

Penaeid and Palaemonid Prawns of Godavari Estuary, Andhra Pradesh with Some New Records

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ABSTRACT: A consolidated check-list of 49 species of prawns of the Godavari estuary, Andhra Pradesh has been prepared based on the present study and available literatures. In the present study a total 19 species of penaeid and palaemonid prawns representing 9 genera and 2 families are recorded. Four species of penaeid prawns, viz., *Melicertus canaliculatus*, *Metapenaeus ensis*, *Metapenaeus lysianassa*, *Mierspenaeopsis sculptilis* and two species of palaemonid prawns, viz., *Macrobrachium banjare* and *Macrobrachium equidens* are reported here for the first time from the estuary. A key to the identification of penaeid and palaemonid prawns is provided.

Keywords: Alpheid, Palaemonid, Penaeid, Sergestid, Solenocerid.

INTRODUCTION

The river Godavari is remarkable for its sacredness and is worshipped by the Hindus since times immemorial. It is the largest of Indian peninsular rivers (Fig. 1) and is

blessed with rich biodiversity. A lot of information is available on the aquatic fauna of this river (Anonymous, 2001), including crabs (Dev Roy and Bhadra, 2001).



Fig. 1.

There are several works in relation to fishery, ecology and biology of prawns from Godavari estuary (Ganapati, 1969; Ganapati and Subramanyam, 1966; Subramanyam, 1969; Rao, 1975; Rajyalakshmi, 1980; Devi, 1988) which indicate its significant contribution to the economy of the state of Andhra Pradesh. However, very little work has been done on the prawn taxonomy and diversity. During 1992-1995, a large number of prawns were collected from the estuary between 16°58'N and 81°45'E by Estuarine Biological Regional Centre, Zoological Survey of India, Brahmapur, Odisha and sent to Zoological Survey of

India, Kolkata for identification. The present account is based on these collections.

MATERIALS AND METHODS

A total of 756 specimens were examined and studied taxonomically. All the specimens of prawn were identified following FAO sheets (1984), Jayachandran (2001) and by consulting other relevant literatures. All the specimens were preserved in 70% alcohol, registered and deposited in the Zoological Survey of India, Kolkata. Collection sites of the specimens are shown in Fig. 2.

