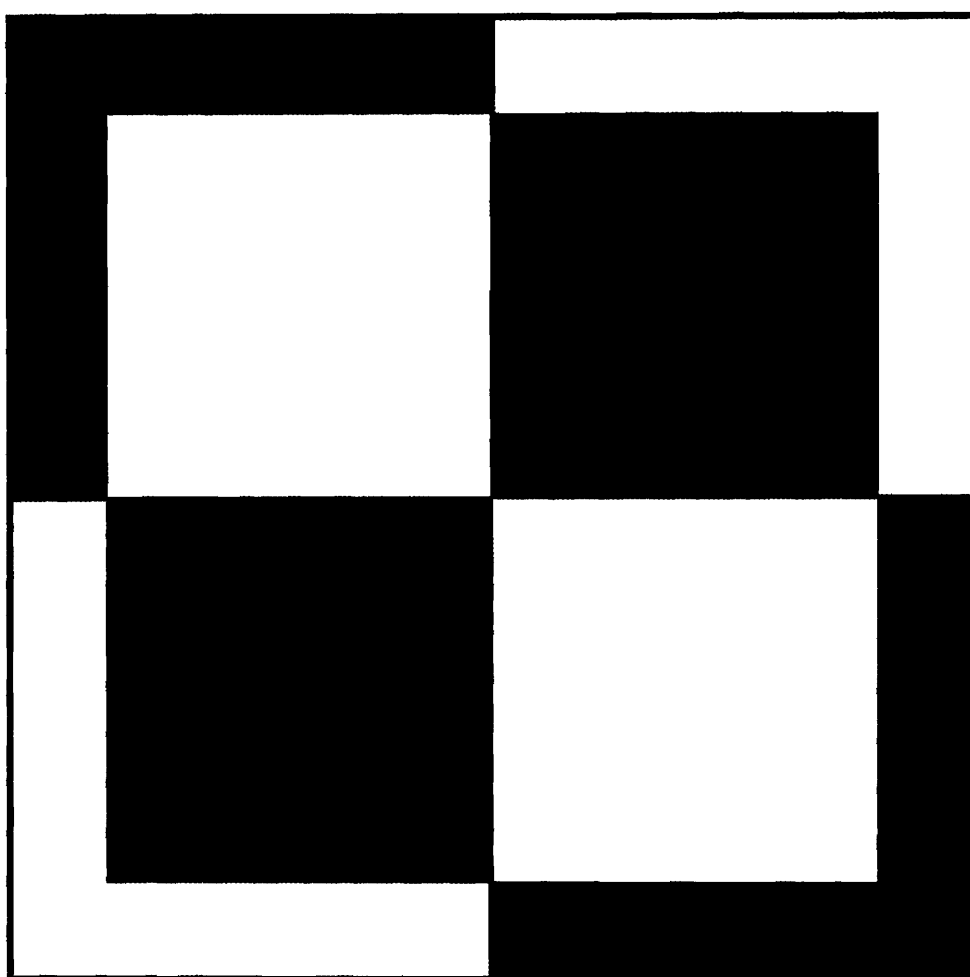




FAUNA OF ANDHRA PRADESH

PART - 7 Marine Molluscs

ZOOLOGICAL SURVEY OF INDIA



State Fauna Series, 5

FAUNA OF ANDHRA PRADESH

(PART-7)

Marine Molluscs

Edited by
The Director, Zoological Survey of India, Kolkata



Zoological Survey of India
Kolkata

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STATE FAUNA SERIES
FAUNA OF ANDHRA PRADESH

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Part-7	2007	1-260
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MARINE MOLLUSCS : POLYPLACOPHORA AND GASTROPODA

RAMAKRISHNA, A. DEY, S. BARUA and A. MUKHOPADHYA

Zoological Survey of India, M-Block, New Alipore, Kolkata-700 053

INTRIODUCTION

The Andhra Pradesh is one of the largest state of southern India lies between 12°14'–19°4' N latitude and 76°50'–84°60' E longitude, occupying a geographical area about 2,75,068 sq kms bounded on the north by Madhya Pradesh and Orissa, on the south by Tamil Nadu, on the east by Bay of Bengal and on the west by Maharashtra and Karnataka. It has 23 districts of which 9 are coastal, the coast line stretches to about 960 kms. The lakes and tanks covers 8,00,000 hacters and the river systems are more than 1500 kms. There are two major river systems Godavari and Krishna originating from Western Ghats and meet the Bay of Bengal. Three mountain ranges—Eastern Ghats, Decan Plateau with Sahyadri range and Harsely and other hills offers different ecosystems for molluscs. It has forest ecosystems for land forms, freshwater ecosystems for freshwater forms, estuarine and marine ecosystems for estuarine and mangrove forms and sea for marine forms.

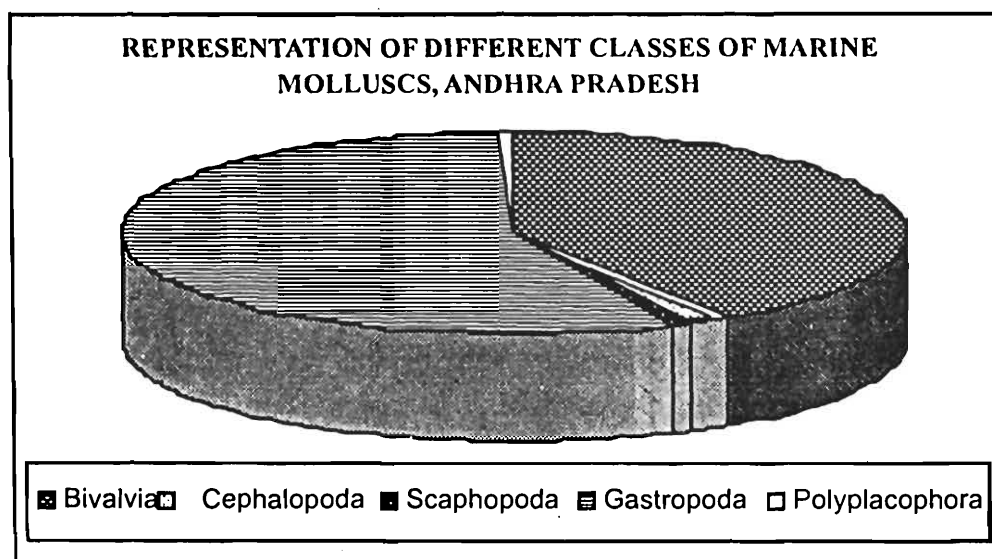
The coast line stretches on the eastern side of the state to about 960 kms covering 9 districts endowed with a number varied habitat like sandy stretches, rocky coast, mud flats, mangrove areas, creeks and backwaters giving a diversified ecosystems for molluscs. Marine fauna is rich and varied on the coast line encompasses almost all type of intertidal habitat from hyper saline and brackish lagoons, estuaries and coastal marsh and mud flats to sandy and rocky shores with every degrees of exposure and widely ranging profile. Sub tidal habits are equally diverse.

The molluscan fauna of Andhra Pradesh are dealt in three parts. The first part included the entire land and freshwater molluscs so far known from the state already published by Mitra *et al.*, 2005. The marine and estuarine molluscs are dealt in two parts, the part I includes the marine and estuarine forms belonging to class Polyplacophora and Gastropoda, the part II deals with remaining three classes Cephalopoda, Bivalvia and Scaphopoda.

Earlier work :

So, as far as the marine molluscs concerned till date there is no consolidated account from the state of Andhra Pradesh. From the available literatures and reports of the faunistic work of the state have been referred in general way. The important studies made are from Nagabhushanam (1955, 1960) who recorded 23 wood boring species from Visakhapatnam harbour. Rajagopal and Mookherjee (1978, 1982), Mookherjee (1985) reported 9 and 8 species of molluscs respectively from Andhra Pradesh during their work on marine molluscs of Coromandel Coast. Subba Rao *et al.* (1991) recorded 69 species of molluscs from the state in their report of Marine molluscs from Orissa coast. Surya Rao and Subba Rao (1991) reported the occurrence 13 species from Andhra Pradesh during their report of Molluscan fauna of Lakshadweep. Subba Rao *et al.* (1992) recorded 41 species of marine and estuarine species from the state of Andhra Pradesh during their work of Estuarine and Marine molluscs of West Bengal. Subba Rao and Dey (2000) listed 43 species of marine molluscs from Andhra Pradesh in their Catalogue of Marine molluscs of Andaman and Nicobar Islands.

A total of 357 species of marine molluscs recorded from Andhra Pradesh of which 2 belongs to Polyplacophora, 200 to Gastropoda, 6 to Cephalopoda, 146 to Bivalvia and 3 to Scaphopoda.



The materials studied includes the collections accumulated since 1894 in the National Zoological Collections of Zoological Survey of India; collections received from different institutions, universities for identification and the collections made by the authors during the surveys conducted along the coast.

The marine molluscs of Andhra Pradesh part I deals with 202 species of which 2 species of Polyplacophora and 200 species of Gastropoda.

The classification followed is that of Vaught (1989).

SYSTEMATIC LIST

Class POLYPLACOPHORA

Order NEOLORICATA

Suborder ISCHONOCHITONINA

Family CHITONIDAE

Subfamily CHITONINAE

Genus *Chiton* Linnaeus, 1758

1. *Chiton granoradiatus* Leloup

Suborder ACANTHOCHITONINA

Family ACANTHOCHITONIDAE

Subfamily ACANTHOCHITONINAE

Genus *Acanthochitona* Gray, 1821

2. *Acanthochitona mahensis* Wickworth

Class GASTROPODA

Subclass PROSOBRANCHIA

Order ARCHAEOGASTROPODA

Superfamily PLEUROTOMARIOIDEA

Family HALIOTIDAE

Genus *Haliotis* Linnaeus, 1758

Subgenus *Ovinotis* Cohon, 1843

3. *Haliotis (Ovinotis) ovina* Gmelin

Superfamily FISSURELLOIDEA

Family FISSURELLIDAE

Subfamily EMARGINULINAE

Genus *Emarginula* Lamarck, 1801

4. *Emarginula obovata* A. Adams

Genus *Scutus* Montfort, 1810

5. *Scutus unguis* Linnaeus

Subfamily DIODORINAE

Genus *Diodora* Gray, 1821

6. *Diodora singaporensis* (Reeve)

Superfamily PATELLOIDEA

Family PATELLIDAE

Subfamily NACELLINAE

Genus *Cellana* H. Adams, 1869

7. *Cellana radiata radiata* (Born)

Superfamily TROCHOIDEA

Family TROCHIDAE

Subfamily MARGARITINAE

Genus *Euchelus* Philippi, 1847

8. *Euchelus asper* (Gmelin)

9. *Euchelus asper* var *tricarinatus* (Lamarck)

Subfamily CALLIOSTOMATINAE

Genus *Calliostoma* Swainson, 1840

10. *Calliostoma scobinata* (A. Adam)

11. **Calliostoma tranquebarica* (Roeding)

Subfamily UMBONIINAE

Genus *Umbonium* Linnaeus, 1758

12. *Umbonium vestiarium* (Linnaeus)

Genus *Monilea* Swainson, 1840

13. *Monilea callifera* (Lamarck)

Family TURBINIDAE

Subfamily TURBININAE

Genus *Turbo* Linnaeus, 1758

Subgenus *Marmarostoma* Swainson, 1829

14. *Turbo (Marmarostoma) brunneus* (Roeding)

Superfamily NERITOIDEA

Family NERITIDAE

Subfamily NERITINAE

Genus *Nerita* Linnaeus, 1758

Subgenus *Amphinerita* von Martens, 1887

15. *Nerita (Amphinerita) polita* Linnaeus

Subgenus *Ritena* Gray, 1857

16. *Nerita (Ritena) plicata* Linnaeus

Subgenus *Theliostyla* Moersch, 1852

17. *Nerita* (*Theliostyla*) *albicilla* Linnaeus
18. *Nerita* (*Theliostyla*) *chamaeleon* Linnaeus
19. *Nerita* (*Theliostyla*) *squamulata* Le Guillon

Genus *Neritina* Lamarck, 1816Subgenus *Dostia* Gray, 1840

20. * *Neritina* (*Dostia*) *crepidularia* (Lamarck)
21. *Neritina* (*Dostia*) *violacea* (Gmelin)

Subgenus *Pseudonerita* H.B. Baker, 1923

22. *Neritina* (*Pseudonerita*) *sulculosa* von Martens

Genus *Theodoxus* Montfort, 1810Subgenus *Clithon* Montfort, 1810

23. *Theodoxus* (*Clithon*) *oualaniensis* (Lesson)

Order MESOGASTROPODA

Superfamily LITTORINOIDEA

Family LITTORINIDAE

Subfamily LITTORININAE

Genus *Littoraria* Griffith and Pidgeon, 1834Subgenus *Littoraria* s. st.

24. *Littoraria* (*Littoraria*) *undulata* (Gray)

Subgenus *Littorinopsis* Moersch, 1876

25. *Littoraria* (*Littorinopsis*) *scabra scabra* (Linnaeus)

Subgenus *Palustorina* Reid, 1986

26. *Littoraria* (*Palustorina*) *melanostoma* (Gray)

Genus *Nodilittorina* von Martens, 1897Subgenus *Nodilittorina* s. st.

27. *Nodilittorina* (*Nodilittorina*) *pyramidalis pyramidalis* (Quoy and Gaimard)

Subgenus *Granulittorina* Habe and Kosuge, 1966

28. *Nodilittorina* (*Granulittorina*) *leucosticta leucosticta* (Philippi)

29. *Nodilittorina* (*Granulittorina*) *millegrana* (Philippi)

Superfamily RISSOIDEA

Family ASSIMINEIDAE

Subfamily ASSIMINEINAE

Genus *Assiminea* Fleming, 1828

30. *Assiminea* *brevicula* (Pfeiffer)

Superfamily CERITHIOIDEA

Family PLANAXIDAE

Genus *Planaxis* Lamarck, 1822Subgenus *Planaxis* s. st.

- 31.
- Planaxis (Planaxis) sulcatus*
- (Born)

Family CERITHIIDAE

Subfamily CERITHINAE

Genus *Clypeomorus* Jousseaume, 1888

- 32.
- Clypeomorus batillariaeformis*
- Habe and Kosuge

33. *
- Clypeomorus moniliferus*
- (Kiener)

Genus *Rhinoclavis* Swainson, 1840

- 34.
- Rhinoclavis (Rhinoclavis) sinensis*
- (Gmelin)

Family POTAMIDIDAE

Subfamily POTAMIDINAE

Genus *Cerithidea* Swainson, 1840Subgenus *Cerithidea* s. st.

- 35.
- Cerithidea (Cerithidea) alata*
- (Philippi)

- 36.
- Cerithidea (Cerithidea) obtusa*
- Lamarck

Subgenus *Cerithideopsilla* Thiele, 1929

- 37.
- Cerithidea (Cerithideopsilla) cingulata*
- (Gmelin)

Genus *Telescopium* Montfort, 1810

- 38.
- Telescopium telescopium*
- (Linnaeus)

Genus *Terebralia* Swainson, 1840

39. *
- Terebralia palustris*
- (Linnaeus)

Family FOSSARIDAE

Genus *Fossarus* Philippi, 1841Subgenus *Conradia* A. Adams, 1860

40. *
- Fossarus (Conradia) stoliczkiana*
- Nevill

Family TURRITELLIDAE

Subfamily TURRITELLINAE

Genus *Turritella* Lamarck, 1799

- 41.
- Turritella attenuata*
- Reeve

- 42.
- Turritella columnaris*
- Kiener

- 43.
- Turritella duplicata*
- (Linnaeus)

Family SILIQUARIIDAE

Genus *Siliquaria* Bruguiere, 1789Subgenus *Tenagodus* Guettard, 1774

- 44.
- Siliquaria*
- (
- Tenagodus*
-)
- tostus*
- Moerch

Superfamily STROMBOIDEA

Family STROMBIDAE

Genus *Strombus* Linnaeus, 1758Subgenus *Euprotomus* Gill, 1870

- 45.
- Strombus*
- (
- Euprotomus*
-)
- listeri*
- Gray

Subgenus *Gibberulus* Jousseaume, 1888

- 46.
- Strombus*
- (
- Gibberulus*
-)
- gibberulus gibberulus*
- Linnaeus

Subgenus *Laevistrombus* Kira, 1955

- 47.
- Strombus*
- (
- Laevistrombus*
-)
- canarium*
- Linnaeus

Genus *Rimella* Agassiz, 1840Subgenus *Varicospira* Eame, 1952

- 48.
- Rimella*
- (
- Varicospira*
-)
- cancellata*
- (Lamarck)

Genus *Tibia* Roeding, 1798

- 49.
- Tibia delicatula*
- (Nevill)

Superfamily CREPIDULOIDEA

Family CREPIDULIDAE

Genus *Crepidula* Lamarck, 1799

- 50.
- Crepidula walshi*
- Herrmannson

Genus *Crucibulum* Schumacher, 1817

- 51.
- Crucibulum extincitorium*
- (Lamarck)

Superfamily XENOPHOROIDEA

Family XENOPHORIDAE

Genus *Xenophora* Fischer, 1807Subgenus *Stellaria* Moeller, 1832

- 52.
- Xenophora*
- (
- Stellaria*
-)
- solaris*
- (Linnaeus)

Superfamily CYPRAEIDEA

Family CYPRAEIDAE

Genus *Cypraea* Linnaeus, 1758

53. *
- Cypraea annulus*
- Linnaeus

- 54.
- Cypraea arabica*
- Linnaeus

55. *Cypraea caputserpentis* Linnaeus

56. *Cypraea erosa* Linnaeus

57. **Cypraea gracilis* Gaskoin

58. *Cypraea lamarckii* Gray

59. *Cypraea moneta* Linnaeus

60. *Cypraea ocellata* Linnaeus

61. *Cypraea pallida* Gray

Family OVULIDAE

Subfamily OVULINAE

Genus *Pseudosimnia* Schilder, 1927

Subgenus *Diminovula* Iredale, 1930

62. *Pseudosimnia (Diminovula) fruticum* (Reeve)

Genus *Volva* Roeding, 1798

63. *Volva sowerbyana* Weinkauff

Superfamily NATICOIDEA

Family NATICIDAE

Subfamily POLINICINAE

Genus *Polinices* Montfort, 1810

Subgenus *Polinices* s. st.

64. *Polinices (Polinices) flamingiana* (Recluz)

65. *P. (Polinices) mammilla* (Linnaeus)

66. *P. (Polinices) tumidus* (Swainson)

Subgenus *Glossaulax* Pilsbry, 1929

67. *Polinices (Glossaulax) didyma* (Roeding)

Subfamily NATICINAE

Genus *Natica* Scopoli, 1777

68. *Natica gualteriana* Recluz

69. *Natica lineata* Lamarck

70. *Natica tigrina* (Roeding)

71. *Natica vitellus* Linnaeus

Subgenus *Naticarius* Dumeril, 1806

72. *Natica (Naticarius) alapapilionis* (Roeding)

73. *Natica (Naticarius) pulicaria* (Philippi)

Subfamily SININAE

Genus *Sinus* Roeding, 1798

74. **Sinum haliotoideum* (Linnaeus)

75. *Sinum neritoideum* (Linnaeus)

Genus *Eunaticina* Fischer, 1885

76. *Eunaticina papilla* (Gmelin)

Superfamily TONNOIDEA

Family TONNIDAE

Genus *Tonna* Bruennich, 1772

77. *Tonna dolium* (Linnaeus)

78. *Tonna sulcosa* (Born)

Family FICIDAE

Genus *Ficus* Roeding, 1798

79. **Ficus ficoides* (Lamarck)

80. *Ficus gracilis* (Sowerby)

81. *Ficus variegata* Roeding

Family CASSIDAE

Subfamily PHALINAE

Genus *Phalium* Link, 1807

Subgenus *Phalium s. st.*

82. *Phalium (Phalium) areola* Linnaeus

Genus *Semicassis* Moersch, 1852

83. *Semicassis bisulcatum bisulcatum* (Schubert and Wagner)

84. *Semuicassis canaliculatum* (Bruguere)

Family RANELLIDAE

Subfamily RANELLINAE

Genus *Gyrineum* Link, 1807

85. *Gyrineum gyrineum* (Linnaeus)

86. *Gyrineum natator* (Roeding)

Subfamily CYMATIINAE

Genus *Cymatium* Roeding, 1798

87. *Cymatium tripus* (Gmelin)

Genus *Linatella* Gray, 1857

88. *Linatella cingulata* (Lamarck)

Subfamily PERSONINAE

Genus *Distorsio* Roeding, 1798

- 89.
- Distorsio reticularis*
- (Linnaeus)

Family BURSIDAE

Genus *Bufonaria* Schumacher, 1817

90. *Bufonaria crumena* (Lamarck)
91. *Bufonaria echinata* (Link)
92. *Bufonaria margaritula* (Deshayes)
93. *Bufonaria rana* (Linnaeus)

Suborder HETEROGLOSSA

Superfamily EPITONOIDEA

Family EPITONIDAE

Genus *Amaea* H. and A. Adams, 1853Subgenus *Acrilla* H. Adams, 1860

- 94.
- Amaea (Acrilla) acuminata*
- (Sowerby)

Family JANTHINIDAE

Genus *Janthina* Roeding, 1798

95. *Janthina globosa* Swainson
96. *Janthina janthina* (Linnaeus)

Order NEOGASTROPODA

Superfamily MURICOIDEA

Family MURICIDAE

Subfamily MURICINAE

Genus *Murex* Linnaeus, 1758

97. *Murex carbonnieri* (Jousseaume)
98. *Murex trapa* Roeding
99. *Murex tribulus* Linnaeus

Genus *Chicoreus* Montfort, 1810

100. *Chicoreus brunneus* (Link)
101. *Chicoreus ramosus* (Linnaeus)

Genus *Hexaplex* Perry, 1811Subgenus *Muricanthus* Swainson, 1840

- 102.
- Hexaplex (Muricanthus) virgineus*
- (Roeding)

Genus *Pterynotus* Swainson, 1833

103. *Pterynotus pinnatus* (Swainson)

Subfamily MURICOPSINAE

Genus *Homalocantha* Moerch, 1852

104. *Homalocantha secundus* (Lamarck)

Subfamily ERGALATAXINAE

Genus *Cronia* H. and A. Adams, 1853

Subgenus *Ergalatax* Iredale, 1931

105. *Cronia (Ergalatax) contracta* (Reeve)

Subfamily THAIDINAE

Genus *Thais* Roeding, 1798

106. *Thais echinata* (Blainville)

107. *Thais hippocastanum* (Linnaeus)

108. *Thais lacera* (Born)

109. *Thais tissorti* (Petit)

Subgenus *Mancinella* Link, 1807

110. *Thais (Mancinella) bufo* (Lamarck)

Genus *Morula* Schumacher, 1817

111. *Morula granulata* (Duclos)

Genus *Purpura* Bruguiere, 1817

112. *Purpura panamua* (Roeding)

113. *Purpura persica* (Linnaeus)

Subfamily RAPANINAE

Genus *Rapana* Schumacher, 1817

114. *Rapana rapiformis* (Born)

Family BUCCINIDAE

Subfamily BUCCININAE

Genus *Babylonia* Schlueter, 1838

115. *Babylonia spirata* (Linnaeus)

116. *Babylonia zeylanica* (Bruguiere)

Genus *Clea* H. and A. Adams, 1855

117. *Clea bocki* Brot

Subfamily PHOTINAE

Genus *Nassaria* Link, 1807

- 118. *Nassaria acuminata* (Reeve)
- 119. *Nassaria coramandelica* E.A. Smith
- 120. **Nassaria nivea* (Gmelin)
- 121. *Nassarius pusilla* Roeding

Subfamily PISANIINAE

Genus *Cantharus* Roeding, 1798Subgenus *Pollia* Gray, 1833

- 122. *Cantharus (Pollia) spiralis* (Gray)
- 123. *Cantharus (Pollia) tranquebaricus* (Gmelin)

Genus *Engina* Gray, 1839

- 124. *Engina armillata* (Reeve)

Family COLUMBELLIDAE

Subfamily COLUMBELLINAE

Genus *Columbella* Lamarck, 1799

- 125. **Columbella duclosiana* Sowerby

Subfamily PYRENINAE

Genus *Anachis* H. and A. Adams, 1853

- 126. *Anachis terpsichore* (Sowerby)

Family NASSARIIDAE

Subfamily NASSARIINAE

Genus *Nassarius* Dumeril, 1806Subgenus *Niotha* H. and A. Adams, 1853

- 127. *Nassarius (Niotha) livescens* (Philippi)
- 128. *Nassarius (Niotha) stolatus* (Gmelin)

Subgenus *Plicaricularia* Thiele, 1929

- 129. *Nassarius (Plicaricularia) globosus* (Quoy & Gaimard)
- 130. *Nassarius (Plicaricularia) pullus* (Linnaeus)

Subgenus *Zeuxis* H. and A. Adams, 1853

- 131. *Nassarius (Zeuxis) dorsatus* (Roeding)
- 132. *Nassarius (Zeuxis) foveolatus* (Dunker)
- 133. *Nassarius (Zeuxis) olivaceus* (Bruguere)

Subfamily DORSANIINAE

Genus *Bullia* Gray in Griffith and Pidgeon, 1834

- 134. **Bullia livida* (Reeve)
- 135. *Bullia melanoides* (Deshayes)
- 136. *Bullia tranquebarica* (Roeding)
- 137. *Bullia vittata* (Linnaeus)

Family MELONGENIDAE

Genus *Pugilina* Schumacher, 1817

Subgenus *Hemifusus* Swainson, 1840

- 138. *Pugilina*(*Hemifusus*) *cochlidium* (Linnaeus)

Family VOLUTIDAE

Subfamily CYMBIINAE

Genus *Melo* Broderip and Sowerby, 1826

- 139. *Melo melo* (Solander)

Family FASCIOLARIIDAE

Subfamily FUSININAE

Genus *Fusinus* Rafinesque, 1815

- 140. *Fusinus colus* (Linnaeus)

Family HARPIDAE

Subfamily HARPINAE

Genus *Harpa* Roeding, 1798

- 141. *Harpa costata* (Linnaeus)
- 142. *Harpa davidis* Roeding
- 143. *Harpa major* Roeding

Family OLIVIDAE

Subfamily OLIVINAE

Genus *Oliva* Bruguiere, 1789

- 144. *Oliva oliva* (Linnaeus)
- 145. *Oliva serica* (Roeding)
- 146. *Oliva vidua* (Roeding)
- 147. *Olivancillaria gibbosa* (Born)

Subfamily ANCILLINAE

Genus *Amalda* H. and A. Adams, 1853

- 148. *Amalda ampula* (Gmelin)

Subfamily AGARONIINAE

Genus *Agaronia* Gray, 1839

- 149.
- Agaronia nebulosa*
- (Lamarck)

Family MARGINELLIDAE

Subfamily MARGINELLINAE

Genus *Marginella* Lamarck, 1799

- 150.
- Marginella angustata*
- Sowerby

- 151.
- Marginella loebeakeana*
- (Weinkauff)

Family MITRIDAE

Subfamily MITRINAE

Genus *Mitra* Lamarck, 1798Subgenus *Nebularia* Swainson, 1840

- 152.
- Mitra (Nebularia) aurantia aurantia*
- (Gmelin)

Subfamily IMBRICARIINAE

Genus *Neocancilla* Cernohorsky, 1966

- 153.
- Neocancilla antoniae*
- (H. Adam)

- 154.
- Neocancilla circula*
- (Kiener)

Superfamily CANCELLARIOIDEA

Family CANCELLARIIDAE

Subfamily CANCELLARIINAE

Genus *Cancellaria* Lamarck, 1799

- 155.
- Cancellaria asperella*
- Lamarck

Genus *Scalptia* Jousseume, 1887

156. *
- Scalptia scalariformis*
- (Lamarck)

- 157.
- Scalptia scalarina*
- (Lamarck)

Superfamily CONOIDEA

Family CONIDAE

Genus *Conus* Linnaeus, 1758

- 158.
- Conus aculeiformis*
- Reeve

- 159.
- Conus betulinus*
- Linnaeus

- 160.
- Conus biliosus*
- (Roeding)

161. *
- Conus characteristicus*
- G. Fischer

- 162.
- Conus eburneus*
- Hwass in Bruguiere

- 163.
- Conus figulinus*
- Linnaeus

164. *Conus generalis* var. *maldives* Hwass

165. *Conus inscriptus* Reeve

166. *Conus lentiginosus* Reeve

167. *Conus mutabilis* Reeve

168. *Conus piperatus* Dillwyn

169. *Conus textile* Linnaeus

170. *Conus zeylandicus* Gmelin

Family TURRIDAE

Subfamily DRILLINAE

Genus *Inquisitor* Hedley, 1918

171. *Inquisitor flava* (Bruguere)

Genus *Splendrilla* Hedley, 1922

172. *Splendrilla persica* (Smith)

Subfamily TURRINAE

Genus *Gemmula* Weinkauff, 1875

173. *Gemmula speciosa* (Linnaeus)

Genus *Lophiotoma* Casey, 1904

174. *Lophiotoma indica* (Roeding)

Subfamily TURRICULINAE

Genus *Turricula* Schumacher, 1817

175. *Turricula javana* (Linnaeus)

176. *Turricula tornata tornata* (Dillwyn)

Subfamily ZONULISPIRINAE

Genus *Ptychobela* Thiele, 1925

177. **Ptychobela nudolosa* (Gmelin)

Subfamily DAPHNELLINAE

Genus *Daphnella* Hinds, 1844

178. **Daphnella lymneiformis* (Kiener)

Family TEREBRIDAE

Genus *Terebra* Bruguere, 1789

179. **Terebra commaculata* (Gmelin)

180. **Terebra guttata* (Roeding)

181. *Terebra maculata* (Linnaeus)

182. *Terebra strigilla* Linnaeus

183. *Terebra succincta* Boss

Genus *Diplomeriza* Dall, 1919

184. *Diplomeriza duplicata* (Linnaeus)

Genus *Hastula* H. and A. Adams, 1853

185. **Hastula bacillum* (Deshayes)

186. *Hastula trailli* (Deshayes)

Genus *Impages* E.A. Smith, 1873

187. **Impages hectica* Linnaeus

Subclass HETEROBRANCHIA

Order ALLOGASTROPODA

Superfamily ARCHITECTONICOIDEA

Family ARCHITECTONICIDAE

Genus *Architectonica* Roeding, 1798

188. *Architectonica laevigata* (Lamarck)

189. *Architectonica perspectiva* (Linnaeus)

Genus *Heliacus* Orbigny, 1841

190. **Heliacus stramineus* (Gmelin)

Superfamily PYRAMIDELLOIDEA

Family AMATHINIDAE

Genus *Amathina* Gray, 1842

191. *Amathina tricarinata* (Linnaeus)

Subclass OPISTHOBRANCHIA

Order CEPHALASPIDES

Superfamily PHILIMOIDEA

Family RINGICULIDAE

Genus *Ringicula* Deshayes, 1838

192. *Ringicula propinquans* Hinds

Family BULLIDAE

Genus *Bulla* Linnaeus, 1758

193. *Bulla ampula* Linnaeus

Family HAMINEIDAE

Subfamily HAMINEINAE

Genus *Haminoea* Turton and Kingston in Carrington, 1830

194. *Haminoea elegans* A. Adams

1. Animal shielded dorsally by 8 articulating shell plates (2)
 Animal not shielded dorsally by 8 articulating shell plates (3)
2. Insertion plates finely grooved on the outside CHITONIDAE
 Insertion plates not grooved but with variable number of slits
 ACANTHOCHITONIDAE

3. Shell uncoiled, whorls irregular, not compact SILIQUARIIDAE
 Shell coiled, whorls regular and compact (4)
4. Shell limpet, cup or cap shaped; spire rudimentary or absent; aperture very large in proportion to size of shell or shell flattened, aperture not definite (5)
 Shell globose or elongate; spire distinct, low or depressed or concealed within the bodywhorl; aperture considerably smaller in proportion to shell (9)
5. Shell with a series of respiratory holes, open in front but closed towards apex
 HALIOTIDAE
 Shell without a series of respiratory holes (6)
6. Shell limpet shape, spire absent (7)
 Shell cup or saucer shape, spire rudimentary (8)
7. Shell with slit or channel on front margin or a round, ovate or key hole opening at the apex FISSURELLIDAE
 Shell without a slit or channel PATELLIDAE
8. Outer surface with three marginal ridges; internal accessory plate absent
 AMATHINIDAE
 Outer surface without three marginal ridges; internal accessory plate present
 CREPIDULIDAE
9. Shell minute, not exceeding than 10 mm (10)
 Shell medium to large exceeding more than 10 mm (12)
10. Shell without operculum RINGICULIDAE
 Shell with operculum (11)
11. Shell ovately conical, subglobose with horny epidermis; aperture ovate
 ASSIMINEIDAE
 Shell ovate, without horny epidermis; aperture subcircular FOSSARIDAE
12. Shell light, fragile, floated by mucous bubble; violet or colour JANTHINIDAE
 Shell heavy, not fragile or floated by mucous bubble; variation in colour (13)
13. Shell with narrow, elongated aperture (14)
 Shell without narrow, elongate aperture (15)
14. Shell highly polished; both the margins of aperture teethes; globular or cylindrical
 CYPRAEIDAE

- Shell not highly polished; outer margin of aperture with teeth; elongate to globular or pear shaped OVULIDAE
15. Shell cone shaped with flattened base, whorls rapidly diminishing in diameter; aperture small, oblique (16)
- Shell globose or elongated; aperture moderate (19)
16. Umbilicus large, margin dentate ARCHITECTONICIDAE
- Umbilicus small or absent (17)
17. Shell dull coloured, internally non nacreous; always attached with foreign bodies XENOPHORIDAE
- Shell brightly coloured, internally nacreous; not attached with foreign bodies (18)
18. Shell conical, pyramidal or turbanate with a circular base; operculum thin; chitinous, flexible, circular and usually multispiral TROCHIDAE
- Shell globose without a circular base; operculum thick, heavy, inner surface bearing a thin chitinous layer, outer surface smooth or variously ornamented TURBINIDAE
19. Spire high, elongate, whorls many (20)
- Spire low, not many whorls, sometimes either concealed or sunken (24)
20. Aperture rounded; anterior canal absent; whorls rounded or keeled (21)
- Aperture ovate; anterior canal present; whorls not keeled (22)
21. Shell large (more than 40 mm); sculpture with spiral striae; whorls keeled in the middle TURRITELLIDAE
- Shell not large (less than 40 mm); sculpture with prominent transpiral ribs; whorls not keeled in the middle EPITONIIDAE
22. Shell broad, dull not polished; aperture broad, outer lip expanded; columella twisted; operculum rounded with many whorls (23)
- Shell slender, polished, brightly coloured; aperture narrow, outer lip simple; columella with anterior fold; operculum oval TEREBRIDAE
23. Columella strongly twisted; siphonal canal not recurved; shell with spiral cords and axial ribs POTAMIDIDAE
- Columella smooth, calloused, many or often with a fold; siphonal canal recurved; shell ornamented with ribs and nodules CERITHIIDAE
24. Spire sunken; animal can not be withdrawn completely within the shell (25)
- Spire not sunken; animal can be withdrawn completely within the shell (26)

25. Shell thinner, often translucent; apical umbilicus not deep; outer lip frequently detached from the apex HAMINEIDAE
 Shell thick; apical umbilicus deep; outer lip rises above the apex BULLIDAE
26. Shell spindle shape, spire and siphonal canal long; aperture small in proportion to shell (27)
 Shell not spindle shape, spire and siphonal canal short; aperture large in proportion to shell (28)
27. Outer lip margin with a deep or shallow notch; siphonal canal shorter than spire TURRIDAE
 Outer lip margin entire; siphonal canal larger than spire FASCIOLARIIDAE
28. Varices absent or poorly developed; whorls smooth or finely sculptured (29)
 Varices thick and strong, ornamented with lamellose or foliaceous or with long spines; whorls strongly sculptured (44)
29. Shell smooth, thick; imperforate (30)
 Shell sculptured; perforate or imperforate (31)
30. Spire prominent; operculum absent; outer lip thin and with smooth margin OLIVIDAE
 Spire concealed in the bodywhorl; operculum present; outer lip margin folded or dentate MARGINELLIDAE
31. Shell thick, bodywhorl not much inflated; spire high (32)
 Shell thin, sometimes fragile; bodywhorl inflated; spire either low or depressed (47)
32. Shell cone shaped; apex at lower part tapering; aperture narrow, elongate; columella straight, lips parallel CONIDAE
 Shell not cone shaped; apex at lower part not tapering; aperture wide; columella curved, lips not parallel (33)
33. Columella smooth (34)
 Columella either with folds or plaits or denticles (38)
34. Shell perforate NATICIDAE
 Shell imperforate (35)
35. Shell large, elongately fusoid; spire high; siphonal canal distinct (36)
 Shell small, turbinate; siphonal canal short, sometimes indistinct or absent (37)

36. Whorls angulate; outer lip without a notch at anterior part nor forming a wing like structure; siphonal canal wide MELONGENIDAE
 Whorls rounded; outer lip extended into a wing like structure with a notch towards anterior part; siphonal canal sometimes drawn to a narrow elongate canal STROMBIDAE
37. Columella truncate; aperture with prominent ridge posteriorly, lirate; shell sculptured with spiral grooves, thicks PLANAXIDAE
 Columella not truncate; aperture without a ridge inside nor lirate; shell sculptured with spiral striae or with rows of nodules or grannules, nor thicks LITTORINIDAE
38. Spire low, sometimes depressed; columella wide, flattened, ornamented; aperture semicircular; operculum with apophysis inside NERITIDAE
 Spire high; columella not flattened, narrow; aperture not semicircular; operculum either calcareous or horny without apophysis inside (39)
39. Shell sculptured, rarely smooth, columella either with placations or with pushes; aperture not narrow, without ridges inside; outer lip thin; animals not air breathing, gills present (40)
 Shell smooth except for growth striae; aperture with ridges or teeth, narrow; outer lip thick; inner lip with folds anteriorly; animals air breathing, gills replaced by lungs.. ELLOBIIDAE
40. Shell ovate; sculpture with axial and spiral ridges given cancellate appearance CANCELLARIIDAE
 Shell either spindle shape or oblong or fusoid; sculpture with prominent axial ribs and light striae but not given cancellate appearance (41)
41. Columella with strong placations; aperture elongate (42)
 Columella with denticles or smooth; aperture oval (43)
42. Operculum absent MITRIDAE
 Operculum present VOLUTIDAE
43. Canal short, not recurved; Columella with denticles above canal; shell polished not covered by periostracum NASSARIIDAE
 Canal either short or long, recurved; Columella smooth; shell usually covered by periostracum BUCCINIDAE
44. Posterior canal well developed; varices two on each whorl, continuous along body and spire BURSIDAE
 Posterior canal absent; varices two or more in each whorl, but continuous (45)

45. Varices two on bodywhorl, bodywhorl inflated, oval in shape; columellar shield well developed; aperture longitudinal CASSIDAE
 Varices two or more on each whorl, bodywhorl not much inflated; columellar shield less developed or absent; aperture circular or oval (46)
46. Varices two on each whorl, bodywhorl rounded; columella wrinkled; aperture oval; outer lip margin thick and toothed RANELLIDAE
 Varices if present more than two; sculptured with either frilled or lamellose spines; columella not wrinkled; outer lip margin not thick, either dentate or lirate
 MURICIDAE
47. Anterior canal long, broadly open; spire very low, sometimes depressed; shell with reticulate sculpture FICIDAE
 Anterior canal short; spire acute; shell sculptured with axial or spiral ribs and threads in between (48)
48. Shell ovoid; sculpture with transpiral ribs; columella smooth without folds; operculum absent; outer lip folded; siphonal faciole absent HARPIDAE
 Shell globose; aperture broad; sculptured with broad flat spiral ribs and threads; columella twisted; operculum present in juvenile stage; outer lip simple; siphonal faciole present
 TONNIDAE

SYSTEMATIC ACCOUNTS

Class POLYPLACOPHORA

Order NEOLORICATA

Suborder ISCHNOCHITONINA

Family CHITONIDAE

Subfamily CHITONINAE

Genus *Chiton* Linnaeus, 1758

1758. *Chiton* Linnaeus, *Syst. Nat.*, ed., 10 : 667.

Chiton granoradiatus Leloup

1937. *Chiton granoradiatus* Leloup, *Bull. Mus. r. Hist. Nat. Belg., Brussels*, 13(38) : 2.

2000. *Chiton granoradiatus* : Subba Rao and Dey, *Rec. zool. Surv. India, Occ. Paper No.*, 187 : 4.

Material examined : i) 9 exs., Waltair (Visakhapatnam) point, Visakhapatnam, June, 1965, M 17704/3, Coll. K.G.K Murthi and Party.

Measurements (in mm) :

Length	Width
28.25–10.90	12.95–6.00

Diagnosis : Yellowish brown tinge, girdle whitish; head valve slightly larger than tail and bears about 40 regular, close set, slightly flattered and finely granulose, radiating riblets with narrow interstices; tail valve slightly concave bearing 30 riblets; anterior end depressed, intermediate valves with median and lateral area.

Distribution : India : Andhra Pradesh, Andaman and Nicobar Islands, Lakshadweep, Maharashtra, Tamil Nadu.

Elsewhere : Philippines.

Attached to rocks in the intertidal region.

Suborder ACANTHOCHITONINA

Family ACANTHOCHITONIDAE

Subfamily ACANTHOCHITONINAE

Genus *Acanthochitona* Gray, 1821

1821. *Acanthochitona* Gray, *London Med. Reposit.*, 15 : 234

Acanthochitona mahensis Winckworth

1927. *Acanthochitona mahensis* Winckworth, *Proc. malac. Soc. London*, 17 : 207, pl. 29, figs. 9&10.

2000. *Acanthochitona mahensis* Subba Rao and Dey, *Rec. zool. Surv. India, Occ. Paper No.*, 187 : 6.

Material examined : (i) 1 ex., Visakhapatnam, June 1965, M 17703/3, Coll. K.G.K. Murti and Party.

Measurements (in mm) :

Length	Width
24.50	11.25

Diagnosis : Elongately ovate, small (not more than 20 mm), encircled by a girdle with eighteen rounded pockets bearing tufts of bristles; valves sculpture with radiating ridges on the lateral side, middle point smooth; brown.

Distribution : India : Andhra Pradesh, Nicobar Islands, Orissa, Pondicherry, Tamil Nadu.

Elsewhere : Sri Lanka.

Class GASTROPODA
 Subclass PROSOBRANCHIA
 Order ARCHAEOGASTROPODA
 Superfamily PLEUROTOMARIOIDEA
 Family HALIOTIDAE
 Genus *Haliotis* Linnaeus, 1758

1758. *Haliotis* Linnaeus, *Syst. Nat.*, ed. 10 : 779.

Type species : *Haliotis assimina* Linnaeus.

Subgenus *Ovinotis* Cotton, 1943

1943. *Ovinotis* Cotton : *Trans. Roy. Soc. S. Australia*, 67(2) : 179.

Type species : *Haliotis ovina* Gmelin.

***Haliotis (Ovinotis) ovina* Gmelin**
 (Pl. 1, Figs. 1 & 2)

1791. *Haliotis ovina* Gmelin, *Syst. Nat.* ed. 13 : 3691.

2000. *Haliotis (Ovinolis) ovina* : Subba Rao and Dey, *Rec. zool. Surv. India, Occ. Paper No.*, 187 : 8.

Material examined : i) 3 exs, Waltair (Visakhapatnam), March 1965, Coll. K.G.K. Murti and Party; ii) 1 ex., Waltair (Visakhapatnam), 7.3.1966, Coll. A.S. Rajagopal and Party.

Measurements (in mm) :

Length	Width
28.70–13.25	21.60–10.15

Diagnosis : Shell moderate, olive green, ornamented with white or creamy yellow radiating streaks; apex with radiating ribs, terminate in a concentric row of nodes; apex slightly elevated, perforation elevated and tubular.

Distribution : India : Andhra Pradesh, Andaman and Nicobar Islands.

Elsewhere : Australia and Japan.

Superfamily FISSURELLOIDEA
 Family FISSURELLIDAE
Key to the Subfamily

Apex not perforate, slit like margin or perforation on the anterior slope
 EMARGINULINAE

Apex cutoff squarely on posterior side; horseshoe shaped muscle scar has hook shaped anterior end DIODORINAE

Subfamily EMARGINULINAE

Shell conical, cap shape or oblong, apex not perforate, but a slit may be present or not on the anterior margin, when with perforation a projecting shelf within replaces apex.

Represented by two genera namely *Emarginula* Lamarck and *Scutus* Montfort from Andhra Pradesh.

Key to the Genera

Slit of varying extent; apex varying in position *Emarginula* Lamarck

Slit absent; apex directed backward *Scutus* Montfort

Genus *Emarginula* Lamarck, 1801

1801. *Emarginula* Lamarck, *Hist. Nat. Anim. Sans. Vert.*, p. 69.

Type species : *Emarginula conica* Lamarck

Emarginula obovata A. Adams

1851. *Emarginula obovata* A. Adams. *Proc zool. Soc. Lond.*, **19** : 83.

1978. *Emarginula obovata* Rajagopal and Mukherjee, *Rec. zool. Surv. India, Occ. Paper No.*, **12** : 9.

Material examined : i) 4 exs, Waltair (Visakhapatnam), March, 1964; Coll. K.G.K. Murti; ii) 3 exs, Waltair (Vishakapatnam) coast, M 22356/4, Coll. T. Vedavati.

Measurements (in mm) :

Length	Width
11.25–6.05	7.85–4.30

Diagnosis : Shell oval, white, apex subcentral, inclined backwards; sculpture with radial and concentric striae, giving prominent latticed appearance.

Distribution : India : Andhra Pradesh, Tamil Nadu.

Elsewhere : Philippines.

Genus *Scutus* Montfort, 1810

1810. *Scutus* Montfort, *Conch.* **2** : 58.

Scutus unguis Linnaeus

1767. *Patella unguis* Linnaeus, *Syst. Nat.*, ed. **12** : 1260.

Material examined : i) 2 exs. Waltair (Visakhapatnam) coast, 8.3.1966, Col. A.S. Rajagopal and Party; ii) 4 exs., Waltair (Visakhapatnam) coast, Reg. No. M 22263/4, Coll. T. Vedavati.

Measurements (in mm) :

Length	Width
30.90–26.50	21.20–15.70

Diagnosis : Shell medium, oblong, depressed, shield shape with anterior region more or less truncated and wavy; sculpture with concentric growth striae, apex directed backwards; without a slit notch or perforation.

Distribution : India : Andhra Pradesh, Tamil Nadu.

Elsewhere : Mauritius, Scycheles, Sri Lanka.

Subfamily DIODORINAE

Shell conical with distinct sculpture, apex perforate, supported within by posteriorly truncated callous; muscle scar open anteriorly and with hook shape terminations.

Genus *Diodora* Gray, 1821

1821. *Diodora* Gray, *London Med. Repository*, **15** : 233.

Type species : *Patella apertura* Montagu.

Diodora singaporensis (Reeve) (Pl. I, Figs. 3 & 4)

1850. *Fissurella singaporensis* Reeve, *Conch. Icon.*, **6** : *Fissurella* sp. no. 100, pl. 14, figs 100, 101.

2003. *Diodora singaporensis* : Subba Rao, *Rec. zool. Surv. India, Occ. Paper No.*, **192** : 67, pl. 3, figs. 5 & 6.

Material examined : i) 2 exs., Waltair (Visakhapatnam) coast, 9.3.1964, Coll. A.S. Rajagopal and Party; ii) 5 exs., Waltair (Visakhapatnam), March, 1965, Coll. K.G.K. Murti and Party.

Measurements (in mm) :

Length	Width
25.00–9.80	20.75–6.90

Diagnosis : Shell oval, aperture oval, subcentral; sculpture with secondary ribs in between main radial ribs, reticulate, ventral margin crenulate; shell with 7–8 broad brown rays extending from apex to ventral margin.

Distribution : India : Andhra Pradesh, Andaman and Nicobar Islands, Goa, Gujarat, Maharashtra, Orissa, Tamil Nadu.

Elsewhere : Pakistan, Myanmar, Iran.

Superfamily PATELLOIDEA

Family PATELLIDAE

Subfamily NACELLINAE

Genus *Cellana* H. Adams, 1869

1869. *Cellana* H. Adams, *Proc. zool. Soc. Lond.*, 1869 : 273.

Type species : *Nacella (Cellana) cermica* H. Adams.

Cellana radiata radiata (Born)

1778. *Patella radiata* Born, *Index Rev. Nat. Mus. Caes. Vind.*, 443 : 1780, pl. 18, fig. 10

2000. *Cellana radiata radiata* : Subba Rao and Dey, *Rec. zool. Surv. India, Occ. Paper No.*, 187 : 14.

Material examined : i) 6 exs. Maharanipeta beach, Visakhapatnam, 02.01.1941; ii) 14 exs., Dolphin nose, Visakhapatnam 03.01.1941; iii) 51 exs. Bheemunipatnam, Vishakapatnam, 04.01.1941; iv) 4 exs. Scandal point, Visakhapatnam, 14.01.1941, Coll. H.A. Hafiz; v) 56 exs., Vishakapatnam coast, 16.02.1947; vi) 21 exs., Bheemunipatnam, Visakhapatnam 20.02.1947, Coll. H.C. Ray; vii) 45 exs. Bheemunipatnam, Visakhapatnam, 08.07.1973; viii) 21 exs., Pithapuram, 11.07.1963, Coll. A. Daniel and party; ix) 2 exs., Visakhapatnam, Jan. 1964, Coll. K.G.K. Murti and Party; x) 17 exs., Visakhapatnam, 05.03.1966; xi) 31 exs., Bheemunipatnam, Visakhapatnam, 12.03.1966; xii) 15 exs., Rishikunda, Visakhapatnam, 13.03.1966; xiii) 2 exs., Dolphin nose, Visakhapatnam, 14.03.1966, Coll. A.S. Rajagopal and Party; xiv) 2 exs., Srikakulam, 17.02.1995, xv) 8 exs., Dolphin nose, Visakhapatnam, 28.02.1995, Coll. D.R.K. Shastry and Party; xvi) 5 exs., Palam beach, Visakhapatnam, K.B. Rao and Party; xvii) 3 exs., Chinnotapally, Vizianagaram, 02.05.2001, Coll. S. Barua and Party.

