IOSR Journal of Pharmacy and Biological Sciences (IOSR-JPBS)
e-ISSN:2278-3008, p-ISSN:2319-7676. Volume 12, Issue 3 Ver. V (May – June 2017), PP 26-31
www.iosrjournals.org

A Chack List of Penaeid Prawns Found In Indian Water with Their Distribution

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Abstract: *Present study is an attempt to up to date the taxonomic information of prawns found in Indian water under family Penaeidae Rafinesque – Schmaltz, 1815. Species composition and their distribution in Indian water is the main part of the work. Family Penaeidae is represented by 25 genera of which 17 genera and 78 species has been recorded from Indian water.*
Key words: *Taxonomy, Penaeidae, Genera, Species, Distribution.*

I. Introduction

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 (Péréz Farfante & Kensley, 1997). Usage of the term 'Prawn' and 'Shrimp' are somewhat confusing. In some western literature the term 'Shrimp' is applied for Penaeoidea and Sergestoidea, but in the east these are called 'Prawn'. Holthuis (1980) discussed the contradiction but did not arrive at any conclusion. In the Prawn Symposium of the Indo-Pacific Fisheries Council held at Tokyo in 1955 it was decided that the word 'Prawn' should be applied to the Penaeids, Pandalids and Palemonids while 'Shrimp' to the smaller species belonging to the other families (Kurian & Sebastian, 1993). As such in the present study the term 'Prawn' is used for all the species belonging to family Penaeidae. Family *Penaeidae* comprises 17 genera and 78 species from Indian water. The genus *Penaeus* comprises the most commercially important species among the penaeid prawn found in Indian water. Systematics and a list of species under different genera has been given bellow.

II. Materials And Methods:

Present work is mainly done on the basis of existing literature survey and collection, preservation as well as identification of specimen from different fish landing centre of Indian coast. Author also studied the specimen preserved in ZSI, Kolkata, CMFRI, Cochin and Mandapum, & NIO, Goa. The materials preserved in rectified spirit (90%) were studied under a stereoscopic binocular microscope. The first comprehensive work on Indian Penaeid prawn was the work of Alcock (1901,1905 and 1906). After Alcock's work there were no remarkable comprehensive systematic work on penaeid prawn of Indian region been found till first half of twentieth century. M. J. George (1969) is the carcinologist on Indian Penaeidae made an attempt to up to date the group from Indian region after second half of twentieth century. Beside the above comprehensive work, there are so many literatures on the group from Indian region but all of these are scattered one. A comprehensive dichotomous key for the Indian genera is the added character of the present work.

Systematic position:

Superclass	:	*Crustacea* Pennant, 1777.
Class	:	*Malcostraca* Latreille, 1806.
Order	:	*Decapoda* Latreille, 1803.
Suborder	:	*Dendrobranchiata* Bate, 1888.
Super family:	*Penaeiodea* Rafinesque-Schmaltz, 1815.	
Family	:	*Penaeidae* Rafinesque – Schmaltz, 1815.

Family *Penaeidae* Rafinesque – Schmaltz, 1815.

Rafinesque-Schmaltz (1815) erected *Penedia* as a subfamily of *Plyonuria*. Subsequent history of the family name has been given in detail by Parez Farfante and Kensley (1997). Alcock (1901) reported this family from Indian water for the first time. Some important contributions in the Indian context are listed below.

1888 *Penaeidae* Bate, Rep. scient. Results Voy. Challenger, 24:220.
1901 *Penaeidae* Alcock, Descr. Cat. Indian Deep-Sea Crust., :11.
1969 *Penaeidae* George, Bull. Cent. Mar. Fish. Res. Inst., 14: 5-48; 1979. In ―Contribution to Marine Sciencel, dedicated to Dr. C. V. Kurian 21-59.

1978 *Penaeidae* Péréz Farfante, FAO Sp. Indent. Sh., 6:1; 1988, NOAA Tech. Rep. NMFS, 64: iii, 8; Perez Farfante & Kensley, 1997, Mem. Mus. nat. Hist. nat. no. 175, 233 pp.
1997 *Penaeidae* Pathan & Jalihal, J. Bombay Nat. Hist. Soc., 94(3): 496-514.