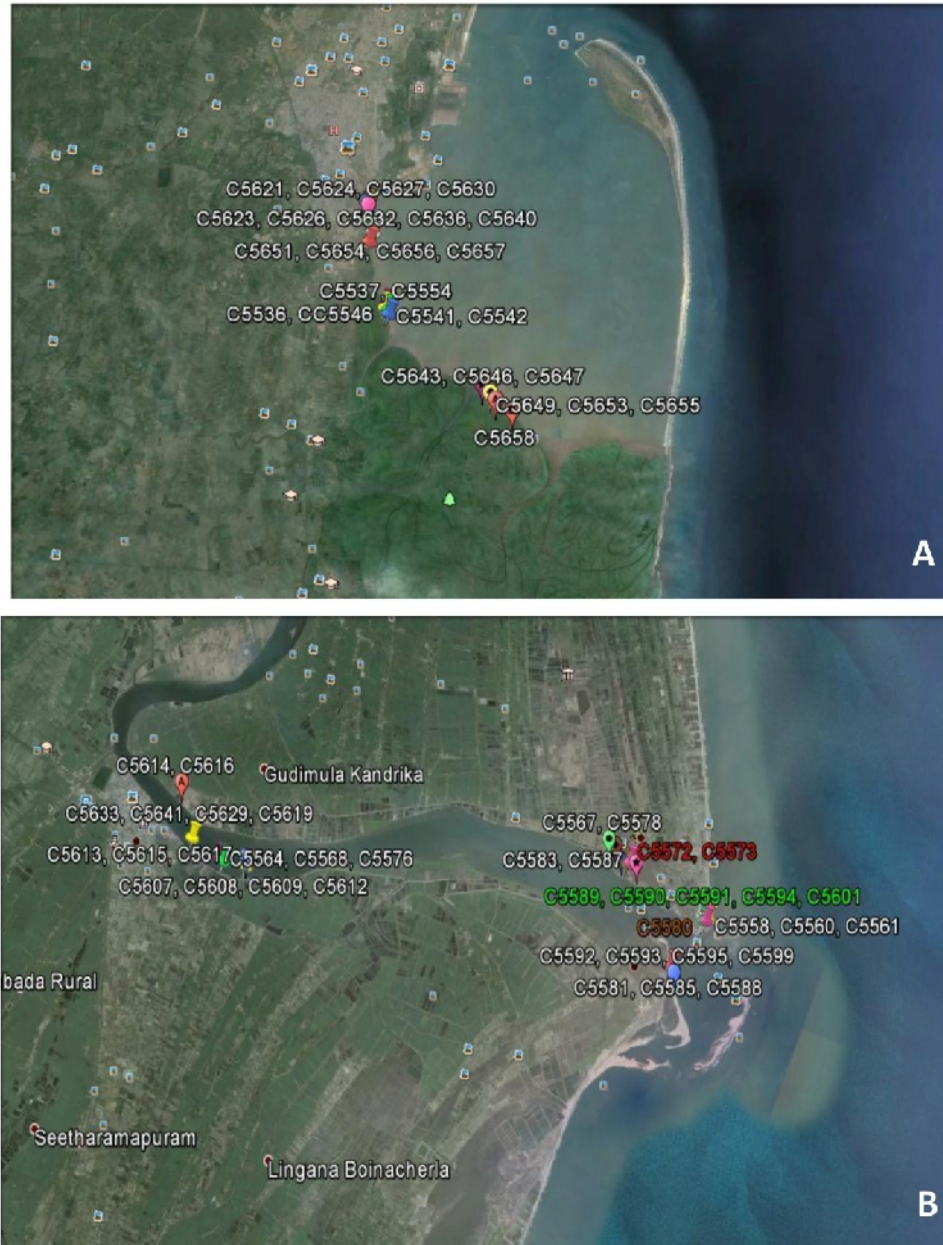


Fig. 2. East Godavari (A) and West Godavari (B) collection points. (Source: Google Earth Geo-Portal satellite imagery).

RESULTS AND DISCUSSION

A consolidated check-list of 49 species of penaeid and palaemonid prawns of the Godavari estuary, Andhra Pradesh has been prepared based on the present study

and available literatures (Table 1). In the present study a total of 19 species of penaeid and palaemonid prawns, which belongs to 9 genera and 2 families, has been recorded from the estuary.

Table 1: Consolidated check-list of prawn species of Godavari Estuary along with published references.

Sl. No.	Name of the species	References
Family Penaeidae		
1.	<i>Fenneropenaeus indicus</i> (H. Milne Edwards, 1837) *	Ganapati and Subramanyam, 1966; also the present study
2.	<i>Fenneropenaeus merguensis</i> (De Man, 1888)	Ganapati and Subramanyam, 1966
3.	<i>Fenneropenaeus penicillatus</i> (Alcock, 1905)	Ganapati and Subramanyam, 1966
4.	<i>Kishinouyepenaeopsis maxillipedo</i> (Alcock, 1905)	Chanda and Roy, 2005
5.	<i>Marsupenaeus japonicas</i> (Bate, 1888) *	Ganapati and Subramanyam, 1966
6.	<i>Melicertus canaliculatus</i> (Olivier, 1811) **	Present study
7.	<i>Metapenaeus affinis</i> (H. Milne Edwards, 1837)	Ganapati and Subramanyam, 1966
8.	<i>Metapenaeus brevicornis</i> (H. Milne Edward, 1837) *	Ganapati and Subramanyam, 1966; also the present study
9.	<i>Metapenaeus dobsoni</i> (Miers, 1878) *	Ganapati and Subramanyam, 1966
10.	<i>Metapenaeus ensis</i> (De Haan, 1844) **	Present study
11.	<i>Metapenaeus lysianassa</i> (De Man, 1888) **	Present study
12.	<i>Metapenaeus monoceros</i> (Fabricius, 1798) *	Ganapati and Subramanyam, 1966; also the present study
13.	<i>Metapenaeopsis novaeguinae</i> (Haswell, 1879)	Ganapati and Subramanyam, 1966
14.	<i>Mierspenaeopsis indica</i> (Muthu, 1972)	Muthu, 1972
15.	<i>Parapenaeopsis acclivirostris</i> Alcock, 1905	Ganapati and Subramanyam, 1966
16.	<i>Mierspenaeopsis sculptilis</i> (Heller, 1862) **	Present study
17.	<i>Parapenaeopsis stylifera</i> var. <i>coromandelica</i> (H. Milne Edward, 1837) *	Ganapati and Subramanyam, 1966
18.	<i>Parapenaeus longipes</i> Alcock, 1905	Ganapati and Subramanyam, 1966
19.	<i>Parapenaeopsis nana</i> Alcock, 1905	Ganapati and Subramanyam, 1966
20.	<i>Parapenaeopsis hardwickii</i> (Miers, 1878)	Ganapati and Subramanyam, 1966
21.	<i>Ganjampenaeopsis uncta</i> (Alcock, 1905)	Ganapati and Subramanyam, 1966; Ganapati, 1969
22.	<i>Penaeus monodon</i> Fabricius, 1798 *	Ganapati and Subramanyam, 1966; also the present study
23.	<i>Penaeus semisulcatus</i> De Haan, 1844 *	Ganapati and Subramanyam, 1966
24.	<i>Trachypenaeus acclivirostris</i> (Stimpson, 1860)	Ganapati and Subramanyam, 1966
25.	<i>Trachysalambria curvirostris</i> (Stimpson, 1860)	Ganapati and Subramanyam, 1966
Family Palaemonidae		
26.	<i>Exopalaemon styliferus</i> (H. Milne Edwards, 1840) *	Ganapati, 1969; also the present study
27.	<i>Leandrites celebensis</i> (De Man, 1881)	Ganapati and Subramanyam, 1966
28.	<i>Leptocarpus potamiscus</i> (Kemp, 1917)	Ganapati and Subramanyam, 1966
29.	<i>Macrobrachium aemulum</i> (Nobili, 1906)	Ganapati and Subramanyam, 1966
30.	<i>Macrobrachium banjare</i> (Tiwari, 1955) **	Present study
31.	<i>Macrobrachium equidens</i> (Dana, 1852) **	Present study
32.	<i>Macrobrachium idella</i> (Hilgendorf, 1898)	Ganapati, 1969
33.	<i>Macrobrachium lamarrei</i> (H. Milne Edwards, 1937) *	Ganapati and Subramanyam, 1966
34.	<i>Macrobrachium malcolmsonii</i> (H. Milne Edwards, 1844) *	Ganapati and Subramanyam, 1966; also the present study
35.	<i>Macrobrachium rosenbergii</i> (De Man, 1879)	Ganapati & Subramanyam, 1966
36.	<i>Macrobrachium rude</i> (Heller, 1862) *	Ganapati and Subramanyam, 1966
37.	<i>Macrobrachium scabriculum</i> Heller, 1862)	Ganapati and Subramanyam, 1966