Measurements (in mm) :

Length	Width
31.30–15.35	24.90–10.85

Diagnosis : Shell moderately small upto 35 mm in length; ovate, apex subcentral; sculpture with close set, radial riblets and prominent distant folds; exterior with radiating dark brown lines, interior bright yellow, often with dark brown radiating markings.

Distribution : India : Andhra Pradesh, Andaman and Nicobar Islands, Maharashtra, Orissa.

Elsewhere : Seychelles, Sri Lanka, Myanmar, New Guinea, Philippines, Queensland.

Remarks : Balaparameswara Rao (1975, 1976, 1978) and Balaparameswara Rao and Ganapati (1967, 1971, 1972 & 1973) studied the biology and physiology of the species from Visakhapatnam coast.

Superfamily TROCHOIDEA

Family TROCHIDAE

Key to the subfamilies

1. Shell with low spire or lenticular, umbilicus partly or entirely filled by a callus pad UMBONIINAE
 Shell conical, turbiform, littoriniform or sublenticulate, umbilicus not partly or entirely filled by a callus pad (2)
2. Shell openly umbilicate MARGARATINAE
 Shell narrowly umbilicate or umbilicus absent CALLIOSTOMATINAE

Subfamily MARGARITINAE Stoliczka

Genus *Euchelus* Philippi, 1847

1847. *Euchelus* Philippi, *Zeitschr. f. Malak.*, p. 20.

Type species : *Trochus quadricarinatus* Holten (= *Trochus asper* (Gmelin)).

Euchelus asper (Gmelin)

1791. *Trochus asper* Gmelin, *Syst. Nat. ed.*, 13 : 3583.

2000. *Euchelus asper* : Subba Rao and Dey, *Rec. zool. Surv. India. Occ. Paper No.*, 187 : 18.

Material examined : i) 11 exs. Taprea (Uppateru), Kakinada, 02.03.1918, Coll. B.L. Chowdhury; ii) 2 exs., Lawson's Bay, Visakhapatnam, 17.02.1947, Coll. ?; iii) 1 ex. Waltair point, (Visakhapatnam), March, 1964, Coll. K.G.K. Murti; iv) 18 exs. Palm beach, Visakhapatnam, 04.03.1966, v) 3 exs., Rocky coast, Waltair (Visakhapatnam) point, Visakhapatnam, 08.03.1966, vi) 6 exs., Dolphins nose, Visakhapatnam, 10.03.1966, Coll. A.S. Rajagopal and Party; vii) 5 exs., Waltair (Visakhapatnam), 25.04.1988, Reg. No. 22686/4; Coll. B. Kamala; viii) 3 exs., Palm beach, Vishakhapatnam, 23.02.1995, Coll. D.R.K. Shastry and Party.

Measurements (in mm) :

Length	Width	Height of the aperture
30.40–16.10	22.50–17.20	19.60–10.20

Diagnosis : Shell moderate, globosely conoid, sculpture with sprial ridges, beaded by axially oriented, dense and stout riblets; columella umbilicate and with a dense small tooth; aperture lirate; violet brown, aperture silver white.

Distribution : India : Andhra Pradesh, Andaman Islands, Kerala, Maharashtra, Tamil Nadu.

Elsewhere : Sri Lanka, Indonesia : Moluccas.

***Euchelus asper* var. *tricarinatus* (Lamarck)**

1822. *Monodonta tricarinata* Lamarck, *Hist. nat. Anim. Sans. Vert.*, (1)7 : 36.

1978. *Euchelus asper* var. *tricarinatus* : Rajagopal and Mookherjee, *Rec. zool. Surv. India, Occ. Paper No.*, 12 : 17.

Material examined : i) 2 exs., Visakhapatnam coast, Coll. B. Kamala, Reg. No. M 22687/4; ii) 3 exs., Visakhapatnam coast, Coll. T. Vedavati, Reg. No. M 22262/4; iii) 2 exs., Bheemunipatnam, Visakhapatnam, Reg. No. M 20094/3; iv) 1 ex. Visakhapatnam, June, 1926, Coll. H.S. Rao and G Vargis; v) 11 exs., Lawsons Bay, Visakhapatnam, 14.02.1947, vi) 3 exs. Kakinada Bay, 20.11.1964, Coll. N.V.Subba Rao and Party; vii) 2 exs., Jalaripet, Visakhapatnam, 06.03.1966, Coll. A.S. Rajagopal and Party.

Measurements (in mm) :

Length	Diameter	Height of the aperture
25.65–5.30	23.15–5.50	15.00–3.90

Diagnosis : Shell moderate to small, upto 30 mm., globosely conoid; sculpture with three prominent beaded spiral ridges or lamellae on the body whorl, which in few cases may be 2 or 4; spire suppressed in young shells while in the adults it is elevated than the *E. asper*, while umbilicus open in young shell, but closed in adults.

Distribution : India : Andhra Pradesh, Gujarat, Maharashtra, Tamil Nadu.

Elsewhere : Indian Ocean.

Subfamily CALLIOSTOMATINAE**Genus *Calliostoma* Swainson, 1840**

1840. *Calliostoma* Swainson, *Treat. Malacol*, p. 218.

Type species : *Trochus conulus* Linnaeus.

***Calliostoma scobinata* (A. Adams)**

1863. *Zizyphinus scobinatus* A. Adams in Reeve, *Conch. Iconica*, 14 : *Zizyphinus*, sp. no. 29, pl. 5, fig. 29.

2003. *Calliostoma scobinata* : Subba Rao, *Rec. zool. Surv. India, Occ. Paper No.*, 192 : 86, pl. 8, fig. 6.

Material examined : i) 1 ex., Visakhapatnam, June, 1926, Coll. H.S. Rao and G. Vargish.

Measurements (in mm) :

Length	Diameter	Height of the aperture
12.40	11.20	4.20

Diagnosis : Shell small, solid, conical; whorls convex; sculpture with granules, close set spiral ridges, base gradually declining with 6 to 7 granular spiral ridges, interstices with thin

granular spiral riblets; aperture subquadrate; columella simple, outer lip compressed on the upper part; dull brown.

Distribution : India : Andhra Pradesh, Maharashtra.

Subfamily UMBONIININAE

Key to the genera

1. Shell spirally ribbed; spire elevated; umbilicus not filled by callus pad **Monilea** Swainson
- Shell glossy or spirally striated; spire depressed; umbilicus filled by callous pad **Umbonium** Link

Genus *Umbonium* Link, 1807

1807. *Umbonium* Link, *Bes. Nat. Samml. Rostock*, pt. 3 : 136.

Type species : *Trochus vestiarius* Linnaeus.

Umbonium vestiarius (Linnaeus)

1758. *Trochus vestiarius* Linnaeus, *Syst. Nat.*, ed. 10 : 758, sp. no. 515.

1990. *Umbonium vestiarius* : Rao and Rao, *Fauna of Orissa, State Fauna Series*, 1(Part-3) : 30.

Material examined : i) 2 exs., Visakhapatnam, May. 1926, Coll. H.S. Rao and G. Vargish; ii) 7 exs., Uppateru, Kakinada, 21.02.1948, Coll. Mahesh Chandra and G. Ramakrishna; iii) 40 exs., Near light house, Kakinada, 19.11.1964, iv) 14 exs., Uppateru, Kakinada, 21.11.1964, Coll. N.V. Subba Rao and Party; v) 23 exs., Visakhapatnam coast, 08.03.1966, Coll. A.S. Rajgopal and Party; vi) 30 exs., Kakinada Bay, 15.04.1978, Coll. N.V. Subba Rao and A. Dey; vii) 1 ex., Visakhapatnam, 08.04.2000, viii) 10 exs. Kakinada Bay, 14.04.2000, Coll. Ramakrishna and Party; ix) 1 ex., Rocky shore at Bhandarvanipet, Srikakulam, Coll.?.; x) 6 exs., Krishnapatnam beach, Nellore, 15.02.2002, Coll. S. Barua and Party.

Measurements (in mm) :

Length	Diameter	Height of the aperture
8.80–2.00	13.20–4.80	5.00–1.00

Diagnosis : Shell medium, spire depressed, body whorl flattened, commonly known as “Button shell” Polymorphic from, plain white to dark gray, many tinges of pink, brown and gray, blotched, striped and banded.

Occurs at the mouth of backwaters, below muddy and sandy area.

Distribution : India : Andhra Pradesh, Goa, Gujarat, Kerala, Maharashtra, Pondicherry, Orissa, Tamil Nadu, West Bengal.

Elsewhere : Indo-Pacific.

Genus *Monilea* Swainson, 1840

1840. *Monilea* Swainson, *Treat. Malacol.*, : 220.

Type species : *Trochus Calliferus* Lamarck

Monilea callifera (Lamarck)

1822. *Monilea callifera* Lamarck, *Hist. nat. Anim. Sans. Vert.*, (9)7 : 27.

2000. *Monilea callifera* : Subba Rao and Dey, *Rec. zool. Surv. India, Occ. Paper No.*, 187 : 18.

Material examined : i) 1 ex., Visakhapatnam, May, 2002 Coll. Ganesh.

Measurements (in mm) :

Length	Diametere	Height of the aperture
12.70	17.50	6.50

Diagnosis : Shell small, conoidal, depressed, umbilicate narrow; aperture rounded–quadrate; body whorl rounded with prominent, fine lirae; columella with denticle below; shining nacreous layer, withen, layer undulating and corresponding with inner lirae.

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

Elsewhere : Sri Lanka, Myanmar, Indonesia, Philippines, Australia.

Family TURBINIDAE

Subfamily TURBININAE

Genus *Turbo* Linnaeus, 1758

1758. *Turbo* Linnaeus, *Syst. Nat.*, ed. 10 : 761.

Type species : *Turbo petholatus* Linnaeus.

Subgenus *Marmarostoma* Swainson, 1829

(Pl. I, Figs. 7 & 8)

1829. *Marmarostoma* Swainson, *Zool. Illustr.*, (2)1(3), pl.14.

Type species : *Turbo chrysostoma* Linnaeus.

Turbo (Marmarostoma) brunneus (Roeding)

1798. *Lunatica brunneus* Roeding, *Mus. Bolten.*, : 102.

2000. *Turbo (Marmarostoma) brunneus* : Subba Rao and Dey, *Rec. zool. Surv. India, Occ. Paper No.*, 187 : 29

Material examined : i) 4 exs., Lawsons Bay, Visakhapatnam, 19.12.1940; ii) 5 exs., Lawsons Bay, Visakhapatnam, 14.02.1947, Coll. ?; iii) 1 ex., Visakhapatnam beach, 13.01.1941; Coll. H.H. Hafiz; iv) 3 exs., Lawsons Bay, Visakhapatnam, 06.07.1963; v) 4 exs.,

Bheemunipatnam, 08.07.1963, Coll. A. Daniel and Party; vi) 5 exs., Kakinada Bay, 19.11.1964; vii) 1 ex., Machilipatnam, 09.12.1964, Coll. N.V. Subba Rao and party; viii) 50 exs., Palm beach, Visakhapatnam, 04.03.1966; ix) 5 exs., Opposite Light house, Visakhapatnam, 07.03.1966; x) 4 exs., Rocky coast of Visakhapatnam, 08.03.1966, Coll. A.S. Rajagopal and Party; xi) 2 exs., Jan. 1969, Coll. K G K Murti; xii) 1 ex., Dolphin nose, Visakhapatnam, 28.02.1995, Coll. D.R.K. Shastry and Party; xiii) 21 exs., Visakhapatnam, 28.01.1998, Coll. D.K. Kundu and Party.

Measurements (in mm) :

Length	Width	Height of the aperture
52.50–21.80	43.40–19.00	25.90–11.40

Diagnosis : Shell upto 55 mm, moderate, early subangulate; whorls cream or fawn colour, ornamented with dark brown or black axial zones; sculpture with irregular sized and scabrous spiral cords and foliated axial ridges; columella with narrow umbilicus, concave, white; operculum purple or purple brown towards the columella, becoming lighter towards the margin, finely granulose all over.

Distribution : India : Andhra Pradesh, Andaman and Nicobar Islands, Goa, Maharashtra, Tamil Nadu.

Elsewhere : Malagasy, Mauritius, Red Sea, Persian Gulf, Maldives, Sri Lanka, Borneo, Indonesia, New Guinea, Philippines, Australia.

Superfamily NERITOIDEA

Family NERITIDAE

Subfamily NERITINAE

Key to the genera

1. Shell thick or solid with spiral ribs; columellar callus large; outer lip dentate *Nerita* Linnaeus
Shell thinner less solid without spiral ribs; columellar callus small; outer lip smooth... (2)
2. Shell smooth and shining, with fine or without spiral striae *Neritina* Lamarck
Shell surface with coarse striae, striated with growth lines *Theodoxus* Montfort

Genus *Nerita* Linnaeus, 1758

1758. *Nerita* Linnaeus, *Syst. Nat.*, ed. 10 : 776.

Type species, *Nerita peloronta* Linnaeus.

Key to the Subgenera

Shell smooth or with fine ribs, columellar callus smooth; columellar margin toothless or with blunt teeth; outer lip faintly toothed ***Amphinerita*** von Martens

Shell with conspicuous ribs; columellar callus granular or wrinkles; columellar margin with fine or strong teeth; outer lip thickened and strongly toothed ***Ritena*** Gray

Subgenus ***Amphinerita*** von Martens, 1887

1887. *Amphinerita* von Martens in Martini-Chemnitz, *Syst. Conch. Cab.*, **9** : 124.

Type species : *N. umlauiana* Krauss.

Nerita (Amphinerita) polita Linnaeus (Pl. I, Figs. 11 & 12)

1758. *Nerita polita* Linnaeus, *Syst. Nat.*, ed. **10** : 778.

2000. *Nerita (Amphinerita) polita* : Subba Rao and Dey, *Rec. zool. Surv. India, Occ. Paper No.*, **187** : 31.

Material Examined : i) 2 exs., Between Dolphine nose and Scandel point, Visakhapatnam, 11.02.1921, Coll. Rev. H. Hosten.

Measurements (in mm) :

Length	Width	Height of the aperture
28.80	21.45	12.70

Diagnosis : Shell thick, obliquely ovate, spire depressed; whorls three, narrowly rounded, laterally compressed towards the aperture, body whorl large and strongly inflated; aperture lunate, procclaneous, polished; columellar callus thick and extensive; sculpture with fine spiral striations; greenish brown or yellowish brown with 2-3 spiral bands of dark grey freckled with brownish markings.

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

Elsewhere : South African Coast, Red sea, Gulf of Aden, Malagasy, Seychelles, Maldives, Sri Lanka, Indonesia: Philippines, Australia.

Subgenus ***Ritena*** Gray, 1857

1857. *Ritena* Gray, *Proc. zool. Soc. London*, **1857** : 93.

Type species : *Nerita plicatus* Linnaeus.

Nerita (Ritena) plicata Linnaeus

1758. *Nerita plicata* Linnaeus, *Syst. Nat.*, ed. **10** : 779.

2001. *Nerita (Ritena) plicata* : Subba Rao and Dey, *Rec. zool. Surv. India, Occ. Paper No.*, **187** : 32

Material examined : i) 1 ex. Visakhapatnam, June, 1926, Coll. H.S. Rao and G. Vargish; ii) 1 ex. Palm beach, Visakhapatnam, March 1965, Coll. K G K Murti.

Measurements (in mm) :

Length	Width	Height of the aperture
21.40–13.90	17.20–12.10	12.60–9.40

Diagnosis : Shell globose, ovate, spire elevated, ornamented with 15–20 rounded, strong and elevated cords on the last whorl, columella with 3–4 strong and squared denticles and labial lip with 5–7 prominent teeth, cream or creamy yellowish.

Distribution : India : Andhra Pradesh, Andaman and Nicobar Islands, Kerala, Lakshadweep, Tamil Nadu.

Elsewhere : South African Coast, Malagasy, Mauritius, Maldives, Sri Lanka, Indonesia : Moluccas; New Guinea, Philippines, Australia.

Subgenus *Theliostyla* Moersch, 1852

1852. *Theliostyla* Moersch, *Cat. Conch. Yoldi.*, **1** : 167.

Type species : *Nerita albicilla* Linnaeus.

Key to the species

1. Spire imperfectly depressed and slightly exserted above the level of upper extremity of the outer lip; ribs not scaly; aperture crescentric, small, deep; columellar callus steeply sloping inward *N. (T.) chamaeleon* Linnaeus
- Spire much depressed; ribs scaly; aperture broadly semilunar, very much effused; columellar callus not much sloping inward (2)
2. Inner margin of outer lip with 15-17 teeth, 1st. two superior teeth broad and large *N. (T.) squamata* Le Geillon
- Inner margin of outer lip with 18-19 fine teeth, knob shaped, superior teeth and inferiormost stronge *N. (T.) albicilla* Linnaeus

Nerita (Theliostyla) albicilla Linnaeus

1758. *Nerita albicilla* Linnaeus, *Syst. Nat.*, ed. **10** : 778.

2000. *Nerita (Theliostyla) albicilla* : Subba Rao and Dey, *Rec. zool. Surv. India, Occ. Paper No.*, **187** : 32.

Material examined : i) 3 exs., Station 4, Waltair (Visakhapatnam), 24. 01. 1921, M 20207/4, ii) 2 exs., Visakhapatnam, 11.02.1921, Coll. Rev. H. Hosten; iii) 1 ex., Visakhapatnam, 13.02.1947, iv) 1 ex., Lawson's Bay, Visakhapatnam, 17.02.1947; v) 1 ex., Visakhapatnam,

Oct. 1964, Coll. K G K Murti; vi) 7 exs., Waltair (Visakhapatnam) beach, 13.02.1947, M 20209/4, Coll. B. Biswas; vii) 2 exs., Visakhapatnam, 24.02.1948, Coll. Mahesh Chandra & G. Ramakrishna; viii) 1 ex., Waltair (Visakhapatnam), 12.07.1963, M 20194/4, Coll. A. Daniel and Party; ix) 12 exs., Palm beach, Waltair (Visakhapatnam), 04.03.1966, M 20300/4, x) 21 exs., Near Lighthouse, Waltair (Visakhapatnam), 07.03.1966, M 20295/4, xi) 3 exs., Rishikunda, Waltair (Visakhapatnam), 08.03.1966, M 20297/4, xii) 16 exs., Bheemunipatnam, Visakhapatnam, 09.03.1966, M 20250/4, xiii) 20 exs., Rishikunda, Waltair (Visakhapatnam), 10.03.1966, M 20253/4, iv) 9 exs., Dolphin Nose, Waltair (Visakhapatnam), 12.03.1966, M 20251/4, Coll. A. S. Rajagopal and Party; xv) 2 exs., Vishakhapatnam, 28.12. 1998, Coll. D.K. Kundu and Party; xvi) 2 exs., Visakhapatnam, 23.02. 1995, Coll. D.R.K. Shastry and Party; xvii) 2 exs., Visakhapatnam, 10.04.2001, Coll. Ramakrishna and Party.

Measurements (in mm) :

Length	Width	Height of the aperture
22.80–10.50	27.60–11.40	17.00–6.20

Diagnosis : Shell thick, cap shaped, spire and base flat, sculpture with very broad and slightly curved cords, which obsoletes near the labial margin, fine granules, variable in colour, densely maculated or blotched, columella flat and broad.

Remarks : Found in the intertidal regions of rocky beaches in sandy damp places.

Distribution : India : Andhra Pradesh, Andaman and Nicobar Islands, Goa, Gujarat, Lakshadweep, Karnataka Maharashtra, Tamil Nadu.

Elsewhere : Mocambique, Reunion, Zanzibar, Amirantes, Seychelles, Red Sea, Persian Gulf, Myanmar, Thailand, Indonesia: Java, Sumatra, Celebes, Moluccas; New Guinea, Philippines, China, Japan, Australia.

Nerita (Theliostyla) chamaeleon Linnaeus

1758. *Nerita chamaeleon*, Linnaeus, *Syst. Nat.*, ed. 10 : 779.

2000. *Nerita (Theliostyla) chamaeleon* : Subba Rao and Dey, *Rec. zool. Surv. India, Occ. Paper No.*, 187 : 33.

Material examined : i) 6 exs., Lova garden, Visakhapatnam, May & June, 1926, M 20388/4, ii) 15 exs., Visakhapatnam, May & June, 1926, M 20396/4, iii) 13 exs., Visakhapatnam, May & June, 1926, M 20398/4, Coll. H.S. Rao & G. Varugish; iv) 2 exs., Visakhapatnam, 13.02.1947, M 20390/4, v) 27 exs., Bheemunipatnam, Visakhapatnam, 18.02.1947, Coll. ?; vi) 1 ex., Rocks on Waltair (Visakhapatnam) beach, 13. 11. 1947, M 20386/4, Coll. B. Biswas; vii) 5 exs., 21.07.1963, M 20391/4, Coll. A. Daniel and Party; viii) 5 exs., Light house, Visakhapatnam, 09.03.1966, M 20490/4, ix) 32 exs., Visakhapatnam, 10.03.1966, M 20399/4, x) 8 exs., Bheemunipatnam, Visakhapatnam, 12.03.1966, M 20493/4, Coll. A.S. Rajagopal and Party; xi) 13 exs., Visakhapatnam, 08.04.2000, Coll. Ramakrishna and Party; xii) 3 exs., Chinatapally beach, Vizianagaram, 02.05.2001, Coll. Barua and Party.

Measurements (in mm) :

Length	Width	Height of the aperture
19.60–11.30	16.10–9.60	13.50–6.65

Diagnosis : Shell subglobose, spire elevated, cream, marbled with dark brown or dark purple brown; sculpture with fine, elevated close set spiral cords and obsolete growth striae, aperture white, columellar pad wrinkled and granulose, columella with generally 2 centrally placed, prominent denticles, labial palp with 10–12 equal size denticles.

Distribution : India : Andhra Pradesh, Andaman and Nicobar Islands, Kerala, Tamil Nadu, West Bengal.

Elsewhere : Gulf of Aden, Gulf of Oman, Myanmar, Thailand, New Guinea, Fiji, Samoa, Australia.

Nerita (Theliostyla) squamulata Le Guillon

1841. *Nerita squamulata* Le Guillon, *Revue, zool, Soc, Cuvier*, p. 344.

2000. *Nerita (Theliostyla) squamulata* : Subba Rao and Dey, *Rec. zool. Surv. India, Occ. Paper No.*, **187** : 34.

Material examined : i) 2 exs., Visakhapatnam, 11.02.1921, Coll. Rev. H. Hosten; ii) 1 ex. Lawson's Bay, Visakhapatnam, Jan. 1921, Coll. S.W. Kemp.

Measurements (in mm) :

Length	Width	Height of the aperture
10.65	11.10	8.00

Diagnosis : Shell moderately small, gray or orange, spire depressed, last whorl rounded at periphery; sculpture with heavy scabrous spiral cords and prominent axial threads; columellar pad concave, plicate and rounded, sculpture with 4–6 small denticles, labial lip with 13–20 denticles.

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

Elsewhere : Sri Lanka, Thailand, Indonesia, Philippines, Australia.

Genus *Neritina* Lamarck, 1815

1815. *Neritina* Lamarck, *Encyl. Method. Vers.*, **2** : pl. 155,

Type species : *Neritia pulligera* Linnaeus.

Subgenus *Dostia* Gray, 1840

1840. *Dostia* Gray, *Syst. Cont. Brit. Mus.*, ed. **42** : 147;

Type species : *Nerita crepidularia* Lamarck.

***Neritina (Dostia) violacea* (Gmelin)**

1791. *Nerita violacea* Gmelin, *Syst. Nat.*, ed. 13 : 68.

2000. *Dostia violacea* Subba Rao and Dey, *Rec. zool. Surv. India, Occ. Paper No.*, 187 : 35.

Material examined : i) 8 exs., Eatimoga, Kakinada, 20.11.1964; ii) 3 exs., Uppateru canal, Kakinada, 22.11. 1964; iii) 4 exs., Bandra canal, Machilipatnam, Visakhapatnam, 07.12.1964; iv) 2 exs., Near Light House, Machilipatnam, Visakhapatnam, 07.12.1964, v) 5 exs., Nizampatnam, 13.12.1964, M 20467/4, Coll. N.V. Subba Rao and Party; vi) 1 ex., Visakhapatnam, Coll. D.R.K. Shastry and Party.

Measurements (in mm) :

Height	Width	Height of the aperture
15.30–9.15	19.60–12.45	13.50–9.50

Diagnosis : Shell thick, ovate, crepidula shaped, dorsal surface bearing irregular spots or patches of light colour on a dark coloured background.

A common mollusc of Indian estuaries.

Distribution : India : Andhra Pradesh, Andaman Islands, Goa, Gujarat, Karnataka, Kerala, Orissa, Tamil Nadu, West Bengal.

Elsewhere : Sri Lanka, Myanmar, Thailand, Indonesia, New Caledonia, Philippines, Japan, Australia.

Subgenus *Pseudonerita* Baker, 1923

1923. *Pseudonerita* Baker, *Proc. Acad. nat. Sci. Philad.*, 75 : 152.

Type species : *Neritina holoserica* Garrett.

***Neritina (Pseudonerita) sulculosa* (von Martens)**

1879. *Neritina sulculosa* von Martens in Martini and Chemnitz's *Syst. Conch. Cab.*, 2(10) : 69, 136, 278, pl. 8, figs. 23–26.

1990. *Neritina (Dostia) sulculosa*: Rao, Rao and Maitra, *Fauna of Orissa, State Fauna Series*, 1(Part 3) : 35.

Material examined : i) 3 exs., Nizamapatnam, 14.12.1964, Coll. N.V. Subba Rao and Party.

Measurements (in mm) :

Length	Width	Height of the aperture
6.20–5.80	7.95–7.90	4.80–4.70

Diagnosis : Spiral striae, outer lip broad and aperture bluish gray. Found in estuaries adhering to wood inside its bark and sometimes in empty tunnels of shipworm.

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

Elsewhere : Indonesia : Celebes, Flores.

Subfamily SMARAGDIINAE

Genus *Theodoxus* Montfort, 1810

1810. *Theodoxus* Montfort, *Conchyl. Syst.*, 2 : 351.

Type species : *Theodoxus lutetianus* Montfort = *Nerita fluviatilis* Linnaeus.

Subgenus *Clithon* Montfort, 1810

1810. *Clithon* Montfort, *Conch. Syst.*, 2 : 326.

Type species : *Nerita corona* Linnaeus.

Theodoxus (Clithon) oualaniensis (Lesson)

1830. *Neritna oualaniensis* Lesson, *Voy Coquille Zool.*, 2(1) : 379.

1990. *Clithon oualaniensis* : Rao, Rao and Maitra, *Fauna of Orissa, State Fauna Series*, 1(Part-3) : 36.

Material examined : i) 21 exs. Kakinada, 17.04.1978, Coll ?; ii) 9 exs. Kakinada beach, 12.04.2000, Coll. Ramakrishna and Party; iii) 5 exs., Krishnapatnam, Nellore, 15.2.2002, Coll. S. Barua and Party.

Measurements (in mm) :

Length	Width	Height of the aperture
9.10–6.95	8.05–7.50	5.50–4.50

Diagnosis : Shell small, moderately ovate, polished, olive green and marked finely in black and crimson lines in various patterns, irregularly or in spiral bands.

Distribution : India : Andhra Pradesh, Andaman and Nicobar Islands, Kerala, Karnataka, Orissa, Tamil Nadu.

Elsewhere : Sri Lanka, Thailand, Indonesia : Java, Sumatra; Polynesia.

Order MESOGASTROPODA

Subfamily LITTORINOIDEA

Family LITTORINIDAE

Subfamily LITTORININAE

Key to the genera

Shell nodulose, granulose or with surface axially folded, spire short.....
 *Nodilittorina* von Martens

Shell surface smooth or spirally folded (caribnate); spire nearly half of the body length
 *Littoraria* Griffith and Pidgeon

Genus *Littoraria* Griffith and Pidgeon, 1834

1834. *Littoraria* Griffith and Pidgeon, *The animal Kingdom*, 12 : 598, pl. 1, fig. 3.

Type species : *Littoraria pulchra* Gray = *Littorina zebra* Donovan, 1825.

Key to the species

1. Columella black *L. (Palustrina) melanostoma* (Gray)
 Columella not black (2)
2. Shell mosaic brown with blotches arranged axially or zig-zag
 *L. (Littorinopsis) scabra* (Linnaeus)
 Shell brown with undulating flammules or spots *L. (Littoraria) undulata* (Gray)

Subgenus *Littoraria* s. st.

Littoraria (Littoraria) undulata (Gray)

1839. *Littorina undulata* Gray. *The Zoology of Captain Bechey's Voyage, Mollusca* : 140.

2000. *Littorina (Littoraria) undulata* : Subba Rao and Dey, *Rec. zool. Surv. India, Occ. Paper No.*, 187 : 36.

Material examined : i) 40 exs. Visakhapatnam, 18.7.1963, Coll. ?; ii) 13 exs., Kakinada, 19.11.1964, iii) 3 exs., Eatimoga, Kakinada, 20.11.1964, iv) 40 exs. Uppateru, canal, Kakinada, 22.11.1964, Coll. N.V. Subba Rao and Party; v) 2 exs., Palm beach, Waltair (Visakhapatnam), Oct. 1965, Coll. K.G.K. Murti; vi) 2 exs., Bandaruvanipeta, Srikakulam, 17.2.1995, Coll. D.R.K. Shastry and Party; vii) 6 exs., Bheemunipatnam, 8.4.2000, Coll. Ramakrishna and Party; viii) 80 exs. Rishikunda, Visakhapatnam, ix) 11 exs., Beach near light house, Visakhapatnam, Coll. A.S. Rajagopal and Party; x) 20 exs. Nizampatnam, Coll. ?; xi) 3 exs., Chinatapally, Vizianagram, 02.05.2001, xii) 2 exs., Mayapadu, Nellore, 16.2.2002, xiii) 1 ex., Kottapatnam, 12.2.2002, xiv) 4 exs., Mahalakshmiapuram, Nellore, 17.02.2002, Coll. S. Barua and Party.

Measurements (in mm.) :

Length	Width	Height of the aperture
18.50–6.65	11.20–5.25	9.05–3.75

Diagnosis : Shell medium, conical, thin; sculpture with spiral cords; aperture semi oval; cream with dark or light brown dashes that form axial flame marks; columella violet.

Distribution : India : Andhra Pradesh, Andaman and Nicobar Islands, Goa, Gujarat, Karnataka, Kerala, Orissa, Tamil Nadu.

Elsewhere : Indo-Pacific. Common on intertidal rocks.

Subgenus *Littorinopsis* Moersch, 1876

1876. *Littorinopsis* Moersch, *Malak. Blatt*, **23** : 135.

Type species : *Turbo littoreus* = *Littorina littorea* (Linnaeus, 1758); subsequent designation.

Littoraria (Littorinopsis) scabra scabra (Linnaeus)

1758. *Helix scabra* Linnaeus, *Syst. Nat.*, ed. **10** : 770.

2000. *Littorina (Littorinopsis) scabra scabra* : Subba Rao and Dey, *Rec. zool. Surv. India, Occ. Paper No.*, **187** : 36.

Material examined : i) 1 ex., Bheemunipatnam, Visakhapatnam, Reg. No. M 22204/4, Coll. ?; ii) 31 exs, Uppateru Canal, Kakinada, 22.11.1964, Coll. N.V. Subba Rao and Party; iii) 5 exs., Vadarevu beach, Chirala, 23.12.1964, Coll. ?; iv) 135 exs. Bheemunipatnam, Visakhapatnam, 1966, Coll. A.S. Rajagopal and Party; vi) 1 ex., Vadarevu beach, Chirala, 18.4.2000, Coll. S. C. Mitra and Party.

Measurements (in mm) :

Length	Width	Height of the aperture
17.60–10.30	10.05–5.80	10.30–4.00

Diagnosis : Shell conical, fairly thin, 7-8 well rounded whorls; suture impressed; aperture large, broadly rounded, columella smooth; sculpture with flat or elevated spiral cords, and axial lines, spire with carinated keel; pale gray or brown maculated with dark brown blotches below suture.

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

Elsewhere : Indo-Pacific.

Subgenus *Palustorina* Reid, 1986

1986. *Palustorina* Reid, The littorinid molluscs of mangrove forests in the Indo-pacific region, *British Museum (Natural History)*, : 173.

Littoraria (Palustorina) melanostoma (Gray)

1839. *Littorina melanostoma* Gray, *Zool. Capt. Becchey's Voy H.M.S. Bloisom Mollusks*, : 140.

1970. *Littorina (Littorinopsis) melanostoma* : Rosewater, *Indo-pacific Mollusca*. **2**(11) : pt.1 : 462-464, pl. 355, figs. 1-4.

Material examined : i) 4 exs, Nizampatnam, Andhra Pradesh, Coll. ?

Measurements (in mm.) :

Length	Width	Height of the aperture
16.80–13.80	8.60–8.40	7.50–7.45

Diagnosis : Shell conical, attenuated, thin, spirally distantly incised, oblique axial lines present. Body whorl flattened and weakly keeled; suture weakly impressed; aperture oval, outer lip thin, inner lip gradually thickened, weakly concave; shell yellowish, white, elongate rhomboidal pattern of longitudinal markings in between the spiral striae arranged axially and sometimes obliquely.

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

Elsewhere : Sri Lanka, Myanmar, Mergui Archipelago, Malaysia, Singapore, Vietnam, Indonesia.

Genus *Nodilittorina* von Martens, 1897

1897. *Nodilittorina* von Martens In Weber's *Zool. Erg. Ein. Rei. Nie. Ost.*, 4 : 204.

Type species : *Littorina pyramidalis* Quoy and Gaimard, 1833

Subgenus *Nodilittorina* s.st.*Nodilittorina (Nodilittorina) pyramidalis pyramidalis* (Quoy and Gaimard)

1833. *Littorina pyramidalis* Quoy and Gaimard, *Voy. L' Astrolabe Zoologie*, 2 : pl. 33, figs. 12-15.

2000. *Nodilittorina (Nodilittorina) pyramidalis pyramidalis* : Subba Rao and Dey, *Rec. zool. Surv. India, Occ. Paper No.*, 187 : 37.

Material examined : i) 6 exs. Palm beach, Visakhapatnam, Sept. 1965, Coll. K.G.K. Murti; ii) 9 exs., Bheemunipatnam, Visakhapatnam, 12.3.1966, iii) 154 exs. Rocky beach opposite to light house, Vishakapatnam, Coll. A.S. Rajagopal; iv) 3 exs., Bheemunipatnam, Visakhapatnam, 8.4.2000, Coll. Ramakrishna; v) 21 exs. Nizampatnam, Coll. ?; vi) 3 exs., Mahalakshampuram, 17.2.2002, Coll. S. Barua and Party.

Measurements (in mm) :

Length	Width	Height of the aperture
9.95–6.00	8.75–3.40	7.00–2.85

Diagnosis : Shell flattened, thick, pyramidal, crescent shaped area on the base adjacent to columellar callus; sculpture with spiral rows of nodules, one on each spiral whorl, two on the body whorl, additional spiral cord present in the interspaces; bluish gray with white nodules and chocolate columella; aperture dark reddish brown with a narrow yellowish white band on the base of columella.

Distribution : India : Andhra Pradesh, Andaman Islands, Goa, Maharashtra, Tamil Nadu.

Elsewhere : Sri Lanka, Thailand, Malaysia, New Guinea, Philippines, China, Australia.

Subgenus *Granulittorina* Habe and Kosuge, 1966

1966. *Granulittorina* Habe and Kosuge, *Shells of the World in Colour*, 2 : 20, pl. 6, fig.13.

Key to species

Shell more slender; bodywhorl with shouldered appearance in mature individuals;
white semi nodulated marking less prominent

.....*N. (G.) leucostica leucostica* (Philippi)

Shell less slender; bodywhorl without shouldered appearance in mature individuals;
white semi nodulated marking prominent *N. (G.) millegrana* (Philippi)

***Nodilittorina (Granulittorina) leucosticta leucosticta* (Philippi)**

1847. *Littorina leucosticta* Philippi, *Abbild. Besch. Conch.*, 2 : 162, pl. 3, fig. 11.

1970. *Nodilittorina (Granulittorina) leucosticta leucosticta* : Rosewater, *Indo-pacific Mollusca*, 2(11) : 497, pl., 384, figs 1-5.

Material examined : i) 4 exs., Visakhapatnam, 01.07.1981, M 21282/4, Coll. K. Hanumantha Rao.

Measurements (in mm) :

Length	Width	Height of the aperture
9.80	6.80	5.00

Diagnosis : Shell turbate to elongate oval, moderately thick, imperforate; sculpture with low, closely spaced 2-4 spiral cords, usually three on the body whorl and stronger than the rest, axial sculpture irregular, with closely spaced lines of growth; aperture elongate oval; outer lip moderately thick, inner lip strongly produced.

Distribution : India : Andhra Pradesh, Goa, Maharashtra, Tamil Nadu.

Elsewhere : Sri Lanka.

***Nodilittorina (Granulittorina) millegrana* (Philippi)**

1848. *Littorina millegrana* Philippi, *Abbild. Bes. Conch.*, 2 : 65, pl. 7, fig. 15.

2000. *Nodilittorina (Granulittorina) millegranam* : Subba Rao and Dey, *Rec. zool. Surv. India, Occ. Paper No.*, 187 : 37.

Material examined : i) 1 ex., Lawson's Bay, Visakhapatnam, 17.3.1947; ii) 6 exs., Dolphin's Nose, Visakhapatnam, 10.3.66, iii) 50 exs. Rocky beach, opposite lighthouse, Vishakapatnam, coll. A.S. Rajagopal and Party; iv) 5 exs., Vadarevu beach, east of Chirala, 18.4.2000. Coll. S.C. Mitra and party; v) 12 exs., Chinnatapally, Vizianagaram, 02.05.2001; vi) 6 exs., Mahalakshampuram, 1702. S. Barua and Party,

Measurements (in mm) :

Length	Width	Height of the aperture
11.75–4.25	8.00–3.40	5.85–3.10

Diagnosis : Shell small, subglobose, 5–6 whorls, sculpture with raised granulose spiral cords and fine microscopic wavy spiral threads in the interspaces; grayish white, ornamented with reddish brown, flame like axial blotches, columella dark brown.

Distribution : India : Andhra Pradesh, Goa, Maharashtra, Pondicherry, Tamil Nadu;

Elsewhere : Indo-West Pacific; on intertidal rocks.

Superfamily RISSOIDEA

Family ASSIMINEIDAE

Subfamily ASSIMINEINAE

Genus *Assiminea* Fleming, 1828

1828. *Assiminea* Fleming, *Hist. Brit. Anim.*, p. 275.

Assiminea brevicula (Pfeiffer)

1854. *Hydrocena brevicula* Pfeiffer, *Proc. zool. Soc. Lond.*, **1854** : 306.

2000. *Assiminea brevicula* : Subba Rao and Dey, *Rec. zool. Surv. India, Occ. Paper No.*, **187** : 43.

Material examined : i) 6 exs., Krishna estuary, 06.04.1965, M 17619/3, Coll. K.P. Rao;
ii) 3 exs., Kakinada Bay, 17.4.1975, Coll. ?

Measurements (in mm) :

Length	Width	Height of the aperture
7.45–6.65	5.80–4.50	3.50–3.40

Diagnosis : Shell small, thick, globose; suture sharpe, smooth; 6-7 whorls; columellar pillar whitish; operculum corneous, thin, elongate with nucleus far off to one side; bright brick red or yellowish tan.

Distribution : India : Andhra Pradesh, Andaman and Nicobar Islands, Tamil Nadu, West Bengal.

Elsewhere : Myanmar, Thailand, Indonesia, Philippines.

Superfamily CERITHOIDEA

Family PLANAXIDAE

Genus *Planaxis* Lamarck, 1822

1822. *Planaxis* Lamarck, *Hist. Nat. Anim. Sans. Vert.*, **7** : 50.

Type species : *Buccinum sulcatum* Born

Subgenus *Planaxis* s. st.*Planaxis (Planaxis) sulcatus* (Born)

1780. *Buccinum sulcatum* Born, *Testacea Musei Caesanei Vindobonensis*, 258, pl. 10, figs. 3, 6.

2000. *Planaxis sulcatus* : Subba Rao and Dey, *Rec. zool. Surv. India, Occ. Paper No.*, 187 : 45.

Material examined : i) Many exs., Bheemunipatnam, Visakhapatnam, 18.2.47, Coll. ?; ii) Many exs., Visakhapatnam, 10.3.86, iii) 1 ex., Visakhapatnam, 1966, Coll. A. S. Rajagopal and Party.

Measurements (in mm) :

Length	Width	Height of the aperture
21.30–11.80	13.60–7.20	11.10–7.10

Diagnosis : Shell medium, conical, body whorl angular below; aperture narrowly ovate, outer lip with distinct spiral ridges, columellar callus thick; sculpture with strong spiral cords separated by spiral grooves and axial striae; purple brown, with light gray spots or oblique reddish brown stripes.

Distribution : India : Andhra Pradesh, Andaman and Nicobar Islands, Lakshadweep, Maharashtra, Tamil Nadu.

Elsewhere : South Africa, Mauritius, Sri Lanka, Myanmar, Indonesia, Philippines and Australia.

Family CERITHIIDAE

Subfamily CERITHIINAE

Key to the genera

Shell without plaits on columellar callus; siphonal canal not upward *Clypeomorus* Jousseaume

Shell with plaits on columellar callus; siphonal canal upward *Rhinoclavis* Swainson

Genus *Clypeomorus* Jousseaume, 1888

1888. *Clypeomorus* Jousseaume, *Mem. Soc. zool. France*, 1 : 171.

Type species : *Clypeomorus clypeomorus* Jousseaume

Clypeomorus batillariaeformis Habe and Kosuge

1966. *Clypeomorus batillariaeformis* Habe and Kosuge, *Venus*, 24(4) : 328, pl. 29, fig. 13.

2000. *Clypeomorus batillariaeformis* : Subba Rao, *Rec. zool. Surv. India, Occ. Paper No.*, 187 : 48.

Material examined : i) 4 exs., Visakhapatnam, 24.1.1921, Coll. ?; ii) 3 exs, Visakhapatnam, June 1965, Coll. K.G.K. Murti; iii) 2 exs., Rocks opposite Jalaripet huts, Visakhapatnam, 6.3.66, iv) 100 exs., Dolphin's nose, Visakhapatnam, 10.3.66, Coll. A.S. Rajagopal and Party.

Measurements (in mm.) :

Length	Width	Height of the aperture
23.00–14.05	10.20–8.90	9.70–6.00

Diagnosis : Shell small, thick with ten convex whorls; suture indistinct aperture ovate; columella with slight callus, outer lip thick and weakly crenulated; anterior canal short, narrow and slightly reflected; sculpture with nodulose spiral canals, 4–5 on penultimate whorl, 9–12 on body whorl; light cream, siphonal cord with alternating dark brown and white spots; columella and aperture white.

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

Elsewhere : South African coast, Malagasy, Seychelles, Sri Lanka, Myanmar, Thailand, Philippines, Australia.

Genus *Rhinoclavis* Swainson, 1840

1840. *Rhinoclavis* Swainson, *Treatise on Malacology*, pt. 2 : 315.

Types species : *Murex vertagus* Linnaeus.

Subgenus *Rhinoclavis* s. st.

Rhinoclavis (Rhinoclavis) sinensis (Gmelin)

(Pl. II, Figs. 13 & 14)

1791. *Murex sinensis* Gmelin, *Syst. Nat.*, ed. 13 : 3542.

2000. *Rhinoclavis (Rhinoclavis) sinensis* : Subba Rao and Dey, *Rec. zool. Surv. India, Occ. Paper No.*, 187 : 50.

Material examined : i) 23 exs., Lawson's Bay, Visakhapatnam, 14.2.47, Coll. ?; ii) 3 exs., Visakhapatnam, May, 1964, Coll. K.G.K. Murti and Party; iii) 23 exs, near Palm beach, Visakhapatnam, 4.3.66, iii) 2 exs., opposite Jalaripet huts, Visakapatnam, 6.3.66, iv) 4 exs., Rocky beach, Visakhapatnam, 7.3.66, v) 5 exs., Rishikunda, Visakhapatnam, 9.3.66, Coll. A.S. Rajagopal and Party; vi) 1 ex., Waltair (Visakhapatnam), M 15811/2, Coll. B. Prashad.

Measurements (in mm.) :

Length	Width	Height of the aperture
42.40–15.20	16.10–7.55	15.40–6.00

Diagnosis : Shell moderate, solid, heavy; whorls 12-13, angular, suture not distinct; sculpture with spiral rows of nodules and fine spiral striae in between the nodulose spiral cords; the

1st and 2nd row of nodules at the suture are large; aperture smooth outer lip simple, columella calloused, anterior canal long and recurved, posterior canal rudimentary; cream, irregularly spotted and marbled with brown or purple, aperture and columella white.

Distribution : India : Andhra Pradesh, Andaman and Nicobar Islands, Goa, Gujarat, Maharashtra, Lakshadweep, Tamil Nadu.

Elsewhere : Indo-Pacific.

Family POTAMIDAE

Subfamily POTAMIDINAE

Key to the genera

Shell conical, large, whorls more than ten, spiral ridges without tubercles, transpiral ridges absent *Telescopium* Montfort

Shell slender, medium, whorls not more than ten, spiral ridges with tubercles from transpiral ridges *Cerithidea* Swainson

Genus *Cerithidea* Swainson, 1840

1840. *Cerithidea* Swainson *Treat. Malac.*, 1840 : 203.

Type species : *Murex decollata* Linnaeus.

Subgenus *Cerithidea* S.st.

Key to the species

1. Shell robust; whorls less than 10; outer lip flattened; spiral ridge not strongly tuberculate *C. (C.) obtusa* (Lamarck)
- Shell narrow, slender; whorls more than 10; outer lip not so flattened; spiral ridge strongly tuberculate (2)
2. Outer lip thick and expanded broadly *C. (C.) cingulata* (Gmelin)
- Outer lip reflected over the sinus, outer and inner lip meet posterior beyond the the shell plane *C. (C.) alata* (Philippi)

Cerithidea (Cerithidea) alata (Philippi)

1847. *Cerithedia alata* Philippi, *Abbild. Bes. Conch.*, 3 : 17.

Material examined : i) 2 exs. Bheemunipatnam, Visakhapatnam, M 20800/4 & M 20805/4, ii) 1 ex., Visakhapatnam, M. 20806/4; iii) 2 exs., Bheemunipatnam, Visakhapatnam, 11.1.1978, Coll. G.G. Mani; iv) 4 exs., Masulitippa canal, Gautami River, 29.11.1964, Coll. N.V. Subba Rao and Party.

Measurements (in mm) :

Length	Width	Height of the aperture
30.00–21.90	9.50–8.95	11.10–10.25

Diagnosis : Shell upto 25 mm. length, thick, elongate with 10-12 flat sided whorls; aperture elongate ovate, outer lip and inner lip meet at a point, siphonal sinus, hollow and short, outer lip reflects over the sinus; sculpture with rounded, somewhat rectangular, close set axial nodules, 3 in each whorl, nodules of the body whorl coalesce together forming broad, flattened raised interspaces separated by shallow grooves.

Distribution : India : Andhra Pradesh, Andaman Islands, Tamil Nadu, West Bengal.

Elsewhere : Indian Ocean.

Cerithidea (Cerithidea) obtusa (Lamarck)

1822. *Cerithium obtusum* Lamarck, *Hist. Nat. Anim. Sans. Vert.*, 7 : 71.

Material examined : i) 1 ex., Kakinada Bay M 21270/4; ii) 3 exs., Kakinada, 29.5.64, iii) 49 exs., Uppateru, Kakinada, 13.12.64, iv) 5 exs., Kakinada, 20.11.64, v) 1 ex., Masulitippa canal, Balusutippa, 29.11.64, Coll. N.V. Subba Rao and Party; vi) 17 exs., Visakhapatnam, 5.3.66, Coll. A.S. Rajagopal and Party; vii) 1 ex. Krishnapatnam estuary, 15.2.02, Coll. S. Barua and Party.

Measurements (in mm) :

Length	Width	Height of the aperture
49.80–30.50	28.40–21.65	18.90–14.70

Diagnosis : Shell upto 50 mm, elongate and light weight, whorls 7-8, apex truncate; Sculpture with prominent spiral cords, nodulated and slender axial ribs and short axial threads between cords; columella concave and smooth, siphonal canal short; light or dark brown, occasionally with a lighter band on whorls, aperture light brown, banded with dark brown.

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

Elsewhere : Indo-West Pacific.

Subgenus *Cerithideopsilla* Thiele, 1929

1929. *Cerithideopsilla* Thiele, *Handb. Syst. Wiecht.*, 1 : 206.

Cerithidea (Cerithideopsilla) cingulata (Gmelin)

1791. *Murex cingulata* Gmelin, *Syst. Nat.*, ed. 3 : 3561.

2000. *Cerithidea (Cerithideopsilla) cingulata* : Subba Rao and Dey, *Rec. zool. Surv. India, Occ. Paper No.*, 187 : 52.

Material examined : i) 1 ex. Krishna estuary, M 176/8/3; ii) 8 exs., Visakhapatnam, June 1926, Coll. H. S. Rao and G. Vargish; iii) 25 exs. Shore collection, Visakhapatnam 17.1.29, iv) 55 exs., Visakhapatnam Feb., 1947, v) 9 exs., Bheemunipatnam, Visakhapatnam, 20.2.47, vi) 2 exs., Visakhapatnam, Coll. ?; vii) 52 exs., Near lighthouse, Kakinada, 19.11.64, viii) 3 exs., near Eatimoga village, Kakinada 20.11.64, ix) 15 exs., Uppateru village, Kakinada, 21.11.64, x) 99 exs. Masulitippa canal, Gautomi River, Balusutippa, 29.11.64, xi) 3 exs., Bandar Canal, Machilipatnam, Visakhapatnam, 6.12.64, xii) 4 exs., Machilipatnam, Visakhapatnam, 7.12.64, Coll. N.V. Subba Rao and Party; xiii) 56 exs., Bheemunipatnam, Visakhapatnam, 17.10.1978, M 20821/4, Coll. K.V. Surya Rao; xiv) 16 exs, Bandar Port area, Machilipatnam, Visakhapatnam, 16.4.2000, Coll. S.C. Mitra and Party; xv) 20 exs., Kishnapatnam estuary, Nellore, 15.2.2002, Coll. S. Barua and Party.