Diagnosis of the family:

Body compressed, well developed rostrum, extending to or beyond the distal margin of first antennular segment [except Genus *Miyadiella* Kubo, 1949 and Trachypenaeopsis Burkenroad, 1934]; armed with dorsal and in some genera with ventral teeth; carapace having no post orbital spine, antennal and hepatic spine usually present; cervical sulcus never extending beyond gastric region; posterior three or four abdominal somites with dorsal carina; telson sharply pointed, with or without lateral spines. Eye with optic calathus lacking median tubercle; basis of eye stalk with moderately developed distomedian scale; ocular plate lacking styliform projection; antennule with prominent foliaceous prosartema, flagella of about almost equal length; exopod present on second and third maxilliped and first four pereopod; third, fourth and fifth pleopods biramous; pleurobranchia on somite IX to XII and sometimes on XIII and XIV; rudimentary arthrobranchia usually present on somite VII two arthrobranchiae on VIII to XII and posterodorsal one on XIII; podobranchia on second maxilliped only; epipod present on first and second maxilliped, lacking on fourth and fifth pereopods; petasma semi-open or semi-closed; second pair of pleopod of male bearing appendix masculina; thelycum open or close.

Remarks: Parez Farfante and Kensley (1997) listed 26 genera under family Penaeidae. Flegel (2007,2008) strongly questioned the six genera classification of the genus Penaeus s.l. The taxonomic revision of the prawns formerly classified in Penaeus s.l. into six genera is still widely debated. Although these prawns can be easily separated into several groups morphologically, whether these subdivisions are truly monophyletic and warrant a generic rank continues to be hotly debated among taxonomists (Ma et al., 2011). While some taxonomists have accepted the revision, others are questioning the necessity of such a classification. Ma et al. (2011) refuted the six genera classification of Penaeus s.l on the basis of examination of mitochondrial and nuclear genes and advocated the restoration of the old Penaeus genus (= Penaeus s.l.) as the classification scheme is in agreement with both morphological and the molecular data. Therefore, present study follows the old classification scheme and up to date the taxonomic status for the species under genus *Penaeus*, found in Indian water.
Chanda, A. (2016) revised the genus *Parapenaeopsis* s.i. into five genera depending upon the species found in Indian water and discarded the eight genera classification of Sakai and Shinomiya (2011) due to some ambiguity in characterization for *Perapenaeopsis* s.l. As such present status for the family *Penaeidae* comprises 25 genera and Indian water represents 17 genera.

Key to the genera found in India:

1. Rostrum not reaching distal end of first antennular segment ……..…….. ……..2
---- Rostrum extend up to or beyond distal end of first antennular segment ……... 3
2. Eye stalk longer than rostrum and extend beyond first antennular segment; eye ball small ……..……*Miyadiella* Kubo, 1949.
---- Eye stalk smaller than rostrum and not extend beyond first antennular segment; eye ball large ……. *Trachypenaeopsis* Burkenroad, 1934.
3. Rostrum armed with dorsal and ventral teeth; …….. 4
---- Rostrum armed with dorsal teeth only; absence of gastro-orbital carina ……... 5
4. Presence of gastro-orbital carina; sixth abdominal somite with three interrupted cicatrix ……..……... *Penaeus* Fabricius, 1798.
----- Absence of gastro-orbital carina; sixth abdominal somite with single long cicatrix ……*Pelagopenaeus* Perez Farfante and Kensley, 1997.
5. Antennal spine very small; hepatic spine reduced or absent ……...…… *Atypopenaeus* Alcock, 1905.
---- Antennal spine prominent; hepatic spine always present and prominent ……..…….. 6
6. Longitudinal suture present; transverse suture present ……..……7
Longitudinal suture absent; transverse suture absent ……..…… ……...10
7. Body thickset, densely pubescent, integument thick; hepatic carina absent ……...……8
---- Body smooth or very minutely pubescent, integument thin; hepatic carina present ……..……..…….……..... 9