Sl. No.	Name of the species	References
38.	<i>Nematopalaemon tenuipes</i> (Henderson, 1893)*	Ganapati, 1969; also present study
39.	<i>Palaemon semmelinki</i> (De Man, 1881)	Ganapati and Subramanyam, 1966
Family Solenoceridae		
40.	<i>Solenocera crassicornis</i> (H. Milne Edwards, 1837)	Kathirvel and Thirumilu, 2011
41.	<i>Solenocera indica</i> Nataraj, 1945	Ganapathi and Subramanyam, 1966
42.	<i>Solenocera melantho</i> De Man, 1907	Ganapathi and Subramanyam, 1966
Family Sergestidae		
43.	<i>Acetes erythraeus</i> Nobili, 1905	Ganapathi and Subramanyam, 1966
44.	<i>Acetes indicus</i> H. Milne Edwards, 1830	Ganapathi and Subramanyam, 1966
Family Alpheidae		
45.	<i>Alpheus malabaricus</i> Alcock and Anderson, 1894	Ganapathi and Subramanyam, 1966
46.	<i>Alpheus macroσκεles</i> Alcock and Anderson, 1894	Alcock and Anderson, 1894
47.	<i>Athanus polymorphus</i> Kemp, 1915	Ganapathi and Subramanyam, 1966
Family Atyidae		
48.	<i>Caridina</i> sp.	Ganapathi and Subramanyam, 1966
Family Hippolytidae		
49.	<i>Exhippolysmata ensirostris</i> (Kemp, 1914)	Ganapathi and Subramanyam, 1966

Note: * represents present collection and ** represents new record to Godavari estuary.

Interesting observations were made in respect of distribution of some prawns. Six species of prawns viz., *Melicertus canaliculatus*, *Metapenaeus ensis*, *Metapenaeus lysianassa*, *Mierspenaeopsis sculptilis*, *Macrobrachium banjare* and *Macrobrachium equidens* are reported here for the first time from this Godavari estuary. The prawn fauna of Godavari estuary consists of pure estuarine, marine, freshwater and widely distributed forms.

Key to the species of penaeid and palaemonid prawns of Godavari Estuary

1. First three thoracic legs chelate, petasma present2
- First two thoracic legs chelate, petasma absent13
2. Rostrum with ventral teeth3
- Rostrum without ventral teeth5
3. Hepatic carina present4
- Hepatic carina absent, rostrum with 7-9 dorsal teeth*Fenneropenaeus indicus*
4. Hepatic carina horizontally straight, rostrum armed with 7-8 dorsal teeth*Penaeus monodon*
- Hepatic carina sloping antero-ventrally, rostrum armed with 5-8 dorsal teeth*Penaeus semisulcatus*
5. Fifth pereopod normal10
- Fifth pereopod without exopod6
6. Distomedian petasma projection with well developed / vestigial apical filament7
- Distomedian petasma projection without apical filament9
7. Rostrum wide and short not reaching to distal end of basal antennular segment*Metapenaeus lysianassa*
- Rostrum projecting beyond antennular segment8

8. Posterior part of rostrum with distinctly elevated crest, anterior plate of thelycum large, square and grooved*Metapenaeus brevicornis*
- Posterior part of rostrum devoid of elevated crest, anterior plate of thelycum tongue-shaped*Metapenaeus dobsoni*
9. Lateral plates of thelycum with raised lateral ridges forming a posteriorly inward curved triangular plate
.....*Metapenaeus ensis*
- Lateral thelycal plate with raised lateral margins forming 2 longitudinal crest
.....*Metapenaeus monoceros*
10. Gastrofrontal sulcus bifid11
- Gastrofrontal sulcus not bifid12
11. Gastrofrontal sulcus weakly bifid posteriorly, thelycum with pair of lateral plates on sternite 14
- Shielding sac-like seminal receptacle opening along mid-line*Melicertus canaliculatus*
- Gastro-frontal sulcus strongly bifid posteriorly, thelycum with single plate on sternite 14 infolded laterally, forming pouch opening anteriorly, functioning as seminal receptacle*Marsupenaeus japonicas*
12. Distomedian projection of petasma horn-like*Parapenaeopsis coromandelica*
- Distomedian projection of petasma leaf-like
.....*Mierspenaeopsis sculptilis*
13. Branchiostegal spine present18
- Branchiostegal spine absent14
14. Rostrum with a distinct elevated crest15
- Rostrum with indistinct elevated crest16
15. Palm of second pereopod longer than fingers
.....*Macrobrachium lamarrei*
- Palm of second pereopod shorter than finger
.....*Macrobrachium malcolmsonii*