Measurements (in mm) :

Length	Width	Height of the aperture
30.00–8.55	11.40–4.25	9.40–3.10

Diagnosis : Shell moderate size, elongate, thick, with flat sided whorls; sutures deeply incised; aperture oval, columella almost straight, outer lip thick and expanded broadly; sculpture with angulate axial ribs which are divided into nodules by 3 deep spiral grooves; labial palp acute and pointed; dark brown, ornamented with whitish line just above sutures, aperture white, lined with brown, periostracum opaque.

Distribution : India, Andhra Pradesh, Andaman Islands, Goa, Gujarat, Kerala, Maharashtra, Orissa, Tamil Nadu, West Bengal.

Elsewhere : Indo-Pacific.

Genus *Telescopium* Montfort, 1810

1810. *Telescopium* Montfort, *Conch. Syst.*, 2 : 438

Type species : *Trochus telescopium* Linnaeus.

Telescopium telescopium (Linnaeus)

1750. *Trochus telescopium* Linnaeus, *Syst. Nat.*, ed. 10 : 760.

2000. *Telescopium telescopium* : Subba Rao and Dey, *Rec. zool. Surv. India, Occ. Paper No.* 187 : 53.

Material examined : i) 12 exs, Visakhapatnam, 18.1.1916, M 21072/4, Coll. Rev. H. Hosten; ii) 14 exs., Bheemunipatnam, Visakhapatnam, 18.2.47, Coll. ? ; iii) 2 exs. Kakinada, 14.7.63, Coll. A. Daniel and Party; iv) 2 exs., Gautami River, east of Bheemunipatnam, Visakhapatnam, 29.11.64, v) 5 exs., Manginipudi, 7 kms from Machilipatnam, Visakhapatnam, 5.12.64, vi) 14 exs., Uppateru canal, Kakinada, 13.12.64, Coll. N.V. Subba Rao and Party; vii) 1 ex., Krishnapatnam estuary, Nellore, 15.2.02, Coll. S. Barua and Party.

Measurements (in mm) :

Length	Width	Height of the aperture
94.75–52.4	40.55–23.00	20.00–11.50

Diagnosis : Shell large, elevated and strongly conical, heavy, thick with 13-16 whorls; suture not distinct; sculpture with 3 larger and 1 narrow, flat spiral cords on whorls, base with concentric cords and a deep channel around columellar pillar, columella twisted and channeled, labial lip accurately curved towards the siphonal canal; dark brown, columella light brown.

Distribution : India : Andhra Pradesh, Andaman and Nicobar Islands; Gujarat, Kerala; Pondicherry, Orissa, Tamil Nadu, West Bengal.

Elsewhere : Malagasy, Sri Lanka, Myanmar, Thailand, Philippines, North Australia.

Family TURRITELLIDAE

Subfamily TURRITELLINAE

Genus *Turritella* Lamarck, 1799

1799. *Turritella* Lamarck, *Mem. Soc. Hist. Nat. Paris*, p. 74.

Type species : *Turbo duplicatus* Linnaeus.

Key to the species

1. Whorls less than 20 (2)
- Whorls more than 20 *T. columnaris* Kiener
2. Shell sharply attenuated; whorls sharply one keeled in the middle .. *T. attenuata* Reeve
- Shell stoutly turbinated; whorls one keel and afterward 2-3 conspicuously elevated small keels *T. duplicata* (Linnaeus)

Turritella attenuata Reeve

(Pl. II, Figs. 15 & 16)

1849. *Turritella attenuata* Reeve, *Conch. Icon.*, 5 : *Turritella* sp. No. 4, pl. 1, fig. 4.

2004. *Turritella attenuata* : Subba Rao, *Rec. zool. Surv. India, Occ. Paper No.*, 192 : 140, pl. 23, fig. 1.

Material examined : i) 2 exs. Rocky coast, Visakhapatnam, 5.3.1966, Coll. A.S. Rajagopal and Party; ii) 1 ex., Maypadu beach, Nellore, 16.2.2002, Coll. S. Barua and Party.

Measurements (in mm.) :

Length	Width	Height of the aperture
90.00–69.00	19.00–16.10	15.00–12.65

Diagnosis : Shell large, elongate and attenuate with 14-15 rounded whorls; aperture sinuate; sculpture with raised spiral striation almost equal in earlier whorls (6-8) and later whorls the middle striations became stronger and other weak and obsolete; whorls strongly keeled in the middle, with sloping upper part and curved lower part; light brownish or pinkish.

Distribution : India : Andhra Pradesh, Orissa, Pondicherry, Tamil Nadu, West Bengal.

Elsewhere : Indonesia.

***Turritella columnaris* Kiener**

1840. *Turritella columnaris* Kiener, *Icon. Viv.*, **10** : 10, pl. 7, fig. 1.

2003. *Turritella columnaris* : Subba Rao, *Rec. zool. Surv. India, Occ. Paper No.*, **192** : 140, Pl. 23, figs., 2 & 3.

Material examined : i) 2 exs. (Broken), Kakinada beach, 12.4.2000, Coll. Ramakrishna and Party.

Measurements (in mm) :

Length	Width	Height of the aperture
63.70 +	14.80	—

Diagnosis : Shell large, elongate, lanceolately turreted with 22 to 28 whorls; suture elevated and not much inflated, sometimes flattened in the middle; sculpture with two strong spiral striations and 10 fine spiral ridges on the earlier 10-12 whorls and gradually the strong spiral striations obsolete and on the later whorls they are almost equal; yellowish brown with vertical brown strips and blotches.

Distribution : India : Andhra Pradesh, Orissa, Pondicherry, Tamil Nadu.

Elsewhere : Sri Lanka, Myanmar, California.

***Turritella duplicata* (Linnaeus)**
(Pl. II, Figs. 17 & 18)

1750. *Turbo duplicata* Linnaeus, *Syst. Nat.*, ed. **12** : 1239.

2000. *Turritella duplicata* : Subba Rao and Dey, *Rec. zool. Surv. India, Occ. Paper No.*, **187** : 53.

Material examined : i) 7 exs. Bheemunipatnam, Visakhapatnam, 20.2.47, ii) 2 exs. Dammula Palem, Kakinada, 23.02.1955, Coll.?, iii) 4 exs., Visakhapatnam coast, 5.3.1966, Coll. A. S. Rajagopal and Party; iv) 2 exs. Kakinada Bay, 12.4.2000, Coll. Ramakrishna and Party; v) 1 ex., Vadarevu, Chirala, 18.04.2000, vi) 2 exs. Suryalanka, Chirala, 19.4.2000, Coll. S.C. Mitra and Party; vii) 2 exs. Kottapatnam, Ongole, 12.2.02, viii) 1 ex., Ethamukkala beach, Ongole, 13.2.2002, ix) 1 ex., Ravanappaslov, 22.2.2002, Coll. S. Barua and Party.

Measurements (in mm) :

Length	Width	Height of the aperture
115.00–62.10	24.25–19.35	20.20–11.25

Diagnosis : Shell large, elongated with 18-20 whorls, earlier whorls convex, after 6-7 earlier whorls, the whorls central ridges becomes elevated into strong keel, which is disappear on the body whorl and the penultimate whorl; whorls sharply angular, pale cream brown.

Distribution : India : Andhra Pradesh, Andaman Islands, Goa, Maharashtra, Orissa, Pondicherry, Tamil Nadu.

Elsewhere : Myanmar, Sri Lanka.

Family SILIQUARIIDAE

Genus *Siliquaria* Bruguiere, 1789

1789. *Siliquaria* Bruguiere, *Ency. Meth. Vers.*, (1) : 15.

Subgenus *Tenagodus* Guettard, 1774

1774. *Tenagodus* Guettard, *Man. Diff. Sci.*, 3 : 128.

Siliquaria (Tenagodus) tostus (Moerch)

1860. *Tenagodus tostus* Moerch, *Proc. zool. Soc. Lond.*, 1860 : 405.

2003. *Tenagodus tostus* : Subba Rao, *Rec. zool. Surv. India, Occ. Paper No.*, 192 : 142, pl. 24, figs. 2 & 3.

Material examined : i) 1 ex., Visakhapatnam, March, 2002, Coll. P. Ganesh.

Measurements : Shell is in broken condition and hence measurements could not be given.

Diagnosis : Shell narrow, elongate, apex coil sculpture; with fine spiral ridges and denticulate ridges on the either side of siphonal slit.

Distribution : India : Andhra Pradesh, Orissa, Pondicherry, Tamil Nadu, West Bengal;

Elsewhere : Philippines.

Subfamily STROMBOIDEA

Family STROMBIDAE

Key to genera

1. Shell with elongated spire (equal or more than the body whorl); siphonal canal long *Tibia* Roeding
- Shell with elongated spire (less than the body whorl); siphonal canal short (2)

2. Outer lip winged, callus not distinct or not running the total length of the body whorl ***Strombus*** Linnaeus
- Outer lip not winged, callus on the inner lip running the total length of the body whorl ***Rimella*** Agassiz

Genus ***Strombus*** Linnaeus, 1758

1758. *Strombus* Linnaeus, *Syst. Nat.*, ed. 10 : 742.

Key to the species

1. Stromboid notch weak or shallow *S. (Laevistrombus) canarium* Linnaeus
- Stromboid notch strong and deep (2)
2. Posterior canal bounded by a swollen white callus on the body wall side; posterior corner of outer lip not protruding, inner edge of outer lip white, a broad violet or dark purple axial band crossed by numerous irregular whitish spiral lirae *S. (Gibberulus) gibberulus gibberulus* Linnaeus
- Posterior canal not bounded by any white callus on the body wall side; posterior corner of outer lip not protrudes very prominently, inner surface of outer lip smooth, polished, enamel white with golden tint *S. (Euprotomus) listeri* Gray

Subgenus ***Euprotomus*** Gill, 1870

1870. *Euprotomus* Gill, *Am. J. Conch.*, 5(3) : 131.

Strombus (Euprotomus) listeri Gray

1853. *Strombus listeri* Gray, *Ann. Mag. Nat. Hist.*, (2)10 : 429.

2003. *Stromus (Doxander) listeri* : Subba Rao, *Rec. zool. Surv. India, Occ. Paper No.*, 192 : 147; pl. 26, figs. 394.

Material examined : i) 1 ex. Visakhapatnam, M 22246/4; ii) 2 exs., Visakhapatnam, M 23838/5.

Measurements (in mm) :

Length	Width	Height of the aperture
121.10–115.70	52.80–48.50	75.40–63.30

Diagnosis : Shell large, thin but strong; spire high, pointed; body whorl long, narrow; outer lip quadrangularly expanded with thickened edge almost parallel to the columella; anterior canal well developed, stromoid notch u shaped and deep; sculpture with many axial ribs and fine spiral cords in between on the early whorls; white and brown covered with chestnut undulating axial stries; aperture white, columella and interior tinged with brown.

Distribution : India : Andhra Pradesh, Pondicherry, Tamil Nadu.

Elsewhere : Gulf of Oman, Sri Lanka, Myanmar, Thailand.

Subgenus *Gibberulus* Jousseaume, 1888

1888. *Gibberulus* Jousseaume, *Mem. Soc. zool. France*, 1 : 174.

Type species : *Strombus gibberulus* Linnaeus.

Strombus (Gibberulus) gibberulus gibberulus Linnaeus
(Pl. II, Figs. 19 & 20)

1758. *Strombus gibberulus* Linnaeus, *Syst. Nat.*, ed. 10 : 744.

2000. *Strombus (Gibberulus) gibberulus gibberulus* : Subba Rao and Dey, *Rec. zool. Surv. India, Occ. Paper No.*, 187 : 60.

Material examined : i) 2 exs., Palm beach, Waltair (Visakhapatnam), 04.03.1966, Coll. A.S. Rajagopal and Party.

Measurements (in mm) :

Length	Width	Height of the aperture
51.45–50.0	12.10–20.00	37.50–37.10

Diagnosis : Shell moderate, solid, fusiform, spire moderately raised, attenuated towards the base with distorted whorls, penultimate whorl expanded bulging over suture dorsally on the bodywhorl; columella smooth; aperture lirate; variable in colour, yellowish or mauve brown, ornamented with 4 to 5 white lines on the last whorl, aperture white, yellow or bright purple, columella white or purple.

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

Subgenus *Laevistrombus* Kira, 1955

1955. *Laevistrombus* Kira, *Coloured Illustr. of the shells of Japan, Osaka, ed.* 1 : 31.

Strombus (Laevistrombus) canarium Linnaeus
(Pl. II, Figs. 21 & 22)

1758. *Strombus canarium* Linnaeus, *Syst. Nat.*, ed. 10 : 745.

2000. *Strombus (Laevistrombus) canarium* : Subba Rao and Dey, *Rec. zool. Surv. India, Occ. Paper No.*, 187 : 55.

Material examined : i) 6 exs., Visakhapatnam, 17.01.1916, Coll. H. Hosten; ii) 8 exs., Visakhapatnam, 21.01.1929, iii) 4 exs., Visakhapatnam, 13.02. 1947; iv) 1 ex. shore collection, Visakhapatnam, 18.01.1929, Coll.?.

Measurements (in mm) :

Length	Width	Height of the aperture
49.80–32.95	35.15–23.80	38.30–21.40

Diagnosis : Shell large, solid, spire short and smooth; early whorls finely axially ribbed and striae, last 2 to 3 whorls smooth; body whorl swollen on the periphery; aperture smooth, columella swollen, calloused and smooth, stromboid notch shallow, columella swollen, gray, ornamented with either brown or white zigzag white lines.

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

Elsewhere : Sri Lanka, Myanmar, Indonesia, Australia, Japan.

Genus *Rimella* Agassiz, 1840

1840. *Rimella* Agassiz in Sowerby, *Min. Conch. Ed. Germ.* : 137.

Subgenus *Varicospira* Eames, 1952

1952. *Varicospira* Eames, *Phil. Trans. Roy. Soc.*, **2368** : 70.

Rimella (Varicospira) cancellata (Lamarck)

1836. *Strombus cancellatus* Lamarck, *Hist. nat. Anim. Sans. Vert.*, **9** : 710.

2000. *Varicospira cancellata* : Subba Rao and Dey, *Rec. zool. Surv. India, Occ. Paper No.*, **187** : 62.

Material examined : i) 1 ex., Nagapatnam, Andhra Pradesh, 2002, Coll. P. Ganesh.

Measurements (in mm) :

Length	Width	Height of the aperture
17.20	6.80	8.85

Diagnosis : Shell small, solid, fusiform; spire acuminate, outer lip thick, crenulated, flanked by a deep furrow, extending towards apex covering 2-3 spire whorls; columella with callus; aperture lirate, siphonal canals short; sculpture with axial ribs connected by pitted, spiral grooves giving cancellate appearance; pale yellowish brown, outer lip edge and varices red brown, columella and aperture white.

Distribution : India : Andhra Pradesh, Andaman and Nicobar Islands;

Elsewhere : Indo-Pacific.

Genus *Tibia* Roeding, 1798

1798. *Tibia* Roeding, *Mus. Bolten*, **2** : 123.

***Tibia delicatula* (Nevill)**
(Pl. II, Figs. 23 & 24)

1881. *Rostellaria delicatula* Nevill, *J. Asiat. Soc. Beng.*, **50**(2) : 262.

2003. *Tibia delicatula* : Subba Rao, *Rec. zool. Surv. India, Occ. Paper No.*, **192** : 151, pl. 25, fig. 8.

Material examined : i) 2 exs., Visakhapatnam, Coll. ?; ii) 1 ex., Vadarevu, Chirala, 18.04.2000, Coll. S.C. Mitra and Party; iii) 2 exs., Kottapatnam, Ongole, 12.02.2002, Coll. S. Barua and Party.

Measurements (in mm) :

Length	Width	Height of the aperture
80.90–54.20	30.95–22.00	29.45–20.00

Diagnosis : Shell moderately large, delicate; aperture oval, anterior canal short, posterior canal with a small groove; whorls ten, convex; columella with thick callus, outer lip thickened with 4 to 5 short digitate processes, posterior smooth, post nuclear whorls with inconspicuous regular striations; pale ochre brown, body whorls with 4-5 white bands.

Distribution : India : Andhra Pradesh, Pondicherry.

Elsewhere : Indian Ocean.

Superfamily CREPIDULOIDEA

Family CREPIDULIDAE

Genus *Crepidula* Lamarck, 1799

1799. *Crepidula* Lamarck, *Mem. Soc. Hist. nat. Paris*, **7** : 78.

Type species : *Patella fornicata* Linnaeus.

***Crepidula walshi* Herrmannsen**

1859. *Crepidula walshi* Herrmannsen in Reeve, *Conch. Icon*, **9** : *Crepidula* pl. 3, fig. 17.

2003. *Crucibulum walshi* : Subba Rao, *Rec. zool. Surv. India, Occ. Paper No.*, **192** : 159, pl. 28, figs., 9, 10.

Material examined : i) 2 exs., Waltair (Visakhapatnam), 27.01.1978, Coll. A. S. Rajagopal and H. P. Mookherjee.

Measurements (in mm) :

Length	Width
8.20	18.50

Diagnosis : Shell small, variable shape, flattened, elongately ovate; spire obsolete, margin irregular, internal shelf flattened and partly covered the aperture, surface with fine concentric striae and coarse growth lines.

Distribution : India : Andhra Pradesh, Andaman and Nicobar Islands, Gujarat, Maharashtra, Orissa, Tamil Nadu.

Elsewhere : Persian Gulf.

Genus *Crucibulum* Schumacher, 1817

1817. *Crucibulum* Schumacher, *Nouv. Gen.*, p. 182

Crucibulum extincitorium (Lamarck)

(Pl. III, Figs. 25 & 26)

1836. *Calyptrea extincitorium* Lamarck, *Hist. Nat. Anim. Sans. Vert.*, 7 : 622.

2003. *Crucibulum extincitorium* : Subba Rao, *Rec. zool. Surv. India, Occ. Paper No.*, 192 : 158, pl. 29, fig. 8, 9.

Material examined : i) 1 ex., Kakinada Bay, 17.04.1975, Coll. N.V. Subba Rao and Party; ii) 2 exs., Kakinada Bay, 12.04.2000. Coll. Ramakrishna and Party; iii) 2 exs., Vadarevu, Chirala, 18.04.2000, iv) 2 exs., Suryalanka, Chirala, 19.04.2000, Coll. S.C. Mitra and Party; v) 1 ex., Kottapatnam, 12.02.2002, vi) 2 exs., Ethamukkala, Ongole, 13.02.2002; vii) 2 exs., Krishnapatnam, Nellore, 15.02.2002, viii) 2 exs., Mahalakshmiapuram, Nellore, 17.02.2002, ix) 1 ex., Ravanappasalov, 22.02.2002, x) 2 exs., Tuplipalem, 01.03.2002, Coll. S. Barua and Party.

Measurements (in mm) :

Length	Width
14.30–7.00	22.50–10.80

Diagnosis : Shell small, variable shape, orbicular to squarely oval, conical, flat or elevated apex, recurved and central; internal shelf not flattened but folded and compressed; surface sculpture with coarse spiral striae; white or pale brown with or without pale pink radiating lines and chestnut spots.

Distribution : India : Andhra Pradesh, Andaman and Nicobar Islands, Karnataka, Orissa, Tamil Nadu.

Elsewhere : Persian Gulf.

Superfamily XENOPHOROIDEA

Family XENOPHORIDAE

Genus *Xenophora* Fischer von Waldheim, 1807

1807. *Xenophora* Fischer von Waldheim, *Mus. Demidoff. Moscou.*, 3 : 213.

Type species : *Xenophora laevigata* Fischer Von Waldheim.

Subgenus *Stellaria* (Schmidt MS) Moeller, 18321832. *Stellaria* Moeller, *Isis Jena* (1832) : 130.Type species : *Trochus solaris* Lamarck by Monotypy.*Xenophora (Stellaria) solaris* (Linnaeus)

(Pl. III, Figs. 27 & 28)

1764. *Trochus solaris* Linnaeus, *Syst. Nat.*, ed. 10 : 645.2000. *Xenophora (Stellaria) solaris* : Subba Rao and Dey, *Rec. zool. Surv. India, Occ. Paper No.*, 187 : 66.*Material examined* : i) 1 ex., Ramathirtham beach, Vetapalem, Chirala, 21.4.2000, Coll. S.C. Mitra and Party; ii) 2 exs., Maypadu beach, Nellore, 16.2.2002, Coll. S. Barua and Party.*Measurements* (in mm) :

Height	Width	Height of the aperture
26.70–18.05	59.40–43.70	36.20–26.00

Diagnosis : Shell medium, orbicular, thin, deeply conoid; spire low; whorls convex with hollow blunt protruding spines at the periphery obscuring the suture; aperture oval, base almost flat; umbilicus deep, broad, with string wavy, uneven nodulose; light brown or shiny dark brown.*Distribution* : India : Andhra Pradesh, Andaman Islands, Goa, Gujarat, Kerala, Maharashtra, Orissa, Tamil Nadu, West Bengal.*Elsewhere* : Red Sea, Gulf of Aden, Gulf of Oman, Pakistan Coast, Maldives, Myanmar Thailand, Malaysia, Indonesia, Philippines.

Superfamily CYPRAEDIDEA

Family CYPRAEIDAE

Genus *Cypraea* Linnaeus, 17581758. *Cypraea* Linnaeus, *Syst. Nat.*, ed. 10 : 718.

Key to the species

1. Shell with broad pentagonal outline; presence of curious nodules ... *C. moneta* Linnaeus
 - Shell without broad pentagonal outline; absence of curious nodules (2)
2. Shell with prominent lipped margin and producing extremities *C. arabica* Linnaeus
 - Shell without prominent lipped margin and not producing extremities (3)
3. Shell with lipped pitted margin *C. erosa* Linnaeus
 - Shell without lipped pitted margin (4)

4. Shell pear shape; margin poorly developed but distinctly pitted *C. lamarckii* Gray
 – Shell rounded ovate or elongated ovate; margin without distinct pits (5)
5. Dorsum greenish-straw colour with three obscure bands fringed with irregular brown spots; margins whitish with purple brown spots *C. pallida* Gray
 – Dorsum orange brown to brown with small white spots and dark brown spots; margin creamy *C. ocellata* Linnaeus

***Cypraea arabica* Linnaeus**
 (Pl. III, Figs. 29 & 30)

1758. *Cypraea arabica* Linnaeus, *Syst. Nat.*, ed. 10 : 718.

2000. *Cypraea arabica* : Subba Rao and Dey, *Rec. zool. Surv. India, Occ. Paper No.*, 187 : 67.

Material examined : i) 1 ex., Waltair (Visakhapatnam), 12.02.1945, M 15907/2, Coll. S.W. Kemp; ii) 2 exs, Visakhapatnam, 06.03.1966. iii) 4 exs, Rishikunda, Visakhapatnam, 09.03.1966, iv) 1 ex., Bheemunipatnam, Visakhapatnam, Coll. A.S. Rajagopal and Party; v) 2 exs., Waltair (Visakhapatnam), M 19386/3, Coll. ?.

Measurements (in mm) :

Length	Width
63.35–41.25	36.75–26.60

Diagnosis : Shell medium, heavy, solid, subcylindrical, broad with flattened base; dorsum ornamented with hieroglyphic pattern of axial brown lines, interrupted by irregular lacunae; dorsal sulcus plain; sides angulated and spotted; cream to gray, teeth chestnut; labial teeth extend 1/3rd towards margin, columellar teeth shorter.

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

Elsewhere : Indo-Pacific.

***Cypraea caputserpentis* Linnaeus**

1758. *Cypraea caputserpentis* Linnaeus, *Syst. Nat.*, 10 : 720.

2000. *Cypraea caputserpentis* : Subba Rao and Dey, *Rec. zool. Surv. India, Occ. Paper No.*, 187 : 68.

Material examined : i) 1 ex., Visakhapatnam, M 18168/3, F. A. Schilder.

Measurements (in mm) :

Length	Width
35.10	26.00

Diagnosis : Shell triangularly ovate slightly gibbous at the dorsum, central oval area adorned with numerous unequal white specks and reticulate markings and bounded on the sides, margin thickened and expanded on the other sides and distinctly angular.

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

Elsewhere : East Africa to Polynesia and Hawaiian Islands.

***Cypraea erosa* Linnaeus**

(Pl. III, Figs. 31 & 32)

1758. *Cypraea erosa* Linnaeus, *Syst. Nat.*, ed. 10 : 723.

2000. *Cypraea erosa* : Subba Rao and Dey, *Rec. zool. Surv. India, Occ. Paper No.*, 187 : 69.

Material examined : i) 1 ex., Visakhapatnam, 20.02.1887, Coll. ?; ii) 2 exs., Visakhapatnam, 05.03.66, Coll. A.S. Rajagopal and Party.

Measurements (in mm) :

Length	Width
36.80–31.0	23.00–21.40

Diagnosis : Shell medium, solid, ovate and elongate; dorsum fawn to olive brown, decorated with small white specks and brown ocellated spots; sides with rectangular dark blotches; teeth large and strong, occasionally streaked with brown; aperture mostly dilated in front, but slightly posteriorly curved; inner lip produced bluntly.

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

Elsewhere : Persian Gulf, Malagassy, Mauritius, Reunion, Sri Lanka, Myanmar, Indonesia : Java, Sumatra; Philippines, New Caledonia, Japan, Australia.

***Cypraea lamarckii* Gray**

(Pl. III, Figs. 33 & 34)

1825. *Cypraea lamarckii* Gray, *Zool. J.*, 1 : 506.

2000. *Cypraea lamarckii*, Subba Rao and Dey, *Rec. zool. Surv. India, Occ. Paper No.*, 187 : 71.

Material examined : i) 8 exs., Bheemunipatnam, Visakhapatnam, 12.03.1966, Coll. A.S. Rajagopal and Party.

Measurements (in mm) :

Length	Width
27.30–21.30	18.75–13.90

Diagnosis : Shell medium, solid, polished, dorsum yellowish brown to olive brown, decorated

with small white specks and brownish spots, sides with brownish, ornamented with irregular chestnut or black rounded irregular spots; teeth strong short; labial teeth well developed.

Distribution : India : Andhra Pradesh, Andaman Islands, Lakshadweep, Maharashtra.

Elsewhere : Mauritius, Malagasy, Zanzibar, Persian Gulf, Maldives, Indonesia : Molucca; Philippines, New Caledonia.

Cypraea moneta Linnaeus

1758. *Cypraea moneta* Linnaeus, *Syst. Nat.*, ed. 10 : 723.

2000. *Cypraea moneta*: Subba Rao and Dey, *Rec. zool. Surv. India, Occ. Paper No.*, 187 : 72.

Material examined : i) 1 ex. Jalaripet, Visakhapatnam, 06.03.66, Coll. A.S. Rajagopal and Party.

Measurements (in mm) :

Length	Width
21.30	16.70

Diagnosis : Shell small, strong, solid, highly polished and enameled, deltoidal or pentagonal owing to the presence of curious nodules, dorsum yellow or greyish white, sometimes with pale bands and annular ring; sides angulated, thickened; teeth short, coarse, knotted at ends.

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

Elsewhere : Indo Pacific.

Cypraea ocellata Linnaeus

1758. *Cypraea ocellata* Linnaeus, *Syst. Nat.*, 10 : 724.

2000. *Cypraea ocellata* : Subba Rao and Dey, *Rec. zool. Surv. India, Occ. Paper No.*, 187 : 73.

Material examined : i) 4 exs., Bheemunipatnam, Visakhapatnam, M 18225/3, 27.01.1953, ii) 3 exs., Visakhapatnam, 28.01.1953, M 18239/3, Coll. H.C. Ray; iii) 7 exs., Bheemunipatnam, Visakhapatnam, 08.07.1963, iv) 2 exs. Gautami river, Nallapalli, Kakinada, 17.07.1963, Coll. A. Daniel and Party; v) 1 ex., Nizampatnam, 13.12.1964, vi) 2 exs. Visakhapatnam, 20.02.1987, Coll. N. V. Subba Rao and Party; vii) 15 exs., Visakhapatnam, 06.03.1966, viii) 10 exs. Bheemunipatnam, Visakhapatnam, 12.03.1966, Coll. A. S. Rajagopal and Party; ix) 1 ex., Vishakhapatnam, 20.02.1987, Coll. ?; x) 1 ex., Krishnapatnam sea beach, Nellore, 15.02.2002, xi) 9 exs., Bheemunipatnam, Visakhapatnam, 10.04.2002, Coll. S. Barua and Party; xii) 2 exs., Lawaons Bay, Waltair (Visakhapatnam), Coll. G. Ramakrishna.

Measurements (in mm) :

Length	Width
31.80–21.25	22.16–15.60

Diagnosis : Shell small to medium, ovate or deltoidal, dorsum rich yellow ochre or bright brick red, profusely sprinkled with numerous small white rounded spots frequently ocellated or pupilled with black or dark brown few ocellated spots; sides thickened, expanded; teeth strong, equal, distantly placed; aperture interior purplish.

Distribution : India : Andhra Pradesh, Andaman Islands, Gujarat, Kerala, Maharashtra, Tamil Nadu.

Elsewhere : Persian Gulf, Mauritius, Seychelles, Zanzibar, Persian Gulf, Sri Lanka, Indonesia, China, Japan.

***Cypraea pallida* Gray**
(Pl. III, Figs. 35 & 36)

1824. *Cypraea pallida* Gray, *Zool. J.*, 1 : 387.

2000. *Cypraea pallida* : Subba Rao and Dey, *Rec. zool. Surv. India, Occ. Paper No.*, 187 : 73.

Material examined : i) 2 exs., Bheemunipatnam, Visakhapatnam, 19.02.1947, M 18692/3, ii) 1 ex., Lawson Bay, Visakhapatnam, Feb. 1947, M 18691/3, iii) 2 exs., Visakhapatnam, 28.01.1953, M 18690/3, Coll. H.C. Ray; iv) 2 exs., Visakhapatnam, 20.02.1987, Coll. N. V. Subba Rao and Party.

Measurements (in mm) :

Length	Width
27.20–26.10	17.10–17.00

Diagnosis : Shell small, ovate or pyriform, dorsum greenish-straw coloured with three obscure bands, profusely freckled with irregular fulvous brown dots, pointed with brown or purple brown, conspicuous spots, whitish with purple brown spots here and there; base white, columellar teeth small.

Distribution : India : Andhra Pradesh, Andaman Islands, Maharashtra, Tamil Nadu.

Elsewhere : Persian Gulf, China, Japan, Australia, New Caledonia.

Family OVULIDAE

Subfamily OVULINAE

Genus ***Pseudosimnia*** Schilder, 1927

1927. *Pseudosimnia* Schilder, *Arch. Natg. Berlin*, 91A : 115.

Subgenus ***Diminovula*** Iredale, 1930

1930. *Diminovula* Iredale, *Rec. Aust. Mus.*, 18(4) : 222.

***Pseudosimnia (Diminovula) fructicum* (Reeve)**

1865. *Ovulum fructicum* Adams MS Reeve in, *Conch. Icon.*, 5 : *Ovulum* sp. no. 16, figs. 16 a & b.

Material examined : i) 1 ex., Visakhapatnam, 2002, Coll. P. Ganesh.

Measurements (in mm) :

Length	Width	Length of the aperture
5.00	3.15	4.95

Diagnosis : Shell pyriformly ovate, smooth, lip thick, ventricose, extremities roundately emarginate; columellar callus ridged above and below, strongly plaited; flesh colour broadly banded with pinkish.

Distribution : India : Andhra Pradesh.

Elsewhere : Indonesia : Moluccas.

Genus *Volva* Roeding, 1798

1798. *Volva*, Roeding, *Mus. Bolten.*, p. 326.

Volva sowerbyana Weinkauff

1881. *Volva sowerbyana* Weinkauff in Kuster, *Conch. Cab.*, pp. 190, 202.

Material examined : i) 1 ex., Kakinada Bay, 17.04.1975, Coll. ?.

Measurements (in mm) :

Length	Width	Height of the aperture
20.90	6.10	20.80

Diagnosis : Shell small, fusiform, extremities provided into short and slender canal, outer lip convex, thick and smooth, columella with about 20 oblique striae and posterior rib; dorsum with numerous transverse striae; light flesh pink with an obscure cream band in the centre.

Distribution : India : Andhra Pradesh, Maharashtra.

Elsewhere : Indo-West Pacific.

Superfamily NATICOIDEA

Family NATICIDAE

Key to the subfamilies

1. Shell medium to large, heavy, columellar callus present; surface smooth or highly polished (2)
 - Shell small, light; columellar callus absent; surface spirally cancellated SININAE
2. Shell laterally compressed, obliquely elongated; Columellar callus almost filling the umbilicus; spire erected highly polished POLINICINAE

Shell subglobose; columellar callus not filling the umbilicus; spire short; shell
 NATICINAE

Subfamily POLINICINAE

Genus *Polinices* Montfort, 1810

1810. *Polinices* Montfort, *Conch. Syst.*, 2: 222.

Type species : *Nerita mamilla* Linnaeus.

Subgenus *Polinices* s. st.

Key to the species

1. Shell comparatively large, heavy; spire depressed; body whorl expanded; Columellar callus divided by a groove in anterior and posterior part *P. (G.) didyma* (Roeding)
- Shell comparatively smaller, heavy; spire exerted; body whorl contracted; Columellar callus not divided by a groove (2)
2. Umbilicus almost closed by callus *P. (P.) mamilla* (Linnaeus)
- Umbilicus almost closed by callus *P. (P.) flamingiana* (Recluz)

Polynices (Polinices) flamingiana (Recluz)

1777. *Natica flamingiana* Recluz in Reeve, *Conch. Icon.*, : 9, *Natica* sp. no. 80.

2000. *Polynices (Polinices) flamingiana*: Subba Rao and Dey, *Rec. zool. Surv. India. Occ. Paper No.*, 187 : 80.

Material examined : i) 1 ex., Maypadu beach, Nellore, 16.02.2002, Coll. S. Barua and Party.

Measurements (in mm) :

Length	Width	Height of the aperture
6.60	5.90	5.50

Diagnosis : Shell small, polished, thick, pyriformly ovate; spire low; aperture obliquely elongated, a deep anterior umbilical groove; operculum corneous with a dark brown zone along the outer margin.

Distribution : India : Andhra Pradesh, Andaman Islands.

Elsewhere : Mauritius, Thailand, Philippines, New caledonia, China.

Polynices (Polinices) mamilla (Linnaeus)

(Pl. IV, Figs. 39 & 40)

1758. *Nerita mamilla* Linnaeus, *Syst. Nat.*, ed. 10 : 776.

2003. *Polynices (Polinices) mammilla* : Subba Rao, *Rec. zool. Surv. India, Occ. Paper No.*, **192** : 190, pl. 38, figs 3 & 4.

Material examined : i) 9 exs. Bheemunipatnam, Visakhapatnam, 18.01.1929, ii) 1 ex. Visakhapatnam, 21.01.1929 Coll.?, iii) 1 ex., Visakhapatnam 13.02.1947, iv) 7 exs., Manginipudi beach, Machilipatnam, Visakhapatnam, 05.12.1964, Coll. N. V. Subba Rao and Party; v) 9 exs., Waltair (Visakhapatnam), 06.03.1966, Coll. A.S. Rajagopal and Party; vi) 7 exs., Machilipatnam, Visakhapatnam, 15.04.2000, vii) 2 exs., Vadarevu, Chirala, 18.04.2000, Coll. S.C. Mitra and S. Barua; viii) 2 exs., Krishnapatnam, Nellore, 15.02.2002, Coll. S. Barua and Party.

Measurements (in mm) :

Length	Width	Height of the aperture
29.75–17.30	23.50–14.50	19.15–11.70

Diagnosis : Shell medium, thick, and heavy, pyriformly ovate, glossy; spire low and bulbous; aperture semicircular, umbilicus area filled with broad and thick funicle; ivory white, often with yellowish tinged on the funicle.

Distribution : India : Andhra Pradesh, Andaman and Nicobar Islands, Goa, Kerala, Maharashtra, Orissa, Pondicherry, Tamil Nadu.

Elsewhere : South African coast, Mauritius, Zanzibar, Amirantes, Seychelles, Red Sea, Persian Gulf, Gulf of Oman, Myanmar, Thailand, Indonesia, Philippines, Japan.

Subgenus *Glossaulax* Pilsbry, 1929

1929. *Glossaulax* Pilsbry, *Nautilus*, **42** : 113.

Polinices (Glossaulax) didyma (Roeding) (Pl. IV, Figs. 37 & 38)

1798. *Albula didyma* Roeding, *Mus. Bolten.*, p. 20.

2003. *Polinices (Glossaulax) didyma* : Subba Rao, *Rec. zool. Surv. India, Occ. Paper No.*, **192** : 189.

Material examined : i) 2 exs., Lawson's Bay, Waltair (Visakhapatnam), 14.02.1947, Coll. ?; ii) 22 exs., Manginipudi beach, Machilipatnam, Visakhapatnam, 05.12.1964, Coll. N.V. Subba Rao; iii) 1 ex. Waltair (Visakhapatnam) Coast, 05.03.1966, Coll. A.S. Rajagopal and Party; iv) 1 ex., Machilipatnam, Visakhapatnam, 15.04.2000, v) 3 exs., Vadarevu, Chirala, 18.04.2000, vi) 1 ex., Suryalanka, Chirala, 19.04.2000, vii) 1 ex., Vetapalem, Chirala, 21.04.2000, Coll. S. C. Mitra and Party; viii) 3 exs. Kottapatnam beach, Ongole, 12.02.2002, S. Barua and Party.

Measurements (in mm) :

Length	Width	Height of the aperture
42.60–14.60	58.00–17.30	35.55–14.20

Diagnosis : Shell large, thick, globose, umbilicated, laterally slightly compressed; spire little exerted; aperture large, semi-ovate, columellar callus terminates towards umbilical opening in a broad transverse expansion deeply grooved in the middle and the posterior large part, fuses with body whorl; umbilicus with a wide excavated angular opening; pale brownish callosity and interior of aperture deep chestnut.

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

Elsewhere : Mauritius, Pakistan coast, Japan, Australia.

Subfamily NATICINAE

Genus *Natica* Scopli, 1777

1777. *Natica* Scopli, *Introd. Hist. Nat.*, : 392.

Type species : *Nerita canrena* Linnaeus.

Key to the species

1. Umbilicus deep and wide (3)
 - Umbilicus largely obscured by parietal callus (2)
2. Spire very low; white with 1 or 2 narrow or broad, spiral brown bands *N. vitellus* (Linnaeus)
 - Spire flat topped; cream with 2 or 3 pale or dark brown bands, speckled with pale brown, sometimes patterned with large blotches *N. plicaria* Philippi
3. Shell with zig zag reddish brown lines *N. lineata* (Lamarck)
 - Shell without zig zag reddish brown lines (4)
4. Body dotted all over with close set purple brown spots, arranged in regular spiral line *N. tigrina* (Roeding)
 - Body not dotted all over (5)
5. Shell globose; greyish brown with unbroken spiral bands or white with 2 to 3 spiral zones of spots or short bars *N. gualteriana* Recluz
 - Shell globose-ovate; pale brown with 4 narrow white bands, regularly spaced, dark brown rectangular spots *N. (Naticarius) alapapiliones* (Roeding)

Natica gualteriana Recluz (Pl. IV, Figs. 43 & 44)

1844. *Natica gualteriana* Recluz, *Proc. zool. Soc. Lond.*, pl. 11 : 208.

2000. *Natica gualteriana* : Subba Rao and Dey, *Rec. zool. Surv. India, Occ. Paper No.*, 187 : 77.

Material examined : i) 17 exs. Kakinada, 21.11.1964, Coll. N.V. Subba Rao and Party; ii) 1 ex. Kakinada, 13.04.2000, Coll. Ramakrishna and Party; iii) 1 ex., Krishnapatnam, Nellore, 15.02.2002, iv) 1 ex., Maypadu beach, Nellore, 16.02.2002, v) 1 ex., Tuplipalem, Nellore, 19.02.2002, Coll. S. Barua and Party.

Measurements (in mm.) :

Length	Width	Height of the aperture
15.65–9.55	13.60–8.65	10.30–7.00

Diagnosis : Shell small, solid, ventricularly globose, umbilicated, spire exerted, surface glossy, spire low; aperture semilunar, columella with a conspicuous fluid, covered major portion of the umbilicus; sculpture with obscure axial growth striae and little prominent subsutural radial ribs; dull grey with brown streaks arranged in 2-3 spiral zones on the body whorl; interior of aperture purple, umbilicus white.

Distribution : India : Andhra Pradesh, Kerala, Lakshadweep, Orissa, Tamil Nadu, West Bengal.

Elsewhere : Indo-Pacific.

Natica lineata Lamarck

1798. *Cochlis lineata* Roeding, *Mus. Bolten.*, p. 147.

2000. *Natica lineata* : Subba Rao and Dey, *Rec. zool. Surv. India, Occ. Paper No.*, 187 : 78.

Material examined : i) 1 ex. Visakhapatnam, 21.01.1929, ii) 1 ex., Lowson's Bay, Waltair (Visakhapatnam), 24.01.1947 iii) 1 ex., Bheemunipatnam, Visakhapatnam, 20.02.1947 Coll. ?; iv) 4 exs., Maypadu, Nellore, 16.02.2002, Coll. S. Barua and Party.

Measurements (in mm) :

Length	Width	Height of the aperture
24.30–15.40	26.45–16.60	18.55–12.45.

Diagnosis : Shell medium, more or less globose with inflated body whorl; spire slightly elevated; apex pointed; whorls rounded; columella thin; spiral callus extended into umbilical groove; aperture semilunar, ashy white ornamented with close set orange yellow, wavy vertical lines, apex tinged with pale bluish grey; umbilicus white.

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

Elsewhere : Indo-Pacific.

Natica tigrina (Roeding) (Pl. IV, Figs. 45 & 46)

1798. *Cochlis tigrina* Roeding, *Mus. Bolten.*, p. 147.

2003. *Natica tigrina*, Subba Rao, *Rec. zool. Surv. India, Occ. Paper No.*, **192** : 186, pl. 37, figs. 7 & 8.

Material examined : i) 6 exs., Kakinada, 19.11.1964, ii) 2 exs., Manginapudi beach, Machilipatnam, Visakhapatnam, 05.12.1964, iii) 1 ex., Visakhapatnam, 20.02.1987. Coll. N.V. Subba Rao and Party iv) 1 ex., Vadarevu beach, Chirala, 18.04.2000 Coll. S. C. Mitra and Party; v) 1 ex. Kakinada Bay, 13.04.2000, Coll. Ramakrishna and Party.

Measurements (in mm) :

Length	Width	Height of the aperture
32.60–15.70	24.60–12.70	22.60–9.60

Diagnosis : Shell medium, globose, umbilicated, spire conically exerted; whorls rounded, bodywhorl inflated, columella with a thick callus at the base; aperture lunar-ovate; white to cream, with close set purple brown spots throughout the body, arranged in a regular spiral line, which may often coalesce with each other, interior of aperture and umbilical area white.

Distribution : India : Andhra Pradesh, Andaman Islands, Gujarat, Maharashtra, Kerala, Orissa, Pondicherry, Tamil Nadu, West Bengal.

Elsewhere : Pakistan coast, Sri Lanka, Indonesia, Philippines, Australia, China and Japan.

Natica vitellus (Linnaeus)

1758. *Natica vitellus* Linnaeus, *Syst. Nat.*, ed. **10** : 776.

2000. *Natica vitellus* : Subba Rao and Dey, *Rec. zool. Surv. India, Occ. Paper No.*, **187** : 78.

Material examined : i) 2 exs., Bheemunipatnam, Visakhapatnam, 22.02.1947 Coll. ?; ii) 3 exs., Visakhapatnam, 08.04.2000, Coll. Ramakrishna and Party; iii) 1 ex., Tuplipalem beach, Nellore, 19.02.2002, Coll. S. Barua and Party.

Measurements (in mm) :

Length	Width	Height of the aperture
42.70–39.80	43.00–39.60	34.75–30.10

Diagnosis : Shell medium, thick, globose, excavately umbilicated with an inflated body whorl; aperture lunar, ovate, columella, smooth with polished callus extended posteriorly and fused with body whorl; fulvous brown, pale band in the middle and whitish in the base and the sutures.

Distribution : India : Andhra Pradesh, Lakshadweep, Maharashtra, Orissa, Tamil Nadu.

Elsewhere : Mauritius, Pakistan coast, Indonesia.

Subgenus *Naticarius* Dumeril, 1806

1806. *Naticarius* Dumeril, *Analytig. Zoologie*, p. 165.

***Natica (Naticarius) alapapilionis* (Roeding)**

1798. *Cochlis alapapilionis* Roeding, *Mus. Bollen.*, p. 146.

2003. *Naticarius alapapiliones* : Subba Rao, *Rec. zool. Surv. India, Occ. Paper No.*, **192** : 187, pl. 37, fig. 15.

Material examined : i) 1 ex., Bheemunipatnam, Visakhapatnam, 20.02.1947, Coll. ?; ii) 1 ex., Kakinada beach, 12.04.2000, coll. Ramakrishna and Party.

Measurements (in mm) :

Length	Width	Height of the aperture
19.60–18.65	19.10–15.60	15.30–14.30

Diagnosis : Shell small, subglobose, umbilicate with exerted spire and deep suture; aperture moderately large; body whorl broadly expanded towards aperture; umbilicus large; columella concave, without callus deposit, a low, rounded funicle entering c-shaped umbilicus; fawn flesh with four widely separated narrow white spiral bands interrupted with squarish or rectangular dark brown markings; aperture purple.

Distribution : India : Andhra Pradesh, Maharashtra, Pondicherry, Tamil Nadu; Elsewhere: Seychelles, Zanzibar, Persian Gulf, Gulf of Oman, Myanmar, China, Philippines, Australia.

***Natica (Naticarius) pulicaria* (Philippi)**

1852. *Natica pulicaria* Philippi, *Conchyl. Cab.*, **2** : 1, *Natica* : 90-91, pl. 13, fig. 9.

2003. *Naticarius pulicaria* : Subba Rao, *Rec. zool. Surv. India, Occ. Paper No.*, **197** : 188, pl. 37, figs. 13, 14.

Material examined : i) 1 ex., Lawson's Bay, Visakhapatnam, 14.02.1947, Coll. ?; ii) 1 ex., Palm beach, Waltair (Visakhapatnam), Sept. 1964, K.G.K. Murti.

Measurements (in mm) :

Length	Width	Height of the aperture
16.60	15.00	11.00

Diagnosis : Shell small, globose, neritoid, umbilicate, smooth; spire short; body whorl squarely rounded; aperture lunar ovate; columella calloused at the upper part, umbilicus circular and partly closed by the callus; ashy white, ornamented with chocolate brown oblique blotches, at periphery and narrow white band on the middle and lower part of the body whorl.

Distribution : India : Andhra Pradesh, Maharashtra, Tamil Nadu.

Elsewhere : Indo-Pacific.

Subfamily SININAE

Key to the genera

Shell not much depressed; spire elevated; umbilicus deep and circular, sometimes with reflected columellar callus..... ***Eunaticina*** Fischer

Shell much depressed; spire short; umbilicus rudimentary or closed; columellar lip arched ***Sinum*** Roeding

Genus *Sinum* Roeding, 1798

1798. *Sinum* Roeding, *Mus. Bolten.*, 2 : 14.

Sinum neritoideum (Linnaeus)
(Pl. IV, Figs. 47 & 48)

1767. *Helix neritoidea* Linnaeus, *Syst. Nat.*, ed. 12 : 1250

2003. *Sinum neritoideum* : Subba Rao, *Rec. zool. Surv. India, Occ. Paper No.*, 192 : 192, pl. 38, figs. 13 & 14.

Material examined : i) 1 ex., Visakhapatnam, 05.03.1966, Coll. A. S. Rajagopal and Party, ii) 2 exs., Krishnapatnam beach, Nellore, 15.02.2002; iii) 1 ex. Maypadu beach, Nellore, 16.02.2002, iv) 2 exs., Ramanathapuram, 22.02.2002, Coll. S. Barua and Party; v) 1 ex., Kakinada, 2002, Coll. P. Ganesh.

Measurements (in mm.) :

Length	width	Height of the aperture
22.20–7.05	44.25–17.85	33.80–15.20

Diagnosis : Shell medium, ovately ear shaped, spire exerted as a small convexity and almost terminal; body whorl large and inflated, ovately depressed; sculpture with close set spiral striae and finely transpiral plications; aperture wide, ovate; columella slightly arched; umbilicus open with a elongated depression; yellowish brown, columella and interior of aperture white.

Distribution : India : Andhra Pradesh, Gujarat, Maharashtra, Orissa, Tamil Nadu.

Elsewhere : Indonesia to Japan.

Genus *Eunaticina* Fischer, 1885

1885. *Eunaticina* Fischer, *Man. Conch.* : 768.

Type species : *Nerita papilla* Gmelin.

Eunaticina papilla (Gmelin)

1791. *Nerita papilla* Gmelin, *Syst. Nat.*, ed. 13 : 3675.

1985. *Eunaticina papilla*, Mukherjee, *Rec. zool. Surv. India, Occ. Paper No.*, **75** : 57.

Material examined : i) 1 ex., Suryalanka, Chirala, 19.04.2000, Coll. S.C. Mitra and Party.
ii) 2 exs., Mahalakshmiapuram, Nellore, 17.02.2002, Coll. S.C. Barua and Party.

Measurements (in mm) :

Length	Width	Height of the aperture
15.00–14.50	12.15–11.00	13.90–11.50

Diagnosis : Shell small, auricular shape, spire exerted, a shallow groove between spire and body whorl; aperture large, ovate, posterior narrow, columella with weak callus; sculpture with fine, irregular spiral grooves intersected by finer close set of transpiral growth lines.