8. Anterior thelycal plate on sternite XIII with a tongue-like caudal extension; distolateral projection of petasma with laterally directed broad base and tip directed forward like a hook ..……*Megokris* Perez Farfante and Kensley, 1997.
---- Anterior thelycal plate on sternite XIII without caudal extension, distolateral projection of petasma directed laterally like a wing ……...*Trachysalambria* Burkenroad, 1934.
9. Postocular sulcus prominent; parapenaeid spine absent …….....…… 13
---- Postocular sulcus absent; parapenaeid spine present…….*Parapenaeus* Smith, 1885.
10. Petasma semiopen; thelycum open …….……...…*Funchalia* Johnson, 1867.
---- Petasma closed or semiclosed; thelyum close ……..…. 11
11. Pterygostomian spine absent; postocular sulcus prominent, exopod absent on fifth pereopod ……...*Metapenaeus* Wood-Mason, 1891.
---- Pterygostomian spine present; postocular sulcus absent; exopod present on all maxillipeds and pereopods …….……...……...…….. 12
12. Carapace with a small orbital spine; sixth abdominal somite without cicatrix; first and second pereopod and third maxilliped with basial spine; petasma asymmetrical …….. *Metapenaeopsis* Bouvier, 1905.
---- Carapace without orbital spine; sixth abdominal somite bearing long, interrupted cicatrix; only first pereopod with basial spine; petasma symmetrical…….…….. *Penaeopsis* Bate, 1881.
13. Epigestric tooth ptesent; epipod absent on third pereopod.....14
------ Epigestric toot absent; epipod absent on all pereopods.... *Batepenaeopsis* Chanda,2016.
14. Orbital spine absent; antennular flagella equal to antennular peduncle; width of anterior thelycal plate is greater than its length. ….*Alcockpenaeopsis* Chanda,2016.
---- Orbital spine present; antennular flagella not equal to antennular peduncle; width of anterior thelycal plate not grater than its length……..15
15. Longitudinal suture short, not reaching cardiac region; a median tuft of long hairs present behind thelycum..…….....*Kishinouyepenaeopsusis* Chanda,2016.
---- Longitudinal suture long, extending upto or beyond cardiac region; a median tuft of hairs absent behind thelycum……...…16
16. Longitudinal suture extending upto cardiac region; orbital spine prominent ……...….*Parapenaeopsis* Alcock, 1901.
---- Longitudinal suture extending beyond cardiac region; orbital spine reduced like an angle……....*Helleropenaeopsis* Chanda,2016.

List of species under different genera and their distribution, found in India:

1. *Alcockpenaeopsis uncta* (Alcock, 1905)- Ganjam, Orissa, Pulicot Lake, Andhra Pradesh, East coast and Cochin, Kerala, West coast.
2. *Atypopenaeus compressipes* (Henderson, 1893)- Chennai, Tamil Nadu, East Coast of India; Mumbai, Maharastra, West Coast of India.
3. *Atypopenaeus stenodactyus* (Stimpson, 1860)- Porbandar, Gujarat, Mumbai, Maharastra, West Coast of India.
4. *Batepenaeopsis acclivirostris* (Alcock, 1905)- Maharastra, Kerala west coast and Ganjam, Visakhapattnam, Chennai, Palk strait east coast.
5. *Batepenaeopsis tenella* (Bate, 1888)- Andhra Pradesh to Gulf of Mannar, East coast.
6. *Funchalia danae* Burkenroad, 1940- Arabian sea
7. *Funchalia villosa (Bouvier, 1905 b)*- West coast & Andamans
8. *Funchalia woodwardi* Johnson, 1867- Arabian Sea and Andaman sea, Bay of Bengal.
9. *Helleropenaeopsis cultirostris* (Alcock, 1906)- Sundarban, West Bengal (Hooghly Delta), Orissa, East coast.
10. *Helleropenaeopsis hardwickii* (Miers, 1878)- Gujarat, Maharastra, Goa, West coast and Ganjam, Orissa; Andhra Pradesh; Chennai, Pondicherry, East coast.
11. *Helleropenaeosis indica* (Muthu, 1972)- Kakinada Bay, East Coact of India.
12. *Helleropenaeosis sculptilis* (Heller, 1862)- Entire East coast & West coast of India and Andaman Islands.
13. *Kishinouyepenaeopsis cornuta* (Kishinouye, 1900)- Goa, Maharastra, Kerala, West coast and Chennai; Andhra Pradesh East coast and also from Andaman Islands.
14. *Kishinouyepenaeopsis maxillipedo* (Alcock, 1906)- Gujarat, Maharastra, Kerala, West coast and Tamil Nadu & Andhra Pradesh, East coast.