16. All podomeres pubescent*Macrobrachium rude*
 - Podomeres not pubescent17
 17. Both fingers of second chelate leg fully covered
 with hairs*Macrobrachium equidens*
 - Fingers of second chelate leg glabrous
*Macrobrachium banjare*
 18. Dactyls of last three pairs of pereopods longer than
 carpus and propodus together, branchiostegal groove
 absent.....*Nematopalaemon tenuipes*
 - Dactyls of last three pairs of propodus always shorter
 than propodus, branchiostegal groove present
*Exopalaemon styliferus*

Systematic account

The systematic account along with diagnosis and distribution of penaeid and palaemonid prawns species of Godavari estuary are given hereunder.

Genus *Penaeus* Weber, 1795

1. *Penaeus monodon* Fabricius, 1798

1798. *Penaeus monodon* Fabricius, *Ent. Syst. Suppl.*: 408.

1991. *Penaeus (Penaeus) monodon*, Paulpandian & Ramasamy, *Guide to the Prawns of Porto Novo CAS in Mar. Biol., Annamalai University, Parangipettai, India*: **36**, pl. 29, fig. 4.

2011. *Penaeus monodon*, De Grave and Fransen, *Zool. Med. Leiden*, **85**: 226.

Diagnosis: Carapace smooth. Rostrum very strong and armed with 7-8 dorsal and 3-4 ventral teeth. Hepatic carina straight. Adrostralcrina 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 coast: West Bengal, Odisha, Andhra Pradesh, Tamil Nadu. West coast: Maharashtra, Goa. Islands: Andaman and Nicobar Islands and Lakshadwip. *Elsewhere*- Pakistan, Sri Lanka, China, Japan, East Africa, Gulf of Aden, Red Sea, West coast of Madagascar, Mauritius, Philippines, New Guinea and Australia.

Remarks: This is a common species of this estuary. Subrahmanyam (1969) while studying ecology of prawn fauna recorded the species from a tidal river of Godavari estuary. Rath and Dev Roy (2008) reported the species from Krishna estuary.

2. *Penaeus semisulcatus* De Haan, 1844

1844. *Penaeus semisulcatus* De Haan, In: von Siebold, *Fauna japon. (Crust.)*: **46**, fig. 1.

1991. *Penaeus (Penaeus) semisulcatus*, Paulpandian & Ramasamy, *Guide to the Prawns of Porto Novo CAS in Mar. Biol., Annamalai University, Parangipettai, India*: **36**, pl. 29, fig. 4.

2011. *Penaeus semisulcatus*, De Grave and Fransen, *Zool. Med. Leiden*, **85**: 226.

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 coast: West Bengal, Odisha, Andhra Pradesh, Tamil Nadu, Pondichery. West coast: Gujarat, Maharashtra, Goa, Malabar coast. *Elsewhere* – East coast of Africa, Madagascar, Mauritius, Red Sea, Pakistan, Sri Lanka, Mergui Archipelago, Akyab, Philippines, Korea, Japan, New Guinea, Northern Australia and the Eastern Mediterranean.

Remarks: This species was earlier reported from Krishna (Rath and Dev Roy, 2008) and Vamsadhara and Nagavali estuaries (Rath and Dev Roy, 2010). It is a common species of this estuary.

Genus *Fenneropenaeus* Farfante, 1969

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

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

1991. *Penaeus (Fenneropenaeus) indicus*, Paulpandian & Ramasamy, *Guide to the Prawns of Porto Novo CAS in Mar. Biol., Annamalai University, Parangipettai, India*: **35**, pl. 28, fig. 2.

2012. *Fenneropenaeus indicus*, Dev Roy and Rath, *Zool. Surv. India Fauna of Maharashtra, State Fauna Series*, **20**(2): 387-388.

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 posterior process vestigial type.

Distribution: *India*- East coast: West Bengal, Odisha, Andhra Pradesh, Tamil Nadu. West coast: Karnataka, Maharashtra, Maharashtra, Goa, Kerala. Islands: Andaman and Nicobar Islands and Lakshadweep. *Elsewhere* - Sri Lanka, China, East African coast, Madagascar, Red Sea, Philippines and Northern Australia.

Remarks: This species occurs abundantly in Godavari estuary. It is also reported from Krishna (Rath and Dev Roy, 2008), Vamsadhara and Nagavali estuaries (Rath and Dev Roy, 2010).