Distribution : India : Andhra Pradesh, Maharashtra, Tamil Nadu.

Elsewhere : Indo-Pacific.

Superfamily TONNOIDEA

Family TONNIDAE

Genus *Tonna* Brunnich, 1772

1772. *Tonna* Brunnich, *Fundum Zool.*, p. 248.

Type species : *Buccinum galea* Linnaeus

Key to the species

Shell thin, outer lip non denticulate *T. sulcosa* (Born)

Shell thick, outer lip flat, denticulate, sometimes with siphonal faciole
..... *T. dolium* (Linnaeus)

Tonna dolium (Linnaeus)

(Pl. IV, Figs. 49 & 50)

1758. *Buccinum dolium* Linnaeus, *Syst. Nat.*, ed. **10** : 140.

2000. *Tonna dolium* : Subba Rao and Dey, *Rec. zool. Surv. India, Occ. Paper No.*, **187** : 83.

Material examined : i) 7 exs., Kakinada Bay, 14.07.1963, M21692/4, Coll. A. Daniel and Party; ii) 4 exs., Vadarevu, 7 km. N.E. Chirala, Chirala, 22.12.1964, Coll. N.V. Subba Rao and Party; iii) 4 exs., Visakhapatnam, 05.03.1966, Coll. A. S., Rajagopal and Party; iv) 2 exs., Vadarevu beach, Chirala, 18.04.2000, Coll. S. C. Mitra and Party; v) 1 ex., Kottapatnam, Ongole, 12.02.2002, vi) 1 ex., Maypadu, Nellore, 16.02.2002, vii) 1 ex., Ravanappasalov, Nellore, 22.02.2002, Coll. S. Barua and Party.

Measurements (in mm) :

Length	Width	Height of the aperture
77.50–28.40	61.74–23.25	60.95–25.15

Diagnosis : Shell large, globose, thin, suture canaliculated; spire low; aperture very wide, outer lip thin, simple, columella almost straight; umbilicus open and deep; sculpture with 2 to 4 spiral cord and occasionally intermediate threads on the penultimate whorl and 11 to 18 spiral cords and occasionally intermediate threads on the last whorl; white, cream or fawn, ornamented with quadrate or rectangular reddish brown spot, upon the spiral cords.

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

Elsewhere : Indo-West-Pacific.

***Tonna sulcosa* (Born)**
(Pl. V, Figs. 51 & 52)

1778. *Buccinum sulcosum* Born, *Index rerum naturalium Mus Caes. Venedeb.*, p. 241.

2000. *Tonna sulcosa* Subba Rao and Dey, *Rec. zool. Surv. India, Occ. Paper No.*, 187 : 83.

Material examined : i) 1 ex. Visakhapatnam, 17.06.1918, Coll. Moti Ram; ii) 1 ex., Visakhapatnam, iii) 1 ex., Bheemunipatnam, Visakhapatnam, Coll. ?.

Measurements (in mm) :

Length	Width
95.45	(Broken)

Diagnosis : Shell large, moderately solid, globosely ovate; spire short, suture canaliculated; aperture wide, outer lip slightly thickened and denticulate; columella with small, thin, parietal shield; sculpture with spiral threads and oblique, radiating striae on the 1st two part nuclear whorls, penultimate whorl with 4 to 6 spiral cords and an intermediate thread, last whorl with 19 to 21 close set, rounded or flattened spiral cords; white ornamented with 3 to 4 brown bands on the last whorl, aperture white.

Distribution : India : Andhra Pradesh, Andaman and Nicobar Islands, Orissa, Tamil Nadu, West Bengal.

Elsewhere : Sri Lanka, China, Philippines, Japan.

Family FICIDAE

Genus *Ficus* Roeding, 1798

1798. *Ficus* Roeding, *Mus. Bolten.*, p. 148.

Type species : *Ficus variegata* Roeding (= *Murex ficus* Linnaeus, 1758)

Key to the species

Sculpture coarse; aperture elongate, interior white; shell with axial brown streaks; outer lip margin smooth *F. gracilis* (Sowerby)

Sculpture fine; aperture wide, interior violet; shell mottled with irregular brown markings; outer lip crenulated *F. variegata* Roeding

***Ficus gracilis* (Sowerby)**
(Pl. V, Figs. 53 & 54)

1825. *Pyrula gracilis* Sowerby, *Cat. Tank*, pl. 17.

2000. *Ficus gracilis* : Subba Rao and Dey, *Rec. zool. Surv. India, Occ. Paper No.*, **187** : 84.

Material examined : i) 7 exs., Visakhapatnam, 14.02.1947, Coll. ?; ii) 10 exs., Bheemunipatnam, Visakhapatnam, 12.03.1966, Coll. A.S. Rajagopal and Party; iii) 2 exs., Bheemunipatnam, Visakhapatnam, 08.04.2000, Coll. Ramakrishna and Party; iv) 2 exs., Visakhapatnam, 18.04.2000, Coll. S. C. Mitra and Party; v) 2 exs., Kottapatnam beach, Ongole, 12.02.2002, Coll. S. Barua and Party.

Measurements (in mm.) :

Length	Width	Height of the aperture
95.10–48.10	57.55–22.45	85.75–43.70

Diagnosis : Shell large, thick, slightly elevated spire and elongated bodywhorl; sculpture with strong, flat, widely spaced spiral cords and smaller axial cords; aperture long and wide, outer lip slightly thickened; columella almost straight with a curve in the central; siphonal canal broad and long; light brown ornamented with many axial, darker brown wavy lines; columella and outer lip blue-gray, aperture chestnut brown.

Distribution : India : Andhra Pradesh, Nicobar Islands, Orissa, Pondicherry, West Bengal.

Elsewhere : Indo-pacific.

***Ficus variegata* Roeding**
(Pl. V, Figs. 55 & 56)

1798. *Ficus variegata* Roeding, *Mus. Bolten*, p. 148, sp. no. 1852.

2003. *Ficus variegata* : Subba Rao, *Rec. zool. Surv. India Occ. Paper No*, **192** : 200, pl. 42, figs. 5-8.

Material examined : i) 2 exs., Visakhapatnam, 28.03.1918, Reg nos. M 19746-47/3, ii) 4 exs. Bheemunipatnam, Visakhapatnam, 20.02.1947. Coll. ? ii) 1 ex., Visakhapatnam, 05.03.1966, iii) 2 exs., Bheemunipatnam, Visakhapatnam, 12.03.1966 Coll. A. S. Rajagopal and Party, iv) 2 exs., Kattapatnam beach, Ongole, 12.02.2002, v) 2 exs., Maypadu beach, Nellore, 16.02.2002, vi) 2 exs., Ravanappasalov, Nellore, 22.02.2002, S. Barua and Party.

Measurements (in mm.) :

Length	Width	Height of the aperture
82.15–40.50	51.30–24.15	72.75–37.25

Diagnosis : Shell large, more globose, bulbous at the shoulder; spire low and depressed; sculptured with high spiral ridges with deep grooves in the inter spaces, axial ridges obsolete to pronounced; aperture wide and long, columella concave, siphonal canal recurved in the left; dark pink or fawn, ornamented with 4 to 5 narrow, whitish lines with brown spots, aperture dark violet.

Distribution : India : Andhra Pradesh, Nicobor Islands, Orissa, Pondicherry, Tamil Nadu West Bengal.

Elsewhere : Indo-Pacific.

Family CASSIDAE

Subfamily PHALINAE

Key to the genera

Columellar shield plicated or granulose; outer lip well toothed ***Phalium*** Link

Columellar shield wrinckled; outer lip thickened and finely denticulated
..... ***Semicassis*** Moerch

Genus ***Phalium*** Link, 1807

1807. *Phalium* Link, *Beschr. Natur. Samml. Rostock*, pl. 3, p. 113.

Type species : *Buccinum cornatum* Linnaeus

Subgenus ***Phalium*** s.st.

Phalium (Phalium) areola Linnaeus (Pl. V, Figs. 57 & 58)

1758. *Buccinum areola* Linnaeus, *Syst. Nat.*, ed. 10 : 736.

2000. *Phalium (Phalium) areola* : Subba Rao and Dey, *Rec. zool. Surv. India, Occ. Paper No.*, 187 : 86.

Material examined : i) 4 exs. Visakhapatnam, ii) 1 ex., Bheemunipatnam, Visakhapatnam, 18.02.1947, iii) 1 ex., Chittivalsa, Bheemunipatnam, Visakhapatnam, Feb., 1947, Coll. ? iv) 4 exs. near Light House, Visakhapatnam, 09.03.1966, v) 3 exs., Bheemunipatnam, Visakhapatnam, 12.03.1966, Coll. A.S. Rajagopal and Party; vi) 1 ex., Vitapalem, Chirala, 21.04.2000, S.C. Mitra and Party.

Measurements (in mm.) :

Length	Width	Height of the aperture
43.45–31.65	26.70–19.80	31.25–21.35

Diagnosis : Shell moderately large, whorls not angulated, spire sharply pointed, outer lip thick recurved, broader towards the base, with about 22 separated teeth; spire and shoulder

of penultimate whorl cancellate, without any nodes, body whorl smooth and glossy, with a varix; white with 5 rows of brown rhomboidal shape spots.

Distribution : India : Andhra Pradesh, Andaman Islands, Orissa, Pondicherry, Tamil Nadu.

Elsewhere : East Africa to Malaysia and Samoa.

Genus *Semicassis* Moersch, 1854

1854. *Semicassis* Moersch, *Cat. Conch. Yoldi*, p. 112.

Type species : *Phalium bisulcatum* Schubert & Wagner, 1827.

Key to the species

Shell thick, spire depressed, suture impressed, last varix not heavy or recurved; columellar shield lirate; *S. bisulcatum* (Schubert and Wagner)

Shell thin, spire exerted, suture wide, last varix or outer lip heavy and recurved; columella shield rugose; *S. canaliculatum* (Bruguiere)

Semicassis bisulcatum bisulcatum (Schubert and Wagner)

1829. *Cassis bisulcata* Schubert and Wagner, *Conchyl. Cab. Nuremberg*, 12 : 68, pl. 223, fig. 4

2000. *Phalium (Semicassis) bisulcatum bisulcatum* : Subba Rao and Dey, *Rec. zool. surv. India, Occ. Paper No.*, 187 : 86.

Material examined : i) 8 exs.. Kottapatnam beach, Ongole, 12.02.2002, Coll. S. Barua and Party.

Measurements (in mm) :

Length	Width	Height of the aperture
43.05–36.70	29.30–22.50	32.55–26.40

Diagnosis : Shell moderately large, globosely ovate, whorls convex or weakly shouldered; spire depressedly conical, specially striated; sculpture with spiral cords and axial lirae on early whorls and spiral grooves on the last whorl; aperture moderately wide, outer lip convex and toothed, parietal shield prominent, closely wrinkled on the lower half; siphonal canal recurved; cream, ornamented with 5 row of square brown spots, outer lip, aperture and columellar shield white.

Distribution : India : Andhra Pradesh, Andaman Islands, Orissa, Pondicherry, Tamil Nadu.

Elsewhere : Indo-Pacific.

Semicassis canaliculatum (Bruguiere)

1792. *Cassidea canaliculata* Bruguiere, *Encycl. Meth. Vers.*, 1(2) : 423.

1985. *Phalium (Semicassis) canaliculatum* : Mookherjee, *Rec. zool. Surv. India, Occ. Paper No.*, 75 : 65, pl. 9, figs 45a & 45b.

Material examined : i) 1 ex., Bheemunipatnam, Visakhapatnam, 19.02.1947, M22208/4, Coll. ?.

Measurements (in mm) :

Length	Width	Height of the aperture
42.60	29.80	29.10

Diagnosis : Shell moderately large, globose, with deeply channel suture; spire exerted with 1-5 former varices and well developed perietal shield; nuclear whorls smooth, post-nuclear whorls with 6-8 spiral lines crossed by oblique axial lines; body whorl with 17-20 incised uniform, transversed spiral grooves; aperture moderately wide, outer lip convex and toothed; columellar lip strongly irregularly plicated; cream with light yellow orange marks.

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

Elsewhere : Sri Lanka, Philippines, China, Japan.

Family RANELLIDAE

Key to the subfamilies

1. Shell ovate, dorso-ventrally depressed; spire exerted; one pair of varices to each whorl; surface with granular ridges; anterior canal short; columella not thickened by callus; outer lip distantly denticulate RANELLINAE
 - Shell elongate, spire depressed; varices may or may not present; surface plane or nodularly ribbed; anterior canal much produced; columella often thickened by callus; outer lip closely denticulate (2)
2. Shell ovately turreted, distorted; surface flat or rounded spiral ridges, nodular ribs present; columella plicated and grained; anterior canal lifted upward PERSONINAE
 - Shell not ovately turreted or distorted; surface reticulately ribbed; columella wrinkled or denticulate; anterior canal not lifted upward CYMATINAE

Subfamily RANELLINAE

Genus *Gyrineum* Link, 1807

1807. *Gyrineum* Link, *Beschr. Nat. Samml. Univ. Rostock*, 3 : 123.

Key to the species

Varices flat and opposite each other, aligned vertically and continuous; sculpture pustulose formed by equally strong axial and spiral cords; siphonal canal recurved; body with wide chocolate brown band in each whorl *G. gyrinum* (Linnaeus)

Varices at 180 degrees interval and angulate near suture; sculpture with spiral rows of granules and spiral threads; siphonal canal short; faint dark band at the base of bodywhorl *G. natator* (Roeding)

***Gyrineum gyrinum* (Linnaeus)**

1758. *Murex gyrinum* Linnaeus, *Syst. Nat.*, ed. 10 : 748.

2000. *Gyrineum gyrinum*: Subba Rao and Dey, *Rec. zool. Surv. India, Occ. Paper No.*, 187 : 90.

Material examined : i) 1 ex. Chittivalsa, Bheemunipatnam, Visakhapatnam, Feb. 1947. Coll. ?

Measurements (in mm) :

Length	Width	Height of the aperture
22.60	6.40	8.35

Diagnosis : Shell small, study, spire elevated, dorsoventrally compressed; whorls deceptively flattened anterior dorsally because of prominent varices aligned each side, columella with strong plicae above and below center; sculptured pustulose with strong axial and spiral cords; outer lip with 7-8 teeth; white brown spiral bands, varices brown, aperture whitish.

Distribution : India : Andhra Pradesh, Andaman Islands.

Elsewhere : Western Pacific.

***Gyrineum natator* (Roeding)**
(Pl. VI, Figs. 61 & 62)

1758. *Tritonium natator* Roeding, *Mus. Bolten*, p. 127.

2000. *Gyrineum natator* : Subba Rao and Dey, *Rec. zool. Surv. India, Occ. Paper No.*, 187 : 90.

Material examined : i) 10 exs., Bandaruvanipeta, Srikakulam, ii) 4 exs., Lawson's Bay, Visakhapatnam, 14.02.1947, Coll ?; iii) ex., Palm beach, Visakhapatnam, April, 1964, Coll. K.G.K. Murti and Party; iv) 2 exs., near light-house, Kakinada, 19.11.64, Coll. N.V. Subba Rao and Party; v) 3 exs., Palm beach, Visakhapatnam, 04.01.1966, vi) 9 exs., Opposite light house, Visakhapatnam, 07.03.1966, vii) 2 exs. Rushikunda, Vishakapatnam, 08.03.1966, viii) 1 ex., Jalaripet hut, Visakhapatnam, 08.03.1966; ix) 2 ex., Bheemunipatnam, Visakhapatnam, 12.03.1966, Coll. A.S. Rajagopal and Party; x) 2 exs., Visakhapatnam, 10.04.2001, Coll. Ramakrishna and Party.

Measurements (in mm.) :

Length	Width	Height of the aperture
46.50–12.25	27.10–8.00	12.00–2.70

Diagnosis : Shell small, solid, thick, ovate, pyramidally convex, dorsoventrally compressed; spire elevated, conical, whorls with a pair of thin varices in each; bodywhorl with spiral rows

of small nodules followed by 4-5 rows of large nodules which may coalesce with smaller ones; aperture small, ovate, outer lip flattened and corded with 7-8 denticles, columella smooth on the upper half and lower half has 3 to 4 obsolete denticles, siphonal canal short; pale brown ornamented with faint darker band at the base of last whorl, aperture white.

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

Elsewhere : Red Sea, Persian Gulf, Thailand, Sri Lanka, Indonesia, Philippines, Japan.

Subfamily CYMATIINAE

Key to the genera

Shell club shaped or trigonal with varices, nodular ribs present; aperture narrowly ovate; columella wrinckled; anterior canal straight and long *Cymatium* Roeding

Shell more or less Tonna shaped; surface with flat or rounded spiral ridges; aperture wide; columella denticulate; anterior canal broad, produced and recurved *Linatella* Gray

Genus *Cymatium* Roeding, 1758

1758. *Cymatium* Roeding, *Mus. Bolten.*, p. 129.

Type species : *Cymatium femorale* Roeding.

Cymatium tripus (Lamarck) (Pl. VI, Figs. 63 & 64)

1843. *Triton tripus* Lamarck, *Hist. nat. Anim. Sans. Vert.*, 9 : 634.

2003. *Cymatium* (*Ranularia*) *tripus* : Subba Rao, *Rec. zool. Surv. India Occ. Paper No.*, 192 : 208, pl. 46, fig. 1.

Material examined : i) 1 ex., Rocky coast, Visakhapatnam, 5.03.1966, Coll. A.S. Rajagopal and Party; ii) 1 ex., Chinnatapally, Vizianagaram, 2.5.2001, iii) 1 ex., Kottapatnam beach, Ongole, 12.02.2002, Coll. S. Barua and Party.

Measurements (in mm) :

Length	Width	Height of the aperture
48.40–41.95	26.25–21.90	19.85–14.55

Diagnosis : Shell moderate, solid; spire elevated, body whorl broad almost equal to the length; aperture narrow, outerlip with strong varix with 7-8 elongated teeth, columella without shield, plicated, siphonal canal long and slightly deflected towards left; sculpture with coarse spiral ribs and axial canals, 7 prominent beaded ribs on the bodywhorl; dull brown, aperture purplish white.

Distribution : India : Andhra Pradesh, Tamil Nadu.

Elsewhere : Indo-Pacific

Genus *Linatella* Gray, 18571857. *Linatella* Gray, *Guide Syst. Distrib. Moll. Brit. Mus.*, p. 39.Type species : *Cassidaria cingulata* Lamarck.*Linatella cingulata* (Lamarck)

(Pl. VI, Figs. 65 & 66)

1844. *Cassidaria cingulata* Lamarck, *Hist. Nat. Anim. Sans. Vert.*, 10 : 9.1985. *Linatella cingulata* : Mukherjee, *Rec. zool. Surv. India, Occ. Paper No.*, 75 : 78.*Material examined* : i) 2 exs., Kottapatnam beach, Ongole, 12.02.2002, ii) 2 exs., Etharnukkala beach, Ongole, 13.02.2002, Coll. S. Barua and Party.*Measurements* (in mm) :

Length	Width	Height of the aperture
37.80–36.05	20.90–18.00	25.00–19.65

Diagnosis : Shell thin, ovately pyriform with or without varix; spire exerted and conical; aperture wide, columella with 8–11 denticles; outerlip with 14 denticles; whorl distinctly angulated at the shoulders, absolutely noded; sculpture with irregular, flattened, spiral ridges; creamy white or fawn.*Distribution* : India : Andhra Pradesh, Maharashtra, Tamil Nadu.*Elsewhere* : Philipines.

Subfamily PERSONINAE

Genus *Distorsio* (Bolten) Roeding, 17981798. *Distorsio* (Bolten) Roeding, *Mus. Bolten.*, 2 : 133.Type species : *Murex anus* Linnaeus.*Distorsio reticularis* (Linnaeus)

(Pl. VI, Figs. 67 & 68)

1758. *Murex reticularis* Linnaeus, *Syst. Nat.*, ed. 10 : 749.2000. *Distorsio (Distorsio) reticularis* : Subba Rao and Dey, *Rec. zool. Surv. India, Occ. Paper No.*, 187 : 89.*Material examined* : 1 ex., Kottapatnam beach, Ongole, 12.02.2002, Coll. S. Barua and Party.*Measurements* (in mm) :

Length	Width	Height of the aperture
44.30	19.90	3.00

Diagnosis : Shell moderately large, irregular shape, aperture small, narrow outer lip flattened with 10 small teeth on the outer edge and inner teeth at the end of the ridges crossing the lip, columella with thin parietal callus; sculpture with spiral cords crossed by axial ribs forming sharp nodules at the intersections, often with a varix on the body whorl; cream, aperture white.

Distribution : India : Andhra Pradesh, Andaman and Nicobar Islands, Lakshadweep, Orissa.

Elsewhere : South African coast, Red Sea, Persian Gulf, New South Wales, Japan.

Family BURSIDAE

Genus *Bufonaria* Schumacher, 1817

1817. *Bufonaria* Schumacher, *Ess. Vers. Test.*, 76 : 251.

Key to the species

1. Shell ventricose, without spines on both side varices (2)
 - Shell oblong-ovate, with spines on both side varices (3)
2. Spire raised; varices with sharper edges and nodes; bodywhorl laterally compressed; sculpture with beaded ridges; outer lip fluted and denticles *B. crumena* (Lamarck)
 - Spire more elevated; varices with round edges; bodywhorl not laterally compressed; sculpture with granular spiral cords; outer lip foliated and denticulated
..... *B. margaritula* (Deshayes)
3. Spire long; varices with long spines; sculpture with spiral ridges and spinose nodes; posterior canal directed backward with a strong spine; columella glazed; outer lip with irregular denticulations *B. echinata* (Link)
 - Spire turreted; varices with short spines; sculpture with regular granular ridges; posterior canal outwardly directed; columella granularly ridged on upper part; outer lip grooved and denticulated *B. rana* (Linnaeus)

.Bufonaria crumena (Lamarck)

1816. *Ranella crumena* Lamarck (non Kiener), *Encycl. Meth Vers.*, pl. 412, fig.3.

2003. *Bursa (Bufonaria) crumena crumena* : Subba Rao, *Rec. zool. Surv. India, Occ. Paper No.*, 192 : 212, pl. 48, fig.7.

Material examined : i) 2 exs. Dolphin's nose, Visakhapatnam, 18.01.1947 Coll. Rev. H. Hosten; ii) 1 ex, Chittivalsa river, Bheemunipatnam, Feb. 47, Coll.?.; iii) 1 ex., Rishikunda, Visakhapatnam, 08.03.1966, Coll. A. S. Rajagopal and Party.

Measurements (in mm) :

Length	Width	Height of the aperture
69.00–57.80	44.75–31.65	32.60–25.15

Diagnosis : Shell moderately large, ovate, ventricose; spire elevately; varices spine less; aperture obliquely ovate; outer lip broader and flatter, supported by a varices, inner margin denticulate, columella with distinct parietal shield and strong plication at the bottom; sculpture with conspicuous beaded ridges and shape nodules in the middle; body whorl with 3 rows of sharpe nodes and with a brown spots close to the nodes; columella calloused with a shield and plicate at the upper part; siphonal canal recurved towards aperture; grayish dark brown, aperture and lips white, often tinged with dark brown.

Distribution : India: Andhra Pradesh, Pondicherry, Tamil Nadu.

Elsewhere : Sri Lanka, Philippines.

***Bufonaria echinata* (Link)**

1807. *Gyrineum echinata* Link, *Mus. Rost.*, 3 : 123.

2003. *Bursa (Bufonaria) echinata*: Subba Rao, *Rec. zool. Surv. India, Occ. Paper No.*, 192 : 213, pl. 46, fig. 2, pl. 48, fig. 10.

Material examined : i) 1 ex., Kakinada, 19.11.1964, ii) 1 ex., Manginipuri, Machilipatnam, Visakhapatnam, 05.12.1964, iii) 7 exs., Vadarevu beach, Chirala, 23.12.1964, Coll. N.V. Subba Rao and Party, iv) 1 ex. Bandaruvani, Sri Kakulam, Coll. ?; v) 1 ex. Vadarevu beach, Chirala, 18.04.2000, Coll. S. C. Mitra and Party; vi) 4 exs., Chinnatapally beach, Vizianagaram, 25.01.02, vii) 3 exs., Kottapatnam, Ongole, 12.02.2002, viii) 2 exs. Ethamukkala beach, Ongole, 13.02.2002, ix) 1 ex. Mahalakshmiapuram beach, Nellore, 16.02.2002, x) 1 ex. Maypadu beach, Nellore, 16.02.2002, Coll. S. Barua and Party.

Measurements (in mm) :

Length	Width	Height of the aperture
84.00–42.40	46.55–23.70	32.75–14.70

Diagnosis : Shell moderately large, with high spire and elongate body whorl, higher than broad; whorls slightly angulated; aperture narrowly ovate; outer lip with strong irregular transverse teeth very prominent at the lower region, columella obsolete, lirations; siphonal canal small, shallow; sculpture with spiral cords and strong outwardly directed elongated spines, four at the outer lip, two long and two small, arranged alternately; pale brown.

Distribution : India : Andhra Pradesh, Andaman and Nicobar Islands.

Elsewhere : Indian Ocean.

***Bufonaria margaritula* (Deshayes)**

1844. *Bursa margaritula* Deshayes, *Voy de Bellanger dans l'Inde Zool.*, pt. 3, figs 13-15.

2003. *Bursa (Bufonaria) margaritula* Subba Rao, *Rec. zool. Surv. India, Occ. Paper No.*, **192** : 213, pl. 49, fig. 2.

Material examined : i) 1 ex., Nagapatnam, Andhra Pradesh, 2002, Coll. P. Ganesh.

Measurements (in mm.) :

Length	Width	Height of the aperture
30.30	20.10	14.05

Diagnosis : Shell thick, medium; spire short, body whorl broader than high; angulated in the middle; aperture round, outer lip with fin like outer edge; columella calloused and plicate; siphonal canal short, and straight, anal canal distinct; sculpture with strong rounded varices, tranversed by coarse granular transverse ridge; yellowish brown often ornamented with three spiral rows of dark brown spots, aperture white to cream.

Distribution : India : Andhra Pradesh, Pondicherry.

Elsewhere : Indian Ocean to Fiji Islands.

***Bufonaria rana* (Linnaeus)**

(Pl. VI, Figs. 69 & 70)

1758. *Murex rana* Linnaeus, *Syst. Nat.*, ed. **10** : 748.

2000. *Bufonaria rana* Subba Rao and Dey, *Rec. zool. Surv. India, Occ. Paper No.*, **187** : 92.

Material examined : i) 2 exs., Nizampatnam, 27.07.1963, Coll. A. Daniel and Party; ii) 3 exs. Vadarevu, N.E. of Chirala, 23.12.1964, Coll. N.V. Subba Rao and Party; iii) 2 exs. Vadarevu, N.E. of Chirala, 18.04.2000, Coll. S.C. Mitra and Party; iv) 2 exs. Kottapatnam beach, Ongole, 12.02.2002, v) 2 exs., Ethamukkala beach, Ongole, 13.02.2002, Coll. S. Barua and Party.

Measurements (in mm) :

Length	Width	Height of the aperture
71.80–46.80	42.65–27.90	32.70–20.60

Diagnosis : Shell moderately large, oblong-ovate, dorsoventrally depressed; spire conical and elevated, varices prominent and with spines; sculpture with fine granulose spiral threads and spinose nodes; body whorls with 2 rows of nodes and the lower rows smaller, ridges at the lower part finely granular and undulated; outer lip denticulate, columella lacks a calloused perietal shield; aperture oblong, ovate; siphonal canal short or extended; white or creamy stained with reddish brown.

Distribution : India : Andhra Pradesh, Andaman and Nicobar Islands, Orissa, Pondicherry, Tamil Nadu, West Bengal.

Elsewhere : Indo-Pacific.

Suborder HETEROGLOSSA.

Superfamily EPITONIOIDEA

Family EPITONIDAE

Genus *Amaea* H. and A. Adams, 1853

1853. *Amaea* H. and A. Adams, *Gen. Rec. Shell*, p. 223.

Subgenus *Acrilla* H. Adams, 1860

1860. *Acrilla* H. Adams, *Proc. zool. Soc. Lond.*, 1860 : 241.

Amaea (Acrilla) acuminata (Sowerby)

1844. *Scalaria acuminata* Sowerby, *Proc. zool. Soc. Lond.*, 1844 : 12.

2003. *Amaea (Acrilla) acuminata* : Subba Rao, *Rec. zool. Surv. India, Occ. Paper No.*, 192 : 216, pl. 49, fig. 4.

Material examined : i) 2 exs, Machilipatnam, Visakhapatnam, 07.12.1964, Coll. N.V. Subba Rao and Party.

Measurements (in mm) :

Length	Width	Height of the aperture
22.60–20.70	6.85–6.50	5.20–5.00

Diagnosis : Shell narrow, elongately turreted, acuminate, with smooth protoconch of 2½ whorls; spire rounded; suture impressed; whorls 15, convex; aperture elongately ovate, columella thin, arched; outer lip thin, umbilicus absent; sculpture with regular low, slightly sinuous ribs (about 30-50); cream with two brown spiral bands.

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

Elsewhere : Arabian Gulf, Sri Lanka, Indonesia : Molucca; Japan.

Family JANTHINIDAE

Genus *Janthina* (Bollen) Roeding, 1798

1798. *Janthina* Roeding, *Mus. Bollen.*, 2 : 75.

Type species : *Helix janthina* Linnaeus, 1758

Key to the species

- Bodywhorl globose and regularly convex; lacks of angle at periphery
 *J. globosa* Swainson
- Bodywhorl not so globose and regularly convex; angle at the periphery
 *J. janthina* (Linnaeus)

***Janthina globosa* Swamison**

1822. *Janthina globosa* Swainson, *Zool. Illust.*, (1)2 : 85.

2003. *Janthina globosa*: Subba Rao, *Rec. zool. Surv. India, Occ. Paper No.*, 192 : 221, pl. 51, figs., 1-3.

Material examined : i) 10 exs. Visakhapatnam, Reg. No. 873.

Measurements (in mm) :

Length	Width	Height of the aperture
35.00–20.40	25.10–16.10	26.65–15.80

Diagnosis : Shell moderate, fragile, thin, similar to *J. janthina* in sculpture and formation of early whorls, but last whorl more globose and convex and lacks of angled at periphery; aperture large and drawn out anteriorly along with columella, violet throughout with pale subsutural area or white band at the sutures.

Distribution : India : Andhra Pradesh, Maharashtra, Tamil Nadu.

Elsewhere : Singapore, Hangkong, U.S.A.

***Janthina janthina* (Linnaeus)**

1758. *Helix janthina* Linnaeus, *Syst. Nat.*, ed. 10 : 772.

2000. *Janthina janthina* Subba Rao and Dey, *Rec. zool. Surv. India, Occ. Paper No.*, 187 : 96.

Material examined : i) 1 ex., Bheemunipatnam, Visakhapatnam, Reg. No. 22205/4

Measurements (in mm) :

Length	Width	Height of the aperture
16.65+	17.00	10.60+

Diagnosis : Shell moderate, thin, fragile, whorls 4, convex with low spire, early whorls convex, last whorl angled centrally; suture well marked; sculpture with arcuate growth striae and a few spiral grooves on the last whorl which became more noticeable towards the base; columella and outer lip thin, base of columella angulate; violet, becomes paler towards the sutures.

Distribution : India : Andhra Pradesh, Gujarat, Maharashtra, Nicobar Islands, Tamil Nadu.

Elsewhere : Persian Gulf, Sri Lanka.

Order NEOGASTROPODA

Super family MURICOIDEA

Family MURICIDAE

Key to the subfamilies

1. Shell pyriform; basal part of bodywhorl with spiral groove; labial tooth on aperture; canal short RAPININAE

- Shell not pyriform; basal part of bodywhorl without spiral groove; aperture without labial tooth; canal short or long (2)
- 2. Shell ornamented with simple, foliated or spinose varices (3)
 - Shell without varices (4)
- 3. Shell with continuous spiral sculpture from bodywhorl to canal; anal sulcus more or less well developed MURICINAE
 - Shell without continuous spiral sculpture from bodywhorl to canal; anal sulcus weakly developed MURICOPSINAE
- 4. Surface with axial ribs; spiral cord scabrous; columella narrow pustules present above canal ERGALATAXINAE
 - Surface without axial ribs; spiral cord not scabrous; columella broad, smooth or plicated THAIDINAE

Subfamily MURINCINAE

Key to the genera

- 1. Bodywhorl club or spindle shape; canal long tubular, with or without spines *Murex* Linnaeus
 - Bodywhorl fusoid or globose; canal short, not tubular (2)
- 2. Shell with more than three varices on each whorl; spines foliaceous or digitate *Hexaplex* Perry
 - Shell with three varices on each whorl; spines lamellose or frondose (3)
- 3. Bodywhorl broad, globose; varices with foliaceous spines *Chicoreus* Montfort,
 - Bodywhorl slender, fusoid; varices with web like extensions composed of fronds *Pteynotus* Swainson

Genus *Murex* Linnaeus, 1758

1758. *Murex* Linnaeus, *Syst. Nat.*, ed. 10 : 746

Key to the species

- 1. Siphonal canal more than four spines either entire or part of canal; whorls rounded; labial tooth short (2)
 - Siphonal canal less than four spines either entire or part of canal; whorls angulated; labial tooth long *M. trapa* Roeding

2. Spiral cords simple, without brown spots *M. tribulus* Linnaeus
 – Spiral cords nodulose, cords with dark brown spots in between nodules
 *M. carbonnieri* (Jousseaume)

***Murex carbonnieri* (Jousseaume)**

(Pl. VI, Figs. 71 & 72)

1881. *Acupurpurea carbonnieri* Jousseaume, *Le Naturliste.*, 44 : 345.

1993. *Murex carbonnieri*, Subba Rao and Surya Rao, *Rec. zool. Surv. India. Occ. Paper No.*, 153 : 33. pl. 4, figs. 1-3.

Material examined : i) 4 exs., Visakhapatnam, 17.06.1916, Coll. Rev. H. Hosten; ii) 1 ex., Visakhapatnam, 05.07.1963, iii) 2 exs. Gautami river, 20.07.1963, M 24093/5, Coll. A. Daniel and Party; iv) 10 exs. Kakinada, 19.11.1964, Coll. N.V.Subba Rao and Party; v) 3 exs., Srikakulam, 15.02.1995, vi) 2 exs., Srikakulam, 16.02.1995, vii) 1 ex., Visakhapatnam, 26.02.1995, Coll. D.R.K. Shastry and Party; viii) 1 ex., Bheemunipatnam, Visakhapatnam, 08.04.2000, Coll. Ramakrishna and Party; ix) 1 ex. Vadaveru beach, Chirala, 18.04.2000; x) 1 ex. Chinnatapally, Vizianagaram, 02.03.2001, xi) 2 exs., Ethamukkala beach, Ongole, 13.02.2002, xii) 1 ex. Maypadu beach, Nellore, 16.02.2002, Coll. S. Barua and Party.

Measurements (in mm) :

Length	Width	Height of the aperture
95.30–63.00	27.95–22.00	23.00–15.20

Diagnosis : Shell club shaped, spire elevated, consist of 7–9 whorls; whorls subangulate, suture simple, deep, crossed by growth lamellae; aperture acute, ovate, outerlip margin crenulated, lower part with small labial tooth, inner lip partly adherent on posterior, body whorl large, preceding the whorls along with the body whorl with three prominent varices, provided with long spines, shoulder spines largest, open straight curved terminally, sculpture consists of three prominent spirals cords; siphonal canal and cords, provided with straight spines up to two third of its length, gradually decreases in length.

Distribution : India : Andhra Pradesh, Andaman and Nicobar Islands, Gujarat, Karnataka, Kerala, Maharashtra, Orissa, Tamil Nadu.

Elsewhere : Malagasy, Maurutius, Zanzibar, Gulf of Oman, Pakistan coast, Indonesia, Philipinnes.

***Murex trapa* Roeding**

1758. *Murex trapa* Roeding, *Mus. Bolten.*, p. 145

1993. *Murex trapa*: Subba Rao and Surya Rao, *Rec. zool. Surv. India, Occ. Paper No.*, 153 : 42, pl. 5, figs. 9, 10, 11; text fig. 17

Material examined : i) 2 exs Kakinada, 23.05.1955, Reg. No. M 22247/4, Coll. ?; ii) 2 exs., Kakinada, 29.05.1955; iii) 2 exs. Gautami–Godavari, 17.03.1963, M 24092/5, iv) 1 ex.

Uppateru, Kakinada, 20.07.1963, Coll. A Daniel and Party, v) 1 ex. Uppateru, Kakinada, 29.02.1964, vi) 1 ex. Uppateru, Kakinada, 19.11.1964, vii) 6 exs., 05.12.1964, Coll. N.V. Subba Rao and Party; viii) 4 exs., Kakinada, 13.04.2000, Coll. Ramakrishna and Party; ix) 3 exs., Vadarevu beach, Chirala, 18.04.2000, x) 1 ex., Ethamukkala beach, Ongole, 13.02.2002, Coll. S. Barua and Party.

Measurements (in mm) :

Length	Width	Height of the aperture
71.00–50.45	28.10–21.45	20.95–14.95

Diagnosis : Club shaped, moderate size, protoconch two and half, whorls smooth, mildly depressed, suture deep, spire elevated, acute, body whorl large, rounded; aperture large, lenticular, anal sulcus broad and deep, outer lip erect and crenulate throughout except anal sulcus and shoulder spine; siphonal canal elongated, straight, narrowly open, body whorl with three varices, rounded and spinose, axial sculpture with 4–5 intervarically low costae, spiral cords include primary, secondary and tertiary ones, spines moderate to short.

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

Elsewhere : Malagasy, Mauritius, Myanmar, Thailand, Malaysia, Indonesia, Philippines, China, Japan.

Murex tribulus Linnaeus

1758. *Murex tribulus* Linnaeus, *Syst. Nat.*, ed. 10 : 746.

2000. *Murex tribulus* Subba Rao and Dey *Rec. zool. Surv. India, Occ. Paper No.*, 187 : 102.

Material examined : i) 2 exs., Visakhapatnam, 12.02.1947, ii) 35 exs., Kakinada 19.11.1964, Coll. N.V. Subba Rao and Party, Reg. No. M 22675/4, 22415/4; iii) 3 exs. Kottapatnam beach, Ongole, 12.02.2002, iv) 1 ex., Tuplipalem beach, 19.02.2002, Coll. S. Barua and Party.

Diagnosis : Shell club shaped, protoconch three and half whorls, sides evenly curved, smooth, spire high with 6–7 rounded whorls, sutures deep and compressed, body whorl globose; aperture large, subcircular, anal sulcus broad and shallow, outer lip erect with crenulations on the lower part, sculpture with 3 spinose, varices on the body whorl, with 3–4 strongly nodose axial costae, spiral sculpture of 3 primary cords enclosing in a secondary and tertiary cords, siphonal canal with 7 spines, decrease in size towards the anterior end.

The spines resembles with *Murex trapa*, but differentiated by possessing more spines on the entire length of the cord and blunt labial teeth.

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

Elsewhere : Indo-West Pacific.

Genus *Chicoreus* Montfort, 18101810. *Chicoreus* Montfort, *Conchyl. Syst.*, 2 : 611.Type species : *Murex ramosus* Linnaeus.

Key to the species

Spire low, Outer lip with prominent labial tooth *C. ramosus* (Linnaeus)Spire high, outer lip without prominent labial tooth *C. brunneus* (Link)*Chicoreus brunneus* (Link)1807. *Purpura brunnea* Link, *Bes. Natur Samm. Univ. Rostock*, p. 121.1993. *Chicoreus brunneus* : Subba Rao and Surya Rao *Rec. zool. Surv. India, Occ. Paper No. 153* : 17 pl.1, figs. 5, 6, text figs. 4, 9.*Material examined* : i) 1 ex., Chinnatapally beach, Vizianagaram 2.5.2001. Coll. Barua and Party.*Measurements* (in mm) :

Length	Width	Height of the aperture
64.15	39.80	17.00

Diagnosis : Shell medium to large, rhomboid, protoconch smooth with two and half whorls, black, spire elevated with 7 post nuclear whorls; aperture small, ovate, anal sulcus deep, outer lip finely dentate, interior lirate, columella adherent posteriorly, detached anteriorly, smooth; siphonal canal short, narrowly open; body whorl large; sculpture with profusely frilled varices; colour dark chestnut brown to black.

Distribution : India : Andhra Pradesh, Andaman and Nicobar Islands, Gujarat, Maharashtra, Tamil Nadu,

Elsewhere : Red Sea, Persian Gulf, Mauritius, Maldives, Sri Lanka, Bangladesh, Indonesia.

Chicoreus ramosus (Linnaeus)1758. *Murex ramosus* Linnaeus, *Syst. Nat.*, ed. 10 : 747.1993. *Chicoreus ramosus* : Subba Rao and Surya Rao *Rec. zool. Surv. India, Occ. Paper No.*, 153 : 25, pl. 2, figs. 9, 10, pl. 3, fig. 1&2; text figs. 10, 13.

Material examined : i) 1 ex., Visakhapatnam, Oct. 1989, Coll. C. Kalavathi; ii) 1 ex., Visakhapatnam, 02.05.2001. Coll. S. Barua and Party.

Measurements (in mm) :

Length	Width	Height of the aperture
46.10	29.80	16.60

Diagnosis : Shell large, fusiform, protoconch smooth, rounded consist of two and half whorls, spire low with 6 post nuclear whorls; suture impressed; bodywhorl large, globose; aperture large, ovately rounded, anal sulcus shallow, outer lip erect, coarsely dentate with prominent labial tooth on the lower half of body whorl, interior lirate, columella partly adherent posteriorly formed into callus, detached and weakly erect anteriorly, smooth; siphonal canal moderate, broad, narrowly open, distally curved upwards to right; body whorl with three varices ornamented with foliaceous spines; axial sculpture with prominent cords and fine scabrous threads; colour white to light brown to dark with pinkish tinge on spiral cords, interior of aperture white with reddish pink margin.

Distribution : India : Andhra Pradesh, Andaman and Nicobar Islands, Gujarat, Pondhicherry, Tamil Nadu.

Elsewhere : Throughout Indo-West Pacific.

Genus *Hexaplex* Perry, 1811

1811. *Hexaplex* Perry, *Conch. Test. Ferussac. J. de pl. ton*, **90** : 284.

Type species : *Hexaplex foliacea* Perry, 1811.

Subgenus *Muricanthus* Swainson, 1840

1841. *Muricanthus* Swainson, *Treatise on Malacology*, p. 419.

Type species : *Murex radix* Gmelin, 1791.

***Hexaplex (Muricanthus) virgineus* (Roeding)**

1798. *Purpura virginea* Roeding. *Museum Bolten*, p. 141.

1993. *Muricanthus virgineus* : Subba Rao and Surya Rao, *Rec. zool. Surv. India, Occ. Paper No.*, **153** : 48 pl. 6, figs. 8-10.

Material examined : i) 6 exs., Tupilpalem beach, 19.02.2002 Coll. S. Barua and Party.

Measurements (in mm) :

Length	Width	Height of the aperture
85.20–77.70	59.00–40.15	30.80–21.65

Diagnosis : Shell medium to large, fusiform, spire elevated with 6-7 subangulate whorls; suture obscured by succeeding whorls; body whorl large, globose, aperture large, ovate, anal

sulcus shallow, inverted U-shaped; outer lip thick, coarse dentate, inner lip adherent completely; body whorl with four rounded varices, axial sculpture with a single prominent knob like ridge; spiral sculpture with 6–7 major cords alternating with minor cords and fine threads, spines on the lower part of the body whorl develop into a wing like structure, canal with two spines, colour light cream with a pinkish or chocolate brown band in the middle of the body whorl.

Distribution : India : Andhra Pradesh, Tamil Nadu.

Elsewhere : Africa to Bay of Bengal (Radwin and D'Attilio, 1976).

Genus *Pterynotus* Swainson, 1833

1833. *Pterynotus* Swainson, *Zool. Illust.*, (2)3 : expl.

Type species : *Murex pinnatus* Swainson = *Purpura alata* Roeding, 1798.

Pterynotus pinnatus (Swainson)

(Pl. VII, Figs. 73 & 74)

1822. *Murex pinnatus* Swainson, *Catalogue of the shells which formed description of the new species*, p. 17

2003. *Pterynotus pinnatus* : Subba Rao, *Rec. zool. Surv. India, occ. Paper No.*, **192** : 232, pl. 554, fig. 12

Material examined : i) Kottapatnam, Ongole, 12.02.2002. Coll. S. Barua and Party

Measurements (in mm) :

Length	Width	Height of the aperture
65.50	24.60	13.70

Diagnosis : Shell moderate, fusiform, spire high, with 6–8 whorls; body whorl large, fusoid, suture shallow; aperture ovately broad, anal sulcus undistinct, outer lip, fine, erect, crenulate and interiorly lirate, innerlip smooth; siphonal canal moderate, centrally open, body whorl with 3 varices expanded into thin flanges, knob like axial ridge prominently on the shoulder in between the varices, spiral sculpture consists of numerous threads, spine like projection on the siphonal canal; white, with brown patches on the wing aperture white.

Distribution : India : Andhra Pradesh, Andaman Islands, Tamil Nadu.

Elsewhere : Tropical Indo-Pacific.

Subfamily MURICOPSINAE

Genus *Homalocantha* Moersch, 1852

1852. *Homalocantha* Moersch, *Cat. Conch.*, p. 95.

Type species : *Murex scorpio* Linnaeus, 1758.

Homalocantha secunda (Lamarck)

1822. *Murex secunda* Lamarck, *Hist. nat. Anim. Sans. Vert.*, **7** : 169.

2003 *Homalocantha secunda* : Subba Rao, *Rec. zool. Surv. India, Occ. Paper No.*, **192** : 227, pl. 53, fig. 3.

Material examined : i) 1 ex., Nagapatnam, 2002, Coll. P. Ganesh.

Measurements (in mm) :

Length	Width	Height of the aperture
29.10	19.20	9.60

Diagnosis : Shell broadly fusiform, spire less elevated, shoulder whorls five; suture deep, obscured by succeeding whorls; aperture small, oval shape, anal sulcus absent, outer lip dentate, inner lip adherent, slightly detached anteriorly, siphonal canal long, broad, narrowly open; body whorl with 5–6 varices, last varix with fine digitate and distally palmate spines, canal with three long spines enclosing smaller spines; light brown to chestnut brown, interior white.

Distribution : India : Andhra Pradesh, Tamil Nadu.

Elsewhere : Sri Lanka, North West Australia, Indonesia, New Caledonia.

Subfamily ERGALATAXINAE

Genus *Cronia* H. and A. Adams, 1853

1853. *Cronia* H. and A. Adams, *Genera Recent Mollusca*, **1** : 128.

Type species : *Purpura amygdala* Kiener, 1835.

Subgenus *Ergalatax* Iredale, 1931

1931. *Ergalatax*, Iredale, *Rec. Australian Mus.*, **18(4)** : 231.

Cronia (Ergalatax) contracta (Reeve) (Pl. VII, Figs. 75 & 76)

1846. *Buccinum contractum* Reeve, *Conch. Icon.*, **3** : *Buccinum*, sp. no. 53, pl. 8. fig. 53.

1993. *Cronia (Ergalatax) contracta*: Subba Rao and Surya Rao, *Rec. zool. Surv. India. Occ. Paper No.*, **153** : 83, pl. 10, figs. 2–4.

Material examined : i) 1 ex., Waltair (Visakhapatnam) point Visakhapatnam, March 1964, Coll. K.G.K Murti; ii) 2 exs., Visakhapatnam, Reg. No. 22261/4, Coll. T. Vedavati; iii) 1 ex. Visakhapatnam, Reg. No. M 24080/5, Coll. Suresh Babu; v) 2 exs. Visakhapatnam, Coll. ?

Measurements (in mm) :

Length	Width	Height of the aperture
31.10–17.70	14.15–8.70	16.00–9.00

Diagnosis : Shell fusiform, spire elevated, acute with six subangulated whorls, body whorl large, aperture large, elongated, ovate, anal sulcus deep inverted U-shaped, outer lip finely

crenulated, interior with 5–6 denticulate, inner lip smooth; canal short, broadly open, sculpture with 8–10 prominent axial ribs with one or two low rounded varices and numerous fine, scabrous spiral threads; chestnut brown to dark brown, aperture white to pinkish white.

Distribution : India : Andhra Pradesh, Andaman and Nicobar Islands, Gujarat, Karnataka, Lakshadweep, Tamil Nadu.

Elsewhere : Persian Gulf, Pakistan coast, Sri Lanka, Myanmar, New Caledonia, Japan, Australia.

Subfamily THAIDINAE

Key to the genera

1. Whorls rounded, sculpture without tubercles or knobs, ribs present *Purpura* Bruguiere
- Whorls angulate, sculpture with rows of tubercles or knobs, in addition to spiral ribs (2)
2. Shell rhomboidal, large; more than 35 mm in length; denticles on outer lip either rounded or horizontal leads into ridges; surface with pointed tubercles *Thais* Roeding
- Shell spindle shaped, smaller in size; less than 35 mm in length; denticles on outer lip rounded, sometimes paired; surface with rounded or squamose tubercles *Morula* Schumacher

Genus *Thais* Roeding, 1798

1798. *Thais* Roeding, *Mus. Bolten.*, p. 54.

Type species : *Murex fucus* Gmelin, 1791.

Key to the species

1. Shell umbilicate (2)
- Shell non umbilicate (3)
2. Shell more than 30 mm; whorls ornamented with tubercles at least 1-2 rows prominent *T. lacera* (Born)
- Shell less than 30 mm; whorls not ornamented with tubercles, conspicuous if present. *T. tissorti* (Petit)
3. Spire elevated; tubercles pointed; aperture white, outer lip more than four denticles *T. echinata* (Blainville)

- Spire low; tubercles blunt; aperture white with purple blotches around, outer lip
 *T. hippocastanum* (Linnaeus)

***Thais echinata* (Blainville)**
 (Pl. VII, Figs. 77 & 78)

1832. *Purpura echinata* Blainville, *Nouv. Ann. Mus. Hist. Nat.*, 1(2) : 222, pl. 11, fig. 2.

