide

posteriorly, median groove widens posteriorly; posterior plate on sternite XIV concave, glabrous transversely cut into two unequal segments; lateral edges of these segments curve up and placed one behind the other.

**4.10.5 Remarks**
This species has been recorded only from Gulf of Kutch by several author [21, 22].

**4.10.6 Distribution**
India: Gulf of Kutch, Gujarat, N.W. Coast.

Elsewhere: No record.

**4.11 *Metapenaeus lysanasa* (De Man, 1888)**
*M. lysanasa* was originally described as *Penaeus lysanasa* by De Man [23] from Margui Archipelago, Myanmar. It was first recorded from India (Orissa & Hooghly Delta) by Alcock [17] as *Metapeneus lysanasa*. A brief history of the species with special reference to Indian contributions are given below.

1888 *Penaeus lysianasa* De Man, J. Linn. Soc. Lond. (Zool.), 22: 290.

1906 *Metapeneus lysianasa* Alcock, Cat. Indian Dec. Crust. Part-III. Mac. Fas I: 1-55.

1934 *Metapenaeus lysianasa* Burkenroad, Bull. Bingham. Oceanogr. Coll., 4(7):1-109; Muthu, 1971, Indian J. Fish., 15: 145-154; Silas & Muthu, 1976, J. mar. biol. Ass. India, 18(1):78-90; Bharati Goswami, 1992, J. mar. biol. Ass. India, 34(1&2):115-137.

**4.11.1 Type Species**
*Penaeus lysanasa* De Man, 1888, J. Linn. Soc. London (Zool.), 22:290.

**4.11.2 Type Locality**
Margui Archipelago, Myanmar.

**4.11.3 Material examined**
3 females (68 – 93 mm), 231. Reg. No. C4875/2, New Digha, Midnapore, West Bengal, Bay of Bengal, 23.2.1995, A. Chanda; 3 females (55-97 mm), 291. Reg. No. C4879/2, Hospital Ghat, Digha, Midnapore, West Bengal, Bay of Bengal, 22.2.1995, A. Chanda; 2 males (55-53 mm) and 2 females (55-69 mm), 291. Reg. No. C4785/2, Roydighi wetland, 24 Parganas South, West Bengal, Bay of Bengal, 30.8.1988, N.C. Nandi; 10 males (45-50) and 13 females (45-56 mm.), ZSI. Reg. No. C4789/2, Girgano, Choprti, Maharashtra, West Coast of India, 29.8.1996, A. Chanda.

**4.11.4 Diagnosis of the species**
Entire body pubescent; rostrum very short, never exceeding first antennular peduncle, armed with 6-7+1 dorsal teeth, rostral crest high; post rostral carina ending near posterior margin of carapace; epigastric tooth close to penultimate tooth; adrostral carina and sulcus reaching the level of second rostral tooth, orbital spine absent, hepatic and antennal spine prominent; postocular sulcus and cervical sulcus indistinct; hepatic sulcus slopes anteroventrally towards rounded pterygostomian angle, branchiocardiac sulcus occupy posterior one-third of carapace; ischial spine on first pereopod minute; merus of fifth pereopod with a proximal notch followed by a large, slightly acute triangular tooth; antennular flagella subequal, dorsal one shorter; telson armed with a row of minute spines on both lateral margin; distomedian projection of median lobe of petasma with a minute filament on its median margins of both half, distolateral projection of lateral lobe of petasma bifurcate distolaterally; anterior plate of thelycum tongue-like, grooved medially; posterior plates on sternite XIV sub-oval with a thick median margin, impregnated females with white conjoined pads on thelycum, circular in outline.

**4.11.5 Remarks**
Present study has recorded this species for the first time from West coast of India (Maharashtra) and from Roydighi wetland of South 24 Pargana.

**4.11.6 Distribution**
India: West Bengal, Orissa, Andhra Pradesh and Gulf of Manner Tamil Nadu, East coast; Maharashtra, West coast and Andaman sea.

Elsewhere: Sri Lanka; Singapore; Myanmar; Malaysia; Indonesia; North Borneo; Thailand; Vietnam.

**4.12 *Metapenaeus monoceros* (Fabricius, 1798)**
*M. monoceros* was originally described as *Penaeus monoceros* by Fabricius [24] from Jakarta, Indonesia. It was first recorded from India by Milne Edwards [6]. A brief history of the species with special reference to Indian contributions are given below.