Genus *Marsupenaeus* Tirmizi, 1971

4. *Marsupenaeus japonicus* Bate, 1888

1888. *Penaeus canaliculatus* var. *japonicus* Bate, *Rep. Sci. Res. "Challenger" (Zool.)*, **24**: 245.
1969. *Penaeus japonicus*, George, *Bull. cent. Mar. Fish. Res. Inst.*, **14**: 21.
1991. *Penaeus (Marsupenaeus) japonicus*, Paulpandian and Ramasamy, *Guide to the Prawns of Porto Novo, CAS in Mar. biol., Annamalai University, Parangipettai, India*: **36**, pt.29, fig 1.
2012. *Marsupenaeus japonicus*, Dev Roy and Rath, *Zool. Surv. India Fauna of Maharashtra, State Fauna Series*, **20**(2): 387-389.

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 coast: West Bengal, Andhra Pradesh, Tamil Nadu. West coast: Maharashtra. *Elsewhere* - South East Africa, Gulf of Madagascar, Red Sea, Mauritius, Korea, Japan, New Guinea and Australia.

Remarks: Previously reported from Krishna estuary (Rath and Dev Roy, 2008), it is now recorded for the first time from Godavari estuary. However, this species is not very common species.

Genus *Melicertus* Rafinesque-Schmaltz, 1814

5. *Melicertus canaliculatus* (Olivier, 1811), Fig. 3 (A)

1811. *Palaemon canaliculatus* Olivier, *Encycl. Method. Hist. Nat. (Ins)*, **8**: 660.
1969. *Penaeus canaliculatus*, George, *Bull. cent. Mar. Fish. Res. Inst.*, **14**: 21.
1991. *Penaeus (Melicertus) canaliculatus*, Paulpandian and Ramasamy, *Guide to the Prawns of Porto Novo, CAS, in Mar. biol., Annamalai University, Parangipettai, India* : **35**.
2012. *Melicertus canaliculatus*, Dev Roy and Rath, *Zool. Surv. India Fauna of Maharashtra, State Fauna Series*, **20**(2): 387-389.

Diagnosis: Carapace smooth. Rostrum strong and straight, dorsally armed with 9-11 teeth and ventrally with a single tooth. Adrostral crest and groove extending beyond the posterior margin of carapace. Gastrofrontal groove bifurcate posteriorly. Telson

unarmed. Band coloration of last abdominal segment continuous. Petasma with short distomedian projections reaching distal margin of costae. Ventral costae broadened apically and having spinules. Thelycum with lateral plates having anteromedian margins diverging then turning in a broad arc continuous with raised to form a depressed area.

Distribution: *India*- East coast: West Bengal, Odisha, Andhra Pradesh, Tamil Nadu. West coasts: Gujarat, Maharashtra, Kerala. Islands: South Andamans and Lakshadweep. *Elsewhere* - South East Africa, Red Sea, Mauritius, Sri Lanka, Taiwan, Polynesia and New Guinea.

Remarks: Previously reported from Krishna estuary (Rath and Dev Roy, 2008). It is collected from Coringa creek and Kakinada of Andhra Pradesh and reported here for the first time from Godavari estuary. This species appears to be rather rare.

Genus *Mierspenaeopsis* Sakai & Shinomiya, 2011

6. *Mierspenaeopsis scuptilis* (Heller, 1862), Fig. 3 (B)

1862. *Penaeus scuptilis* Heller, *Verh. Zool.-bot Ges. Wien.*, **12**: 528.
1995. *Parapenaopsis scuptilis*, Reddy, *Zool. Surv. India Estuarine Ecosystem Series, Part 2: Hugli Matla Estuary*: 297.
2011. *Mierspenaeopsis scuptilis*, De Grave and Fransen, *Zool. Med. Leiden*, **85**: 224.

Diagnosis: Body smooth. Rostrum strong and a little upwards directed; dorsally armed with 7-9 teeth, distal half with no 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*-East coast: West Bengal, Andhra Pradesh, Tamil Nadu. West coast: Gujarat, Maharashtra, Goa. *Elsewhere*- Pakistan, Bangladesh, Myanmar, Malaya, Hong Kong, Philippines, China, Japan, Indonesia, New Guinea and Australia.

Remarks: It is collected from Antervadi, Narsapur and Coringa creek, Kakinada of Andhra Pradesh and reported here for the first time from Godavari estuary. This prawn is earlier known from Gangetic delta (Jones, 1967), estuaries of Goa (George, 1980) and Krishna estuary (Rathand Dev Roy, 2008).

Genus *Parapenaopsis* Alcock, 1901

7. *Parapenaopsis stylifera* var. *Coromandelica* (H. Milne Edwards, 1837)

1906. *Parapenaopsis coromandelica* Alcock, *Cat. Indian Decapod Crust.*, **3**(1): 37.

2005. *Parapenaeopsis coromandelica*, Chanda and Roy, *Zool. Surv. India State Fauna Series 5: Fauna of Andhra Pradesh* (Part 5): 541.