1993. *Thais echinata* : Subba Rao and Surya Rao *Rec. zool. Surv. India, Occ. Paper No.*, 153 : 110. Pl.13, fig. 7, text fig. 26.

Material examined : i) 2 exs., Visakhapatnam, 12.03.1918, M23200/4, Coll. B.L.Chowshury;
 ii) 1 ex. Chinnatapally beach, Vizianagaram, 02.05.2001 S Barua and Party.

Measurements (in mm) :

Length	Width	Height of the aperture
45.55	29.60	29.50

Diagnosis : Shell ovate, spire acute, moderately high, consists of 3-4 tuberculated whorls; aperture ovate, outer lip crenulated, interior dentate; canal short and open, sculpture with fine rows of prominent blunt spines, scabrous spiral ridges; light brown, aperture white with yellowish margin.

Distribution : India : Andhra Pradesh, Andaman and Nicobar Islands, Gujarat.

Elsewhere : Sri Lanka, Indonesia, Philippines, Japan

***Thais hippocastanum* (Linnaeus)**

1758. *Murex hippocastanum* Linnaeus, *Syst. Nat.*, ed. 10 : 751.

2000. *Thais hippocastanum* Subba Rao and Dey, *Rec. zool. Surv. India, Occ. Paper No.*, 187 : 113.

Material examined : i) 10 exs., Waltair (Visakhapatnam), 08.01.1966, M23202/4, ii) 7 exs., Waltair (Visakhapatnam), 06.03.1966, M23205/4, Coll. A.S. Rajagopal and Party;
 iii) 1 ex., Port Trust beach, Visakhapatnam, 09.04.2000 Coll. Ramakrishna and Party.

Measurements (in mm) :

Length	Width	Height of the aperture
10.80	2.85	2.50

Diagnosis : Shell moderate, ovate, acuminate, with high spire consists of four angulated whorls; aperture ovately narrow, outer lip crenulate; columella smooth, slightly folded anteriorly; anal sulcus deep, open, canal short, open, sculpture with 4-7 spiral threads, between spiral rows, chocolate brown, vertical bands and dark brown spires; aperture bluish white tinged with brown at margins, denticles and ridges chocolate brown.

Distribution : India : Andhra Pradesh, Andaman and Nicobar Islands, Maharashtra.

Elsewhere : Mauritius, Maldives, Sri Lanka, Myanmar, Indonesia.

***Thais lacera* (Born)**
(Pl. VII, Figs. 79 & 80)

1778. *Murex lacera* Born. *Index reruem natur Musei Caes. Vindob.*, p. 308.

2000. *Thais lacera* : Subba Rao and Dey, *Rec. zool. Surv. India, Occ. Paper No.*, 187 : 113.

Material examined : i) 1 ex. Bheemunipatnam, Visakhapatnam, Feb. 1947, ii) 1 ex. Kakinada, 29.05.1955, M 22248/4, Coll. ?; iii) 1 ex. Visakhapatnam beach, 13.11.1947, Coll. B. Biswas and Party, iv) 1 ex. Kakinada, 29.02.1948, Coll. Mahesh Chandra and G. Ramakrishna; v) 1 ex., Waltair (Visakhapatnam), 16.02.1963, M 22578/4, Coll. A. Daniel and Party; vi) 1 ex., Kakinada, 19.11. 1966, Coll. Subba Rao and Party, vii) 1 ex. Rishikunda, Visakhapatnam, 09.03.1966, Coll. A.S. Rajagopal and Party; viii) 5 exs., Vadarevu, Chirala, 18.04.2000, Coll. S.C.Mitra and Party.

Measurements (in mm) :

Length	Width	Height of the aperture
47.35–26.45	31.50–17.50	28.90–15.40

Diagnosis : Shell moderate, ovate, spire acute, with four tuberculate, angulated whorls, body whorl large, ovate, tuberculated on shoulder; aperture large, ovate, outer lip finely crenulated, interior lirate; columella smooth, callose, partly close the umbilicus; anal sulcus deep, inverted U-shaped; sculpture with transeverse striations, flat, mildly scabrous, 2 rows of tubercles on the upper part of the body whorl, some times like spines; ashy brown, aperture light brown.

Distribution : India : Andhra Pradesh, very common in east and west coast.

Elsewhere : Persian Gulf, Pakistan, Myanmar, Sri Lanka, Israel.

***Thais tissorti* (Petit)**

1852. *Purpura tissorti* Petit, *J Conch. Paris.*, 3 : 163, pl. 7, fig.4.

2000. *Thais tissorti* : Subba Rao and Dey, *Rec. zool. Surv. India, Occ. Paper No.*, 187 : 114.

Material examined : i) 6 exs., Visakhapatnam, Jan. 1921, Coll. S.W. Kemp; ii) 2 exs. Kakinada 29.05.1955, iii) 1 ex. Kakinada, 20.11.1964, Coll. N.V.Subba Rao and Party, iv) 1 ex. Visakhapatnam, Reg. No. M 19122/3, v) 6 exs., Visakhapatnam, 08.03.1966, Coll. A.S. Rajagoopal and Party, vi) 1 ex., Visakhapatnam, 01.10.1969, M19122/3, Coll. ?; vii) 2 exs., Dolphin nose, Visakhapatnam, 28.02.1995 Coll. D.R.K. Shastry and Party; viii) 1 ex., Kakinada, 12.04.2000, Coll. Ramakrishna and Party.

Mesurements (in mm) :

Length	Width	Height of the aperture
28.80–12.70	14.30–7.60	14.0–6.60

Diagnosis : Shell small, spindle shape, spire elevated, acute, body whorl large, and oblong; aperture narrowly ovate, outer margin crenulate, interior lirate, columella smooth, anal sulcus deep, inverted U-shaped; sculpture with four thick spiral ridges, with bisulcated grooves and two narrow cords, ornamented with low tubercles, spiral cord scabrous, umbilicus almost close; light brown with dark brown tubercles.

Distribution : India : Andhra Pradesh, Daman, Goa, Gujarat, Karnataka, Kerala, Maharashtra, Tamil Nadu.

Elsewhere : Persian Gulf, Sri Lanka, Pakistan, Myanmar.

Subgenus *Mancinella* Link, 1807

1807. *Mancinella* Link, *Bes. der. Natur. Samn. Univ. Rostock*, p. 115.

Type species : *Mancinella aculeata* Link, 1807 = *Volema alouina* Roeding, 1798.

Thais (Mancinella) bufo (Lamarck) (Pl. VII, Figs. 81 & 82)

1822. *Purpura bufo* Lamarck, *Hist. Anim. Sans. Vert.*, (2)10 : 99, fig. 13.

2000. *Mancinella bufo*, Subba Rao and Dey, *Rec. zool. Surv. India, Occ. Paper No.*, 187 : 109

Material examined : i) 25 exs., Visakhapatnam, 12.03.1918, M 23229/4, Coll. B.L. Chowdhury; ii) 22 exs. Waltair (Visakhapatnam), March, 1925, Coll. B. Prashad; iii) 4 exs., Scandel point, Waltair (Visakhapatnam), 14.1.41, iv) 5 exs., Scandel point, Waltair (Visakhapatnam), 14.02.1941, Coll. H.A. Hafiz; v) 3 exs. Bheemunipatnam, Visakhapatnam, 18.02.1947, vi) 18 exs. Waltair (Visakhapatnam), 12.02.1947, vii) 15 exs., Visakhapatnam, Coll. ?; viii) 4 exs. Waltair (Visakhapatnam), 12.11.1947, Coll. B. Biswas and Party; ix) 11 exs., Visakhapatnam, 05.07.1963, M23099/4, x) 38 exs., Bheemunipatnam, Visakhapatnam, 08.07.1963, M21700/4, xi) 33 exs., Nizampatnam, 12.07.1963, xii) 25 exs., Pithapuram, Reg. No. M24102/5, Coll. A. Daniel and Party; xiii) 1 ex. Chirala, 02.12.1964, Coll. N.V. Subba Rao and Party; xiv) 3 exs., Waltair (Visakhapatnam), 06.03.1966, xv) 20 exs., Waltair (Visakhapatnam), 07.03.1966, M21701/4, xvi) 19 exs., Waltair (Visakhapatnam), 08.03.1966, M23271/4, xvii) 1 ex., Rishikunda, Waltair (Visakhapatnam), 09.03.1966, xviii) 5 exs., Vishakhapatnam, 10.03.1966, M23231/4, xix) 86 exs., Bheemunipatnam, Visakhapatnam, 12.03.1966, xx) 4 exs., Palm beach, Waltair (Visakhapatnam), 4.11.1966, xxi) 17 exs. Waltair (Visakhapatnam), Coll. A.S. Rajagopal and Party; xxii) 1 ex. Visakhapatnam, 20.02.1987, Coll. ?; xxiii) 36 exs., Bheemunipatnam, Visakhapatnam, Reg. No. 19739/3, xxiv) 2 exs. Jalaripeta beach, Visakhapatnam, Reg. No. M24100/5; xxv) 1 ex., Port trust beach, Visakhapatnam, 06.04.2000, xxvi) 1 ex., Visakhapatnam, 08.04.2000, Coll. Ramakrishna and Party; xxvii) 1 ex., Mahalakshmpuram, Nellore, 17.02.2002, xxviii) 1 ex., Tulipalem beach, 19.02.2002, Coll. S. Barua and Party.

Measurements (in mm) :

Length	Width	Height of the aperture
77.60–20.10	54.40– 4.60	47.30–13.70

Diagnosis : Shell moderate to large, solid, heavy, globose, spire less elevated, acute with 3-4 whorls, body whorl large, aperture large, ovate, outer lip crenulate, interior lirate, columella smooth; and sulcus deep, open, siphonal canal short, broadly open; sculpture consists of 3-4 rows of tubercles gradually absolutely anterior; spiral cords in between the rows of tubercles; aperture creamy white, outer lip margin chocolate brown, columella creamy yellow.

Distribution : India : Andhra Pradesh, East and West Coast including Andaman and Nicbar Islands except West Bengal coast;

Elsewhere : Gulf of Oman, Persian Gulf, Pakistan, Sri Lanka, Maldives, Myanmar.

Genus *Morula* Schumacher, 1917

1917. *Morula* Schumacher, *Esasai. Ver. Test.*, 72 : 227.

Morula granulata (Duclos) (Pl. VII, Figs. 83 & 84)

1832. *Purpurea granulata* Duclos, *Ann. Sci. Nat.*, 2 : fig. 9.

2000. *Morula granulata* : Subba Rao and Dey, *Rec. zool. Surv. India, Occ. Paper No.*, 187 : 110.

Material examined : i) 2 exs. Lawsons Bay, Waltair (Visakhapatnam), 19.02.1940, ii) 1 ex. Waltair (Visakhapatnam) beach, 12.02.1947, iii) 20 exs., Waltair (Visakhapatnam), 13.02.1947, iv) 7 exs. Bheemunipatnam, Vishakapatnam, 20.02.1947, v) 4 exs., Visakhapatnam, vi) 1 ex., Bandarunipeta, Srikakulam, vii) 13 exs., Vishakapatnam, viii) 2 exs. Bheemunipatnam, Visakhapatnam, Coll. ?; ix) 3 exs., Waltair point, (Visakhapatnam), March, 1964, Coll. K.G.K. Murti and Party; x) 8 exs. Visakhapatnam, 13.11.1947, Coll. B. Biswas and Party; xi) 20 exs., Scandel point, Waltair (Visakhapatnam), 11.01.1941, Coll. H.A.Hafiz and Party; xii) 12 exs., Palm beach, Waltair (Visakhapatnam), 04.03.1966, xiii) 34 exs., Waltair (Vishakapatnam), 07.03.1966, xiv) 20 exs., Waltair (Vishakapatnam), 08.03.1966, xv) 3 exs. Rishikunda, Waltair (Visakhapatnam), 09.03. 1966, xvi) 5 exs., Waltair (Visakhapatnam), 10.03.1966, xvii) 82 exs. Bheemunipatnam, Visakhapatnam, Coll. A.S. Rajagopal and Party; xviii) 4 exs., Port trust beach, Visakhapatnam, 09.04.2000, Ramakrishna and Party; xix) 3 exs., Vadaveru beach, Chirala, 18.04.2002, Coll. S Barua and Party.

Measurements (in mm) :

Length	Width	Height of the aperture
24.40–12.80	15.20–9.00	13.00–7.80

Diagnosis : Shell small, broad, spindle shaped, spire acute and elevated with 4-5 tuberculated whorls, body whorl large and angulated; aperture narrowly ovate, outer lip thick, margin crenulated, interior with four teeth, inner lip smooth; sculpture with prominent spiral rows of tubercles, two on spire whorls and four on the body whorl with fine scabrous threads in between, tubercles more prominent near the shoulder; colour dark gray to black, base of tubercles white, aperture violet, outer lip bluish white.

Distribution : India : Common throughout Indian coast.

Elsewhere : Persian Gulf, Malagasy, Maldives, Sri Lanka, Myanmar, Indonesia, Australia.

Genus *Purpura* Bruguiere, 1782

1782. *Purpura* Bruguiere, *Encycl. Meth.*, 15 : 1782.

Key to the species

- Spire high; bodywhorl not rounded, less inflated, whorls angulate
 *P. panama* (Roeding)
- Spire low; bodywhorl globose, much inflated, whorls rounded
 *P. persica* (Linnaeus)

***Purpura panama* (Roeding)**

1798. *Purpura panama* Roeding, *Mus. Bolten.*, p. 54.

2000. *Purpurea panama* Subba Rao and Dey, *Rec. zool. Surv. India, Occ. Paper No.*, 187 : 111.

Material examined : i) 4 exs., Waltair (Visakhapatnam), March, 1935, Coll. J. Woodmason; ii) 2 exs. Waltair (Visakhapatnam), 12.02.1947, iii) 1 ex. Waltair (Visakhapatnam), 05.03.1966, Reg. No. 23228/4, iv) 2 exs., Waltair (Visakhapatnam), 07.03.1966, Reg. No. M 22329/4, Coll. A.S. Rajagopal and Party.

Measurement (in mm) :

Length	Width	Height of the aperture
44.50–42.60	31.70–27.00	32.00–28.00

Diagnosis : Shell large, broad, spindle shape, spire high with 3-4 whorls, body whorl large, angulate; aperture ovate, outer lip margin crenulate, interior lirate, columella broad, obliquely grooved; anal sulcus deep; siphonal canal short, broad, open; sculpture with five broad spiral ridges, each followed with 4-5 narrow ridges; dark chestnut brown.

Distribution : India : Andhra Pradesh, Andaman and Nicobar Islands, Diu, Gujarat, Lakshadweep, Maharashtra, Tamil Nadu.

Elsewhere : Seychelles, Pakistan, Sri Lanka, Philippines.

***Purpura persica* (Linnaeus)**

1758. *Buccinum persica* Linnaeus *Syst. Nat.*, ed. 10 : 738.

2000. *Purpurea persica*: Subba Rao and Dey, *Rec. zool. Surv. India, Occ. Paper No.*, 187 : 112.

Material examined : i) 1 ex., Rocky shore of Bandaruvanipeta, Srikakulam Coll. ?.

Measurements (in mm) :

Length	Width	Height of the aperture
53.90	33.50	37.50

Diagnosis : Shell medium oblong, spire acute, short consists of 3 whorls, body whorl inflated; aperture wide, outer lip crenulated, interior with blunt teeth running as dark grooves, anal sulcus wide, deep, siphonal canal short, wide, open, columella inflated; sculpture with broad, absolutely knobbed, narrow spiral ridges; greyish brown, ridges white with dark brown stripes.

Distribution : India : Andhra Pradesh Andaman and Nicobar Islands Gujarat.

Elsewhere : Mauritius, Philippines, New Zealand.

Subfamily RAPANINAE

Genus *Rapana* Schumacher, 1817

1817. *Rapana* Schumacher, *Nouv. Gen.*, p. 214.

Rapana rapiformis (Born)
(Pl. VIII, Figs. 85 & 86)

1778. *Murex rapiformis* Born, *Index rerum natur. Musei. Caes. Vindob.*, pl. 1.

2000. *Rapana rapiformis* : Subba Rao and Dey, *Rec. zool. Surv. India, Occ. Paper No.*, 187 : 107.

Material examined : i) 2 exs., Kottapatnam, Ongole, 12.02.2002, ii) 1 ex. Tuplipalem, iii) 1 ex., Maypadu beach, Nellore, 16.02.2002, iv) 1 ex., Ravanappasalov, 22.02.2002, Coll. S. Barua and Party

Measurements (in mm) :

Length	Width	Height of the aperture
84.35–76.70	60.90–56.40	54.35–52.30

Diagnosis : Shell large, pyriform; spire low, suture deep and canaliculated with 4–5 whorls, body whorl large and inflated; aperture wide and oval, outer lip margin denticulate, interior lirate, inner lip smooth, wide and deep umbilicus, sculpture with 3 low slightly nodulose spiral ridges, shoulder bear 15 open, blunt hollow spines, 2nd and 3rd rows of spines on the middle and lower part of the body whorl decrease in size; light brown with 3–4 chocolate brown band on the body whorl, aperture light brown to cream.

Distribution : India : Andhra Pradesh, Andaman and Nicobar Islands, Gujarat, Lakshadweep, Orissa, Pondicherry, Tamil Nadu.

Elsewhere : Persian Gulf, Gulf of Aden, Pakistan, Sri Lanka, Hong Kong, Philippines, China, Japan.

Family BUCCINIDAE

Key to the subfamilies

Subfamily BUCCININAE

Key to the genera

1. Shell smooth; suture channeled, sloping inwards **Babylonia** Schlueter
 - Shell sculptured; suture not channeled (2)
2. Shell narrow; spire short; sculpture with fine axial and spiral striae
 - **Clea** H. and A. Adams
 - Shell broad; spire not short; sculpture with ridges either axial or spiral or both (3)
3. Shell biconic or fusiform; outer lip wavy, thickened with lumpy teeth; sculpture with axial ribs and strong spiral cords **Engina** Gray
 - Shell biconic or ovate; outer lip not wavy, without lumpy teeth; sculpture with axial ribs or spiral or both cords (4)
4. Spire long; bodywhorl rounded; umbilicus absent; varix present on opposite to mouth on body whorl; outer lip thickened **Nassaria** Link
 - Spire short; bodywhorl ovate; umbilicus present; varix absent; outer lip not thickened **Cantharus** Roeding

Genus **Babylonia** Schlueter, 1838

1838. *Babylonia* Schlueter, *Kruzg. Syst. Verz. Conch.* p. 18.

Key to the species

- Spire short, bodywhorl more inflated; sutures deep channelled; outer lip with strongly flexed at top **B. spirata** (Linnaeus)
- Spire elongated, bodywhorl narrower; sutures not channelled; outer lip without strongly flexed at top **B. zealandica** (Bruguiere)

Babylonia spirata (Linnaeus)

(Pl. VIII, Figs. 87 & 88)

1758. *Buccinum spirata* Linnaeus, *Syst. Nat.*, ed. 10 : 753.

2000. *Babylonia spirata* Subba Rao and Dey, *Rec. zool. Surv. India, Occ. Paper No.*, 187 : 116.

Material examined : i) 5 exs., Visakhapatnam, 08.01.1916, M 19282/3, Coll. Rev. H. Hosten; ii) 2 exs., Lawsons Bay, Visakhapatnam 14.02.1947 iii) 1 ex., Bheemunipatnam, Visakhapatnam, Feb. 1947, iv) 3 exs., Kakinada, Reg. No. M22203/4, v) 1 ex., Visakhapatnam,

Coll. ?; vi) 1 ex., Nallapalli, Kakinada, 17.07.1963 vii) 2 exs., Uppateru, Kakinada, 20.07.1963, Coll. A. Daniel and Party; viii) 3 exs., Kakinada, 19.11.1964, ix) 1 ex., Vadarevu beach, Chirala 23.12.1964, Coll. N.V. Subba Rao and Party; x) 1 ex., Bheemunipatnam, Visakhapatnam, 12.03.1966, Coll. A. Daniel and Party; xi) 2 exs., Visakhapatnam, 08.04.2000, Coll. Ramakrishna and Party; xii) 3 exs., Vadarevu, Chirala, 18.04.2000, xiii) 2 exs., Suryalanka, Chirala, 19.4.2000, xiv) 1 ex., Chinnatapally, Vizianagaram, 25.03.2001, Coll. S.C. Mitra and Praty; xv) 2 exs., Kottapatnam, Ongole, 12.02.2002, xvi) 2 exs., Ethamukkala beach, Ongole, 13.2.2002, xvii) 1 ex., Tuplipalem, 19.02.2002, Coll S. Barua and Party.

Measurements (in mm.) :

Length	Width	Height of the aperture
50.30–27.40	31.35–19.35	29.95–17.40

Diagnosis : Shell medium, solid, ovate, heavy, spire elongate, high; inflated body whorl, sulcus channeled and deep; aperture, ovate, large, outer lip sharp and smooth, strongly flexed at top; columella smooth and heavy callus; umbilicus broad and deep; anterior canal in the form of a oblique notch posterior canal well developed, broader by parietal callus; white with light brown blotches, oblique streaks and spots; aperture white.

Distribution : India : Andhra Pradesh, Andaman Islands, Goa, Gujarat, Kerala, Maharashtra, Orissa, Tamil Nadu.

Elsewhere : Pakistan, Sri Lanka, Myanmar, Malaysia, Indonesia, Philippines.

***Babylonia zeylanica* (Bruguiere)**

1789. *Buccinum zeylanica* Bruguiere, *Dict.*, p. 27.

2003. *Babylonia zeylanica* : Subba Rao, *Rec. zool. Surv. India, Occ. Paper No.*, 192 : 253, fig. 33, pl. 60, fig. 3

Material examined : i) 4 exs., Visakhapatnam, Reg. No. 3623, 09.02.1894, Coll. D. Hungerford; ii) 1 ex. Vadarevu beach, Chirala, 18.04. 2000, Coll. S. Barua and Party.

Measurements (in mm) :

Length	Width	Height of the aperture
71.35–25.66	37.00–17.80	34.50–13.40

Diagnosis : Shell larger than *B. spirata*, fusiform, solid, with less inflated body whorl; spire high, aperture large, outer lip and columella smooth, with heavy broad callus posteriorly but narrow anteriorly; anterior canal broad and deep, posterior canal not distinct, surface smooth, white with large brown blotches.

Distribution : India : Andhra Pradesh, Kerala, Pondicherry.

Elsewhere : Indian Ocean.

Genus *Clea* H. and A. Adams, 1855

1855. *Clea* H. and A. Adams, *Gen. Rec. Shells*, 2 : 623.

Clea bocki Brot

2003. *Clea bocki*: Subba Rao, *Rec. zool. Surv. India, Occ. Paper No.*, 192 : 253, pl. 61.

Material examined : i) 7 ex., Vasista Godhavari, Narsapur, W. Godhavari, Reg. No. M 20803/4, Coll. D. Srinivasa Rao and Party.

Measurements (in mm) :

Length	Width	Height of the aperture
9.35–5.00	5.00–2.90	5.75–2.15

Diagnosis : Shell small, thin, six whorls, body whorl three fourth of the total length, sutures shallow; aperture large, outer lip thickened; columella smooth, with callus, anterior canal short, broad and shallow; umbonium absent; sculpture with axial and spiral ribs, grayish brown with white aperture.

Distribution : India : Andhra Pradesh.

Subfamily PHOTINAE

Genus *Nassaria* Link, 1807

1807. *Nassaria* Link, *Besche. Nat. Samml. Unni. Rostock*, (3) : 123.

Key to the species

1. Spire equal to bodywhorl; sculpture with strong axial ribs and occasional varices crossed by crowded spiral cords *N. acuminata* (Reeve)
- Spire less than bodywhorl; sculpture with narrow axial ribs crossed by spiral cords forming nodules at cross section (2)
2. Shell fusiform, outer lip thickened, margin smooth; columella with strong parietal plications *N. coromandalica* E.A.Smith
- Shell balbous, outer lip not thickened, margin finely corrugated; columella lirate *N. pusilla* (Roeding)

Nassaria acuminata (Reeve)
(Pl. VIII, Figs. 89 & 90)

1844. *Scaloria acuminata* Reeve, *Proc. zool. Soc. Lond.*, 1844 : 31.

2000. *Nassaria acuminata* : Subba Rao and Dey, *Rec. zool. Surv. India, Occ. Paper No.*, 187 : 119.

Material examined : i) 1 ex. Vadaveru beach, Chirala, 12.04.2000, Coll. S.C. Mitra and Party.

Measurements (in mm) :

Length	Width	Height of the aperture
19.10	9.65	4.50

Diagnosis : Shell small, solid, spire high almost equal to the body whorl, protoconch smooth with 2–3 whorls; suture distinct; aperture small, with strong lirations on the interior, outer lip thickened with a varix, finely denticulate at the margin; columella plicate; anterior canal short; sculpture with strong ribs and occasional varices crossed by crossed spiral cords; yellowish, aperture white

Distribution : India : Andhra Pradesh, Andaman Islands, Maharashtra, Orissa, Pondicherry, Tamil Nadu.

Elsewhere : Sri Lanka, Malaysia, Philippines.

***Nassaria coromandalica* E.A.Smith**

1894. *Nassaria coromandalica* E.A. Smith, *Ann. Mag. Nat. Hist. Soc.*, (6)163, pl. 4, figs.3 & 4.

2003. *Nassaria coromandalica* : Subba Rao, *Rec. zool. Surv. India, Occ. Paper No.*, 192 : 255, pl. 60, fig. 5.

Material examined : i) 1 ex., Kakinada, 2002, Coll. P. Ganesh.

Measurements (in mm) :

Length	Width	Height of the aperture
22.30	10.20	9.10

Diagnosis : Shell small, fusiform, spire high, protoconch smooth, glossy and of 2 whorls; body whorl half of the length; aperture narrow with lirations interior, outer lip thickened, columella with strong parietal plications; sculpture with narrow axial ribs crossed by spiral cords forming nodules at cross section; white or dull brown, aperture white.

Distribution : India : Andhra Pradesh, Tamil Nadu.

Elsewhere : Sri Lanka.

***Nassaria pusilla* Roeding**

1798. *Nassaria pusilla* Roeding, *Mus. Bolten.*,

2000. *Nassaria pusilla* : Subba Rao and Dey, *Rec. zool. Surv. India, Occ. Paper No.*, 187 : 119.

Material examined : i) 4 exs. Visakhapatnam, 28.09.1966, Coll. ?; ii) 2 exs., Visakhapatnam, 08.04.2000, Coll. Ramakrishna and Party.

Measurements (in mm) :

Length	Width	Height of the aperture
17.80–11.40	10.30–7.80	9.50–6.50

Diagnosis : Shell small, solid, spire elevated, protoconch smooth, spire longer than the body whorl; aperture small with strong lirations interior, outer lip finely crenulated, columella lirate, anterior canal slightly elongated, creamy with white aperture.

Distribution : India : Andhra Pradesh, Andaman Islands, Orissa, Tamil Nadu.

Elsewhere : Philippines.

Subfamily PISSANIINAE

Key to the genera

Genus *Cantharus* Roeding, 1798

1798. *Cantharus* Roeding, *Mus. Bolten.*, p. 32.

Subgenus *Pollia* Gray, 1833

1833. *Pollia* Gray in Sowerby, *Gen. Rec. Foss. Shells*, 2 : foot note to *Purpura* pl. 237, fig.12.

Key to the species

Shell more globose, bodywhorl more inflated; whorls angulate at shoulder; anterior canal broad and short; sculpture with varix like axial ridges, crossed by spiral cords separated by shallow grooves *C. (P.) tranquebarica* (Gmelin)

Shell biconic, bodywhorl slender; whorls not angulate at shoulder; anterior canal narrow, long slightly bend downwards; sculpture with spiral ribs separated by spiral grooves ..
..... *C. (P.) spiralis* (Gray)

Cantharus (Pollia) spiralis (Gray)

1846. *Pollia spiralis* Gray, *Zoology of Bechey's Voyage*, p. 111.

2003. *Cantharus (Pollia) spiralis* : Subba Rao, *Rec. zool. Surv. India, Occ. Paper No.*, 192 : 256, pl. 61, fig. 3.

Material examined : i) 2 exs. Kottapatnam, Ongole, 12.02.2002 Coll. S. Barua and Party

Measurements (in mm) :

Length	Width	Height of the aperture
35.30–29.70	19.75–15.80	22.60–17.60

Diagnosis : Shell thick, fusiform, with strongly shouldered whorls; spire short narrow and shorter than bodywhorl; aperture broad, outer lip thick, wavy and reflected at top; columella

with callus, smooth; sculpture with strong white spiral ribs, separated by broad brownish grooves.

Distribution : India : Andhra Pradesh, Gujarat, Maharashtra, Pondicherry, Tamil Nadu;

Elsewhere : Indo-Pacific.

***Cantharus (Polia) tranquebaricus* (Gmelin)**

(Pl. VIII, Figs. 91 & 92)

1791. *Buccinum tranquebarica* Gmelin, *Syst. Nat.*, ed. 13 : 3491.

2003. *Cantharus (Polia) tranquebaricus* : Subba Rao, *Rec. zool. Surv. India, Occ. Paper No.*, 192 : 256, pl. 61, figs. 1 & 2

Material examined : i) 2 exs. Bheemunipatnam, Visakhapatnam, 20.02.1947; ii) 2 exs. Chittivalsa, Bheemunipatnam, Feb. 1947; iii) 1 ex. Kottapatnam, Ongole, 12.02.2002 Coll. S. Barua and Party.

Measurements (in mm) :

Length	Width	Height of the aperture
35.10–24.00	25.00–16.40	19.70–15.35

Diagnosis : Shell thick, medium, fusiform, spire short with 5–6 whorls; body whorl larger; suture well developed, whorl angulate at the shoulder; aperture large, outer lip thick with distinct teeth continuing on the anterior ridges; columella with callus and irregular wrinkles, anterior canal short and broad, posterior canal absent; sculpture with varix like axial ridges, nine on the body whorl, crossed by spiral chords separated by shallow grooves, yellowish, aperture white.

Distribution : India : Andhra Pradesh, Kerala, Pondicherry, Tamil Nadu.

Elsewhere : Indian Ocean.

Genus *Engina* Gray, 1839

1839. *Engina* Gray, *Zool. Capt. Beechey's Voy. Blossom*, p. 112.

***Engina armillata* (Reeve)**

(Pl. VIII, Figs. 93 & 94)

1846. *Ricinula armillata* Reeve, *Conch. Icon.*, 3 : *Ricinula* sp. no. 47, pl. 6, fig. 47..

Material examined : i) 1 ex., Machlipatnam, Visakhapatnam, 16.12.1964, Coll. N.V. Subba Rao and Party.

Measurements (in mm) :

Length	Width	Height of the aperture
15.60	9.45	7.55

Diagnosis : Shell pyramidally ovate; spire sharply acuminate; whorls encircled round the upper part with a single nodulose keel nodulose ribbed beneath, interstices smooth.

Distribution : India : Andhra Pradesh.

Elsewhere : Philippines.

Family COLUMBELLIDAE

Subfamily PYRENINAE

Genus *Anachis* H. and A. Adams, 1853

1853. *Anachis* H. and A. Adams, *Gen. Rec. Moll.*, 1 : 201.

Anachis terpsichore (Sowerby)

(Pl. VIII, Figs. 95 & 96)

1834. *Columbella terpsichore* Sowerby, *Gen. Rec. Shells*, p. 6.

Material examined : i) 27 exs. Visakhapatnam, 04.03.1966, Coll. A.S. Rajagopal and Party; ii) 10 exs., Visakhapatnam, 20.02.1987, Coll. K.V. Surya Rao and Party; iii) 6 exs. Visakhapatnam, 09.04.2000 Coll. Ramakrishna and Party; iv) 6 exs., Waltair (Visakhapatnam), M 22260/4, Coll. T. Vedavati.

Measurements (in mm) :

Length	Width	Height of the aperture
15.80–10.00	7.50–4.65	9.50–3.60

Diagnosis : Shell small, thick, fusiformly ovate, spire less than the body whorl larger, suture impressed, wavy; columella straight with few plications; sculpture with strong axial ribs; outer lip thick; white with black axial or wavy streaks and blotches on the ribs, columella and aperture white.

Distribution : India : Andhra Pradesh.

Elsewhere : Philippines.

Family NASSARIIDAE

Key to the genera

- Shell ovate or conical; spire small and either equal or less than the body whorl.....
 *Nassarius* Dumeril
- Shell turreted; spire more elongated and larger than the body whorl *Bullia* Griffith

Subfamily NASSARINAE

Genus *Nassarius* Dumeril, 1806

1806. *Nassarius* Dumeril, *Zool. Analyt.*, p. 166.

Type species, *Buccinum arcularia* Linnaeus

Key to the species

1. Columellar callus large covering almost ventral part of body (2)
 - Columellar callus not large nor covering almost ventral part of body (3)
2. Sculpture with beaded axial ribs and spiral rows of granules *N. (P.) globosus* (Quoy and Gaimard)
 - Sculpture with humped callosity on dorsum, early whorls ribbed, slender axial ribs throughout except on the left of dorsal hump *N. (P.) pullus* (Linnaeus)
3. Shell elongate-ovate *N. (Z.) foveolatus* (Dunker)
 - Shell globose (4)
4. Sculpture with oblique axial ribs and crossed by deeply incised or shallow spiral grooves forming granules at the intersections *N. (N.) livescens* (Philippi)
 - Sculpture with axial ribs, obsolete or axial ribs on the early whorls, bodywhorl smooth with spiral grooves at the base (5)
5. Shell larger more than 30 mm; sculpture with axial ribs and sutural nodules on the apical whorl; bodywhorl smooth with 8-10 oblique cords or spiral grooves at base (6)
 - Shell less than 30 mm; sculpture with axial ribs and 2-3 bisecting cords form nodules upon ribs *N. (N.) stolatus* (Gmelin)
6. Sculpture with axial ribs only on a few apical whorls, other whorls smooth, except the bodywhorl with 8-10 oblique cords at the base; suture deeply canalised; columella callous finely denticulate *N. (Z.) dorsatus* (Roeding)
 - Sculpture with oblique axial ribs which may persist to the last whorl or obsolete on last two whorls; suture deep but not canalised; columella callous denticulate *N. (Z.) olivaceus* (Bruguiere)

Subgenus *Niotha* (H. and A. Adams, 1853)

1853. *Niotha* H and A Adams, *Gen. Rec. Moll.*, 1 : 117.

Type species : *Nassa cumingii* A. Adams.

Nassarius (Niotha) livescens (Philippi)

1849. *Buccinum livescens* Philippi, *Zeit. Malakozool.*, 5 : 135.

2000. *Nassarius (Niotha) livescens* : Subba Rao and Dey, *Rec. zool. Surv. India, Occ. Paper No.*, 18 : 126.

Material examined : i) 5 exs. Visakhapatnam, 21.01.1929, ii) 1 ex., Visakhapatnam, March, 1965, Coll. K.G.K. Murti and Party; iii) 2 exs., Kottapatnam, Ongole, 12.02.2002, Coll. S. Barua and Party.

Measurements (in mm) :

Length	Width	Height of the aperture
20.40–15.20	12.00–9.00	10.50–6.90

Diagnosis : Shell small, gemmulated, inflated body whorl: spire pointed, aperture ovate, outer lip with 10–13 denticles, which continue as lirae for a short distance into the aperture, sculpture with 14–24 slender axial ribs on the body whorl and 16–26 ribs on the penultimate whorl; finely incised, deep or moderate shallow spiral grooves, crossed with axial ribs from granules, 4–6 on the penultimate and 11–13 on the body whorls; columella with strong callus, 4–10 denticles in the inner margin, anal canal short and deep, creamy white with 2–3 broad brown bands on the body whorl, sometimes clouded with brown.

Distribution : India : Andhra Pradesh, Andaman and Nicobar Islands, Lakshadweep, Maharashtra, Orissa, Tamil Nadu.

Elsewhere : Indonesia, Philippines, Japan.

Nassarius (Niotha) stolatus (Gmelin)

1791. *Buccinum stolatum* Gmelin, *Syst. Nat.*, ed. 13 : 3496.

2003. *Nassarius (Hima) stolatus* : Subba Rao, *Rec. zool. Surv. India, Occ. Paper No.*, 192 : 267, pl. 65, fig. 8.

Material examined : i) 2 exs. Visakhapatnam, June, 1926, Coll. H.S. Rao and G. Varugis; ii) 5 exs., Visakhapatnam, 21.01.1929, Coll. ?; iii) 6 exs., Dindishore, 24.07.1963; iv) 2 exs., Kottapatnam, 29.07.1963, v) 2 exs. Visakhapatnam, 02.08.1963 Coll. A. Daniel and Party; vi) 57 exs., Kakinada, 19.11. 1964, vii) 1 ex. Machilipatnam, Visakhapatnam 07.12.1964, viii) 3 exs., Manginipudi beach, Machilipatnam, Visakhapatnam 5.12.1964, Coll. N.V. Subba Rao and Party; ix) 5 exs., Kakinada Bay, 17.4.1978, Coll. N.V.Subba Rao and A. Dey; x) 8 exs., Kakinada, 13.04.2000, Coll. Ramakrishna and Party; xi) 1 ex., Vadarevu, Chirala, 18.04.2000, xii) 1 ex., Suryalanka, 19.4.2000, xiii) 1 ex., Vitpalem, Chirala, 21.4.2000, Coll. S.C. Mitra and Party; xiv) 1 ex., Mahalakshmiapuram, Nellore, 17.2.2002, Coll. S. Barua and Party.

Measurements (in mm) :

Length	Width	Height of the aperture
23.00–9.60	12.90–4.10	10.00–3.70

Diagnosis : Shell small, ovately conical with inflated body whorl; spire pointed; whorls overlapping at the suture; aperture ovate with a small apical notch, outer lip thickened; columella calloused with 5–6 denticles; sculpture with axial ribs, almost obsolete on the dorsal side and forms nodules below suture, spiral grooves prominent at the base of the body whorl; yellowish white with broad chestnut spiral bands.

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

Elsewhere : Gulf of Aden, Persian Gulf, Red Sea to Philippines and Japan.

Subgenus *Plicarcularia* Thiele, 1929

1929. *Plicarcularia* Thiele, *Handb. Syst. Wieicht.*, 1 : 324.

Type species, *Nassa (Plicarcularia) thersites* (Bruguiere) = *Buccinum pullus* Linnaeus

Nassarius (Plicarcularia) globosus (Quoy and Gaimard)

1833. *Buccinum globosum* Quoy and Gaimard, *Voy L'Astrolabe*, 2 : 448, pl. 32, figs. 25-27.

2003. *Nassarius (Plicarcularia) globosus* : Subba Rao, *Rec. zool. Surv. India, Occ. Paper No.*, 192 : 270, pl. 64, figs. 9, 10

Material examined : i) 5 exs., Visakhapatnam, 18.01.1929; ii) exs., Vadarevu, Chirala, Dec. 1964, Coll. N.V. Subba Rao and Party.

Measurements (in mm) :

Length	Width	Height of the aperture
12.60–10.90	9.85–8.55	6.10–5.50

Diagnosis : Shell small, globose, spire pointed; aperture small, columellar callus orbicular, spreading reaching body whorl suture; outer lip 5–10 denticles, extend as lirae into the aperture, columella with 2–4 denticles anterior; sculpture with beaded axial ribs and spiral rows of granules all over; white, fawn or tan ornamental with broad, light to dark brown band on the body whorl; aperture purple brown.

Distribution : India : Andhra Pradesh, Andman and Nicobar Islands.

Elsewhere : Red sea, Sri Lanka, Malayasia, Indonasia, New Guinea, Samoa, Tonga, New Zealand, Philippines, China, Japan, Australia.

Nassarius (Plicarcularia) pullus (Linnaeus)

1758. *Buccinum pullus* Linnaeus, *Syst. Nat.*, ed. 10 : 737.

2000. *Nassarius (Plicarcularia) pullus* : Subba Rao and Dey, *Rec. zool. Surv. India, Occ. Paper No.*, 187 : 125.

Material examined : i) 5 exs. Shore collection, Visakhapatnam, 21.01.1929, Coll. ?; ii) 1 ex., Tuplipalem, 2002, Coll. S. Barua and Party.

Measurements (in mm) :

Length	Width	Height of the aperture
20.50–17.40	14.40–12.45	8.45–7.10

Diagnosis : Shell small, solid, spire less than the body whorl, aperture small, outer lip strongly thickened and lirate on the interior; columellar callus large, cream colour, 3–4 denticles at lower part; sculpture with slender axial ribs, divided into 2–3 rows of spiral rows of nodules at the sutures; axial ribs obsolete in small area immediately to the left of the dorsal hump, intertices obsoletely grooved, 2–4 granulose spiral cords at the base; olive, green or brown, interior aperture purple brown.

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

Elsewhere : Mauritius, Maldives, Sri Lanka, Indonesia, Malaysia, New Guinea, Philippines, China, Australia.

Subgenus *Zeuxis* H. and A. Adams, 1853

1853. *Zeuxis* H and A Adams, *Gen. Rec. Moll.*, 1 : 119.

Type species : *Buccinum taenia* Gmelin = *Buccinum olicium* Brugiere

Nassarius (Zeuxis) dorsatus (Roeding)

1798. *Buccinum dorsatum* Roeding, *Mus. Bolten.*, p. 111.

2000. *Nassarius (Zeuxis) dorsatus* : Subba Rao and Dey, *Rec. zool. Surv. India, Occ. Paper No.*, 187 : 128.

Material examined : i) 1 ex., Visakhapatnam, 24.02.1948, Coll. Mahesh Chandra and G. Ramakrishna; ii) 1 ex., Vadarevu beach, Chirala, 23.12.1964, iii) 1 ex., Visakhapatnam, 20.09.1996, Coll. N.V. Subba Rao and Party; iv) 1 ex., Visakhapatnam, 20.2.1987, Coll. ?; v) 1 ex., Kakinada, 13.4.2000, Coll. Ramakrishna and Party; vi) 1 ex., Suryalanka beach, Chirala, 19.04.2000, Coll. S.C. Mitra and Party.

Measurements (in mm) :

Length	Width	Height of the aperture
34.98–30.80	17.30–16.00	17.75–13.00

Diagnosis : Shell moderate, thin, shining, with large body whorl; spire elongated, pointed, post nuclear whorls with axial ribs and sutural nodules, last 3–4 whorls smooth; aperture ovate, outer lip with prominent varix; columella calloused, finely denticulate along entire length; body whorl smooth, plicate at the ventral edge; variable colour, steel gray, banded with brown, some times tan or dark brown, columella and edge of the outer lip white; aperture purple brown.

Distribution : India : Andhra Pradesh, Kerala.

Elsewhere : Indo-Pacific.

Nassarius (Zeuxis) foveolatus (Dunker)

1847. *Buccinum foveolatum* Dunker, *Zeit. f. Malak.*, 4 : 63.

1984. *Nassarius (Zeuxis) foveolatus* : Cernohorsky, *Bull. Auckland Mus.*, 14 : 148, pl. 29, figs. 12, 13, pl. 30, fig. 4.

Material examined : i) 2 exs., Visakhapatnam, June 1926, Coll. H.S. Rao and G. Vargish; ii) 1 ex., Chittivalsa, Bheemunipatnam, Jan. 1947, iii) 1 ex. Bheemunipatnam, Visakhapatnam, 20.02.1947, iv) 2 exs., Visakhapatnam, April, 1964, Coll. K.G.K. Murti; v) 2 exs., Kakinada, 19.11.1964, vi) 2 exs., Eatimoga, Kakinada, 20.11.1964, vii) 2 exs., Machilipatnam, Visakhapatnam, 06.12.1964, Coll. N.V. Subba Rao and Party; viii) 3 exs., Visakhapatnam, 20.02.1987, Coll. K.V. Surya Rao and Party; ix) 2 exs., Visakhapatnam, 01.03.1993 Coll. D.R.K. Shastry and Party.

Measurements (in mm) :

Length	Width	Height of the aperture
22.25–11.40	9.75–5.25	9.80–5.10

Diagnosis : Shell small, oblong-ovate; spire acute, elevated, body whorl narrower; aperture ovate, outer lip supported by varix, 12–14 liriation on the interior; columella not much expanded callus, margin with denticles all along, anal canal narrow, anterior canal broad and deep; sculpture with close set, fine axial ribs interstices with spiral striae giving cancellate appearance; yellow or yellowish brown, aperture cream.

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

Elsewhere : Pakistan coast, Maldives, Sri Lanka, Myanmar, Malaysia, Indonesia, New Guinea, Philippines, China, Australia.

Nassarius (Zeuxis) olivaceus (Bruguiere)

1789. *Buccinum olivaceus* Bruguiere, *Encycl. Meth. Vers.*, 1 : 272.

2003. *Nassarius (Zeuxis) olivaceus* : Subba Rao, *Rec. zool. Surv. India, Occ. Paper No.*, 192 : 272.

Material examined : i) 1 ex., Kakinada, 2002, ii) 1 ex., Visakhapatnam, 2002, Coll. P. Ganesh.

Diagnosis : Shell medium, thick, solid, body whorl larger than spire; aperture small, sculpture with oblique axial ribs on the early whorls, later smooth, body whorl smooth with spiral grooves; columella calloused and denticulate along entire length, outer lip 7–14 denticles which are confined to the edge of the aperture; tan to dark brown often with yellow band at the shoulder of body whorl, interior of aperture brown or purplish-brown.

Distribution : India : Andhra Pradesh, Andaman Islands, Pondicherry, Tamil Nadu.

Elsewhere : Indo-Pacific.

Subfamily DORSINIINAE

Genus *Bullia* Gray in Griffith and Pidgeon, 1834

1834. *Bullia* Gray in Griffith and Pidgeon, *Animal Kingdom Bar. Cuvier, Moll. & Radiata*, 12, pl. 37, fig. 8.

Type species : *Bullia semiplicata* Gray in Griffith and Pidgeon = *Buccinum callosum* Wood.

Key to the species

1. Spire whorls with latticed sculpture *Bullia melanoides* (Deshayes)
- Spire whorls without latticed sculpture (2)
2. Spire more elongated than bodywhorl; sculpture with spiral grooves separated by wide interspaces, three rows of beaded spiral cord between the suture
..... *B. (B.) vittata* (Linnaeus)
- Spire almost equal to bodywhorl; sculpture with irregular spiral grooves, more prominent at the base of bodywhorl *B. (B.) tranquebarica* (Roeding)

Bullia melanoides (Deshayes)

1832. *Buccinum melanoides* Deshayes in Belanger, *Voy. Indes-Orientales*, p. 430, pl. 2, figs. 3&4.

2003. *Bullia (Bullia) melanoides* : Subba Rao, *Rec. zool. Surv. India, Occ. Paper No.*, 192 : 264, pl., 63, fig., 3.

Material examined : i) 13 exs., Chittivalsa river, Bheemunipatnam, Visakhapatnam, Jan. 1947, ii) 1 ex., Bandar canal, Machlipatnam, Visakhapatnam Coll. ?.

Diagnosis : Shell small, solid, narrowly elongate with slender spire; suture well developed; whorls slightly inflated; protoconch with 2-3 smooth whorls; aperture small widely notch of the anterior canal, outer lip thin; dark purplish gray with a whitish or pale brown, glossy apex.

Distribution : India : Andhra Pradesh, Gujarat, Karnataka, Kerala, Tamil Nadu. Restricted to sandy shores of India.

Bullia tranquebarica (Roeding)

1831. *Plotia tranquebarica* Roeding, *Mus. Bolten.*, p. 96.

2003. *Bullia (Bullia) tranquebarica* : Subba Rao, *Rec. zool. Surv. India, Occ. Paper No.*, 192 : 265, pl. 63 fig. 2.

Material examined : i) 1 ex., Suryalanka, Chirala, 19.04.2000, Coll. S.C. Mitra and Party.

Diagnosis : Shell moderate to small, elongate, ovate, body whorl half of the shell length, aperture wide, outer lip smooth, callus smooth, anterior canal short, broad and fissured;

sculpture with irregular spiral grooves and subsutural ridge, spiral grooves more prominent at the base of the body whorl; yellowish to pale brown often with dark brown wavy axial streaks.

Distribution : India : Andhra Pradesh, Laksadweep, Maharashtra, Orissa, Tamil Nadu.

Elsewhere : Indian Ocean.

***Bullia vittata* (Linnaeus)**

1767. *Buccinum vittatum* Linnaeus, *Syst. Nat.*, ed. 12 : 1206.

2000. *Bullia vittata*: Subba Rao and Dey, *Rec. zool. Surv. India, Occ. Paper No.*, 187 : 130.

Material examined : i) 1 ex., Waltair (Visakhapatnam), March 1965, Coll. K.G.K. Murti; ii) 10 exs., Bheemunipatnam, Visakhapatnam, Jan. 1947, Coll. ?; iii) 2 exs., Uppateru, Kakinada, 21.11.1964; iv) 3 exs., Machilipatnam, 05.12.1964, v) 1 ex., Vadarevu, Chirala, 20.12.1964, Coll. N.V. Subba Rao and Party; vi) 1 ex., Rishikunda, Visakhapatnam, 09.03.1966, Coll. A.S. Rajagopal and Party; vii) 9 exs., Kalingapatnam; viii) 1 ex., Nurvula revu, Srikakulam, 16.02.1995; ix) 3 exs., Visakhapatnam, 14.02.1995; x) 2 exs., Pakkanapeta, Srikakulam, 19.02.1995, Coll. D.R.K. Shastry and Party; xi) 4 exs., Waltair (Visakhapatnam) coast, 29.04.1988, M 22688/4, Coll. B. Kamala; xii) 2 exs., Machilipatnam, Visakhapatnam, 15.04.2000; xiii) 1 ex., Suryalanka, Chirala, 17.04.2000; xiv) 2 exs., Kalingapatnam, 29.04.2000; xv) 2 exs., Vitapalem, 21.04.2000, Coll. S.C. Mitra and Party; xvi) 13 exs., Visakhapatnam, M 18820/3, Cool. Rev. H. Hosten.