1798 *Penaeus monoceros* Fabricius, Suppl. Ent. Syst.: 409; Milne Edwards, 1837, Histoire Naturelle des crustacés, comprenantl'Anatomie, la Physiologie *et al.* Classification de ces Animaus, Vol. 2: 1-532, Paris; Mers, 1878, Proc. Zool. Soc. London, 1878: 298-310;

1903 *Metapenaeus monoceros* Nobili, Boll. Mus. Zool. Anat. com. del. R. Univer. Torino, 18(452):1-39; Burkenroad, 1934, Bull. Bingham. Oceanogr. Coll., 4(7):1-109; Nataraj, 1942, Curr. Sci., 11(12):468-469; Menon, 1956, Proc. Indo-Pacific Fish-Counc., 6(3):345-347; George, 1969. Bull. Cent. Mar. Fish. Res. Inst., No. 14: 5-48; 1972. J. Mar.Sci, 1(1):89-92; 1979, Contribution to Marine Science, dedicated to Dr. C.V. Kurian, 21-59; Muthu, 1971, Indian J. Fish., 15:145-154; Rao, 1988, J. mar. biol. Ass. India, 30(1&2):171–181; Rao and Krishnamoorthi, 1990, J. mar. biol. Ass. India, 32(1&2):154-161.

1906 *Metapeneus monoceros* Alcock, Cat. Indian Dec. Crust. Part-III. Mac. Fas.I: 1-55.

**4.12.1 Type Species**
*Penaeus monoceros* Fabricius, 1798, Suppl. Eng. Syst.,: 409.

**4.12.2 Type Locality**
Jakarta, Indonesia.

**4.12.3 Material Examined**
3 females (50 – 70 mm) and 2 males (51 – 53 mm) ZSI. Reg. No. C4901/2, Bhabanagar, Ghoga Bandar, Gujarat, N.W. Coast of India, 19.12.1992, H.C. Ghosh and party; 14 females (30-90 mm) and 19 males (33-58 mm), ZSI. Reg. No. C4884/2, F.L.C. Chennai, Tamil Nadu, 27.8.1995, T. Roy and party; 3 females (46-96 mm) and 2 males (54-58 mm), ZSI. Reg. No. C4888/2, Dona Paula, Goa, 31.7.1997,

A. Chanda; 1 male (67 mm), ZSI. Reg. No. C4837/2, Lawsom's Bay, Visakhapatannam, Andhra Pradesh, 14.9.1995, A. Chanda; 11 males (75 – 80 mm) and 1 female (79 mm), ZSI. Reg. No. C4846/2, Pithapuram, Kakinada, Andhra Pradesh, 10.9.1995, A. Chanda; 16 males (50 – 90 mm) and 16 females (50 – 110 mm), ZSI. Reg. No. C4847/2, Kaligiri Reservoir, Andhra Pradesh, 30.8.1995, A. Chanda; 1 male (120 mm.), ZSI Reg. No. C4863/2, Bhimapattnam, Andhra Pradesh, 25.3.1997, T. Roy and party; 20 males (60 – 80 mm) and 35 females (60 – 90 mm.), ZSI. Reg. No. C4868/2, Narsapur, W. Godavori, Andhra Pradesh, 20.3.1997, T. Roy and party; 1 female (98 mm.), ZSI. Reg. No. C4877/2, Hospital Ghat, Digha, Midnapore, West Bengal, 22.2.95, A. Chanda; 2 males (75-92 mm) and 5 females (76-100 mm) ZSI. Reg. No. C4763/2, Chilogalapudi, Kakinada, Andhra Pradesh, 11.9.1995, A. Chanda; 2 male (52-57 mm) and 1 female (69 mm.), ZSI. Reg. No. C4804/2, Palk Bay, Tamil Nadu, 8.8.1997, A. Chanda; 18 females (35-98 mm) and 12 males (36-78 mm), ZSI. Reg. No. C4809/2, F.L.C. Chennai, Tamil Nadu, 26.8.1995, A. Chanda; 2 males (56-78 mm.), ZSI. Reg. No. C4921/2, Rambha Village, Orissa, 22.2.1975, K.K. Tiwari; 1 male (50 mm.) and 1 female (30 mm.), ZSI. Reg. No. C4927/2, Gelanchundi, Machlipattnam, Andhra Pradesh, 8.9.1995, A. Chanda; 1 female (92 mm.), ZSI. Reg. No. C4944/2, Baribeel, 24 Parganas (S), West Bengal, 29.8.1988. N.C. Nandi.