2011. *Parapenaeopsis stylifera* var. *coromandelica*, De Grave and Fransen, *Zool. Med. Leiden*, **85**: 224.

Diagnosis: Body smooth. Rostrum sigmoidal, sharply bent upward, distal half toothless rest part armed with 6-8 dorsal teeth. Epigastric tooth present. Telson armed with 1-2 pair of fixed spines. Distolateral projections of petasma slender, horn like and straight. Thelycum square-cut and concave with a slender stem like posterior process.

Distribution: *India*- East coast - Andhra Pradesh, Tamil Nadu. West coast - Kerala. *Elsewhere*- Sri Lanka, Gulf of Thailand, Indonesian Archipelago and Borneo.

Remarks: This species was earlier recorded from Krishna estuary (Rath and Dev Roy, 2008).

Genus *Metapenaeus* Wood Mason and Alcock, 1891.

8. *Metapenaeus brevicornis* (H. Milne Edwards, 1837)

1837. *Penaeus brevicornis* H. Milne Edwards, *Hist. Nat. Crust., Paris*, **2**: 417.

1906. *Metapenaeus brevicornis*, Alcock, *Cat. Indian Decapod Crust.*, **3**(1): 22.

1995. *Metapenaeus brevicornis*, Reddy, *Zool. Surv. India Estuarine Ecosystem Series Part 2: Hugli Matla Estuary*: 293.

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 pereopod. In adult male, merus of 5th pereopod 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 coast: West Bengal, Andhra Pradesh, Tamil Nadu. West coast: Maharashtra, Goa. *Elsewhere* - Pakistan, Thailand, Malaysia, Viet Nam and Indonesia.

Remarks: This is a common prawn of Godavari estuary. Subramanyam (1969) while studying ecology of prawn fauna recorded the species from a tidal river of Godavari estuary. This species has also been reported from Krishna (Rath and Dev Roy, 2008), Hugli-Matla (Reddy, 1995) and Zuari estuaries (George, 1980).

9. *Metapenaeus dobsoni* (Miers, 1878)

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

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

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

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

Distribution: *India*- East coast: West Bengal, Andhra Pradesh, Tamil Nadu. West coast: Maharashtra, Karnataka, Goa, Kerala. Islands: Andaman Islands. *Elsewhere*- Sri Lanka, Gulf of Thailand, Philippines and Indonesia.

Remarks: This is also a common prawn of Godavari estuary. Subramanyam (1969) while studying ecology of prawn fauna recorded the species from a tidal river of Godavari estuary. The species is also known from Krishna (Rath and Dev Roy, 2008) and Hugli-Matla estuaries (Reddy, 1995).

10. *Metapenaeus ensis* (De Haan, 1844), Fig. 3 (C)

1844. *Penaeus ensis* De Haan, In: von Siebold, *Fauna Japon. (Crust.)*(6/7): pl. 46, fig. 2.

2005. *Metapenaeus ensis*, Chanda and Roy, *Zool. Surv. India State Fauna Series 5: Fauna of Andhra Pradesh* (Part 5): 541.

Diagnosis: Body pubescent, often restricted to dorsal part of carapace only. Rostrum long, reaching to tip of antennular peduncle and armed with 9-10 dorsal teeth on entire length of dorsal margin. Post rostral crest reaching as far as posterior margin of carapace. Adrostral crest culminating behind 2nd rostral tooth. Telson armed with spinules. Petasma with each distomedian projections convoluted greatly swollen and directed forward, triangular in shape. Distolateral projections cocealed. Thelycum having long anterior plate bearing a deep groove, lateral plates form two inwardly curved triangular projections.



Fig. 3. (A). *Melicertus canaliculatus* (Olivier, 1811) (B). *Mierspenaeopsis sculptilis* (Heller, 1862), (C) *Metapenaeus ensis* De Haan, 1844, (D). *Metapenaeus lysianassa* (de Man, 1888), (E). *Macrobrachium banjare* (Tiwari, 1958), (F). *Macrobrachium equidens* (Dana, 1852).

Distribution: *India*- East coast: Odisha, Andhra Pradesh. West coast: Gujarat. Islands: North and South Andamans. *Elsewhere* - Bangladesh, Sri Lanka, Japan, New Guinea and Australia.

Remarks: This species has been recorded earlier from Krishna estuary (Rath and Dev Roy, 2008). It is collected from Darbha Revu, Narsapur of Andhra Pradesh and reported here for the first time from Godavari estuary

11. *Metapenaeus lysianassa* (De Man, 1888), Fig. 3 (D)

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

1906. *Metapenaeus lysianassa*, Alcock, *Cat. Indian Decapod Crust.*, **3**(1): 23.

1995. *Metapenaeus lysianassa*, Reddy, *Zool. Surv. India Estuarine Ecosystem series, Part. 2: Hugli Matla Estuary*: 295.

Diagnosis: Body pubescent. Rostrum very wide high and short reaching almost first antennular article and dorsally armed with 6-7 teeth. Adrostral crest and groove reaching as far as third rostral tooth. Telson armed with spinules. Distolateral projections of petasma bifurcate distally. Small apical filament like structure present at median margin of distomedian projection. Anterior and lateral plates of thelycum sub-equal, middle one small and tongue like.