15. *Megokris granulosus* (Haswell, 1879)- Kakinada, Andhra Pradesh, Palk Bay, Mandapam, Tamil Nadu, East Coast of India.
16. *Megokris pescadoreensis* (Schmitt, 1931a)- Southeast & Southwest coast of India.
17. *Megokris sedili* (Hall, 1961)- Machelipattnam, Visakhapattnam, Andhra Pradesh to Trivandram (Arabian Sea), Kerala.
18. *Metapenaeopsis andamanensis* (Wood-Mason, 1891)- Cochin, South-West Coast, and Andaman Sea.
19. *Metapenaeopsis barbata* (De Haan, 1844)- Visakhapattnam, Andhra Pradesh, Palk Bay, Tamil Nadu, East coast of India.
20. *Metapenaeopsis commensalis* (Borradaile, 1898)- Lakshadive Island.
21. *Metapenaeopsis coniger* (Wood-Mason, 1891)- Orissa to Andhra Pradesh, east coast, Cochin, south- west coast, Andaman Islands.
22. *Metapenaeopsis ceylonica* Starobogatov, 1972 - Kakinada Bay.
23. *Metapenaeopsis gaillardi* Crosnier, 1991- Southern India
24. *Metapenaeopsis gallensis* (Pearson, 1905)- Chennai, Tamil Nadu, east coast.
25. *Metapenaeopsis hilarula* (De Man, 1911)- Chennai, Tamil Nadu, East coast, Cochin, Kerala, West coast.
26. *Metapenaeopsis mogiensis* (Rathbun, 1902)- Andhra Pradesh East coast; Cochin, West coast and Andaman sea.
27. *Metapenaeopsis novaeguineae* (Haswell, 1879)- Kakinada, Andhra Pradesh East coast.
28. *Metapenaeopsis palmensis* (Haswell, 1879)- Pulicot Lake and Bhimapattnam, Andhra Pradesh, East coast.
29. *Metapenaeopsis philippii* (Bate, 1881)- Cochin, South-west coast.
30. *Metapenaeopsis stridulans* Alcock, 1905- Orissa, Andhra Pradesh, East coast of India; Gujarat, Maharastra and Travancore, West coast of India and Andaman sea.
31. *Metapenaeopsis toloensis* Hall, 1962- Andaman sea, Andhra Pradesh, east coast of India.
32. *Metapenaeus affinis* (H. Milne Edwards, 1837)- 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.
33. *Metapenaeus alcocki* George and Rao, 1966- Gulf of Kutch to Porbandar, Gujarat, Goa, West coast.
34. *Metapenaeus brevicornis* (Milne Edwards, 1837)- Gujarat, Maharashtra, Goa, Karnataka, Kerala, West Coast and Andhra Pradesh, Orissa, West Bengal, East coast; Andaman sea.
35. *Metapenaeus dobsoni* (Miers, 1878)- Orissa, Andhra Pradesh, Tamil Nadu, East coast of India; Kerala, Karnataka, Goa, Maharashtra, West coast of India; Andaman Sea.
36. *Metapenaeus eboracensis* Dall, 1957- Muthukuru, Nellore, Andhra Pradesh, east coast of India.
37. *Metapenaeus elegans* De Man, 1907- Andaman Sea; Andhra Pradesh, east coast of India.
38. *Metapenaeus endeavouri* (Schmitt, 1926a)- Kakinada, Andhra Pradesh
39. *Metapenaeus ensis* (De Haan, 1850)- Gujarat, West coast, Tamil Nadu, Andhra Pradesh, Gangetic delta, Bay of Bengal, Andaman sea.
40. *Metapenaeus intermedius* (Kishinouye, 1900)- Andaman Islands.
41. *Metapenaeus krishnatrii* Silas and Muthu, 1974- Corbyn's cove, Port Blair, Andamans.
42. *Metapenaeus kutchensis* George, George and Rao, 1963- Gulf of Kutch, Gujarat, N.W. Coast.
43. *Metapenaeus lysanasa* (De Man, 1888)- West Bengal, Orissa, Andhra Pradesh and Gulf of Manner Tamil Nadu, East coast; Maharashtra, West coast and Andaman sea.
44. *Metapenaeus monoceros* (Fabricius, 1798)- Distributed from Bengal to Gujarat in entire coastal belt of India and in Andaman Islands.
45. *Metapenaeus moyebi* (Kishinouye, 1896)- Andhra Pradesh; Tamil Nadu, East coast, Kerala, Goa, West coast and Andaman.
46. *Metapenaeus stebbingi* Nobili, 1904- Gulf of Kutch & Maharashtra, West coast of India.
47. *Miyadiella podophthalmus* (Stimpsons, 1860)- Maharastra, West coast of India.
48. *Parapenaeopsis longirostris* Chanda and Bhattacharya, 2004- Ongaria ghat, Odisha,East Coast
49. *Parapenaeopsis nana* Alcock, 1905- Ganjam, Orissa to Kakinada, Andhra Pradesh, East coast.
50. *Parapenaeopsis stylifera coromandelica* Alcock, 1906- Entire east & West coast.
51. *Parapenaeopsis stylifera stylifera* (Milne Edwards, 1837)- Entire East and West coast.
52. *Parapenaeopsis stylifera cochinensis* George, 1975- Cochin, Kerala, South-west coast of India.
53. *Parapenaeus fissurus* (Bate, 1881)- Orissa to Chennai, East coast and Andaman Islands.
54. *Parapenaeus fissuroides indicus* Crosnier, 1985- Mangalore, India.
55. *Parapenaeus investigatoris* Alcock and Anderson, 1899- Pulicot Lake, Andhra Pradesh, Gulf of Mannar, Tamil Nadu, East coast; Cochin, Kerala, West coast and Andaman Islands.
56. *Parapenaeus longipes* Alcock, 1905- Mangalore, Cochin, West coast; Ganjam, Orissa, Visakhapattnam, East coast.
57. *Parapenaeus sextuberculatus* Kubo, 1949- Cochin, Kerala, S.W. coast of India.
58. *Pelagopenaeus balboae* (Faxon, 1893) – South-west coast, Arabian Sea.