**4.12.4 Diagnosis of the species**

Entire body pubescent; rostrum straight, long, extend upto tip of antennular peduncle, armed with 8-9+1 dorsal teeth; epigastric tooth conspicuously separated from penultimate tooth; post rostral carina reaching posterior margin of carapace; adrostral carina ending behind second rostral tooth and sulcus behind epigastric tooth; hepatic and antennal spine prominent, orbital angle blunt, cervical sulcus ascends obliquely after hepatic spine, hepatic sulcus descending vertically downward, turning anteroventrally towards the pterygostomian angle, pterygostomian angle without spine; branchiocardiac carina prominent, reaching hepatic spine; a small ischial spine present on first pereopod; merus of fifth pereopod of male with a proximal notch followed by a long, inwardly curved spine and a row of tubercles; antennular flagella subequal, dorsal one is slightly longer than ventral; telson armed with minute spines on lateral margin of carapace; distomedian projection of median lobe of petasma convoluted, swollen, bulbiform, directed anterolaterally, tip of the projections trifurcated curling in a rounded form, concealing distolateral projections in ventral view; anterior plate of thelycum narrow, tongue-like, ventrally grooved; posterior plate on sternite XIV deeply notched anteriorly, lateral margins of the plate raised longitudinally into a cup-like structure.

**4.12.5 Remarks**

The species is first time reported from wetland ecosystem of South 24 Parganas (Baribeel).

**4.12.6 Distribution**

India: Distributed from Bengal to Gujarat in entire coastal belt of India and in Andaman Islands.

Elsewhere: Eastern Mediterranean sea; Red sea; East coast of South Africa; Mozambique; Madagascar; Reunion Island; Mauritius; Saudi Arabia; Pakistan; Sri Lanka; Mayanmar; Malaysia; Indonesia.

**4.13 *Metapenaeus moyebi* (Kishinouye, 1896)**

*M. moyebi* was originally described as *Penaeus moyebi* by Kishinouye [25] from Japanese water. It was first recorded from India by George [26] under the name *M. burkenroadi* Kubo, 1949, which was later on synonomized with *M. moyebi* by Miquel [27] A brief history of the species with special reference to Indian contributions are given below.

1896 *Penaeus moyebi* Kishinouye, Zool. Mag. Tokyo, 8: 373.

1954 *Metapenaeus burkenroadi* Kubo. J. Tokyo Univ. Fish, 41(1):89-93; George, 1969, Bull. Cent. Mar. Fish. Res. Inst. No. 14: 5-48; 1979, Contribution to Marine Science, dedicated to Dr. C.V. Kurian, 21-59; Muthu and Sampson Manickam, 1973, Indian J. Fish., 20: 214-216; George,

1978, J. Bombay Nat. Hist. Soc., 76: 297-303; George and Suseelan, 1982, Proc. Symp. Coastal Aquaculture, 1: 273-284.

1982 *Metapenaeus moyebi* Miquel, Zool. Verh., Leiden, 195: 1-137; Fischer and Bianchi, 1983, FAO Species Identification sheet, Area 51: 20.

**4.13.1 Type Species**

*Penaeus moyebi* Kishinouye, 1896, Zool. Mag. Tokyo, 8: 373.

**4.13.2 Type Locality**

Japan.

**4.13.3 Material Examined**

7 males (35 – 57 mm) and 3 females (30 – 47 mm), ZSI. Reg. No. C4885/2, F.L.C., Chennai, Tamil Nadu, 27.8.1995, T. Roy and party; 1 male (57 mm.), ZSI. Reg. No. C4849/2, Kaligiri Reservoir, Andhra Pradesh, 30.8.1995. A. Chanda.