Distribution: *India*- East coast: West Bengal, Andhra Pradesh. *Elsewhere*- Sri Lanka, Gulf of Tonkin, Indonesia.

Remarks: This species has been recorded earlier from Krishna estuary (Rath and Dev Roy, 2008). It is collected from Antervadi, Narsapur, Biyaputhippa, B.V. Palem and Coringa creek, Kakinada of Andhra Pradesh and it is now reported for the first time from Godavari estuary.

12. *Metapenaeus monoceros* (Fabricius, 1798)

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

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

2012. *Metapenaeus monoceros*, Dev Roy and Rath, *Zool. Surv. India Fauna of Maharashtra, State Fauna Series*, **20**(2): 388, 391.

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

Distribution: *India*- East coast: West Bengal, Odisha, Andhra Pradesh, Tamil Nadu. West coast: Gujarat, Maharashtra, Goa, Kerala. *Elsewhere* - South Africa, Madagascar, Mauritius, Red Sea, Sri Lanka, Malay Peninsula, Hong Kong, Philippines, Indonesia and the Mediterranean.

Remarks: This species occurs very abundantly in Godavari estuary. It is recorded from estuaries and the sea of Goa (George, 1980), Mahanadi (Deb, 1998) and Vamsadhara and Nagavali estuaries (Rath and Dev Roy, 2010).

Genus *Macrobrachium* Bate, 1868

13. *Macrobrachium banjare* (Tiwari, 1955), Fig. 3 (E)

1955. *Palaemon banjarae* Tiwari, *Rec. Indian Mus.*, **53**: 299.

2001. *Macrobrachium banjarae*, Jayachandran, *Palaemonid Prawns Biodiversity, Taxonomy, Biology and Management*: **82**, figs. 16A-D.

Diagnosis: Carapace smooth with antennal and hepatic spines. Rostrum long, extending to tip of antennal scale with 11-15 equidistant teeth dorsally out of which 2 is post-orbital and 4-6 teeth ventrally. Abdomen smooth, telson elongate reaching beyond level of spine of uropodalexopod. Uropodalexopod with accessory sub-apical spine.

Distribution: *India*- East coast: Andhra Pradesh, Madhya Pradesh. West coast: Karnataka, Maharashtra.

Remarks: This species has earlier been reported from Vamsadhara and Nagavali estuaries (Rath and Dev Roy, 2010) and Pocharam Lake (Ghatak *et al.*, 2010) of Andhra Pradesh. It is collected from Coringa creek and B.V. Palem, Kakinada of Andhra Pradesh and it is now reported for the first time from Godavari estuary.

14. *Macrobrachium equidens* (Dana, 1852), Fig. 3 (F)

1852. *Penaeus equidens* Dana, *Proc. Acad. Nat. Sci., Philad.*, **6**: 26, 591.

1950. *Macrobrachium equidens*, Holthuis, *Siboga Exped.*, **39**: 162.

1995. *Macrobrachium equidens*, Reddy, *Zool. Surv. India, Estuarine Ecosystem Series, Part 2: Hugli Matla Estuary*: 310.

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*- East coast: West Bengal, Andhra Pradesh, Pondichery. West coast: Kerala. Islands: Andaman and Nicobar Islands. *Elsewhere*- East coast of Africa, Madagascar, Pakistan, Sri Lanka, Singapore, Philippines, China and New Caledonia.

Remarks: This is the most common palaemonid prawn of this estuary where it occurs abundantly. This species has been recorded from Hugli Matla estuary (Reddy, 1995), Krishna (Rath and Dev Roy, 2008) and Vamsadhara and Nagavali estuaries (Rath and Dev Roy, 2010). It is collected from Girijampeta, Vodala Revu, Light house, Coringa, Cholangi, Dariyalpeta, Bhairava Palem, Biyaputhippa, B. V. Plaem, Mondigattu, Kakinada, Darva Revu, Antervedi, Chakalitippa, Sankha Revu, Sakhinetipalli, Chintawarapetta Matla Palem, Clunchinada and Narsapur of Andhra Pradesh and it is now reported for the first time from Godavari estuary.

15. *Macrobrachium lamarrei* (H. Milne Edwards, 1837)

1837. *Palaemon lamarrei* H. Milne Edwards, *Hist. Nat. Crust., Paris*, **2**: 397.

1908. *Palaemon (Eupalaemon) lamarrei*, De Man, *Rec. Indian Mus.*, **2**(3): 222, pl. 19, fig. 4.

1969. *Macrobrachium lamarrei*, George, *Bull. cent. Mar. Fish. Res. Inst.*, **14**: 39.