59. *Penaeopsis eduardoi* Pérez Farfante, 1977- Bay of Bengal.
60. *Penaeopsis jerryi* Pérez Farfante, 1979- Cochin, West coast, Chennai East coast and Andaman Islands.
61. *Penaeopsis rectacuta* (Bate, 1881)- Kerala, West coast; Andhra Pradesh, Tamilnadu, East coast and Andaman Islands.
62. *Penaeus monodon* Fabricius, 1798- In all coasts of India and Andaman sea.
63. *Penaeus semisulcatus* De Haan, 1844- Entire east and west coast and Andaman Islands.
64. *Penaeus indicus* (H. Milne Edwards, 1837)- Entire coastal region, estuaries and backwaters from West Bengal to Maharastra, Andaman & Nicobar Island.
65. *Penaeus japonicus* (Bate, 1888)- Maharastra, Goa, Karnataka, West coast of India, Andhra Pradesh, East coast of India. Recently, Reddy (1995) recorded the species from Hooghly Matla estuary and Andaman sea.
66. *Penaeus Konkani* (Chanda & Bhattacharya, 2003)- Found in entire Maharastra coast.
67. *Penaeus merguiensis* (De Man, 1888)- From Orissa to Andhra Pradesh in east coast, Maharastra in West coast and Andaman Island.
68. *Penaeus penicillatus* (Alcock, 1905)- This species is recorded from Gujarat to Maharastra, West Coast and Orissa to Mandapam, Kanyakumari, Tamil Nadu, East Coast of India.
69. *Penaeus silasi* Muthu & Motho, 1979 - Channi, India.
70. *Penaeus canaliculatus* (Olivier, 1811)- Digha, West Bengal; Kakinada, Andhra Pradesh; Travancore, Cochin; Kerala; Mumbai, Maharastra; Goa & Andaman sea.
71. *Penaeus hathor* Burkenroad, 1959- Indian Ocean.
72. *Penaeus latisulcatus* (Kishinouye, 1900)- Gulf of Kutch, Maharastra; Cochin, West coast of India; Antervedi, E. Godavori, Andhra Pradesh, East Coast of India.
73. *Penaeus marginatus* (Randall, 1840)- Arabian Sea and Bay of Bengal.
74. *Penaeus similis* (Chanda & Bhattacharya, 2002)- Port Blair, Andaman Islands, Bay of Bengal.
75. *Trachypenaeopsis minicoyensis* Thomas, 1972.- Laccadive Sea.
76. *Trachysalambria aspera* (Alcock, 1905)- Orissa, Andhra Pradesh, East coast of India; Andaman Sea.
77. *Trachysalambria curvirostris* (Stimpson, 1860) - Orissa, Andhra Pradesh, East coast; Veraval, Gujarat; Cochin, Kerala, West coast and also in Andaman Islands.
78. *Trachysalambria fulva* (Dall, 1957)- Chennai, Southeast coast.

III. Conclusion :

In many regions of the world, diversity of prawn stocks are being exploited without much taxonomic assistance. However, it is impossible to develop conservation plans and long-term management practise without knowing what species are involved, and preferably also whether subpopulations are exist, and how to identify them. Important faunal guides have been published by different author, but in several regions new species continue to be discovered, both from fresh material and from old museum specimens. Taxonomic resources may also play a role in prospecting for new resources as is done particularly in aquaculture. Present work is certainly been an up to date picture of the biodiversity of food resource from coastal India.

Acknowledgements

Author is extremely indebted to Professor Tanmoy Bhattacharya, Ex-Emeritus Professor, Department of Zoology, Vidyasagar University; Dr. Probodh Kumar Maity, Emeritus scientist-SF, ZSI, Kolkata and Dr. Tusherendu Roy, Scientist-C, ZSI, Kolkata for their endless guidance and inspiration. Author expressed his gratitude to Prof. Samir Kumar Benerjee, Prof. of Zoology, Calcutta University for his inspiration during preparation of manuscript in present format. Author is also grateful to the Director, Zoological Survey of India for granting him a fellowship during which the work has been completed.

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