Measurements (in mm) :

Length	Width	Height of the aperture
46.25–19.50	18.60–7.60	19.50–7.65

Diagnosis : Shell moderate, elongated turreted, protoconch consists of three whorls, aperture wide, outer lip smooth, callus smooth, anterior canal short; sculpture with irregular spiral grooves and subsutural ridges, spiral groove more prominent at the base of the body whorl, yellowish to pale brown often with dark brown wavy axial streaks.

Distribution : India : Andhra Pradesh, Andaman and Nicobar Islands, Maharashtra, Orissa, Pondicherry, Tamil Nadu.

Elsewhere : Mauritius, Zanzibar, Sri Lanka, Iran, Philippines.

Family MELONGINIDAE

Genus *Pugilina* Schumacher, 1817

1817. *Pugilina* Schumacher *Ess. Vers. Test.*, p. 65.

Subgenus *Hemifusus* Swainson, 1840

1840. *Hemifusus* Swainson, *Treat. Malacol.*, p. 91.

Pugilina (Hemifusus) cochlidium (Linnaeus)

1758. *Murex cochlidium* Linnaeus, *Syst. Nat.* ed., 10 : 753.

2000. *Pugilina cochlidium* : Subba Rao and Dey *Rec. zool. Surv. India, Occ. Paper No.*, 187 : 131.

Material examined : i) 8 exs., Visakhapatnam, 17.01.1916, M.19072/3, ii) 7 exs., Visakhapatnam, 18.01.1916, M 19077/3, Coll. H. Hosten; iii) 1 ex., Visakhapatnam, June 1926, Coll. H.S. Rao and G. Varugis; iv) 7 exs., Visakhapatnam 21.01.1929 v) 2 exs., Lawsons bay Visakhapatnam, 14.02.1947, Coll. ?; vi) 3 exs., Bandar canal, Machlipatnam 06.12. 1964; vii) 4 exs., Eatimoga village, Kakinada, 20.11.1964; viii) 3 exs., Uppateru canal, Kakinada 22.11. 1964 Coll. N.V. Subba Rao and Party; ix) 12 exs., Dolphin's nose, Waltair (Visakhapatnam), 14.03.1966, Coll. A.S. Rajagopal and Party; x) 9 exs. Kakinada bay, 17.04.1978 Coll. N.V. Subba Rao and A. Dey; xi) 2 exs., Kottapatnam, Ongole, 12.2.2002, xii) 2 exs., Mayapadu beach, Nellore, 16.02.2002, S. Barua and Party.

Measurements (in mm) :

Length	Width	Height of the aperture
119.45–32.10	65.00–18.55	84.15–25.20

Diagnosis : Shell large, heavy, solid, almost pear shaped; whorls angular concave from suture to shoulder; aperture narrow and elongated; anterior lip with obsolete ridges, columella without fold; anterior canal short and broadly open; sculpture with axial ribs on the spire whorls, body whorl with close sets of spiral ridges on the lower half, with 8 strong compressed tubercles at angular shoulder of the last two whorls; reddish brown.

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

Elsewhere : Persian Gulf, Sri Lanka, Malaya.

Family VOLUTIDAE

Subfamily CYMBIINAE

Genus *Melo* Broderip and Sowerby, 1826

1826. *Melo* Broderip and Sowerby, *Gen. Shells*, p. 28.

Melo melo (Solander)

(Pl. IX, Figs. 97 & 98)

1786. *Voluta melo* Solander *Cat. Portland Mus.*, p. 3.

2003. *Melo melo* : Subba Rao, *Rec. zool. Surv. India, Occ. Paper No.*, 192 : 283, pl. 70, figs. 4 & 5.

Material examined : i) 2 exs., (Broken) Kottapatnam beach, Ongole, 12.02.2002, Coll. S. Barua and Party.

Measurements (in mm) :

Length	Width	Height of the aperture
100.90	64.60	96.50

Diagnosis : Shell large, ovoid, not very thick; spire reduced; bodywhorl enlarge and strongly inflated; aperture very wide and elongated; columella with 2 to 4 folds; anterior canal broad and deeply excavated; sculpture smooth except few oblique axial growth striae; yellowish orange, ornamented with dark brown patches around the middle of the body whorl.

Distribution : India : Andhra Pradesh, Tamil Nadu.

Elsewhere : Bangladesh to China Sea through Malaysia.

Family FASCIOARIIDAE

Subfamily FUSININAE

Genus *Fusinus* Rafinesque, 1815

1815. *Fusinus* Rafinesque, *Analyse*, 1 : 49.

Fusinus colus (Linnaeus) (Pl. IX, Figs. 99 & 100)

1758. *Murex colus* Linnaeus *Syst. Nat.*, ed. 10 : 753.

2004. *Fusinus colus* : Subba Rao, *Rec. zool. Surv. India, Occ. Paper No.*, 192 : 277, pl. 67, fig. 5.

Material examined : i) 5 exs., Visakhapatnam, 05.02.1894, Reg. No. 3384, Coll. D. Hungerford; ii) 2 exs., Lawsons bay, Visakhapatnam, 14.02.1947; iii) 2 exs. Chittivalsa, Bheemunipatnam, Feb. 1947, Coll.?.; iv) 1 ex., Vadarevu beach, Chirala, 18.04.2000, Coll. S.C. Mitra and Party.

Measurements (in mm) :

Length	Width	Height of the aperture
140.00–88.50	33.00–17.50	28.40–14.70

Diagnosis : Shell large, slender, fusiform; spire elevated, with 9–10 whorls, early whorls with prominent axial ribs, last 3 whorls with longitudinally oriented nodules on the shoulder, prominent spiral cords encircle the shell to the siphonal canal; aperture narrow, lirate, outer lip finely dentate, columella with thin callus, without plaits, siphonal canal very long and slender; white or cream with few brown streaks, aperture white.

One shell collected from the Lawsons bay, Visakhapatnam having curved siphonal canal, which is abnormal.

Distribution : India : Andhra Pradesh, Andaman Islands, Orissa, Tamil Nadu.

Elsewhere : Indo-Pacific.

Family HARPIDAE

Subfamily HARPINAE

Genus *Harpa* Roeding, 1798

1798. *Harpa* Roeding, *Mus. Bolten*, p. 149.

Key to the species

1. Bodywhorls with more than 20 ribs *H. costata* (Linnaeus)
- Bodywhorls less than 20 ribs (2)
2. Shell broadly oval; ribs of bodywhorl of varying width *H. major* Roeding
- Shell broadly ovate and rounded; ribs of the bodywhorl tend to narrower and more distant *H. dividis* Roeding

***Harpa costata* (Linnaeus)**

1758. *Buccinum costata* Linnaeus, *Syst. Nat.*, ed. 10 : 738.

1973. *Harpa costata*: Rehder, *Indo-Pacific Mollusca*, (3) 16 : 253.

Material examined : i) 1 ex., Manginipudi, Machilipatnam, Visakhapatnam, 5.12.1964, Coll. N.V. Subba Rao and Party.

Measurements (in mm) :

Length	Width	Height of the aperture
19.90	14.40	17.60

Diagnosis : Shell medium, broadly subquadrate, solid; spire broadly conical; whorls 4, smooth, postnuclear whorls broadly shouldered, with spaced axial riblet and fine spiral cords, more crowded later; bodywhorl with 30–40 ribs, lamellar, recurved; aperture broad, subrectangular; inner lip straight, outer lip angled at the shoulder; parietal callus thin, columellar callus heavier; flesh or white.

Distribution : India : Andhra Pradesh.

Elsewhere : Mauritius, Malagasy, Reunion.

This species recorded for the first time from India.

***Harpa davidis* Roeding**
(Pl. IX, Figs. 101 & 102)

1798. *Harpa davidis* Roeding, *Mus. Bolten*, p. 150.

2000. *Harpa davidis*: Subba Rao and Dey, *Rec. zool. Surv. India, Occ. Paper No.*, **187** : 136.

Material examined : i) 1 ex., Vadarevu beach East of Chirala, 1.04.2000, Coll. S.C. Mitra and Party; ii) 1 ex., Chinnatapally, Vizianagaram, 02.05.2001 Coll. S. Barua and Party.

Measurements (in mm) :

Length	Width	Height of the aperture
51.30	35.75	43.70

Diagnosis : Shell moderately large, light, spire moderate, sculpture with 12–14 slender axial ribs, longitudinal threads and obsolete spiral striae in interstices; aperture wide, columella glazed and siphonal fasciole twisted; interstices are ornamented with brown, arrow shaped markings, axial ribs are closely lined with dark brown bars arranged in pairs or three, aperture bluish white and with large brown blotches, columella chocolate brown.

Distribution : India : Andhra Pradesh, Andaman and Nicobar Islands, Orissa, Tamil Nadu;

Elsewhere : Maldives, Sri Lanka, Myanmar, Thailand, Indonasia.

***Harpa major* Roeding**
(Pl. IX, Figs. 103 & 104)

1798. *Harpa major* Roeding, *Mus. Bolten*, p. 149.

2000. *Harpa major* : Subba Rao and Dey, *Rec. zool. Surv. India, Occ. Paper No.*, **187** : 136.

Material examined : i) 1 ex., Visakhapatnam, ii) 1 ex., Lawsons bay, Visakhapatnam, 14.02.1947, iii) 1 ex., Chittivalsa river, Bheemunipatnam, Visakhapatnam Feb. 1947; iv) 1 ex. Bheemunipatnam, Visakhapatnam, 12.03.1966, Coll. A.S. Rajagopal and Party; v) 2 exs., Kottapatnam beach, Ongole, 12.02.2002, Coll. S. Barua and Party.

Measurements (in mm) :

Length	Width	Height of the aperture
88.25–49.50	59.00–33.80	74.35 – 41.70

Diagnosis : Shell moderately large, broadly oval, body whorl convexly slopping or subangulate at the shoulder; sculpture with 11–13 broad axial ribs and fine longitudinal striae; aperture large, wide, columella glazed and siphonal fasciole twisted; pinkish flesh colour, spaces between the ribs ornamented with axial interposing white lines and occasional dark brown lines, columellar and parietal area with a large deep chestnut blotch, more or less divided in the middle of the parietal wall.

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

Elsewhere : Throughout Indo-Pacific.

Family OLIVIDAE

Key to the genera

1. Shell thick; suture deep; columella not twisted; aperture some times wide anteriorly ... (2)
 - Shell thin; suture enamelled; columella twisted slightly; aperture wide *Amalda* H.&A.Adams
2. Columella heavily calloused posteriorly; aperture anteriorly wide (3)
 - Columella not calloused posteriorly; aperture narrow throughout *Oliva* Bruguiere
3. Shell oviform; suture canaliculate; spire high *Agaronia* Gary
 - Shell oblong; suture not canaliculate; spire short *Olivancillaria* d'Orbigny

Subfamily OLIVINAE

Genus *Oliva* Bruguiere, 1789

1789. *Oliva* Bruguiere, *Encl. Meth. Vers.*, (1) : 15.

Key to the species

1. Suture deeply and narrowly grooved; columella not plicate throughout the length (2)
 - Suture deeply channelled; columella plicate throughout the length... *O. serica* (Roeding)
2. Spire stunted; outer lip extends to the level of spire *O. vidua* (Roeding)
 - Spire short; outer lip not extends to the level of spire *O. oliva* (Linnaeus)

Oliva oliva (Linnaeus) (Pl. IX, Figs. 105 & 106)

1758. *Voluta oliva* Linnaeus, *Syst. Nat.*, ed. 10 : 729.

2000. *Oliva oliva* : Subba Rao and Dey, *Rec. zool. Surv. India, Occ. Paper No.*, 187 : 138.

Material examined : i) 23 exs., Visakhapatnam, 10.03.1918, Coll. B.L. Chowdhury; ii) 9 exs., Lawson's Bay, Visakhapatnam, Jan. 1921, Coll. S. W. Kemp; iii) 30 exs. Visakhapatnam, 1925, Coll. B. Prashad; iv) 1 ex., Scandel point, Visakhapatnam, 13.01.1941, Coll. H A Hafiz, v) 1 ex., Bheemunipatnam, Visakhapatnam, Jan. 1947; v) 4 exs. Lawson's Bay, Waltair (Visakhapatnam), 19.02.1947; vi) 5 exs. Bandaruvanipeta, Srikakulam, Coll.?, vii) 6 exs.,

Vadarevu, Chirala, 23.12.1964, Coll. K.G.K. Murti; viii) 2 exs., Bandar Canal, Machilipatnam, 7.12.1964, ix) 7 exs., Vadarevu, Chirala, 23.12.1964, N.V. Subba Rao and Party; x) 3 exs. Kalingapatnam, Srikakulam, 18.02. 1965, Coll. D.R.K. Shastry and Party; xi) 4 exs., Gangavaram beach, Visakhapatnam, 19.12.1987, M 22672/4, Coll. K.V. Divakar and R. Venugopal Rao; xii) 4 exs., Vadarevu beach, Chirala, 19.04.2000, xiii) 3 exs. Suryalanka, Chirala, 19.04.2000, Coll. S.C. Mitra and Party; xiv) 7 exs., Kottapatnam, Ongole, 17.02.2000, xv) 2 exs., Krishnapatnam, Nellore, 15.02.2002, xvi) Mahalakshmiapuram, Ongole, 17.02.2002, Coll. S. Barua and Party.

Measurements (in mm) :

Length	Width	Height of the aperture
33.30–16.50	16.20–6.75	30.40–12.50

Diagnosis : Shell thick, medium, polished, spire short, sutural grooves narrow and deep; aperture narrow, columella with a callus on the anterior 2/3rd and oblique; highly variable in colour, white, creamy, brown, yellow or black, ornamented with dark spots and blotches, aperture brown, white or pink.

Distribution : India : Andhra Pradesh, Andaman and Nicobar Islands, Lakshadweep, Maharashtra, Orissa, Pondicherry, Tamil Nadu.

Elsewhere : Philippines.

Oliva serica (Roeding)

1798. *Porphyria serica* Roeding, *Mus. Bolten.*, p. 33.

2000. *Oliva serica* : Subba Rao and Dey, *Rec. zool. Surv. India, Occ. Paper No.*, 187 : 138.

Material examined : i) 1 ex., Rishikunda, Visakhapatnam, 08.03.1966, Coll. A.S. Rajagopal and Party.

Measurements (in mm) :

Length	Width	Height of the aperture
46.05	21.50	43.10

Diagnosis : Shell moderate, with very low spire and pointed apex; suture narrow and deep, with a callous projection; aperture narrow; outer lip extended posterior; columella with plicae; surface ornamented with 3 dark coloured bands on a creamy white background; two broad, bluish brown spiral zones.

Distribution : India : Andhra Pradesh, Andaman and Nicobar Islands.

Elsewhere : Philippines.

***Oliva vidua* (Roeding)**
(Pl. IX, Figs. 107 & 108)

1798. *Porphyria vidua* Roeding, *Mus. Bolten*, p. 34.

2000. *Oliva vidua* : Subba Rao and Dey, *Rec. zool. Surv. India, Occ. Paper No.*, 187 : 139.

Material examined : i) 1 ex., Lawson's Bay, Visakhapatnam, 14.02. 1947; ii) 2 exs., Bheemunipatnam, 20.02.1947, Coll. ?; iii) e exs., Nizamapatnam, 27.07.1963, Coll. A. Daniel and Party; iv) 1 ex., Vadarevu, Chirala, 21.12.1964, Coll. N.V. Subba Rao and Party; v) 1 ex., Rocky point, Waltair (Visakhapatnam), 05.03.1966, vi) 1 ex. Rishikunda, Visakhapatnam, 09.03.1966, Coll. A.S. Rajagopal and Party; vii) 1 ex., Kakinada Bay, 16.04.1978, Coll. N.V. Subba Rao and A. Dey; viii) 1 ex., Gangavaram beach, Visakhapatnam, 19.12.1987, M 22670/4, Coll. K.V. Divakar and R. Venugopal Rao.

Measurements (in mm) :

Length	Width	Height of the aperture
43.40–38.75	19.50–17.20	37.70–35.30

Diagnosis : Shell medium with stunted spire; suture deep and narrowly grooved, body whorl rather inflated posteriorly; columella with broad callus on the anterior end gradually thinning towards the posterior half, with ridges throughout, posterior end of the columella extends to level with the beak like extension of the outer lip which extends to level with spire; colour highly variable, brown with wavy dark brown line and zigzag pattern, often with dark spiral band in the middle.

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

Elsewhere : Indo-Pacific.

Genus *Olivancillaria* d'Orbigny, 1841

1841. *Olivancillaria* d'Orbigny, *American Marid (Moll.)*, p. 420.

***Olivancillaria gibbosa* (Born)**
(Pl. X, Figs. 109 & 110)

1778. *Voluta gibbosa* Born, *Index Rer. Natr. Cae. Vinod.*, p. 202.

2000. *Olivancillaria gibbosa* : Subba Rao and Dey, *Rec. zool. Surv. India, Occ. Paper No.*, 187 : 139.

Material examined : i) 3 exs., Visakhapatnam, 21.01.1929; ii) 1 ex., Visakhapatnam, iii) 2 exs., Chittivalsa, Bheemunipatnam, Feb. 1947, Coll. ?; iv) 1 ex., Uppateru, Kakinada, 27.02.1948, Coll. Mahesh Chandra and G. Ramakrishna; v) 5 exs., Vadarevu, Chirala, 22.12.1964; vi) 1 ex., Kakinada Bay, 19.11.1966, Coll. N.V. Subba Rao and Party; vii) 2 exs., Rishikunda Visakhapatnam, 09.03.1966, Coll. A.S. Rajagopal and Party; viii) 1 ex., Visakhapatnam, 20.02.1987, D.R.K. Shastry and Party; ix) 9 exs., Visakhapatnam, 08.04.2000,

x) 3 exs., Kakinada, 12. 02. 2002, Coll. Ramakrishna and Party; xi) 1 ex., Kalingapatnam, 15.02.2002, xii) 3 exs. Tuplipalem, 01.02.2002, Coll. S. Barua and Party.

Measurements (in mm) :

Length	Width	Height of the aperture
52.00–30.10	36.50–12.50	40.65–22.40

Diagnosis : Shell thick, solid, moderate, elongately ovate, spire acuminate, short, body whorl inflated, suture channelled; aperture wide with slit like posterior canal, columella with thick callus, pale yellowish brown with prominent yellow band at base, mottled or streaked with black spots, sometimes with zigzag transpiral brownish bands, aperture bluish white.

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

Elsewhere : East Africa, Sri Lanka, Myanmar, Thailand, Philippines.

Subfamily ANCILLINAE

Genus *Amalda* H. & A.Adams, 1853

1853. *Amalda* H. & A. Adams, *Gen. Rec. Moll.*, 1 : 148.

Amalda ampula (Gmelin)
(Pl. X, Figs. 111 & 112)

1791. 1791. *Voluta ampula* Gmelin, *Syst. Nat.*, ed. 13 : 3467.

2003. *Amalda ampulla* Subba Rao, *Rec. zool. Surv. India, Occ. Paper No.*, 192 : 293, pl. 71, fig. 4, pl.72, figs. 6 and 7.

Material examined : i) 22 exs., Visakhapatnam, 20.02.1948, Coll. Mahesh Chandra and G. Ramakrishna; ii) 12 exs. Vadarevu, Chirala, 21.12.1964; iii) 14 exs., Vadarevu, Chirala, 22.12.1964, Coll. N.V. Subba Rao and Party; iv) 1 ex., Rishikunda, Visakhapatnam, 09.03.1966; v) 3 exs., Bheemunipatnam, Visakhapatnam 12.03.1966, Coll. A.S. Rajagopal and Party; vi) 1 ex., Visakhapatnam, 08.04.2000, Coll. Ramakrishna and Party; vii) 3 exs., Vadarevu beach, Chirala, 12.4.2000, viii) 1 ex. Suryalanka, Chirala, 19.04.2000, Coll. S.C. Mitra and Party.

Measurements (in mm) :

Length	Width	Height of the aperture
26.20–13.30	15.40–10.35	16.90–10.00

Diagnosis : Shell medium, elongate, slender with elevated spire and pointed apex, suture almost covered with callus, aperture wide, columella twisted in the middle with deep furrow; surface highly polished, white to creamy brown, often tinged with orange brown towards the spire and apex.

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

Elsewhere : Red Sea, Sri Lanka.

Subfamily AGARONINAE

Genus *Agaronia* Gray, 1839

1839. *Agaronia* Gray, *Zool. Blossom*, p. 132.

Agaronia nebulosa (Lamarck)
(Pl. X, Figs. 113 & 114)

1845. *Oliva nebulosa* Lamarck, *Hist. Nat. Anim. Sans. Vert.*, 10 : 628.

2000. *Agaronia nebulosa* : Subba Rao and Dey, *Rec. zool. Surv. India, Occ. Paper No.*, 187 : 140.

Material examined : i) 2 exs., Lawson's Bay, Visakhapatnam 18.12.1940; ii) 7 exs., Kakinada, 29.05.1964.

Measurements (in mm) :

Length	Width	Height of the aperture
37.25–22.15	14.70–9.30	28.40–16.90

Diagnosis : Shell medium, elongate, slender, spire narrow and acute; suture deep, aperture elongate and anteriorly wider, columella with broad, strong, callus, columellar plaits stronger and twisted at base, pinkish white ornamented with zigzag brown lines and oblique concentric streaks below the suture.

Distribution : India : Andhra Pradesh, Andaman and Nicobar Islands, Diu, Gujarat, Maharashtra, Orissa, Pondicherry, Tamil Nadu.

Elsewhere : Sri Lanka, Indonesia.

Family MARGINELLIDAE

Subfamily MARGINELLINAE

Genus *Marginella* Lamarck, 1801

1801. *Marginella* Lamarck, *Syst. Anim.*, p. 75.

Key to the species

Spire flat, cylindrically ovate, outer lip thickened and smooth, columella with four obtuse folds and the anterior most smallest *M. angustata* Sowerby

Spire slightly elevated; ovate with broad anterior end, outer lip thickened with many denticles on inner margin, columella with five fold *M. loebeckeana* (Weinkauff)

***Marginella angustata* Sowerby**

1846. *Marginella angustata* Sowerby, *Thes. Conch.*, **1** : *Marginella*, sp. no. 399, pl. 77, fig., 169, 170.

2000. *Marginella angustata* : Subba Rao and Dey, *Rec. zool. Surv. India, Occ. Paper No.*, **187** : 141.

Material examined : i) 1 ex., Visakhapatnam, 08.04.2000, Coll. Ramakrishna and Party;
ii) 1 ex., Mahalakshmiapuram beach, Nellore, 17.02.2002, Coll. S. Barua and Party.

Measurements (in mm) :

Length	Width	Height of the aperture
15.40	8.90	13.80

Diagnosis : Shell small, cylindrical ovate; spire calloused and flat; aperture narrow, outer lip thickened and smooth, columella with four oblique folds at the anterior end and the anterior most smallest; surface smooth, ash-white with grayish brown spiral bands crossed by bluish axial lines.

Distribution : India : Andhra Pradesh, Andaman Islands, Maharashtra, Lakshadweep, Orissa, Pondicherry, Tamil Nadu.

Elsewhere : Australia, Sri Lanka, New Holland.

***Marginella loebeckeana* (Weinkauff)**
(Pl. X, Figs. 115 & 116)

2003. *Marginella loebeckeana* : Subba Rao, *Rec. zool. Surv. India, Occ. Paper No.*, **192** : 296, pl. 73, fig. 4.

Material examined : i) 1 ex. Bheemunipatnam, Visakhapatnam, 20.02.1947, Coll.?.; ii) 2 exs. Mahalakshmiapuram beach, Nellore, 17.02.2002, Coll. S. Barua and Party.

Measurements (in mm) :

Length	Width	Height of the aperture
22.50–9.80	15.20–6.50	20.50–7.40

Diagnosis : Shell small, solid, spire slightly elevated, aperture narrow, wider at the anterior end, outer lip thickened with many denticles on the inner margin, columella with 5 plaits; shell surface glossy, light gray, outer lip white inside, columellar callus yellowish at the anterior end.

Distribution : India : Andhra Pradesh, Andaman Islands, Pondicherry.

Elsewhere : Indian Ocean.

Family MITRIDAE

Key to the subfamilies

Sculpture with smooth or punctated spiral striae MITRINAE

Sculpture with annulated spiral striae IMBRICARIINAE

Subfamily MITRINAE

Genus *Mitra* Lamarck, 1778

1778. *Mitra* Lamarck, *Tabl. Encl. Meth. Paris*, p. 369.

Subgenus *Nebularia* Swainson, 1840

1840. *Nebularia* Swainson, *Treat. Malacology*, p. 130, 131, 319.

Mitra (Nebularia) aurantia aurantia (Gmelin)

(Pl. X, Figs. 117 & 118)

1791. *Voluta aurantia* Gmelin, *Syst., Nat.*, ed. 13 : 3454.

2000. *Mitra (Nebularia) aurantia aurantia* : Subba Rao and Dey, *Rec. zool. Surv. India, Occ. paper No.*, 187 : 141.

Material examined : i) 3 exs., Visakhapatnam, March, 1964, Coll. K.G.K. Murti; ii) 2 exs. Visakhapatnam, 05.03.1966, Coll. A.S. Rajagopal and Party; iii) 2 exs., Waltair (Visakhapatnam), M 21230/4, Coll. ?.

Measurements (in mm) :

Length	Width	Height of the aperture
26.40–18.55	11.70–7.90	13.60–9.00

Diagnosis : Shell fusiform, medium, whorls six, spire acuminate, suture deep, aperture long; columella with four oblique folds, outer lip with a shallow notch at the upper part and with 12–14 crenulations; orange or chocolate brown.

Distribution : India : Andhra Pradesh, Andaman and Nicobar Islands, Lakshadweep, Gujarat.

Elsewhere : Indo-Pacific.

Subfamily IMBRICARIINAE

Genus *Neocancilla* Cernohorsky, 1966

1966. *Neocancilla* Cernohorsky, *Veliger*, 9(2) : 110.

Key to the species

Sculpture with angulated spiral ridges *N. circula* Kiener

Sculpture with spiral ridges bisected by axial grooves *N. antoniae* (A.Adams)

Neocancilla antoniae (A. Adams)

1870. *Mitra antoniae* A. Adams, *Proc. zool. Soc. Lond.*, p. 788.

2000. *Neocancilla antoniae* : Subba Rao and Dey, *Rec. zool. Surv. India, Occ. Paper No.*, 187 : 148.

Material examined : i) 1 ex., Kakinada, 2002, Coll. P. Ganesh.

Measurements (in mm) :

Length	Width	Height of the aperture
26.80	10.00	15.10

Diagnosis : Shell fusiform, ovate; suture impressed, broad spiral ridges alternating with narrow ones, axial grooves bisect spiral ridges; whorls seven, columella with five oblique folds, outer lip weakly crenulated, ornamented with small orange brown quadrate spots on the spiral ridges and faint rose coloured streaks.

Distribution : India : Andhra Pradesh, Andaman Islands.

Elsewhere : Red sea to Fiji.

Neocancilla circula (Kiener)

1838. *Mitra circula* Kiener, *Icon. Conq. Viv.*, 3 : 21, pl. 5, fig. 13.

2000. *Neocancilla circula* : Subba Rao and Dey, *Rec. zool. Surv. India, Occ. Paper No.*, 187 : 148.

Material examined : i) 1 ex., Visakhapatnam, 28.09.1966.

Measurements (in mm) :

Length	Width	Height of the aperture
14.70	4.95	6.80

Diagnosis : Shell acuminate fusiform; spire sharp, pointed, sculpture with strong, sharp elevated and distinctly placed spiral ridges, interstices distinctly cancellated with axial striae, the base contracted and slightly recurved; aperture longer, columella with four oblique folds.

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

Elsewhere : Indo-Pacific.

Superfamily CANCELLARIOIDEA

Family CANCELLARIIDAE

Genus *Cancellaria* Lamarck, 1799

1798. *Cancellaria* Lamarck, *Mem. Soc. Hist. nat. Paris*, p. 71.

Cancellaria asperella Lamarck

1822. *Cancellaria asperella* Lamarck, *Hist. nat. Anim. Sans. Vert.*, 7 : 112.

Material examined : i) 1 ex., Kakinada, 2002, Coll. P. Ganesh.

Measurements (in mm) :

Length	Width	Height of the aperture
21.90	15.65	11.00

Diagnosis : Shell globose to elongate-ovate; spire short, apex pointed, suture narrow and deep; aperture wide, outer lip thick, strong lirations on the interior; columella with callus, bearing 3 folds; sculpture with numerous axial riblets crossed by alternately thick and then spiral ridges; siphonal canal short and broad.

Distribution : India : Andhra Pradesh, Orissa.

Elsewhere : China, Japan, Philippines, East Australia.

Genus *Scalptia* Jausseume, 1887

1887. *Scalptia* Jausseume, *Le Naturalise*, (2)1 : 213.

Scalptia scalarina (Lamarck)

(Pl. X, Figs. 119 & 120)

1822. *Cancellaria scalarina* Lamarck, *Hist. Nat. Anim. Sans. Vert.*, 7 : 113

2000. *Scalptia scalarina*, Subba Rao and Dey, *Rec. zool. Surv. India, Occ. Paper No.*, 187 : 158.

Material examined : i) 1 ex., Kakinada, 19.11.1964, Coll. N.V. Subba Rao and Party; ii) 1 ex. Srikakulam, 16.02.1995, Coll. D.R.K. Shastry and Party; iii) 1 ex., Krishnapatnam, Nellore, 15.02.2002, Coll. S. Barua and Party.

Measurements (in mm) :

Length	Width	Height of the aperture
22.95–17.25	14.25–9.45	11.65–8.80

Diagnosis : Shell small, solid, spire short, aperture narrow and obliquely oval, outer lip thick and lirated, columella with callus bearing 3 oblique folds, aperture bordering the short siphonal canal; umbilicus groove partly covered by the columellar callus; sculpture with strong axial ribs, separated by broad interspaces; body whorl with 9 axial ribs forming crenulations at the shoulder; pale brown, white often with a white band on the middle of the body whorl, aperture lined with brown.

Distribution : India : Andhra Pradesh, Andaman Islands.

Elsewhere : Mauritius.

Superfamily CONOIDEA

Family CONIDAE

Genus *Conus* Linnaeus, 1750

1750. *Conus* Linnaeus, *Syst. Nat.*, ed. 10 : 712.

Key to the species

1. Shell very large and heavy; much broader ($3/5$ th or more of the total length)
..... *C. betulinus* Linnaeus
- Shell not very large and heavy; not much broader (less than $3/5$ of the total length) ...
..... (2)
2. Shell elongately ovate; yellowish white or golden yellow with large irregular, orange brown maculation's, often arranged in two or three reddish brown interrupted spiral bands in shoulder and spire *C. textiles* Linnaeus
- Shell broadly conical or elongately cylindrical; colour varies (3)
3. Shell uniformly light brown encircled with dark brown spiral lines, pale tan band at shoulder *C. figulinus* Linnaeus
- Shell of various colour patterns not encircled with dark brown spiral lines, pale tan band absent at shoulder (4)
4. Shell spindle shaped, spire elevated; sculpture with round spiral ridges separated by minute beaded grooves *C. aculeiformis* Reeve
- Shell not spindle shape; sculpture without round spiral ridges separated by minute beaded grooves (5)
5. Shell width $\frac{1}{2}$ or less than length (6)
- Shell width more than $\frac{1}{2}$ of the length (8)
6. Spire whorl shallowly channeled, last whorl smooth or with growth flames
..... *C. generalis* var. *maldives* Hwass
- Spire whorl concave, pointed protoconch; upper $2/3$ rd. of the last whorl smooth, lower third spirally grooved, deeper towards base (7)
7. Body whorl creamy white covered with pale or darker brown, squarish spots and axial streaks *C. inscriptus* Reeve
- Body whorl with light to dark brown axial flammules, extending to dark brown with interrupted darker spiral lines *C. mutabilis* Reeve
8. Shell moderately large, heavy (9)
- Shell medium, not heavy (10)
9. Columella not twisted at base; rounded shoulders and flattened top; spire small and pointed; white with regularly arranged spiral rows of black or dark brown quadrangular spots *C. eburneus* Hwass
- Columella twisted at base; broadly conical, shoulders light coronated, convex sided; spire

- short; with pinkish brown zig zag encompassing darker brown dots and dashes
 *C. zeylanicus* Gmelin
10. Shoulder sharply keeled; spire short, concave sided, pointed protoconch
 *C. lentiginosus* Reeve
- Shoulder and spire with obsolete coronations; protoconch not pointed (11)
11. Columella slightly twisted at base; wavy spiral ridges and coarse growth lines; orange
 violet with paler spiral band centrally *C. biliosus* (Roeding)
- Columella not twisted at base; spire and shoulder of body whorl with obsolete coronations;
 light brown gray with an obsolete pale brown band *C. piperatus* Dillwyn

***Conus aculeiformis* Reeve**

(Pl. XI, 121 & 122)

1843. *Conus aculeiformis* Reeve, *Proc. zool. Soc. Lond.*, **1843** : 176.

2003. *Conus aculeiformis* : Subba Rao, *Rec. zool. Surv. India, Occ. Paper No.*, **192** : 311, pl. 81, fig.1.

Material examined : i) 1 ex. Visakhapatnam, 28.09.1996, Coll. ?.

Measurements (in mm) :

Length	Width	Height of the aperture
17.00	8.50	13.35

Diagnosis : Shell small, solid, fusiform, spire elongate, side of the spires concave, body whorl smooth, polished, except the lower 1/3rd which is spirally grooved, grooves progressively deeper at the base, creamy white with orange brown blotched.

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

Elsewhere : Red Sea to Philippines.

***Conus betulinus* Linnaeus**

1758. *Conus betulinus* Linnaeus, *Syst. Nat.*, ed. **10** :

2003. *Conus betulinus* : Subba Rao, *Rec. zool. Surv. India, Occ. Paper No.*, **192** : 313, pl. 80, fig.1.

Material examined : i) 1 ex., Kottapatnam, Ongole, 12.02.2002, ii) Ethamukkal beach, Ongole, 13.02.2002, Coll. S. Barua and Party.

Diagnosis : Shell large, solid, heavy, broadly coiled, almost flat topped, sometimes only the apical whorl elevated; suture incised, shoulder rounded, creamy white with spiral rows of large and small spots, aperture creamy white.

Distribution : India : Andhra Pradesh, Orissa, Pondicherry, Tamil Nadu.

Elsewhere : Indo-West Pacific.

***Conus biliosus* (Roeding)**
(Pl. XI, Figs. 123 & 124)

1798. *Cucullus biliosus* Roeding, *Mus. Bolt.*, p. 39.

2000. *Conus biliosus* : Subba Rao and Dey, *Rec. zool. Surv. India, Occ. Paper No.*, **187** : 160.

Material examined : i) 1 ex., Visakhapatnam, 12.03.1918, ii) 2 exs., Bheemunipatnam, Feb. 1947, Coll. ?; iii) 2 exs., Visakhapatnam, March, 1965, Coll. B. Prashad; iv) 1 ex., Lawson's Bay, Vishakapatnam, Coll. S. W. Kemp; v) 2 exs., Visakhapatnam, March, 1964, Coll. K.G.K. Murti and Party; vi) 2 exs., Visakhapatnam, 05.03.1966; vii) 5 exs., Visakhapatnam, 07.03.1966, Coll. A.S. Rajagaopal and Party.

Measurements (in mm) :

Length	Width	Height of the aperture
42.50–20.50	23.90–12.50	36.50–17.45

Diagnosis : Shell small, solid, heavy, almost straight sided; spire elevated, shoulder keeled slightly ornamented; columella slightly twisted at the base; wavy spiral ridges and coarse growth lines; orange–violet with paler spiral band centrally, short brown flecks on the spire whorls; aperture with violet edge.

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

Elsewhere : South African coast, Persian Gulf.

***Conus eburneus* Hwass**

1792. *Conus eburneus* Hwass in Bruguiere, *Encyl. Meth, Vers.*, **1** : 640.

2000. *Conus eburneus* : Subba Rao and Dey, *Rec. zool. Surv. India, Occ. Paper No.*, **187** : 162.

Material examined : i) 1 ex., Visakhapatnam, 18.01.1929, Coll. ?

Measurements (in mm) :

Length	Width	Height of the aperture
34.30	22.10	32.20

Diagnosis : Shell medium heavy, with rounded shoulders and flattened top; spire small and pointed; periostacum olive brown; colour white with regular spiral rows of black or dark brown quadrangular spots.

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

Elsewhere : Indo-West Pacific.

***Conus figulinus* Linnaeus**

1758. *Conus figulinus* Linnaeus, *Syst. Nat.*, ed., 10 : 715.

2000. *Conus fugilinus* Subba Rao and Dey, *Rec. zool. Surv. India, Occ. Paper No.*, 187 : 163.

Material examined : i) 1 ex., Visakhapatnam, 2002, Coll. P. Ganesh.

Measurements (in mm) :

Length	Width	Height of the aperture
35.00	17.20	28.15

Diagnosis : Shell large, heavy, pyriform, spire elevated; light brown encircled with many dark spiral lines, pale tan band at shoulder.

Distribution : India : Andhra Pradesh, Andaman and Nicobar Islands, Kerala, Tamil Nadu;

Elsewhere : Mocambique, Amirantes, Sri Lanka, Indonesia, New Guinea, Philippines, China, Queensland.

***Conus generalis* var. *maldives* Hwass**

1792. *Conus generalis* var. *maldives* Hwass in Bruguiere, *Encyl. Method. Vers.*, p. 644.

2000. *Conus generalis* var. *maldives* : Subba Rao and Dey, *Rec. zool. Surv. India, Occ. Paper No.*, 187 : 164.

Material examined : i) 2 exs., Visakhapatnam, 2002, Coll. P. Ganesh.

Measurements (in mm) :

Length	Width	Height of the aperture
35.00	17.20	28.15

Diagnosis : Shell moderately large, thick, elongate-conic, spire short, early whorls elevated and sharply pointed, spire whorls shallowly channelled; body whorl smooth; dark brown spiral lines and dashes partly covered by paler brown or orange blotches and band; base violet, aperture white.

Distribution : India : Andhra Pradesh, Andaman Islands.

Elsewhere : African coast, Malagasy, Seychelles, Persian Gulf, Gulf of Oman, Maldives, Sri Lanka.

***Conus inscriptus* Reeve**
(Pl. XI, Figs. 125 & 126)

1843. *Conus inscriptus* Reeve, *Conch. Icon.*, 1 : *Conus* sp. no. 164, pl. 29, fig. 164.

2003. *Conus inscriptus* : Subba Rao, *Rec. zool. Surv. India, Occ. Paper No.*, 192 : 316, pl. 81, fig. 8.

Material examined : i) 1 ex., Machilipatnam, Visakhapatnam, 05.12.1964, Coll. N.V. Subba Rao and Party; ii) 1 ex., Vadarevu beach, Chirala, 18.04.2000, Coll. S.C. Mitra and Party; iii) 1 ex., Kottapatnam, Ongole, 12.02.2002, Coll. S. Barua and Party.

Measurements (in mm) :

Length	Width	Height of the aperture
50.00–36.75	24.10–16.40	42.55–28.40

Diagnosis : Shell medium, solid, elongately conical, keeled at shoulder; spire short, concave sides, protoconch pointed, upper 1/3rd of the body whorl smooth, lower 2/3rd spirally grooved, grooves progressively deeper at the base; creamy white with pale or dark brown, squarish spots and axial streaks; spire radially streaked, aperture white.

Distribution : India: Andhra Pradesh, Maharashtra, Tamil Nadu.

Elsewhere : Red Sea to Bay of Bengal.

***Conus lentiginosus* Reeve**

1844. *Conus lentiginosus* Reeve, *Proc. zool. Soc. Lond*, 1843 : 177.

Material examined : i) 2 exs., Lowson Bay, Waltair (Visakhapatnam), 14.02.1947, Coll. ? ii) 2 exs., Kakinada, 2002, Coll. P. Ganesh.

Measurements (in mm) :

Length	Width	Height of the aperture
28.90–13.50	15.40–8.40	22.10–10.95

Diagnosis : Shell medium, solid, elongate-conic, keeled at shoulder; spire pointed, with exserted whorls; spiral grooves towards base; white, ornamented with brownish yellow spots, aperture white.

Distribution : India : Andhra Pradesh.

Elsewhere : Philippines.

***Conus mutabilis* Reeve**

1844. *Conus mutabilis* Reeve, *Conch. Icon.*, 1 : *Conus* sp. no. 249, pl. 45, fig. 249.

2003. *Conus mutabilis* : Subba Rao, *Rec. zool. Surv. India, Occ. Paper No.*, 192 : 318, pl. 81, fig. 7.

Material examined : i) 8 exs., Visakhapatnam, 24.07.1963, Coll. A. Daniel and Party.

Measurements (in mm) :

Length	Width	Height of the aperture
58.20–41.95	35.50–25.50	49.80–36.85

Diagnosis : Shell medium, solid, broadly conical; spire elevated, apex pointed, body whorl with light or dark brown axial flammules, extending to dark brown with interrupted spiral lines, spire tan, with dark brown axial flammules, aperture white.

Distribution : India : Andhra Pradesh, Goa, Karnataka, Maharashtra, Tamil Nadu.

Elsewhere : Sri Lanka, Indonesia : Borneo; Hong Kong.

***Conus piperatus* Dillwyn**

1817. *Conus piperatus* Dillwyn, *Desc. Cat. Rec. Shells*, 2 : 1-2.

2003. *Conus piperatus* : Subba Rao, *Rec. zool. Surv. India, Occ. Paper No.*, 192 : 319, pl. 65, fig., 8.

Material examined : i) 8 exs., Visakhapatnam, 14.02.1947, M19719/3, ii) 3 exs., 18.02.1947, M 19720/3, Coll. K.G. Murti and Party.

Diagnosis : Shell medium, solid; spire elevated, spire and shoulder of the body whorl obsoletely coronated; light bluish grey with pale brown band and a violet band anteriorly.

Distribution : India : Andhra Pradesh, Andaman Islands.

Elsewhere : Indian Ocean.

***Conus textile* Linnaeus**

1758. *Conus textile* Linnaeus, *Syst. Nat.*, ed. 10 : 717.

2000. *Conus textile* : Subba Rao and Dey, *Rec. zool. Surv. India, Occ. Paper No.*, 187 : 168.

Material examined : i) 1 exs., Waltair (Visakhapatnam), 15/02/1947, Coll. Waltair Survey.

Measurements (in mm) :

Length	Width	Height of the aperture
51.60	24.25	41.65

Diagnosis : Shell ovate conical, glossy, heavy, convex sided with rounded shoulder; spire concave sided, top of the later whorls channelled; apex pointed; weak spiral ridges at base; early whorls pinkish; white to bluish white covered by brown edged overlapping open, large and small tents, aperture white of pinkish.

Distribution : India : Andhra Pradesh, Andaman Islands.

Elsewhere : Indo-Pacific.

***Conus zeylandicus* Gmelin**

1791. *Conus zeylandicus* Gmelin, *Syst. Nat.*, ed. 13 :

1995. *Conus zeylanicus* : Bartsch, Dance, Moolenbeck and Oliver, *Seashells of Eastern arabia*, : 166, fig. 731.

Material examined : i) 1 exs., Nagapatnam, 2002, Coll.P.Ganesh.

Measurements (in mm) :

Length	Width	Height of the aperture
23.90	12.85	19.65

Diagnosis : Shell medium, heavy, thick, moderately glossy, broadly conical; spire short, convex, solid; columella twisted at base, spiral ridge swollen above, spiral whorls slightly coronated; white to pink with pinkish brown zig zags encompassing darker brown dots, aperture white to pink.

Distribution : India : Andhra Pradesh.

Elsewhere : Arabian Gulf.

Family TURRIDAE

Subfamily DRILLINAE

Genus *Inquisitor* Hedley, 1918

1918. *Inquisitor* Hedley, J. & *Proc. Roy. Soc., N.S.W.*, 51 : M 79.

***Inquisitor flavida* (Lamarck)**

1822. *Columbella flavida* Lamarck, *Hist. nat. Anim. Sans. Vert.*, (2)10 : 268.

2003. *Funa flavidula* : Subba Rao, *Rec. zool. Surv. India, Occ. Paper No.*, 192 : 330, pl. 86, fig. 5.

Material examined : i) 1 ex., Visakhapatnam, 28.09.1966, Coll. A.S. Rajagopal and Party.

Measurements (in mm) :

Length	Width	Height of the aperture
17.20–37.80	5.00	6.45

Diagnosis : Shell medium, thick, elongate, fusiform, spire almost half of the total length; suture distinct; columella straight with callus on the upper part, posterior sinus deep; siphonal canal broad and short; sculpture with strong, rather close set of axial ribs crossed by spiral threads; yellowish with dark brown bands, aperture light orange.

Distribution : India : Andhra pradesh, Tamil Nadu.

Elsewhere : Gulf of Arabia.

Genus *Splendrilla* Hedley, 1922

1922. *Splendrilla* Hedley, *Rec. Austral Mus.*, 13 : 250.

Splendrilla persica (Smith)

1888. *Pleurotoma (Drillia) persica* Smith, T.C. p. 306.

1995. *Splendrilla persica* : Bosch, Dance, Moolenbeek and Oliver, *Sea Shells of Eastern Arabia*, p. 168, fig. 77

Material examined : i) 2 exs., Kakinada, 2002, Coll. P. Ganesh.

Measurements (in mm) :

Length	Width	Height of the aperture
10.30	3.30	3.05

Diagnosis : Shell elongately fusiform, thick; sutures incised; protoconch 2½ whorls; outer lip strongly curved profile; spire larger than body whorl; axial ribs restricted to their tops by broad, sub sutural channel; weak spiral ridges at base; translucent white.

Distribution : India : Andhra Pradesh.

Elsewhere : Persian Gulf, Pakistan coast.

Subfamily TURRINAE

Genus *Gemmula* Weinkauff, 1875

1875. *Gemmula* Weinkauff, *Jahr. Deuts. Mal. Ges.*, 2 : 287.

Gemmula speciosa (Reeve)

1843. *Pleurotoma speciosa* Reeve, *Conch. Icon.*, 1, pl. 2, fig. 9.

1964. *Gemmula speciosa* : Powell, *Indo-Pacific Mollusca*, 1(5) : 245, pl. 186, fig. 1.

Material examined : i) 2 exs., Bheemunipatnam, Visakhapatnam, 08.04.2000, Coll. Ramakrishna and Party; ii) 2 exs., Visakhapatnam, 2002, Coll. P. Ganesh.

Diagnosis : Shell fusiform, light brown with tall spire and long tapered and slightly flexed anterior canal; whorls strongly angulate; sculpture with 1-3 plain weak threads inter spaces of the primaries, crowded with weak, crips axial threads.

Distribution : India : Andhra Pradesh.

Elsewhere : Philippines.

Genus *Lophiotoma* Casey, 1904

1904. *Lophiotoma* Casey, *Trans. Academ. Sci. Sl. Louis*, 14(5) : 130.

***Lophiotoma indica* (Roeding)**
(Pl. XI, Figs. 129 & 130)

1798. *Turris indica* Roeding, *Mus. Bolten.*, p. 124.

2000. *Lohiotoma indica* : Subba Rao and Dey, *Rec. zool. Surv. India, Occ. Paper No.*, **187** : 170.

Material examined : i) 3 exs. Kottapatnam, Ongole, 12.02.2002, Coll. S. Barua and Party.

Measurements (in mm) :

Length	Width	Height of the aperture
62.10–37.80	17.10–13.60	14.00–11.90

Diagnosis : Shell moderate, elongate, fusiform, spire long, aperture short, columella smooth, siphonal canal short and slightly recurved; sculpture with bi or tri corded central keel and close set spiral threads above and below the keel; cream, ornamented, with dark brown tranverse lines upon the 2 or 3 cords of the keel; aperture and columella are white or violet.

Distribution : India : Andhra pradesh, Andaman Islands, Lakshadweep, Orissa, Pondicherry, Tamil Nadu, West Bengal.

Elsewhere : Persian Gulf, Sri Lanka to Australia and Fiji.

Subfamily TURRICULINAE

Genus *Turricula* Schumacher, 1817

1917. *Turricula* Schumacher, *Essai Nouv. Syst.*, p. 217.

***Turricula javana* (Linnaeus)**

1767. *Murex javana* Linnaeus, *Syst. Nat.*, ed. 12 : 1221, sp. no 555.

2003. *Turricula javana* : Subba Rao, *Rec. zool. Surv. India, Occ. Paper No.*, **192** : 324, pl. 84, figs. 8 & 9.

Material examined : i) 1 ex., Rocky Coast, Visakhapatnam, 05.03.1966, ii) 1 ex., Thondiyarpet, 25.01.1975, Coll. A.S. Rajagopal and Party; ii) 2 exs., Bheemunipatnam, Visakhapatnam, 08.04.200, Coll. Ramakrishna and Party; iii) 1 ex., Manginipudi beach, Machilipatnam, Visakahapatnam, 15.04.2000, Coll. S.C. Mitra and Party; iv) 1 ex., Ethamukkala beach, Ongole, 13.02.2002, v) 2 exs., Maypadu beach, Ongole, 16.02.2002, Coll. S. Barua and Party.

Measurements (in mm) :

Length	Width	Height of the aperture
63.15–19.70	22.50–7.10	30.00–10.50

Diagnosis : Shell large, elongate, fusiform, spire high and slightly smaller than the body whorl, aperture broad, with wide posterior sinus extending from shoulder to suture; siphonal

canal short and often twisted; sculpture with oblique set and axially elongate nodules on the shoulder, 2 narrow, spiral ridges below suture; brownish yellow with lighter nodules.

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

Elsewhere : Tanzania, Persian Gulf, Pakistan, Sri Lanka, Penang, Indonesia : Moluccas; China, Philippines.

***Turricula tornata tornata* (Dillwyn)**

1817. *Murex tornatus* Dillwyn, *Descriptive Catalogue of Recent Shells*, 2 : 715.

2003. *Turricula tornata tornata* : Subba Rao, *Rec. zool. Surv. India, Occ. Paper No.*, 197 : 325, pl. 84, figs. 1 & 2.