Diagnosis: Carapace smooth, with antennal and hepatic spine. Rostrum long, extending beyond antennal scale by 1/3rd of its length, basal crest elevated with 7-8 dorsal teeth of which 2 teeth out of which on proximal elevated part and followed by long edentate gap. Small setae present between teeth, and 7-8 teeth ventrally. First pair of chelate legs reaching up to outer lateral spine of antennal scale. Abdomen smooth, telson slender, posterior end sharply pointed and reaching as far as uropodalendopod, dorsal surface with 2 pairs of spines at posterior half both are close to each other. Distal end also have 2 pairs of spines outer smaller and immovable and inner pair longer and movable over reaching tip of telson.

Distribution: *India* – East coast: West Bengal, Bihar, Odisha, Andhra Pradesh, Tamil Nadu. *Elsewhere* – Pakistan.

Remarks: This species has been reported from freshwater systems of Andhra Pradesh, viz. Lake Kolleru (Ghosh *et al.*, 2005) and pond (Ghosh *et al.*, 2005) and from estuarine tracts of Godavari river (Ganapati and Subramanyam, 1966).

16. *Macrobrachium malcomsonii* (H. Milne Edwards, 1844)

1844. *Palaemon malcomsonii* H. Milne Edwards, *Voy. Inde Jacquemont*, **4**(2): 8.

1950. *Macrobrachium malcomsonii*, Holthuis, *Siboga Exped.*, **39**(a-9): 121.

1995. *Macrobrachium malcomsonii*, Reddy, *Zool. Surv. India, Estuarine Ecosystem series, Part 2 Hugli; Matla Estuary*: 310.

Diagnosis: Body symmetrical. Rostrum strong and long reaching end of antennal scale; dorsally armed with 7-

11 teeth, of which, 3 placed behind orbital margin, 1-2 sub-distal and rest evenly placed teeth. Hepatic spine at a lower level than antennal spine. Telson tip sharp, over-reaching the postero lateral spines.

Distribution: *India*-East coast from Odisha to Tamil Nadu, also Madhya Pradesh, Bihar and Gujarat. *Elsewhere* -Pakistan, Bangladesh, Sri Lanka and Myanmar.

Remarks: A very common species of Andhra Pradesh occurring in varied ecosystems, viz. Kolleru Lake (Seshagiri Rao, 1988; Ghosh *et al.*, 2005), Kaligiri Reservoir (Ghosh *et al.*, 2005), Godavari (Ganapati, 1969), Krishna (Rath and Dev Roy, 2008) and Vamsadhara and Nagavali estuaries (Rath and Dev Roy, 2010).

17. *Macrobrachium rude* (Heller, 1862)

1862. *Palaemon rude* Heller, *Verh. Zool. bot. Ges. Wien.*, **12**: 525.

1950. *Macrobrachium rude*, Holthuis, *Siboga Exped.*, **39**(a-9): 150.

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 pair of spines dorsally. Apex of fingers acute and hooked. Hepatic spine situated at lower level than antennal spine.

Distribution: *India*- East coast: Odisha, Andhra Pradesh, Tamil Nadu, Pondichery. West coast: Kerala. *Elsewhere* - East coast of South Africa, South Somalia, Madagascar, Bangladesh and Sri Lanka.

Remarks: This species has been recorded from Mahanadi estuary (Deb, 1998), Vamsadhara and Nagavali estuaries (Rath and Dev Roy, 2010), Lake Kolleru (Seshagiri Rao, 1988) and Chilka Lake (Kemp, 1915). It appears to be rare in Godavari estuary.

Genus *Nematopalaemon* Holthuis, 1950.

18. *Nematopalaemon tenuipes* (Henderson, 1893)

1893. *Leander tenuipes* Henderson, *Trans. Lind. Soc. Lond. (Zool.)*, ser. 2, **5**: 440.

2001. *Nematopalaemon tenuipes*, Jayachandran, *Palaemonid Prawns Biodiversity, Taxonomy, Biology and Management*: 194.

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 coasts. *Elsewhere:* Africa, Somalia, Pakistan, Viet Nam, Philippines and New Guinea.

Remarks: Earlier reported from Godavari estuarine system (Ganapati, 1969), this is a common species in this estuary.

Genus *Exopalaemon* Holthuis, 1950.

19. *Exopalaemon styliferus* (H. Milne Edwards, 1840) 1840. *Palaemon styliferus* H. Milne Edwards, *Hist. Nat. Crust.*, **3**: 638.

1950. *Palaemon (Exopalaemon) styliferus*, Holthuis, *Siboga Exped.*, **39**(a-9): 46.

1993. *Exopalaemon styliferus* Chace and Bruce, *Smithson. Contrib. Zool.*, **543**: 5.

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 with 2 pair of minute spine-like structure. Branchiostegal spine and crest present. Fifth abdominal segment rounded dorsally. Dactylus of fifth pair of pereopods about 1/3rd as long as propodus.

Distribution: India-East coast: West Bengal, Odisha, Andhra Pradesh. *Elsewhere:* Pakistan, Thailand, Borneo and Indonesia.

Remarks: A very common species of Hugli Matla estuary, also recorded from Mahanadi (Deb, 1998), Godavari (Ganapati, 1969) and Krishna (Rath and Dev Roy, 2008) estuaries.

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