**4.13.4 Diagnosis of the species**

Entire body pubescent, sometimes pubescence restricted to few patches on abdomen and dorsal side of carapace; rostrum strait, slightly uplifted, armed with 7-9+1 teeth along dorsal margin, reaching upto distal margin of third segment of antennular peduncle; epigastric tooth conspicuously separated from rest of the teeth; post rostral carina ending near posterior margin of carapace; adrostral carina not exceeding beyond epigastric tooth, adrostral sulcus extends little beyond epigastric tooth; orbital angle blunt, antennal and hepatic spine prominent; cervical sulcus prominent, hepatic sulcus descends vertically, then turn towards pterygostomian angle; branchiocardiac carina feeble, occupy posterior one-third of carpace; ischial spine on first pereopod minute; merus of fifth pereopod with a proximal notch followed by a twisted keeled tubercle; antennular flagella equal; telson armed with minute lateral row of spine on both side, distomedian projection of median lobe of petasma laminose, diverging anteriorly; distolateral projection of lateral lobe of petasma broad blunt and directed anterolaterally; anterior plate of thelycum on sternite XIII flask-shaped, anterior margin of it slightly convex, bearing three tubercles of subequal size; lateral plates kidney shaped, often with angular contour.

**4.13.5 Distribution**

India: Andhra Pradesh; Tamil Nadu, East coast, Kerala, Goa,

West coast and Andaman.

Elsewhere: Sri Lanka; Malaysia; Borneo; Thailand; China; Philippines; Taiwan and Japan.

**4.14 *Metapenaeus stebbingi* Nobili, 1904**

*M. stebbingi* was first described by Nobili [28] from Red Sea. It was first recorded from India by Ramamurthy [29] from Gulf of Kutch. A brief history of the species with special reference to Indian contributions are given below.

1904 *Metapenaeus stebbingi* Nobili, Bull. Mus. Hist. Nat., Paris, 10: 228-238; Ramamurthy, 1964, J. mar. biol. Ass. India, 6(1):170-171; George, 1969, Bull. Cent. Mar. Fish. Res. Inst. No. 14: 5-48; 1979, Cont. Mar. Sci. dedicated to Dr. C.V. Kurian, 21-59.

**4.14.1 Type Species**

*Metapenaeus stebbingi* Nobili, 1904. Bull. Mus. Hist. Nat. Paris, 10: 228-238.

**4.14.2 Type Locality**

Red sea.

**4.14.3 Material Examined**

No specimen could be collected during present study. Diagnosis of the species is based on existing literature.

**4.14.4 Diagnosis of the species**

Body glabrous; rostrum straight, extending beyond antennular peduncle, armed with 8-9+1 dorsal teeth only; epigastric tooth conspicuously separated from rest of the teeth, adrostral carina not exceeding epigastric tooth, adrostral sulcus extends little beyond epigastric tooth; post-rostral carina low, ending near middle of carapace; orbital spine absent, hepatic and antennal spine prominent; post-ocular sulcus oblique antennal and cervical carina present, prominent hepatic carina, hepatic sulcus descending anteroventrally towards the pterygostomian angle; branchiocardiac sulcus indistinct; ischial spine on first pereopod absent; merus of fifth pereopod of adult male with a proximal notch followed a keel-shaped tubercle; abdomen with mid-dorsal carina extending from posterior half of fourth abdominal somite to posterior margin of sixth somite ending in a sharp spine; antennular flagella equal; telson armed on each side with a row of small, movable spines, each half of petasma with dorsomedian style on median lobe, armed ventrally, distolateral projection of lateral lobe with three laterally directed projections; thelycum with posterior transverse plate protruding forward between lateral plates on sternite XIV, forming an inverted T-shaped plate; lateral plates triangular with apex directed posteriorly, fitting closely in hollows of T-shaped median process of posterior plate.

**4.14.5 Distribution**

India: Gulf of Kutch & Maharashtra, West coast of India.

Elsewhere: Eastern Mediterranean; Southeast African coast; Mozambique; Gulf of Suez; Red sea; Madagascar; Yemen; Saudi Arabia; Persian Gulf; Pakistan.