Material examined : i) 2 exs.. Dolphin's nose, Visakhapatnam, Coll. ?.

Measurements (in mm) :

Length	Width	Height of the aperture
79.20–61.70	22.90–18.90	37.00–30.40

Diagnosis : Shell large, fusiform, solid, heavy; spire less than 1/3rd of the total length, suture shallow, aperture wide, posterior sinus deep, siphonal canal long, twisted, shell surface smooth, except spiral ridges below, suture and spiral striations at the base of the body whorl; creamy white, ornamented with brown lines.

Distribution : India : Andhra Pradesh, Maharashtra, Orissa, Tamil Nadu.

Elsewhere : Sri Lanka, Myanmar, Thailand.

Family TEREBRIDAE

Genus *Terebra* Bruguiere, 1798

1798. *Terebra* Bruguiere, *Encly. Meth. Hist. Nat. Vers.*, 1 : 15.

***Terebra maculata* (Linnaeus)**

1758. *Buccinum maculata* Linnaeus, *Syst. Nat.*, ed. 10 : 741.

2000. *Terebra maculata* : Subba Rao and Dey, *Rec. zool. Surv. India, Occ. Paper No.*, 187 : 174.

Material examined : i) 1 ex., Kottapatnam beach, Ongole, 12.02.2002, Coll. S. Barua and Party.

Measurements (in mm) :

Length	Width	Height of the aperture
79.00	25.10	28.00

Diagnosis : Shell elongate, stout and heavy with 18 rounded whorls; aperture wide, columella smooth except for a weak parietal fold, fasciole small but strong with a central groove; surface smooth except for a weak axial plications on the early whorl and growth lines on the later whorls, white ornamented with two spiral rows of irregular, purple brown blotches on each whorl.

Distribution : India : Andhra Pradesh, Andaman and Nicobar Islands, Lakshadweep.

Elsewhere : Tropical Indo-Pacific.

***Terebra strigilata* Linnaeus**

1758. *Terebra strigilata* Linnaeus, *Syst. Nat.*, ed. 10 : sp. no. 484.

Material examined : i) 1 exs., Visakhapatnam, 05.03.1966, Coll. A.S. Rajagopal and Party.

Measurements (in mm) :

Length	Width	Height of the aperture
49.10	9.50	9.00

Diagnosis : Shell elongate, stout; whorls 10-15; sculpture with broad and flat axial ribs, interstices narrow and smooth; grey or greenish grey, ornamented with blackish brown, rhomboidal blotches or a white pre sutural band, bodywhorl with a white peripheral band.

Distribution : India : Andhra Pradesh.

Elsewhere : Tropical Pacific.

***Terebra succinata* Boss**

1801. *Terebra succinata* Boss, *Deterville ed Buffon Moll.*, 4 : 17.

2000. *Terebra succinata* : Subba Rao and Dey, *Rec. zool. Surv. India, Occ. Paper No.*, 187 : 175.

Material examined : i) 5 exs., Visakhapatnam, 28.09.1996, Coll. ?.

Measurements (in mm) :

Length	Width	Height of the aperture
23.20–15.50	4.20–3.50	4.10–3.40

Diagnosis : Shell solid, elongate, straight sided; whorls 17, stepped at suture, axial ribs strong, spiral subsutural grooves resembling a secondary suture on each whorls; dark brown

Distribution : India : Andhra Pradesh, Andaman Islands.

Elsewhere : Tropical Pacific.

Genus *Diplomeriza* Dall, 1919

1919. *Diplomeriza* Dall, *Nautilus*, 33 : 22.

***Diplomeriza duplicata* (Linnaeus)**
(Pl. XI, Figs. 131 & 132)

1767. *Buccinum duplicatum* Linnaeus, *Syst. Nat.*, ed. 12 : 1206.

2000. *Duplicaria duplicata* : Subba Rao, *Rec. zool. Surv. India, Occ. Paper No.*, 192 : 339, pl. 87, figs. 2 & 3, pl. 89, figs 6 & 7.

Material examined : i) 4 exs., Visakhapatnam, March, 1964, Coll. K.G.K. Murti; ii) 1 ex., Suryalanka, Chirala, 19.04.2000, Coll. S. C. Mitra and Party; iii) 1 ex., Kottapatnam, Ongole, 12.02.2002, iv) 1 ex., Ethamukkala beach, Ongole, 13.02.2002, v) 1 ex., Ravanappasalov beach, 22.02.2002, Coll. S. Barua and Party.

Measurements (in mm) :

Length	Width	Height of the aperture
47.70	9.35	11.45

Diagnosis : Shell medium, narrowly elongate with 15–17 whorls; aperture small, ovate; columella twisted, anterior canal recurved; sculpture with a deep sutural groove and 25 to 30 close set axial ribs, divided by a spiral groove above the middle; cream or brown with darker rusty brown transpirally elongate markings and often with a pale band just above suture.

Distribution : India : Andhra Pradesh, Andaman and Nicobar Islands, Tamil Nadu;

Elsewhere : Indo-Pacific.

Genus *Hastula* H and A. Adams, 1853

1853. *Hastula* H and A Adams, *Gen. Rec. Moll.*, 1 : 225.

***Hastula trailli* (Deshayes)**
(Pl. XI, Figs. 127 & 128)

1859. *Terebra trailli* Deshayes, *Proc. zool. Soc. London*, 1859 : 285.

Type locality : Vasigapatnam, Ocean Indian = Visakhapatnam.

2003. *Hastula trailli* : Subba Rao, *Rec. zool. Surv. India, Occ. Paper No.*, 192 : 338, pl. 89, figs. 3 & 4.

Material examined : i) 36 exs., Visakhapatnam, 13.01.1894, Coll. Marine Survey; ii) Many exs., 17.01.1945, M 15812/2, Coll. B. Prashad; iii) 18 exs., Kalingapatnam, Srikakulam, 18.02.1995; iv) 5 exs., Pukkallabeta, Srikakulam, 19.02.1995, v) 3 exs., Visakhapatnam, 28.01.1998, Coll. D.R.K. Shastry and Party; vi) 3 exs., Visakhapatnam, 28.1.1998, Coll. D.K. Kundu and Party; vii) 5 exs., Machilipatnam, Visakhapatnam, 15.4.2000, viii) 19 exs., Vadarevu

beach, Chirala, 18.04.2000 Coll. S.C. Mitra and Party; ix) 21 exs., Kottapatnam, Ongole, 12.02.2002, Coll. S. Barua and Party; x) 62 exs., Visakhapatnam, xi) 11 exs, Visakhapatnam, 13.2.1997, xii) 5 exs., Kalingapatnam, Srikakulam, xiii) 1 ex., Badarevu beach, Srikakulam, Coll. ?.

Measurements (in mm) :

Length	Width	Height of the aperture
32.50–17.15	5.50–3.45	5.20–3.50

Diagnosis : Shell small, narrow, needle shape, with flattened sloping whorls; suture indistinct; aperture small, columella arched and short, surface almost smooth, except for elongate plications on the upper part of the whorls, white, apex lead, whorls with ash colour spiral bands and indistinct spots below suture.

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

Elsewhere : Indian Ocean.

Subclass HETEROBRANCHIA

Order ALLOGASTROPODA

Superfamily ARCHITECTONICOIDEA

Family ARCHITECTONICIDAE

Genus *Architectonica* (Roeding, 1798)

1798. *Architectonica* Roeding, *Mus. Bolten.*, 2 : 98.

Type species : *Trochus perspectivus* Linnaeus.

Key to the species

Whorls with 4 deep spiral grooves crossed by radiating grooves; suture deep; umbilicus bordered by beaded margin with two grooves; brown or yellowish brown bands always broken into blotches *A. laevigata* (Lamarck)

Whorls with broad spiral zone with a cord above and another below crossed by radiating grooves; suture fine; umbilicus lined with denticulate ridge; brown on yellowish brown bands continuous *A. perspectiva* (Linnaeus)

Architectonica laevigata (Lamarck)

(Pl. XII, Figs. 133 & 134)

1822. *Solarium laevigatum* Lamarck, *Hist. Nat. Anim. Sans. Vert.*, 7 : 3.

2000. *Architectonica laevigata* : Subba Rao and Dey, *Rec. zool. Surv. India, Occ. Paper No.*, 187 : 177.

Material examined : i) 2 exs., Visakhapatnam, 11.01.1941, Coll. H.A. Hafiz; ii) 1 ex., Bheemunipatnam, Visakhapatnam, 20.02.1947, Coll. ?; iii) 1 ex., Machlipatnam, Visakhapatnam, 7.12.1964, iv) 1 ex., Kakinada, 19.11.1964, v) 2 exs., Visakhapatnam, 20.02.1987, Coll. N.V. Subba Rao and Party; vi) 2 exs., Kakinada, 12.4.2000 vii) 1 ex., Krishnapatnam, Srikakulam, 22.04.2000, viii) 1 ex., Ramathirtham beach, Vitapalem, 21.01.2002, Coll. Ramakrishna and Party; ix) 1 ex., Mahalakshmpuram beach, Nellore, 17.02.2002, Coll. S. Barua and Party.

Measurements (in mm) :

Length	Width	Height of the aperture
23.80–7.15	38.10–14.55	16.45–6.00

Diagnosis : Shell small, depressed by conical with sharply angulated margin; whorls 4-5, almost equal, rounded, aperture angular, umbilicus deep, wide, base fawn with blue tinge on middle area and with brown radial markings on the periphery, profuse blotches of orange or yellowish brown, bands broken into blotches.

Distribution : India : Andhra Pradesh, Andaman Islands, Gujarat, Maharashtra, Orissa, Pondicherry, Tamil Nadu.

Elsewhere : Persian Gulf, South African Coast, Pakistan, Iran.

Architectonica perspectiva (Linnaeus)

(Pl. XII, Figs. 135 & 136)

1758. *Trochus perspectiva* Linnaeus, *Syst. Nat.*, ed. 10 : 757.

2000. *Architectonica perspectiva* : Subba Rao and Dey, *Rec. zool. Surv. India, Occ. Paper No.*, 187 : 177.

Material examined : i) 1 ex., Visakhapatnam, 13.01.1941, Coll. H.A. Hafiz; ii) 1 ex., Bheemunipatnam, Visakhapatnam, 18.02.1947, Coll. ?; iii) 1 ex., Kakinada, 19.11.1964, Coll. N.V. Subba Rao and Party; iv) 1 ex., Mayapadu beach, Nellore, 16.02.2002; v) 6 exs., Mahalakshmpuram beach, Nellore, 17.02.2002, Coll. S. Barua and Party.

Measurements (in mm) :

Length	Width	Height of the aperture
17.10–9.15	36.00–20.00	15.10–8.50

Diagnosis : Shell moderate, spire conoidal and convex, suture canaliculated, sculpture with a cingulate thread on top and bottom of each whorl; whorls decussated by oblique axial grooves; aperture small and elliptical, umbilicus wide, deep and crenulate; fawn, gray or yellowish brown, posterior sutural sulcus white, followed by a dark brown band, anterior sutural sulcus spotted dark brown and yellowish brown.

Distribution : India : Andhra Pradesh, Andaman and Nicobar Islands, Tamil Nadu, West Bengal.

Elsewhere : Baluchistan coast, Mergui, Arakan, Penang, China, Australia.

Superfamily PYRAMIDELLOIDEA

Family AMATHINIDAE

Genus *Amathina* Gray, 1842

1842. *Amathina* Gray, *Synop. Cont. Brit. Mus.*, ed. 44 : 63, 90.

Amathina tricarinata (Linnaeus)

1767. *Patella tricarinata* Linnaeus, *Syst. Nat.*, ed. 12 : 1259.

2003. *Amathina tricarinata* : Subba Rao, *Rec. zool. Surv. India, Occ. Paper No.*, 192 : 346, pl. 93, fig. 1 & 2.

Material examined : i) 1 ex., Krishnapatnam, Nellore, 15.02.2002, Coll. S. Barua and Party.

Measurements (in mm) :

Length	Width
28.95	19.90

Diagnosis : Shell small, limpet like, solid, dull, rather oval in shape, apex at the posterior end, three strong rounded ridges or carinate radiate from the apex and project beyond the outline of the shell, surface with wavy radiating ribs cut the posterior end, white covered with brownish periostracum, inside white

Distribution : India : Andhra Pradesh, Andaman and Nicobar Islands, Goa, Lakhsadweep, Minicoy Islands.

Elsewhere : Persian Gulf, Japan.

Subclass OPISTHOBRANCHIA

Order CEPHALASPIDES

Superfamily PHILIMOIDEA

Family RINGICULIDAE

Genus *Ringicula* Deshayes, 1838

1838. *Ringicula* Deshayes in Lamarck, *Hist. nat. Anim. Sans. Vert.*, (2) 8 : 342.

Ringicula propinquans Hinds

1844. *Ringicula propinquans* Hinds, *Proc. zool. Soc. Lond.*, 12 : 96.

2003. *Ringicula propinquans* : Subba Rao, *Rec. zool. Surv. India, Occ. Paper No.*, **192** : 348, pl. 92, figs. 12 & 13.

Material examined : i) 3 exs., Bottom of Channel, Visakhapatnam Harbour, May & June, 1926, Coll. H.C.Ray and G. Vargis; ii) 2 exs., Vasitha Godavari estuary, M 20804/4

Measurements (in mm) :

Length	Width	Height of the aperture
3.50–3.00	1.90–1.80	1.20–1.15

Diagnosis : Shell thick, solid, glossy translucent with globose last whorl; spire whorls rounded, sutures deep sculpture with widely spaced spiral grooves; aperture narrow, outer lip thickened and with a large central teeth on the edge; columella thick with two strong folds at parietal ridges; white.

Distribution : India : Andhra Pradesh, Kerala, Maharashtra, Orissa, Tamil Nadu.

Elsewhere : Persian Gulf, Gulf of Aden, Pakistan coast.

Family BULLIDAE

Genus *Bulla* Linnaeus, 1758

1758. *Bulla* Linnaeus, *Syst. Nat.*, ed., **10** : 725.

Bulla ampulla Linnaeus
(Pl. XII, Figs. 137 & 138)

1758. *Bulla ampulla* Linnaeus, *Syst. Nat.*, ed. **10** : 727.

2000. *Bulla ampulla* : Subba Rao and Dey, *Rec. zool. Surv. India, Occ. Paper No.*, **187** : 183.

Material examined : i) 1 ex., Jalaripet halt, Visakhapatnam, 06.03.1966, Coll. A.S. Rajagopal and Party.

Measurements (in mm) :

Length	Width	Height of the aperture
26.75	19.05	24.50

Diagnosis : Shell moderate, solid, and broadly ovoid; body whorl expanded; spire very much invaginated and marked by a depression; outer lip extends posteriorly; columella smooth and with thin callus; shell surface smooth and polished; pale brownish, red or clouds of light brown, aperture and columella white.

Distribution : India : Andhra Pradesh, Andaman and Nicobar Islands.

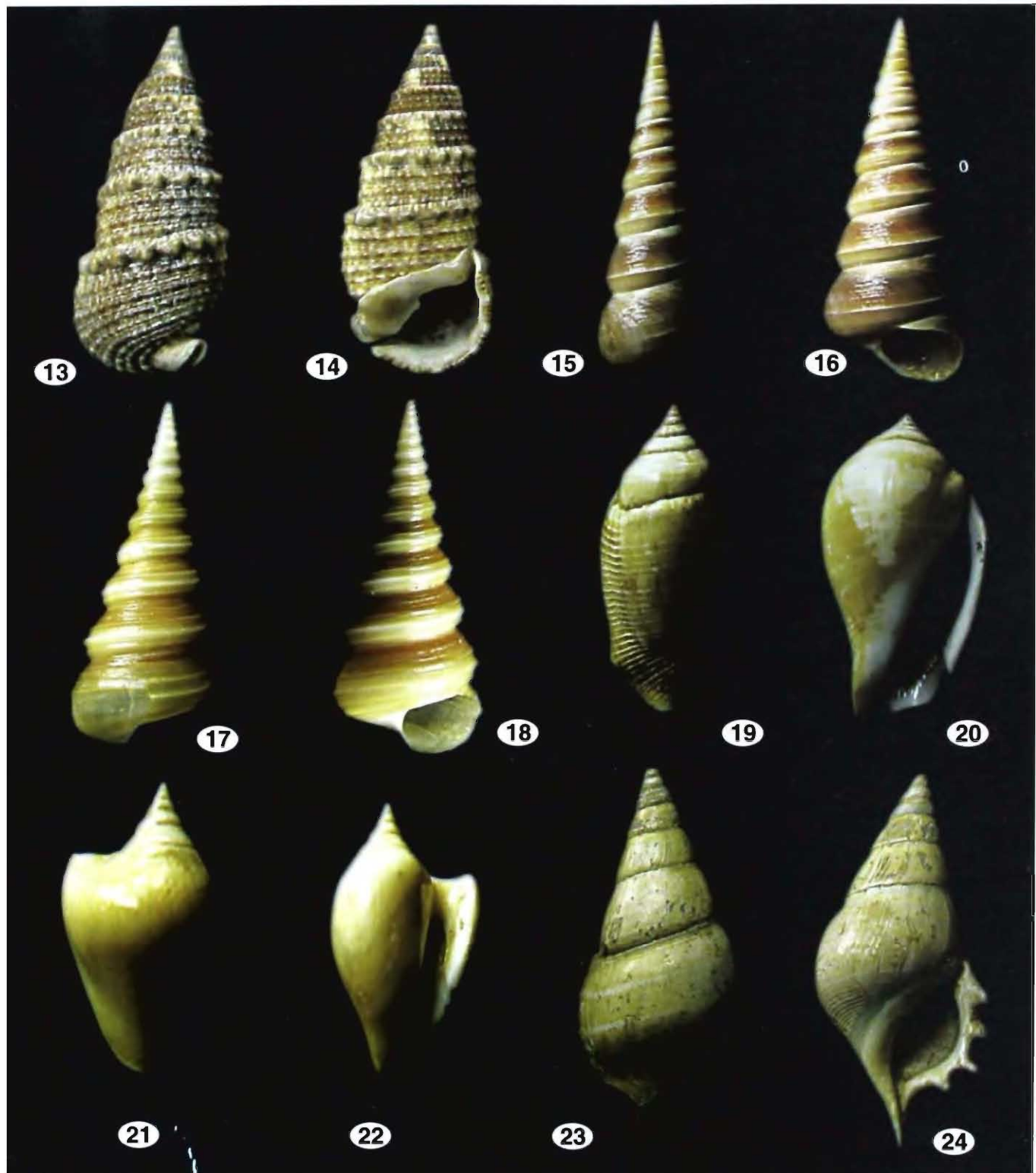
Elsewhere : South Africa, Malagasy, Reunion, Mauritius, Amirantes, Seychelles, Red Sea, Philippines, Viti, Fiji.

PLATE I



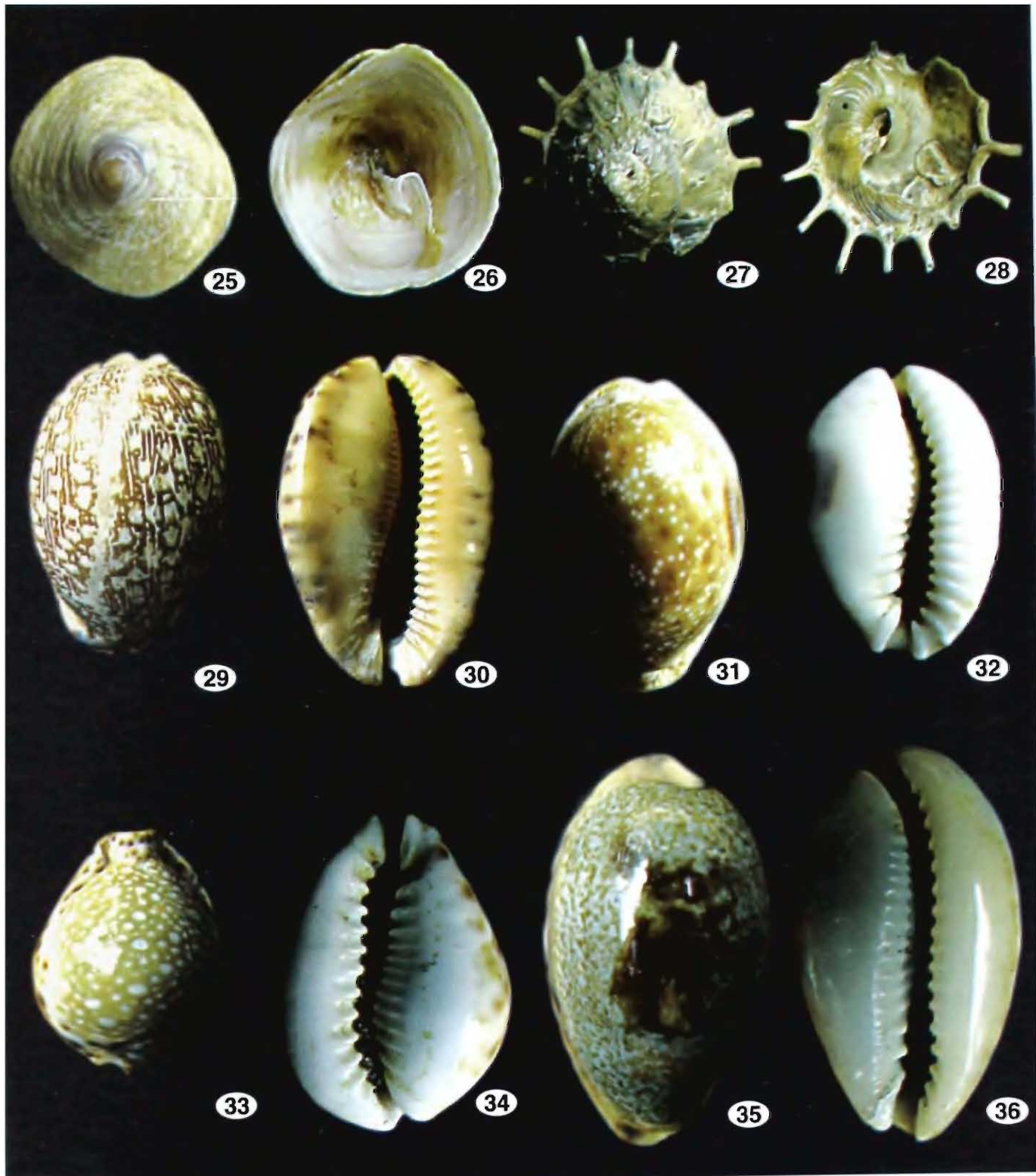
Figs. 1-12 : 1&2. Dorsal & Ventral view of *Haliotis (Ovinotis) ovina* Gmelin; 3&4. Dorsal & Ventral view of *Diodora signaporensis* (Reeve); 5&6. Dorsal & Ventral view of *Diodora funiculata*; 7&8. Dorsal & Ventral view of *Turbo (Marmorostoma) brunneus* (Roeding); 9&10. Dorsal & Ventral view of *Nerita (Amphinerita) polita* Linnaeus; 11&12. Dorsal & Ventral view of *Clypeomorus moniliferus* (Kiener).

PLATE - II



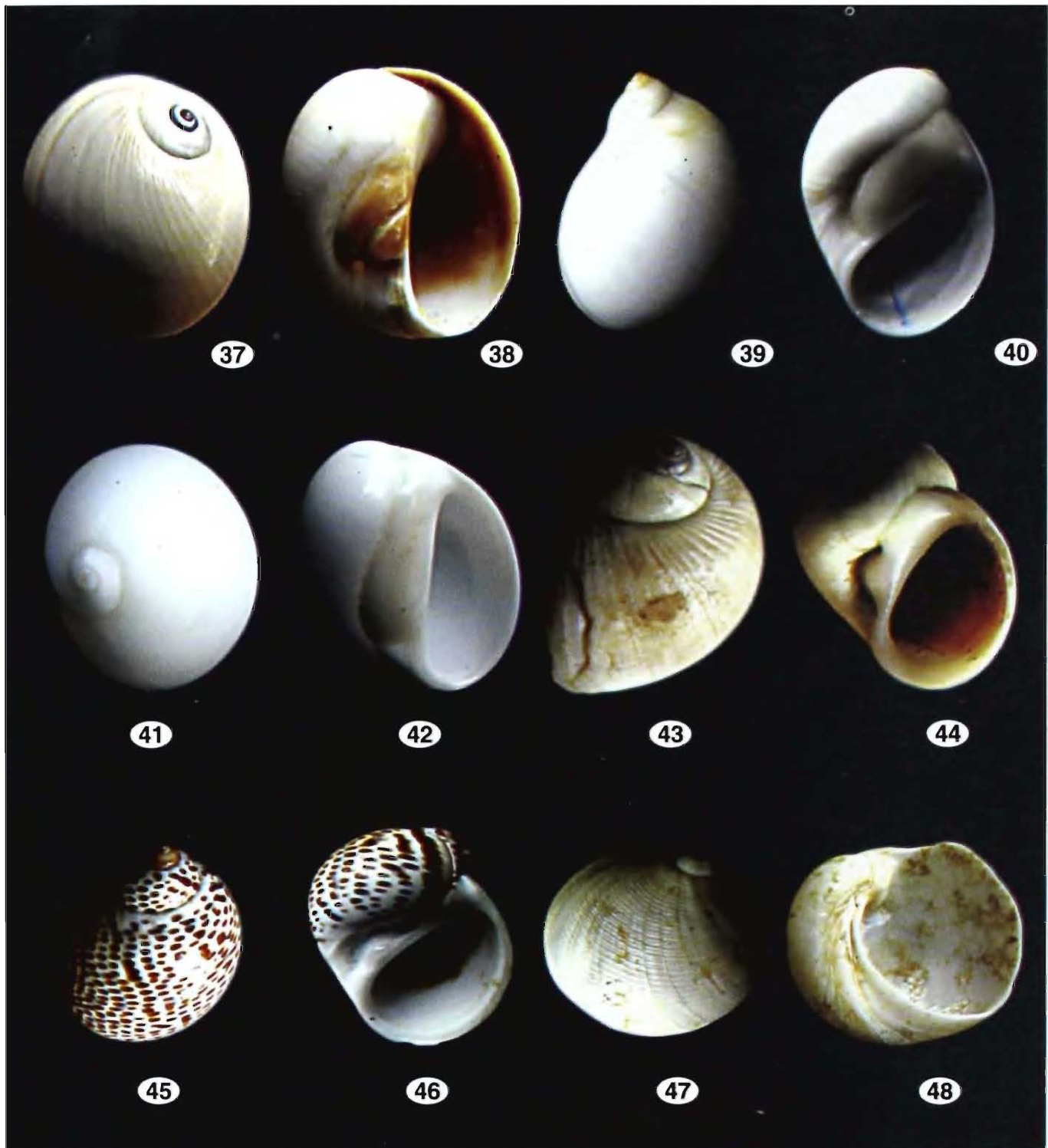
Figs. 13-24 : 13&14. Dorsal & Ventral view of *Rhinoclavis (Rhinoclovis) sinensis* (Gmelin); 15&16. Dorsal & Ventral view of *Turritella attenuata* Reeve; 17&18. Dorsal & Ventral view of *Turritella duplicata* (Linnaeus); 19&20. Dorsal & Ventral view of *Strombus (Gibberulus) gibberulus gibberulus*; 21&22. Dorsal & Ventral view of *Strombus (Laevistrombus) cananium* Linnaeus; 23&24. Dorsal & Ventral view of *Tibia delicatula* (Nevill).

PLATE - III



Figs. 25-36 : 25&26. Dorsal & Ventral view of *Crucibulum extingtorium* (Lamarck); 27&28. Dorsal & Ventral view of *Xenophora (Stellaria) solaris* (Linnaeus); 29&30. Dorsal & Ventral view of *Cypraea arabica* Linnaeus; 31&32. Dorsal & Ventral view of *Cypraea erosa* Linnaeus; 33&34. Dorsal & Ventral view of *Cypraea lamarckii* Gray; 35&36. Dorsal & Ventral view of *Cypraea pallidula* Gaskoin.

PLATE - IV



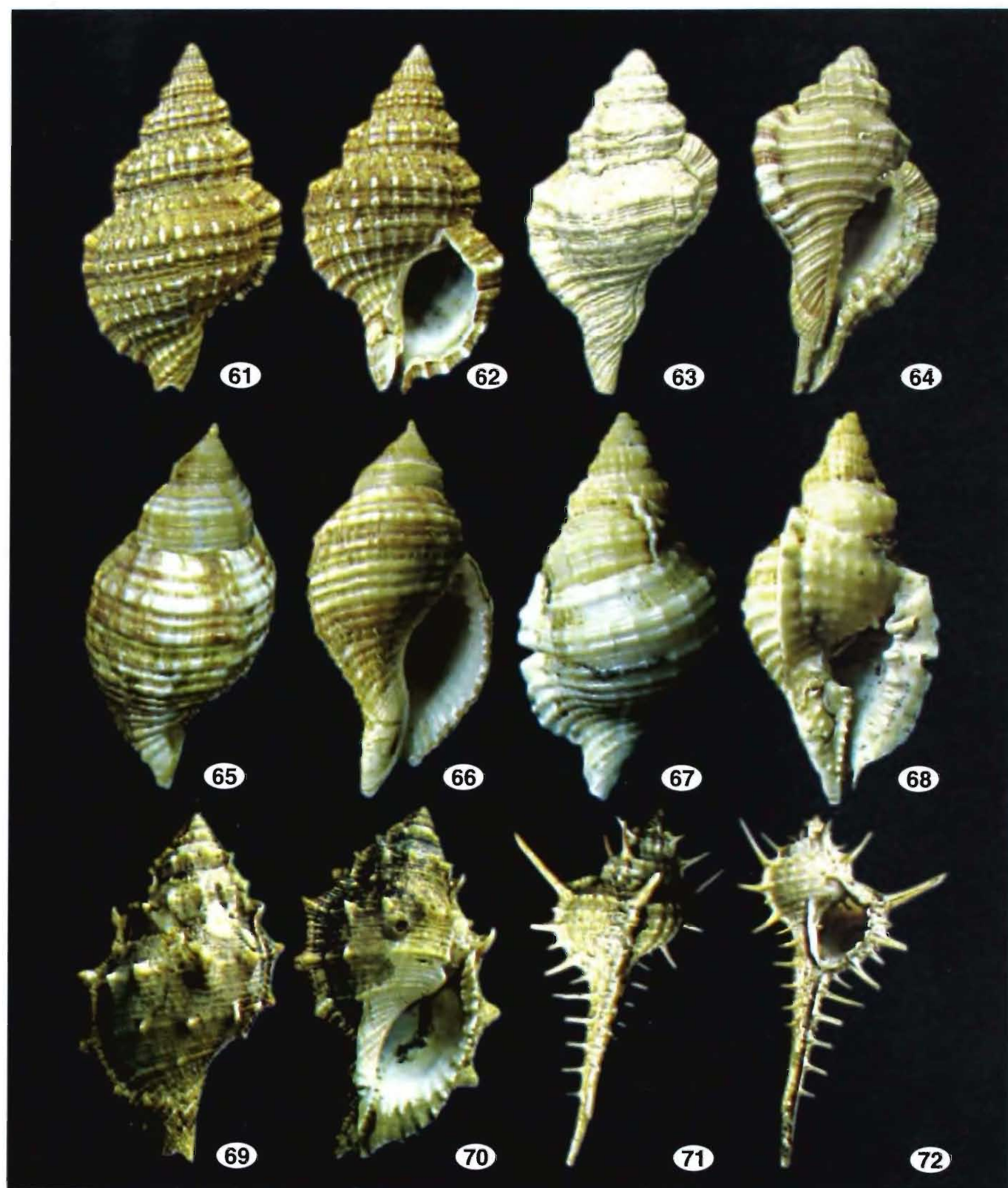
Figs. 37-38 : 37&38. Dorsal & Ventral view of *Polinices (Glossaulox) didyma* (Roeding); 39&40. Dorsal & Ventral view of *Polinices (P.) mamilla* (Linnaeus); 41&42. Dorsal & Ventral view of *Polinices (P.) tumidus* (Swainson); 43&44. Dorsal & Ventral view of *Natica gualteriana* Recluz; 45&46. Dorsal & Ventral view of *Natica tigrina* (Roeding); 47&48. Dorsal & Ventral view of *Sinum neritoideum* (Linnaeus).

PLATE V



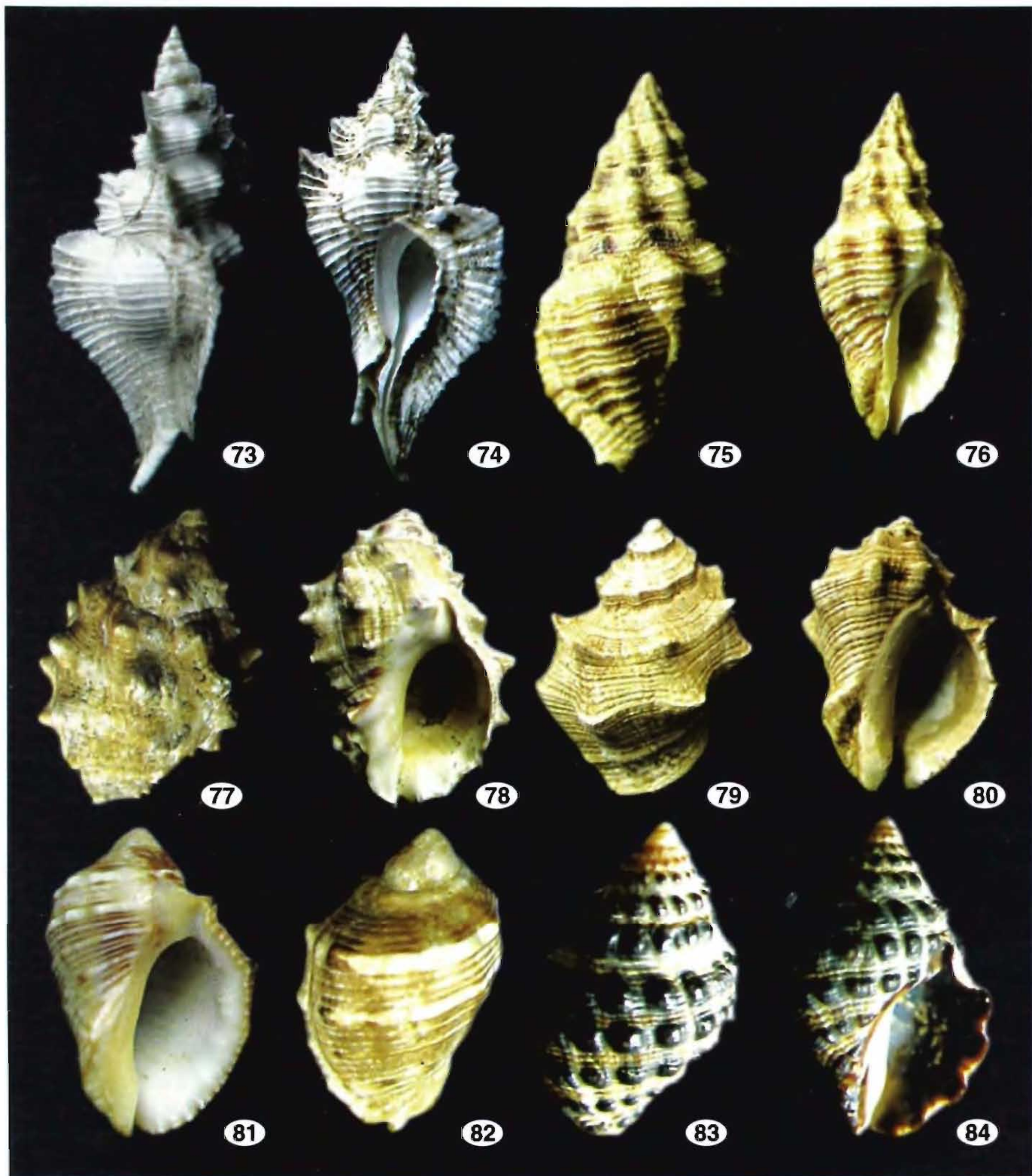
Figs. 49-60 : 49&50. Dorsal & Ventral view of *Tonna dolium* (Linnaeus); 51&52. Dorsal & Ventral view of *Tonna sulcosa* (Born); 53&54. Dorsal & Ventral view of *Ficus gracilis* (Sowerby); 55&56. Dorsal & Ventral view of *Ficus variegata* Roeding; 57&58. Dorsal & Ventral view of *Phalium* (P.) *areola* Linnaeus; 59&60. Dorsal & Ventral view of *Melampus ceylonicus* Petit.

PLATE - VI



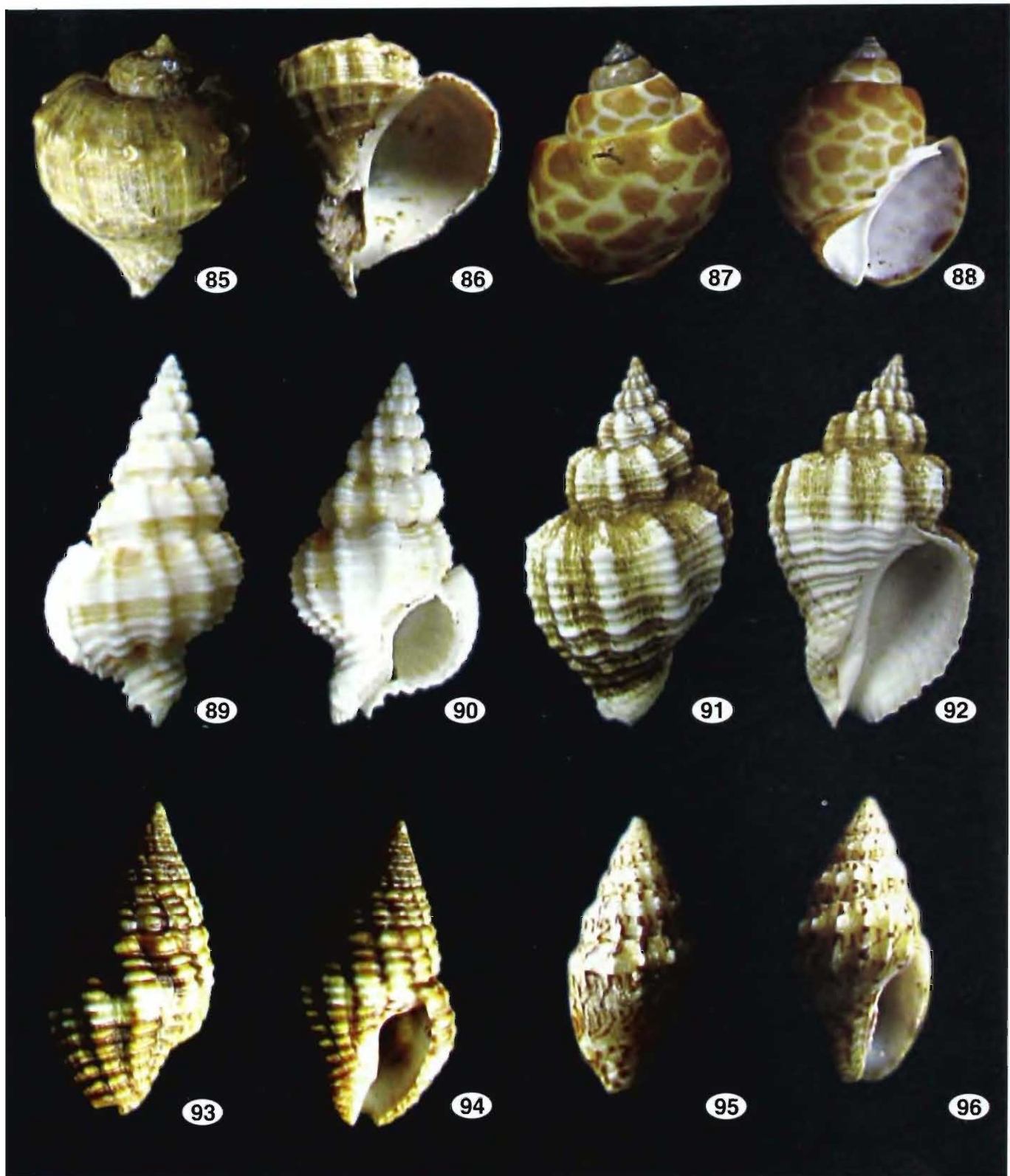
Figs. 61-72 : 61 & 62. Dorsal & Ventral view of *Gyrineum natator* (Roeding); 63 & 64. Dorsal & Ventral view of *Cymatium tripus* (Gmelin); 65 & 66. Dorsal & Ventral view of *Linatella cingulata* (Lamarck); 67 & 68. Dorsal & Ventral view of *Distorsio reticularis* (Linnaeus); 69 & 70. Dorsal & Ventral view of *Bufo naria rana* (Linnaeus); 71 & 72. Dorsal & Ventral view of *Murex carbonnieri* (Joussaeume).

PLATE - VII



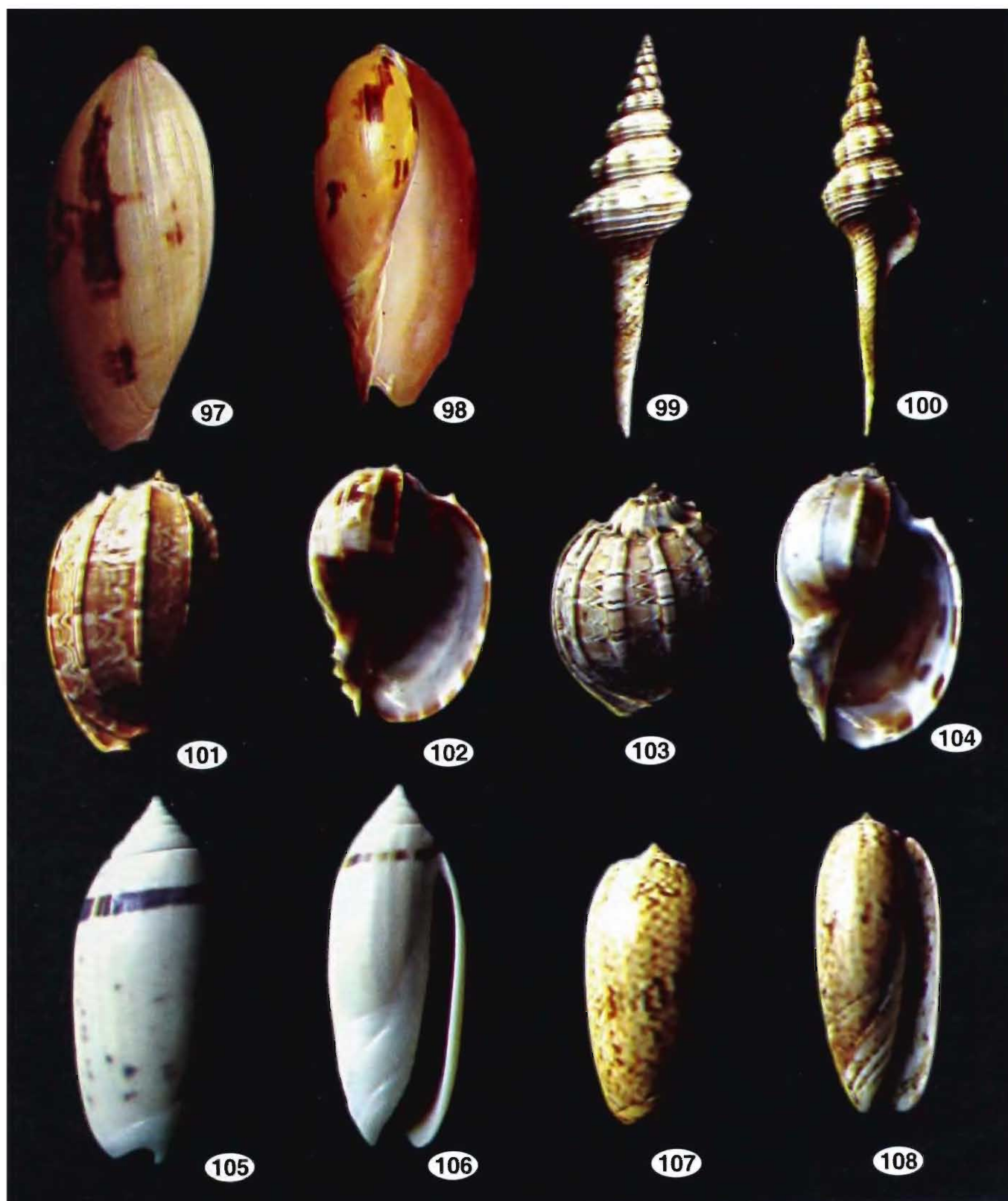
Figs. 73-84 : 73&74. Dorsal & Ventral view of *Pterynotus pinnatus* (Swainson); 75&76. Dorsal & Ventral view of *Cronia (Ergalatax) contracta* (Reeve); 77&78. Dorsal & Ventral view of *Thais echinata* (Blainville); 79&80. Dorsal & Ventral view of *Thais lacera* (Born); 81&82. Dorsal & Ventral view of *Thais (Mancinella) bufo* (Lamarck); 83&84. Dorsal & Ventral view of *Morula granulata* (Duclos).

PLATE VIII



Figs. 85-96 : 85&86. Dorsal & Ventral view of *Rapana rapiformis* (Born); 87&88. Dorsal & Ventral view of *Babylonia spirata* (Linnaeus); 89&90. Dorsal & Ventral view of *Nassaria acuminata* (Reeve); 91&92. Dorsal & Ventral view of *Cantharus (Polia) tranquebaricus* (Gmelin); 93&94. Dorsal & Ventral view of *Engina armillata* Reeve; 95&96. Dorsal & Ventral view of *Anachis terpsichore* (Sowerby).

PLATE - IX



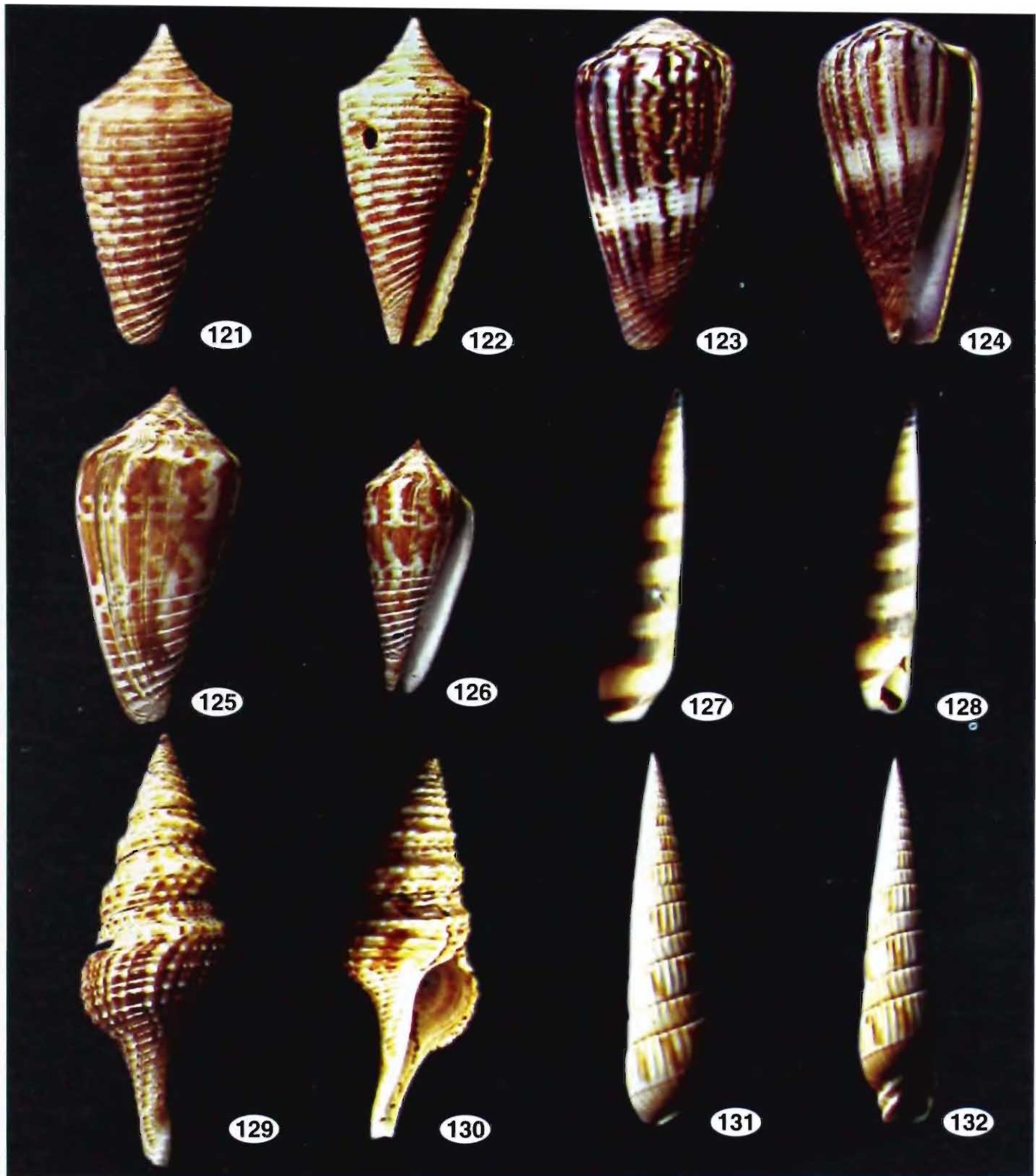
Figs. 97-108: 97&98. Dorsal & Ventral view of *Melo melo* (Solander); 99&100. Dorsal & Ventral view of *Fusinus colus* (Linnaeus); 101&102. Dorsal & Ventral view of *Harpa davidis* Roeding; 103&104. Dorsal & Ventral view of *Harpa major* Roeding; 105&106. Dorsal & Ventral view of *Oliva oliva* (Linnaeus); 107&108. Dorsal & Ventral view of *Oliva vidua* (Roeding).