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**6. References**

1. Farfante IP, Kensley B. *Penaeoid* and Sergestoid Shrimps and Prawns of the World. Keys and Diagnoses for the Families and Genera. Mem Mus nat d'Hist nat 1997; 175:1-233.
2. Wood-Mason J. Natural history notes from H.M. Marine Surveying Steamer 'Investigator'. Ann. Mag. nat. Hist. February 1891:187-199: October 1891: 269-286; November 1891: 353-362.
3. Miers EJ. Notes on the *Penaeidae* in the collection of the British Museum, with descriptions of some new species. Proc Zool Soc London 1878; 289-310.
4. Nobili G, Crostacei di Singapore. Bollettino dei Musei di Zoologia ed Anatomia comparata della R. Universitá di Torino, 1903, 18(455):1-39.
5. George MJ. Taxonomy of Indian prawns (Curstacea, Decapoda, Penaeidae). "In contribution to Marine Science", dedicated to Dr. C.V. Kurian, 1979; 21-59.
6. Edwards HM. Histoire Naturelle des Crustacés, comprenant l'Anatomie, la Physiologie et la Classification de ces Animaux 1837; 2:1-532.
7. George PC, George MJ, Rao PV. *Metapenaeus kutchensis* sp nov., a penaeid prawn from the Gulf of Kutch. J mar biol Ass India 1963; 5:284-88.
8. Chanda A. Telson spine is a variable diagnostic character in *Metapenaeus brevicornis* (Milne Edwards, 1837). Int J Sc Tech 2014.
9. Dall W. A revision of the Australian species of *Penaeinae* (Crustacea, Decapoda: Penaeidae). Aust J Mar Freshw Res 1957; 8:136-231.
10. Chanda A. First record of two Australian species: one under *Metapenaeopsis* and another under *Metapenaeus* from Indian water, their diagnosis and distribution. J Ento Zool Study, 2014.
11. Man JGD. Diagnoses of new species of macrurous Decapod Crustacea from Siboga Expedition. Notes Leiden Mus 1907; 29:127-147.
12. Silas EG, Muthu MS. On a new species of penaeid prawn of the genus Metapenaeus Wood-Mason and Alcock, from the Andamans. J mar biol Ass India 1974; 16:645-648.
13. Silas EG, Muthu MS. On a new species of penaeid prawn of the genus *Metapenaeus* Wood Mason and Alcock, from the Andamans. J mar boil Ass India 1976; 16(2):645-648.
14. Haan W, Crustacea D. In: P.F. Von Siebold, Fauna Japonica sive descriptio animalium, quae in itinere per Japoniam, jussu et auspiciis superiorum, qui summum in India Batava Imperium tenant, suscepto, annis 1823-1830 collegit, notis, observationibus et adumbrationibus illustravit. fasc. 1833-1850, 1-8:1-243, Lugduni-Batavorum [Leiden].
15. Alcock A. Catalogue of the Indian Decapod Crustacea in the collection of the Indian Museum. Part III. Macrura. Fasciculus I. The prawns of the *Peneus* group. Indian Museum, Calcutta, 1906; 1-55.
16. Kishinouye K. Japanese species of the genus *Penaeus.* J Fish Bur, Tokyo 1900; 8(1):1-29, 1-8.
17. Johnson JY. Descriptions of a new genus and a new

species of macrurous decapod Crustaceans belonging to the *Penaeidae*, discovered at Madeira. Proc Zool Soc London 1867, 895-901.
18. George MJ, Vedavyasa PR. A new specie,s of *Metapenaeus* (Decapoda, Penaeidae). J mar biol Ass India 1966; 8(1):146-151.
19. De Man. Report on the podophthalmus Crustacea of the Mergui Archipelago, collected for the Trustees of the Indian Museum, Calcutta, by Dr. John Anderson, F.R.S., Superintendent of the Museum. J Linn Soc London (Zoology) 1888; 22:1-312.
20. Fabricius JC. Supplementum Entomologiae Systematicae 1798, 1-572.
21. Kishinouye K. Note on a Japanese *Penaeus* and its classification. Zoological Magazine, Tokyo, 1896, 8:372.
22. George MJ. Systematics-Taxonomic considerations and general distribution. In prawn Fisheries of India. Bull Cent Mar Fish Res Inst 1969; 14:5-48.
23. Miquel JCE. Le genre *Metapenaeu* (Crustacea, Penaeidae): taxonomie, biologie et pêches mondiales. Zool Verh Leiden 1982; 195:1-137.
24. Nobili G, Diagnoses préliminaires de vingt-huit espèces nouvelles de Stomatopodes et Décapodes Macroures de la Mer Rouge. Bull Mus nat d'Hist. nat Paris 1904; 10(5):228-238.
25. Ramamurthy S. On a new record of *Metapenaeus stebbingi* Nobili in Indian waters. J mar biol Ass India 1964; 6:170-71.