PLATE - X



Figs. 109-120 : 109& 110. Dorsal & Ventral view of *Olivancillaria gibbosa* (Born); 111&112. Dorsal & Ventral view of *Amalda ampula* (Gmelin); 113&114. Dorsal & Ventral view of *Agaronia nebulosa* (Lamarck); 115&116. Dorsal & Ventral view of *Marginella loebeakeana* (Weinkauff); 117&118. Dorsal & Ventral view of *Mitra (Nebularia) aurantia aurantia* (Gmelin); 119&120. Dorsal & Ventral view of *Scalptia scalarina* (Lamarck).

PLATE - XI



Figs. 121-132 : 121&122. Dorsal & Ventral view of *Conus aculeiformis* Reeve; 123&124. Dorsal & Ventral view of *Conus biliosus* (Roeding); 125&126. Dorsal & Ventral view of *Conus inscriptus* Reeve; 127&128. Dorsal & Ventral view of *Hastula trailli* (Deshayes); 129&130. Dorsal & Ventral view of *Lophiotoma indica* (Roeding); 131&132. Dorsal & Ventral view of *Diplomeriza duplicata* (Linnaeus).

PLATE - XII



Figs. 133-144 : 133&134. Dorsal & Ventral view of *Architectonica laevigata* (Lamarck); 135&136. Dorsal & Ventral view of *Architectonica perspectiva* (Linnaeus); 137&138. Dorsal & Ventral view of *Bulla ampula* Linnaeus; 139&140. Dorsal & Ventral view of *Ellobium gangeticum* (Pfeiffer); 141&142. Dorsal & Ventral view of *Cassidula nucleus* Martyn; 143&144. Dorsal & Ventral view of *Pythia plicata* (Gray).

Family HAMINEIDAE

Subfamily HAMINEINAE

Genus *Haminoea* Turton and Kingston, 1830

1830. *Haminoea* Turton and Kingston in Carrington, *Teignmouth Guide*, part 2, sig. n, F.8.

Haminoea elegans A. Adams

1850. *Bulla elegans* A. Adams in Sowerby's *Thes. Conch.*, *Bulla* sp. no. 64, fig. 92.

2003. *Haminea elegans* : Subba Rao, *Rec.zool. Surv. India, Occ. Paper No.*, 192 : 355, pl. 94, fig. 1.

Material examined : i) 6 exs., Machilipatnam, Visakhapatnam, 20.02.1894, M 4349, Coll. D. Hungerford.

Measurements (in mm) :

Length	Width	Height of the aperture
20.00–16.95	13.15–10.15	20.20–17.10

Diagnosis : Shell thin, globosely-ovate, without spire with slightly broad anterior; sculpture with spiral scratches and coarse growth lines; aperture longer than the body whorl, narrower at posterior; outer lip elongately produced and arched over middle, columella thickened at base; light yellowish and glaze white.

Distribution : India : Andhra Pradesh.

Elsewhere : Philippines.

Subclass PULMONATA

Order ARCHAEPULMONATA

Superfamily ELLOBIOIDEA

Family ELLOBIIDAE

Genus *Ellobium* Roeding, 1798

1798. *Ellobium* Roeding, *Mus. Bolen.*, p. 105

Ellobium gangeticum (Pfeiffer)

(Pl. XII, Figs. 139 & 140)

1853. *Auricula gangetica* (Benson Ms.) Pfeiffer, *Malak. Blatt.*, 2 : 7.

2000. *Ellobium gangetica*: Subba Rao and Dey, *Rec. zool. Surv. India, Occ. Paper*, 187 : 187.

Material examined : i) 8 exs., Manginipudi, Machilipatnam, Visakhapatnam, 04.12.1964; ii) 5 exs., Machilipatnam, Vishapatnam, 07.12.1964, iii) 1 ex., Krishna River, Naga Lanka.

Machilipatnam, Vishakapatnam, 09.12.1964, Coll. N.V. Subba Rao and Party; iv) 15 exs. Bandar Port area, Machilipatnam, Visakhapatnam, 16.04.2000, Coll. S.C. Mitra and Party.

Measurements (in mm) :

Length	Width	Height of the aperture
28.50–7.40	11.75–2.80	15.66–4.00

Diagnosis : Shell ovate, fusiform, thin, covered with straw coloured epidermis, spire short, whorls tumid; aperture slightly expanded below, columella with two plaits, surface with thin axial striae.

Distribution : India : Andhra Pradesh, Andaman and Nicobar Islands, Maharashtra, Orissa, Tamilnadu, West Bengal.

Elsewhere : Sri Lanka, Myanmar.

Genus *Cassidula* Gray, 1847

1847. *Cassidula* Gray, *Proc. zool. Soc. London*, 1847 : 179.

Cassidula nucleus Martyn (Pl. XII, Figs. 141 & 142)

1838. *Cassidula nucleus* Martyn, *Index Moll. Mus. Ch. Fred.*, (1) : 52.

2000. *Cassidula nucleus*: Subba Rao and Dey, *Rec.zool. Surv. India, Occ. Paper No.*, 187 : 188.

Material examined : i) 9 exs., Bhiravapalem, Yamen, 04.12.1964; ii) 1 ex., Manginipudi, Machilipatnam, Visakhapatnam, 05.12.1964; iii) 1 ex., Krishna River, Naga Lanka, Machilipatnam, Visakhapatnam, 09.12.1964, iv) 19 exs., Uppateru canal, Nizamaptnam, 13.12.1964, Coll. N. V. Subba Rao and Pary; v) 5 exs., Krishnapatnam, 15.02.2002, Coll. S. Barua and Party.

Measurements (in mm) :

Length	Width	Height of the aperture
18.80–14.00	11.60–9.40	13.00–9.50

Diagnosis : Shell small, ovate, thick, with convex body whorl and a short spire; body whorl angular at the shoulder; aperture narrow and longer than spire; columella with callus and two folds; outer lip thickened, denticulate and angulate; fawn coloured.

Distribution : India : Andhra Pradesh, Andaman Islands, Maharastra, Tamil Nadu, West Bengal.

Elsewhere : Indo-West Pacific.

Genus *Pythia* Roeding, 1798

1798. *Pythia* Roeding, *Mus. Bolten.*, p. 105.

Pythia plicata (Gray)
(Pl. XII, Figs. 143 & 144)

1825. *Scarabus plicatus* (Ferrusac) Gray, *Ann. Phil.*, **25** : 415.

2000. *Pythia plicatus* : Subba Rao and Dey, *Rec. zool. Surv. India, Occ. Paper No.*, **187** : 188.

Material examined : i) 11 exs., Uppateru canal, Kakinada, 22.02.1964, ii) 2 exs., Machilipatnam, Visakhapatnam, 07.12.1964, Coll. N.V. Subba Rao and Party; iii) 2 exs., Bandar Port area, Machilipatnam, Visakhapatnam, 16.04.2000, Coll. S.C. Mitra and Party; iv) 2 exs., Pulicat Lake, 21.02.2002, Coll. S. Barua and Party.

Measurements (in mm) :

Length	Width	Height of the aperture
20.30–10.45	14.55–7.45	10.50–5.45

Diagnosis : Shell small, compressed, ovate; spire acute, body whorl large; suture impressed; aperture narrow, outer lip margin reflected with 3–4 plicae; columella calloused, umbilicus deep; light purple with a white band.

Distribution : India : Andhra Pradesh, Andaman and Nicobar Islands, Orissa, Pondicherry, Tamil Nadu, West Bengal.

Elsewhere : Sri Lanka, Myanmar, Thailand, Indonesia.

Subfamily MELAMPODINAE

Genus *Melampus* Montfort, 1810

1810. *Melampus* Montfort, *Syst. Conchyl.*, **2** : 318.

Melampus ceylonicus (Petit)
(Pl. V, Figs. 59 & 60)

1843. *Auricula ceylonica* Petit, *Proc. zool. Soc. Lond.*, **1843** : 202.

2003. *Melampus ceylonicus* : Subba Rao, *Rec. zool. Surv. India, Occ. Paper No.*, **192** : 371, pl. 95, fig. 3.

Material examined : i) 11 exs., Kakinada, Reg. No., M 20077/3; ii) 20 exs., Kakinada Bay, 19.11.1964; iii) 76 exs., Uppateru canal, Kakinada, 22.11.1964, iv) 16 exs., Manginipudi, Machilipatnam, Visakhapatnam, 05.12.1964, v) 43 exs., Krishna River, Naga Lanka, Machilipatnam, Visakhapatnam, 09.12.1964, Coll. N.V. Subba Rao and Party; vi) 7 exs., Bandar Port area, Machilipatnam, Visakhapatnam, 16.04. 2000, Coll. S.C. Mitra and Party.

Measurements (in mm) :

Length	Width	Height of the aperture
13.00–7.65	7.70–4.40	8.50–4.50

Diagnosis : Shell small, ovate; spire conical, acute; body whorl narrow; suture lineate; aperture narrowly elongate, oblique and protruding below; outer lip margin thin; inner margin 6-teeth; columella obliquely rounded with 3 plaits; light brown with dark bands.

Distribution : India : Andhra Pradesh, Andaman and Nicobar Islands, Maharashtra, Orissa.

Elsewhere : Mauritius, Seychelles, Sri Lanka, New Hebrides.

Melampus pulchella (Petit)

1842. *Auricularia pulchella* Petit., *Proc. Zool. Soc. Lond.*, 1843 : 202.

2003. *Melampus pulchella* : Subba Rao, *Rec. zool. Surv. India, Occ. Paper No.*, 192 : 371, pl. 95, fig. 4.

Material examined : i) 1 ex., Uppateru canal, Kakinada, 22.11.1964, Coll. N.V. Subba Rao and Party.

Diagnosis : Shell very small, ovately fusiform, solid; spire convexly conoid; whorl 6–7; aperture narrow, produced at the base, columella or plait strong; outer lip denticulate; light brown.

Distribution : India : Andhra Pradesh, West Bengal.

Elsewhere : Philippines, Singapore.

Subfamily PEDIPEDINAE

Genus *Laemodonta* Philippi, 1843

1843. *Laemodonta* Philippi, *Z. Malakozool.*, 3 : 98.

Laemodonta cumingiana (Blanford)

Material examined : i) 11 exs., Uppateru Canal, Kakinada, 22.11.1964, Coll. N.V. Subba Rao and Party.

Measurements (in mm) :

Length	Width	Height of the aperture
7.50–5.45	4.45–3.10	4.10–2.70

Diagnosis : Shell small, thick, roundly ovate; spire short; protoconch with 2 to 5, smooth, whorls; outer lip thickened with 3 stout tooth; columella with three strong folds, parietal callus well developed; whorl with strong encircled close set ribs; amber, aperture paler; periostracum froms small spiral frills.

Distribution : India : Andhra Pradesh.

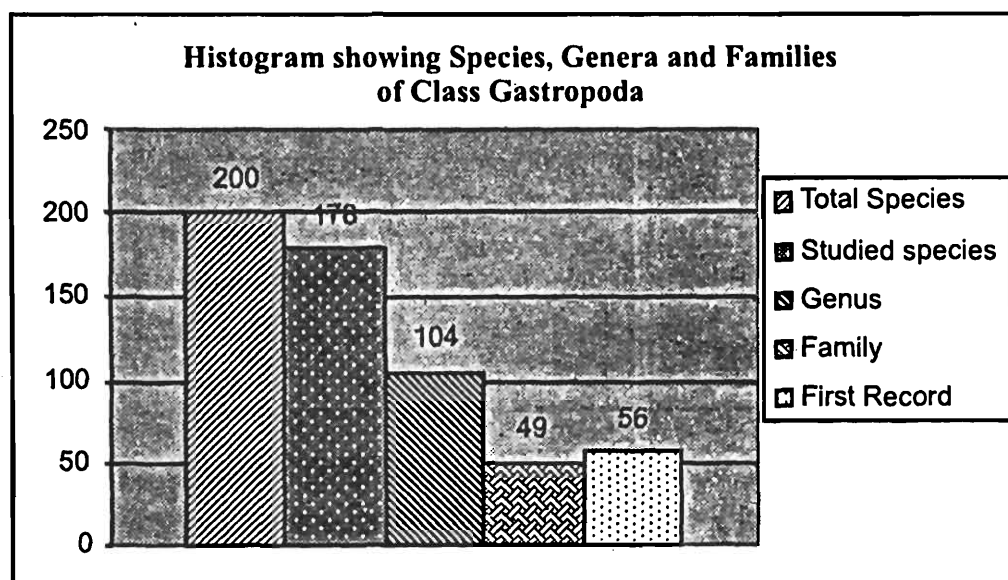
Elsewhere : Gulf of Arabia.

SUMMARY AND DISCUSSION

Total number of species of Polyplacophora and Gastropoda occurring in Andhra Pradesh is 202, belonging to 106 genera and 51 families, of which 22 species recorded from literature only. Out of these 180 species studied 2 species of Polyplacophora and 178 species are of Gastropoda.

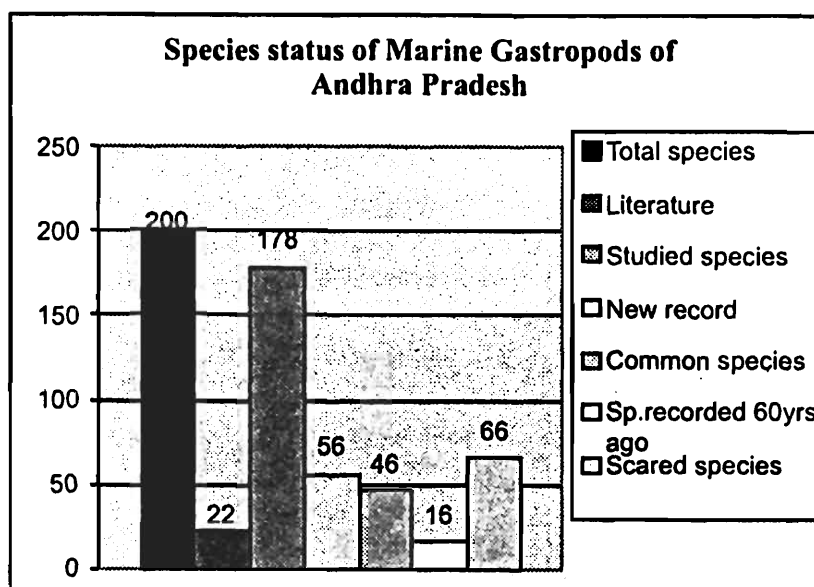
Class Polyplacophora is representing by 2 species belongs to two genera and two families.

Class Gastropoda represented by 200 species, belongs to 104 genera and 49 families. Out of which 22 species recorded from literature only. Among 178 species studied 56 reported for the first time from Andhra Pradesh accounting 31.46% of the studied species. The species namely: *Cellana radiata radiata* (Born), *Euchelus asper* (Gmelin), *E. asper* var. *tricarinatus* (Lamarck), *Umbonium vestiarius* (Linnaeus), *Turbo* (*Marmarostoma*) *brunneus* (Roeding), *Nerita* (*Theliostyla*) *albicilla* Linnaeus, *Nerita* (*Theliostyla*) *chamaeleon* Linnaeus, *Littoraria* (*Littoraria*) *undulata* (Gray), *L.* (*Littorinopsis*) *scabra scabra* (Linnaeus), *Nodolittorina* (*Nodilittorina*) *pyramidalis pyramidalis* (Quoy and Gaimard), *N.* (*Granulittorina*) *millegrana* (Philippi), *Cerithidea* (*Cerithidea*) *obtusata* Lamarck, *C.* (*Cerithideopsilla*) *cingulata* (Gmelin)



Telescopium telescopium (Linnaeus), *Turritella duplicata* (Linnaeus), *Crucibulum extensorium* (Lamarck), *Cypraea ocellata* Linnaeus, *Polinices* (*Glossaulax*) *didyma* (Roeding), *P.* (*Polinices*) *mamilla* (Linnaeus), *Tonna dolium* (Linnaeus), *Ficus gracilis* (Sowerby), *Ficus variegata* Roeding, *Gyrineum natator* (Roeding), *Bufonaria echinata* (Link), *Bufonaria rana* (Linnaeus), *Murex carbonnieri* (Jousseaume), *M. trapa* Roeding, *Thais lacera* (Born), *T. tissorti* (Petit), *T.* (*Mancinella*) *bufo* (Lamarck), *Morula granulata* (Duclos), *Babylonia spirata* (Linnaeus) *Nassarius* (*Noitha*) *stolatus* (Gmelin), *N.* (*Zeuxis*) *dorsatus* (Roeding), *N.* (*Zeuxis*) *foveolatus*

(Dunker), *Bullia vittata* (Linnaeus), *Pugilina (Hemifusus) cochilidium* (Linnaeus), *Oliva oliva* (Linnaeus), *O. vidua* (Roeding), *Olivancillaria gibbosa* (Born), *Amalda ampula* (Gmelin), *Turricula javana* (Linnaeus), *Hastula trailli* (Deshayes), *Architectonica laevigata* (Lamarck), *Cassidula nucleus* Martyn, *Melampus ceylonicus* (Petit) are common species, which is about 25.84% of the studied species. Species like *Callistoma scobinata* (A.Adam), *Nerita (Amphinerita) polita* Linnaeus, *Nerita (Theliostyla) squmulata* Le Guillon, *Strombus (Euprotomus) listeri* Gray, *Strombus (Laeistrombus) canarium* Linnaeus, *Cypraea caputserpentis* Linnaeus, *Tonna sulcosa* (Born), *Semicassis canaliculatum* (Bruguiere), *Gyrineum gyrenium* (Linnaeus), *Jathina globosa* Swainson, *J. janthina* (Linnaeus), *Conus eberneus* Hwass, *Conus piperatus* Dillwyn, *Conus textile* Linnaeus, *Ringicula propinquans* Hinds and *Haminoea elegans* A. Adams were recorded more than 60 years ago however not recorded at present, which is about 8.98% of the studied species. The species *Chiton granoradiatus* Leloup, *Acanthochitona mahaensis* Wickworth, *Haliotis (Ovinotis) ovina* Gmelin, *Monilea callifera* (Lamarck), *Nerita (Ritena) plicata* Linnaeus, *Neritina (Pseudonerita) sulcolosa* von Martens, *Littoraria (Palustorina) melanostoma* (Gray), *Nodolittorina (Granulittorina) leucostica leucostica* (Philippi), *Turritella columnaris* Kiener, *Siliquaria*



(*Tenagodus*) *tostus* Moerch, *Strombus (Gibberulus) gibberulus gibberulus* Linnaeus, *Rimella (Varicospira) cancellata* (Lamarck), *Crepidula walshi* Herrmannson, *Cypraea erosa* Linnaeus, *C. caputserpentis* Linnaeus, *C. moneta* Linnaeus, *Volva sowerbyana* Weinkauff, *Pseudosimnia (Diminovula) fruticum* (Reeve), *Polinices (Polinices) flamingiana* (Recluz), *N. (Naticarius) pulicaria* (Philippi), *N. (Naticarius) alapapilionis* (Roeding), *Eunaticina papilla* (Gmelin), *Linatella cingulata* (Lamarck), *Distorsio reticularis* (Linnaeus), *Bufonaria margaritula* (Deshayes), *Amaea (Acrilla) acuminata* (Sowerby), *Chicoreus brunneus* (Link), *Chicoreus ramosus* (Linnaeus), *Pteronotus pinnatus* (Swainson), *Homalocanthus secunda* (Lamarck), *Purpura persica* (Linnaeus), *Nassaria acuminata* (Reeve), *N. coramandelica* E.A. Smith, *N. pusilla* Roeding, *Cantharus (Polia) spiralis* (Gray), *Engina armillata* (Reeve), *Nassarius*

(*Plicaricularia*) *globosus* (Quoy and Gaimard), *Nassarius* (*Plicaricularia*) *pullus* (Linnaeus), *Nassarius* (*Zeuxis*) *olivaceus* (Bruguiere), *Bullia tranquebarica* (Roeding), *Melo melo* (Solander), *Harpa costata* (Linnaeus), *Harpa davidis* Roeding, *Oliva serica* (Roeding), *Agaronia nebulosa* (Lamarck), *Marginella angustata* Sowerby, *Marginella loebeakeana* (Weinkauff), *Neocancilla antoniae* (H. Adams), *N. circula* (Kiener), *Cancellaria asperella* Lamarck, *Conus aculeiformis* Reeve, *Conus betulinus* Linnaeus, *C. figulinus* Linnaeus, *C. generalis* var. *maldives* Hwass, *Conus lentiginosus* Reeve, *C. mutabilis* Reeve, *C. zeylandicus* Gmelin, *Inquisitor flavida* (Lamarck), *Spendrilla persica* (Smith), *Gemmula speciosa* (Linnaeus), *Lophiotoma indica* (Roeding), *Turricula tornata tornata* (Dillwyn), *Terebra maculata* (Linnaeus), *T. succinata* Boss, *Amathina tricarinata* (Linnaeus), *Bulla ampula* Linnaeus, *Haminoea elegans* A. Adams, *Melampus pulchella* (Petit) and *Laemodonta cumingiana* (Blanford) species are rare in distribution in Andhra Pradesh which is about 37.07% of the studied species.

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MARINE MOLLUSCS : BIVALVIA, SCAPHOPODA AND CEPHALOPODA

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INTRODUCTION

The marine molluscs of Andhra Pradesh part II deals with the three classes Bivalvia, Scaphopoda and Cephalopoda.

The present work is a consolidated report on Bivalvia, Scaphopoda and Cephalopoda of Andhra Pradesh deals with 151 species of marine and estuarine molluscs belonging to 78 genera under 43 families. The class Cephalopoda represented by 5 species under 5 genera and 4 families, while the Bivalvia represented by 142 species under 72 genera and 38 families and Scaphopoda by 3 species under single genus and family.

The consolidated report of marine molluscs part II is based on the collections accumulated over 90 years (i.e. from 1916 collection made by H. Hosten) in the National Zoological Collections of Zoological Survey of India; collections received from different Institutions and Universities for identification and by the authors collected during the various surveys along the Andhra coast from 2000 to 2004.

Perusal of the literature and available records, the important studies on these classes from Andhra Pradesh are as follows: Nagabhushanam (1955, 1960) reported 23 species of wood boring bivalves from Vishakhapatnam harbour. Ganapati and Rao (1959) reported the occurrence of wood boring bivalves from Godavari estuary. Subba Rao (1968) reported 5 species of wood boring bivalves from Andhra Pradesh during his report of wood boring molluscs of Mahanadi estuary. Subba Rao *et. al.* (1990) reported the occurrence of 34 species of bivalves and one species of cephalopods from Andhra Pradesh during their work of molluscs of Orissa coast. Surya Rao and Subba Rao (1991) recorded one species of bivalves from Andhra Pradesh during their work on molluscan fauna of Lakshadweep. Subba Rao *et al.* (1992) reported 19 species of bivalves and 3 species of cephalopods from Andhra Pradesh during their work on estuarine and marine molluscs of West Bengal. Subba Rao and Dey (2000) recorded 9 species of bivalves from Andhra Pradesh coast during their catalogue of

marine molluscs of Andaman and Nicobar Islands. Mahapatra (2001) reported 28 species of bivalves and 2 species of cephalopods from Godavari estuary.

The classification followed is that of Vaught (1989).

Abbreviation used

Coll.	–	Collector
ex.	–	example
exs.	–	examples
Reg. No.	–	Registration number
mm	–	Millimeter

SYSTEMATIC LIST

Class CEPHALOPODA

Subclass NAUTILOIDEA

Order NAUTILIDA

Family NAUTILIDAE

Genus *Nautilus* Linnaeus, 1758

1. *Nautilus pompilius* Linnaeus

Subclass COLEOIDEA

Order SEPIIDA

Suborder SEPIINA

Family SEPIIDAE

Genus *Sepia* Linnaeus, 1758

2. *Sepia aculeata* Ferrussac and d'Orbigny

Genus *Sepiella* Gray, 1849

3. *Sepiella inermis* Ferrussac and d'Orbigny

Order TEUTHIDA

Suborder MYOPSIDA

Family LOLIGINIDAE

Genus *Loligo* Schneider, 1784

4. *Loligo duvanceli* Ferrussac

Genus *Loliolus* Steenstrup, 1856

5. *Loliolus investigatoris* Goodrich

Order OCTOPODA
 Suborder INCIRRATA
 Superfamily OCTOPODOIDEA
 Family OCTOPODIDAE
 Subfamily OCTOPODINAE
 Genus ***Octopus*** Lamarck, 1798

6. *Octopus macropus* Risso

Class BIVALVIA
 Subclass PTERIOMORPHIA
 Order ARCOIDA
 Superfamily ARCOIDEA
 Family ARCIDAE
 Subfamily ARCINAE
 Genus ***Barbatia*** Gray, 1842

7. *Barbatia obliquata* (Wood)

Genus ***Trisidos*** Roeding, 1798

8. *Trisidos tortuosa* (Linnaeus)

Subfamily ANADARINAE
 Genus ***Anadara*** Gray, 1847

9. *Anadara antiquata* (Linnaeus)

10. *A. granosa* (Linnaeus)

11. *A. rhombea* (Born)

Subgenus ***Scapharca*** Gray, 1847

12. *A. (Scapharca) deyrollei* Joussaeume

13. *A. (Scapharca) inaequalvis* (Bruguiere)

Family NOETIIDAE
 Subfamily NOETIINAE
 Genus ***Noetia*** Gray, 1857

14. *Noetia martinii* (Reeve)

Subfamily STRIARCINAE
 Genus ***Striarca*** Conrad, 1801

15. *Striarca afra* (Gmelin)

16. *Striarca lactea* (Linnaeus)

Family CUCULAEIDAE

Genus *Cucullaea* Lamarck, 180117. *Cucullaea* (C.) *concumorta* Martini18. *Cucullaea* (C.) *labiata* (Lightfoot)

Superfamily LIMOPSOIDEA

Family GLYCYMERIDIDAE

Genus *Glycymeris* Da Costa, 177819. *Glycymeris arabica* (H. Adam)20. *Glycymeris castaneus* (Lamarck)21. *Glycymeris lividus* (Reeve)22. *Glycymeris taylori* (Angus)23. *Glycymeris tenuicostatus* (Reeve)

Order MYTILOIDA

Superfamily MYTILOIDEA

Family MYTILIDAE

Subfamily MYTILINAE

Genus *Perna* Philipsson, 178824. *Perna viridis* (Linnaeus)Genus *Septifer* Recluz, 184825. *Septifer bilocularis* (Linnaeus)

Subfamily MODIOLINAE

Genus *Modiolus* Lamarck, 179926. *Modiolus metcalfei* Hanley27. *Modiolus philippinarum* Hanley28. *Modiolus striatulus* Hanley29. *Modiolus undulatus* (Dunker)Genus *Amygdalum* Megerele, 181130. *Amygdalum watsoni* (E.A.Smith)

Order PTERIOIDA

Suborder PTERIINA

Superfamily PTERIOIDEA

Family PTERIIDAE

Genus *Pteria* Scopoli, 177731. *Pteria smithi* (Preston)

Genus *Pinctada* Roeding, 1798

32. *Pinctada anomioides* (Reeve)

33. *Pinctada margaritifera* (Linnaeus)

Family ISOGNOMONIDAE

Genus *Isognomon* Solander in Lightfoot, 1786

34. *Isognomon legumen* (Gmelin)

Suborder PINNINA

Superfamily PINNOIDEA

Family PINNIDAE

Genus *Pinna* Linnaeus

35. *Pinna bicolor* Gmelin

36. *Pinna incurva* Gmelin

Order LIMOIDA

Superfamily LIMOIDEA

Family LIMIDAE

Genus *Lima* Bruguiere, 1797

37. *Lima fragilis* (Gmelin)

38. *Lima lima* (Linnaeus)

Order OSTREOIDA

Suborder OSTREINA

Superfamily OSTREOIDEA

Family OSTREIDAE

Subfamily CRASSOSTREINAE

Genus *Crassostrea* Sacco, 1897

39. *Crassostrea cuttackensis* (Newton and Smith)

Genus *Saccostrea* Dollfus and Dautenberg, 1920

40. *Saccostrea cucullata* (Born)

Family GRYPHAEIDAE

Genus *Hyotissa* Stenzel, 1971

*41. *Hyotissa hyotissa* (Linnaeus)

Suborder PECTININA

Superfamily PECTINOIDEA

Family PECTINIDAE

Subfamily CHLAMYDINAE

Genus *Chlamys* Roeding, 1798

42. *Chlamys senatoria* (Gmelin)

Subgenus *Argopecten* Monterosato, 1889

- 43.
- Chlamys (Argopecten) tranquebaria*
- (Gmelin)

Family PROPEAMUSSIDAE

- 44.
- Amusium pleuronectes*
- (Linnaeus)

Family SPONDYLIDAE

Genus *Spondylus* Linnaeus, 1758

- 45.
- Spondylus hystrix*
- Roeding

- 46.
- Spondylus layardi*
- Reeve

- 47.
- Spondylus microlepus*
- Lamarck

Superfamily ANOMIOIDEA

Family ANOMIIDAE

Genus *Anomia* Linnaeus, 1758

- 48.
- Anomia achaeus*
- Gray

- 49.
- Anomia ephippium*
- Linnaeus

Family PLACUNIDAE

Genus *Placuna* Solander in Lightfoot, 1786

- 50.
- Placuna placenta*
- Linnaeus

Subclass HETERODONTA

Order VENEROIDA

Superfamily LUCINOIDEA

Family LUCINIDAE

Genus *Anodontia* Link, 1807

- 51.
- Anodontia edentula*
- (Linnaeus)

Superfamily CARDITOIDEA

Family CARDITIDAE

Subfamily CARDITINAE

Genus *Cardita* Bruguiere, 1792

- 52.
- Cardita antiquata*
- (Linnaeus)

- 53.
- Cardita variegata*
- Bruguiere

Subfamily CARDITESINAE

Genus *Cardites* Link, 1807

- 54.
- Cardites bicolor*
- (Lamarck)

Superfamily CHAMOIDEA

Family CHAMIDAE

Genus *Chama* Linnaeus, 1758

55. *Chama brassica* Reeve

56. *Chama isotoma* Conrad

57. *Chama reflexa* Reeve

Superfamily CRASSATELLOIDEA

Family CRASSATELLIDAE

Subfamily CRASSATELLINAE

Genus *Eucrassatella* Iredale, 1924

58. *Eucrassatella rostrata* (Lamarck)

Superfamily CARDIOIDEA

Family CARDIIDAE

Subfamily CARDIINAE

Genus *Acanthocardia* Gray, 1851

59. *Acanthocardia coronata* (Schroeter)

60. *Acanthocardia lata* (Born)

Subfamily TRACHYCARDIINAE

Genus *Trachycardium* Moerch, 1853

61. *Trachycardium asiaticum* (Bruguere)

Superfamily MACTROIDEA

Family MACTRIDAE

Subfamily MACTRINAE

Genus *Macra* Linnaeus, 1758

62. *Macra attenuata* Deshayes

63. *Macra cuneata* Gmelin

64. *Macra luzonica* Deshayes

65. *Macra mera* Deshayes

Subgenus *Coelomactra* Dall, 1895

66. *Macra* (*Coelomactra*) *violacea* Gmelin

67. *Macra* (*Coelomactra*) *turgida* Gmelin

Subgenus *Macrinula* Gray, 1853

68. *Macra* (*Macrinula*) *laevis* Chemnitz

69. *Macra* (*Macrinula*) *plicartaria* Linnaeus

Subfamily LUTRARIINAE

Genus *Lutraria* Lamarck, 179970. *Lutraria planata* ChemnitzGenus *Meropesta* Iredale, 192971. *Meropesta pellucida* (Gmelin)

Superfamily SOLENOIDEA

Family SOLENIDAE

Genus *Solen* Linnaeus, 175872. *Solen annandalei* Preston73. *Solen brevis* Gray74. *Solen kemp* Preston75. *Solen vagina* Linnaeus

Family CULTELLIDAE

Genus *Neosolen* Ghosh, 1920*76. *Neosolen aquae-dulcioris* GhoshGenus *Phaxas* Leach in Gray, 1852Subgenus *Ensiculus* H. Adams, 1860*77. *Phaxas (Ensiculus) cultellus* var. *lividus* (Dunker)Genus *Siliqua* Megerle, 181178. *Siliqua radiata* (Linnaeus)

Superfamily TELLINOIDEA

Family TELLINIDAE

Subfamily TELLININAE

Genus *Tellina* Linnaeus, 1758Subgenus *Angulus* Megerle, 181179. *Tellina (Angulus) lanceolata* GmelinSubgenus *Dallitellina* Afshar, 196980. *Tellina (Dallitellina) rostrata* LinnaeusSubgenus *Moerella* Fischer, 188781. *Tellina (Moerella) philippinarum* Hanley82. *Tellina (Pharaonella) iridescent* (Benson)Subgenus *Serratina* Pallary, 192283. *Tellina (Serratina) capsoides* LamarckSubgenus *Tellinides* Lamarck, 181884. *Tellina (Tellinides) sinuata* Spengler

Subfamily MACOMINAE

Genus *Macoma* Leach, 1819

Subgenus *Psammacoma* Dall, 1900

*85. *Macoma (Psammacoma) birmanica* (Philippi)

86. *Macoma (Psammacoma) candida* Lamarck

Subgenus *Scissulina* Dall, 1924

87. *Macoma (Scissulina) reticulata* (Sowerby)

Genus *Apolymetis* Salisbury, 1929

88. *Apolymetis edentula* (Spengler)

89. *Apolymetis papyracea* (Gmelin)

Genus *Gastrana* Schumacher, 1817

90. *Gastrana polygona* (Gmelin)

Genus *Psammotreta* Dall, 1900

91. *Psammotreta ala* (Hanley)

Family SEMELIDAE

Genus *Semele* Schumacher, 1817

92. *Semele sinensis* A. Adam

Family PSAMMOBIIDAE

Subfamily PSAMMOBIINAE

Genus *Gari* Schumacher, 1817

Subgenus *Psammobia* Lamarck, 1818

93. *Gari (Psammobia) pulchella* Lamarck

94. *Gari (Psammobia) weinkauffi* (Crosse)

Subfamily SANGUINOLARIINAE

Genus *Sanguinolaria* Lamarck, 1799

Subgenus *Soletellina* Blainville, 1824

95. *Sanguinolaria (Soletellina) acuminata* (Deshayes)

96. *Sanguinolaria (Soletellina) lunalata* (Deshayes)

Subfamily SOLECURTINAE

Genus *Solecurtus* Blainville, 1824

97. *Solecurtus australis* (Dunker)

Genus *Azorinus* Recluz, 1869

98. *Azorinus emarginata* (Spengler)

Family DONACIDAE

Genus *Donax* Linnaeus, 175899. *Donax pulchella* HanleySubgenus *Hecuba* Schumacher, 1817100. *Donax (Hecuba) scortum* (Linnaeus)Subgenus *Latona* Schumacher, 1817101. *Donax (Latona) cuneatus* Linnaeus102. *Donax (Latona) incarnatus* Gmelin

Superfamily DREISSENOIDEA

Family DREISSENIDAE

Genus *Mytilopsis* Conrad, 1857103. *Mytilopsis adamsi* Morrison

Superfamily ARCTICOIDEA

FAMILY TRAPEZIIDAE

Genus *Trapezium* Megerle, 1811Subgenus *Neotrapezium* Habe, 1951104. *Trapezium (Neotrapezium) sublaevigatum* (Lamarck)

Superfamily GLOSSOIDEA

Family GLOSSIDAE

Genus *Meiocardia* H. and A. Adams, 1857105. *Meiocardia lamarckii* Reeve

Superfamily VESICOMYIDAE

Family CORBICULIDAE

Genus *Polymesoda* Rafinesque*106. *Polymesoda (Geloina) erosa* (Solander)

Superfamily VENEROIDEA

Family VENERIDAE

Subfamily VENERINAE

Genus *Periglypta* Jukes-Browne, 1914107. *Periglypta crispata* (Deshayes)

Subfamily CIRCINAE

Genus *Circe* Schumacher, 1817108. *Circe scripta* Linnaeus

Genus ***Gafrarium*** Roeding, 1798

- 109. *Gafrarium divaricatum* (Gmelin)
- 110. *Gafrarium pectinatum* (Linnaeus)
- 111. *Gafrarium tumidum* Roeding

Subfamily SUNETTINAE

Genus ***Sunetta*** Link, 1807

- 112. *Sunetta donacina* (Gmelin)
- 113. *S. effosa* (Hanley)
- *114. *S. excavata* (Hanley)
- 115. *S. kurachensis* Sowerby
- 116. *S. meroe* (Linnaeus)
- 117. *S. perexcavata* Fulton
- 118. *S. scripta* (Linnaeus)

Subfamily CHIONINAE

Genus ***Anomalocardia*** Schumacher, 1817

- *119. *Anomalocardia squamosa* (Linnaeus)

Genus ***Placamen*** Iredale, 1925

- 120. *Placamen tiara* (Dillwyn)

Genus ***Timoclea*** Brown, 1827

- 121. *Timoclea arakana* (G. & H.Nevill)
- 122. *Timoclea imbricata* (Sowerby)

Subfamily MERETRICINAE

Genus ***Meretrix*** Lamarck, 1799

- 123. *Meretrix casta* (Gmelin)
- 124. *Meretrix meretrix* (Linnaeus)

Subfamily PITARINAE

Genus ***Pitar*** Roemer, 1857

- 125. *Pitar alabastrum* (Reeve)

Genus ***Callista*** Poli, 1791

- 126. *Callista nivea* (Hanley)

Subfamily TAPETINAE

Genus ***Marcia*** H. & A. Adams, 1857

- 127. *Marcia pinguis* (Schroeter)

Genus ***Paphia*** Roeding, 1798128. *Paphia tetrica* (Solander)129. *Paphia undulata* (Born)Subgenus ***Protapes*** Dall, 1902130. *Paphia (Protapes) cor* (Sowerby)131. *Paphia (Protapes) gallus* (Gmelin)132. *Paphia (Protapes) malabarica* (Schroeter)

Subfamily DOSINIINAE

Genus ***Dosinia*** Scopoli, 1777133. *Dosinia bruguieri* Gray134. *Dosinia excisa* (Schroeter)135. *Dosinia fibula* (Reeve)136. *Dosinia tumida* (Gray)Genus ***Tapes*** Mergerle, 1811Subgenus ***Ruditapes*** Chiamenti, 1900137. *Tapes (Ruditapes) bruguieri* (Hanley)

Family GLAUCONOMIDAE

Genus ***Glaucanome*** Gray, 1828138. *Glaucanome sculpta* Sowerby

Order MYOIDA

Suborder MYININA

Superfamily MYOIDEA

Family CORBULIDAE

Genus ***Corbula*** Bruguiere, 1797*139. *Corbula modesta* Reeve140. *Corbula tunicata* (Hinds)

Suborder PHOLADINA

Superfamily PHOLADOIDEA

Family PHOLADIDAE

Subfamily PHOLADINAE

Genus ***Pholas*** Linnaeus, 1758141. *Pholas orientalis* Gmelin

Subfamily MARTESINAE

Genus *Martesia* (Leach MS) G.B. Sowerby, 1824

*142. *Martesia fragilis* Verrill and Bush

143. *Martesia striata* (Linnaeus)

Family TEREDINIDAE

Subfamily TEREDININAE

Genus *Bactronophorus* Tapparone-Canefri, 1877

144. *Bactronophorus thoracites* (Gould)

Genus *Dicyathifer* Iredale, 1932

145. *Dicyathifer manni* (Wright)

Subfamily BANKIINAE

Genus *Bankia* Gray, 1842

146. *Bankia campanellata* Moll and Roch

147. *B. carinata* (Gray)

*148. *B. rochi* Moll

Genus *Nausitora* Wright, 1864

*149. *Nausitora dunlopei* Wright

Genus *Nototerredo* Bartsch, 1923

150. *Nototerredo knoxi* (Bartsch)

Subclass ANOMALODESMATA

Order PHOLADOMYOIDA

Superfamily PANDOROIDEA

Family LATERNULIDAE

Genus *Laternula* Roeding, 1798

151. *Laternula anatina* (Linnaeus)

Superfamily CLAVAGELLOIDEA

Family CLAVAGELLIDAE

Genus *Penicillus* Bruguiere, 1789

152. *Penicillus penis* (Linnaeus)

Class SCAPHOPODA

Order DENTALIIDA

Family DENTALIIDAE

Genus *Dentalium* Linnaeus, 1758

153. *Dentalium octangulatum* Donovan

*From literature

154. *Dentalium subfolium* Nevill

Subgenus *Lentigodentalium* Habe, 1963

155. *Dentalium (Lentigodentalium) variabile* Deshayes

SYSTEMATIC ACCOUNT

Class CEPHALOPODA

Key to the Families

1. Shell external, coiled Nautilidae; shell internal, reduced (2)
2. Animal with eight arms Octopodidae; animal more than eight arms (3)
3. Animal long and slender; fins extend $\frac{1}{2}$ of body length or less, united posteriorly
..... LOLIGINIDAE

Animal oval; fins narrow lateral, extending almost to the full length and free at posterior end SEPIIDAE

Subclass NAUTILOIDEA

Order NAUTILIDA

Family NAUTILIDAE

Genus *Nautilus* Linnaeus, 1798

1758. *Nautilus* Linnaeus, *Syst. Nat.*, ed. 10 : 709.

Nautilus pompilius Linnaeus

1758. *Nautilus pompilius* Linnaeus, *Syst. Nat.*, ed. 10 : 709.

Type locality : Habitat in India.

Material Examined : i) 2 exs., Vadarevu beach, Chirala, 18/04/2000, Coll. S. C. Mitra and Party.

Diagnosis : Shell large, smooth apart from numerous, crowded and curved growth striae; aperture large and open; imperforate umbilicus; White or cream, ornamented with broad, brown or reddish brown streaks, narrow towards umbilical area, absent on back of the aperture; umbilical patch dark brown or black.

Remarks : This species inhabits of Central Pacific to Indian Ocean. Abbott and Dance (1983) reported the living colonies from Philippines and Palau Islands, floating dead shell elsewhere. Two broken shell were collected from Vadarevu, Chirala district of Andhra Pradesh.

Subclass COLEOIDEA

Order SEPIIDA

Suborder SEPIINA

Family SEPIIDAE

Key to the genera

Posterior end of the mantle with glandular pore; cuttle bone without spines at the posterior end *Sepiella* Gray

Posterior end of the mantle without glandular pore; cuttle bone with spines at the posterior end *Sepia* Linnaeus

Genus *Sepia* Linnaeus, 1758

1758. *Sepia* Linnaeus, *Syst. Nat.*, ed. 10 : 658.

***Sepia aculeata* Ferussac and d'Orbigny**

1848. *Sepia aculeata* Ferrussac and d'Orbigny, *Hist. nat. gen. Part. Paris*, p. 287, pl. 5, fig. 25.

Material Examined : i) 1 ex., Visakhapatnam, 28/09/1960, M 20905/4, ii) 2 exs. Visakhapatnam, 12/07/1963, M 21596/4, Coll. A. Daniel and Party.

Diagnosis : Tentacle suckers small, sub equal, arranged in 12 longitudinal rows; proximal part of left ventral arm hectocotylised and 3 series of normal suckers, with 5-6 series of minute suckers; cuttle bone long and broad with striated zone in the ventral surface; last locus short, concave in the middle.

Distribution : India: Andhra Pradesh, Andaman and Nicobar Islands, Karnataka, Kerala, Maharashtra, Orissa, Tamil Nadu.

Elsewhere : Indo-Pacific.

Genus *Sepiella* Gray, 1849

1849. *Sepiella* Gray, *Cat. Moll. Coll. Brit. Mus.*, 1 : 106.

***Sepiella inermis* Ferussac and d'Orbigny**

1848. *Sepiella inermis* Ferussac and d'Orbigny, *Hist. nat. gen. Part. Paris*, p. 286, pl. 20, figs. 1-9.

Material Examined : i) 3 exs., Visakhapatnam, 05/07/1963, ii) 4 exs., Kakinada Bay, 18/07/1963, Coll. A. Daniel and Party; iii) 2 exs., Vadarevu beach, Chirala, 20/12/1964, M 21889/4, Coll. N.V. Subba Rao and Party; iv) 5 exs., Visakhapatnam, M 21930/4, Coll. M. Rao and Party.

Diagnosis : Body oblong, width 2/3rd of length, arm short, mantle broad, widest anteriorly; distinct glandular pore at the posterior end of the mantle; tentacular suckers minute and not any particular order; cuttle bone flat, posterior end laminate and devoid of spines.

Distribution : India : Andhra Pradesh, Andaman and Nicobar Islands, Kerala, Lakshadweep, Maharashtra, Orissa, Pondicherry, Tamil Nadu, West Bengal.

Elsewhere : Indo-Pacific.

Order TEUTHIDA

Suborder MYOPSIDA

Family LOLIGINIDAE

Key to the genera

Fin length nearly or more than 70% of the total length ***Loliolus*** Steenstrup

Fin length less than 70% of the total length ***Loligo*** Schneider

Genus ***Loligo*** Schneider, 1784

1784. *Loligo* Schneider, *Bull. Sci. Soc. Philom. Paris*, 17 : 130.

Loligo duvanceli Ferussac and d'Orbigny

1848. *Loligo duvanceli* Ferussac and d'Orbigny, *Hist. nat. gen. Part. Paris*, p. 318, pl. 14, figs. 6-16.

Material Examined : i) 1 ex., Visakhapatnam, 29.07.1913, M 8226/1, ii) 1 ex., Visakhapatnam, 29/07/1913, M 8227/1, iii) 1 ex., Vadarevu beach, Chirala, 20/12/1964, Coll. N.V. Subba Rao and Party; iv) 4 exs., Visakhapatnam, M 17468/3, Coll. B.L.Chowdhury; v) 7 exs., Visakhapatnam, M 20948/4; vi) 7 exs., Chirala, M 21888/4, Coll. K. Satyanarayana and Party.

Diagnosis : Mantle slender, long, tubular and tapering gradually from the middle to a blunt posterior end; fins rhomboid, widest above the mid point; funnel well developed, set in deep groove, opening on level with the eyes; left ventral arm hectocotylised by the modification of the distal half of the arm possessing pedicles flattened into conical papillae.

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

Elsewhere : Indo-Pacific.

Genus ***Loliolus*** Steenstrup, 1856

1856. *Loliolus* Steenstrup, *Danske Vidensk. Selsk. Skrift.*, (5)4 : 190.

***Loliolus investigatoris* Goodrich**

1896. *Loliolus investigatoris* Goodrich, *Trans. Linn. Soc. Lond.*, 7 : 8, pl. 2, figs. 29-37.

Material Examined : i) 11 exs., Uppateru, Kakinada, 19/07/1963, M 21478/4, Coll. A. Daniel and Party.

Diagnosis : Body width about 2/3rd of the length; head length 30.5% of the mantle length; funnel thin walled, wider posteriorly; mantle short and stout, fins broad, about 70% of the mantle length; entire left ventral arm hectocotylied due to modification of suckers.

Distribution : India : Andhra Pradesh, Andaman and Nicobar Islands, Orissa, Tamil Nadu, West Bnegal.

Elsewhere : Indo-Pacific.

Order OCTOPODA

Suborder INCIRRATA

Superfamily OCTOPODOIDEA

Family OCTOPODIDAE

Subfamily OCTOPODINAE

Genus *Octopus* Lamarck, 1798

1798. *Octopus* Lamarck, *Bull. Sci. Soc. Philam. Paris*, 2 : 129.

***Octopus macropus* Risso**

1826. *Octopus macropus* Risso, *Hist. nat. Europe Meridion*, 4 : 3.

Material Examined : i) 2 exs., Visakhapatnam, 05/07/1963, M20945/4, Coll. A. Daniel and Party.

Diagnosis : Dorsal pair of arm long and stout; length of the hectocotylied right arm III stout and folded inwards; 12 lamellae present in the outer demibranch of each gill; colour buff with minute chromatophore on the dorsal side and pale on the ventral side.

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

Elsewhere : Cosmopolitan; in the warm and temperate seas throughout the World.

Class BIVALVIA

Key to the Families

1. Shell greatly reduced covering only anterior tip of animal; body elongated worm like, posterior end provided with a pair of pallets TEREDINIDAE

- Shell completely enclosing the animal; body not worm like, without any pallets(2)
- 2. Shell tubular, both valves fused into tube CLAVAGELLIDAE
- Shell composed of two separate valves of different shaped(3)
- 3. Hinge with numerous teeth arranged in straight line or broken and curved on either side of umbo; muscle scars two, well developed(4)
- Hinge with not more than five teeth when present or reduced or absent; muscle scars usually two, reduced to one or even absent (7)
- 4. Hinge straight, teeth arranged in straight line, middle teeth small; attached by byssus thread on ventral margin (5)
- Hinge arched, teeth of equal size arranged in lateral rows on either side of ligamental pit; animal without byssus thread GLYCYMERIDIDAE
- 5. Byssal gape on ventral margin, muscle scars without shelf on the inner margin ARCIDAE
- Byssal gape absent, muscle scars with shelf on its inner margin(6)
- 6. Teeth more or less similar as in Arcidae; ligament ventrically striated NOETIIDAE
- Teeth undifferentiated, central small followed by transverse, divergent towards anterior and posterior margin; ligament with few chevron shaped grooves CUCULAEIDAE
- 7. Anterior adductor scar much reduced or absent; hinge teeth scarcely developed, if developed either tubercles or tooth like process(8)
- Anterior adductor scar well developed; hinge teeth well developed and differentiated.(20)
- 8. Umbo terminal or sub terminal; hinge dyssodont; animals attached by byssus(9)
- Umbo central; ligament with one or two nodules; animals free or attached by either valves(11)
- 9. Shell wedge or ham shaped, thin, fragile; shell gape at ventral and posterior margin .. PINNIDAE
- Shell mytiliform, thick, non fragile; shell not gape at ventral and posterior margin(10)
- 10. Shell internally nacreous; anterior adductor scar small or absent, posterior adductor scar confluent with posterior retractor MYTILIDAE
- Shell internally non nacreous; anterior adductor scar absent, posterior adductor scar long DREISSENIDAE

11. Shell irregular shape, attached by left valve or byssus; umbo without wing like extension (12)
 - Shell regular shape, free or attached by valves; umbo with wing like extension (15)
12. Right valve with foramen; byssus modified to plug like, horny; upper valve (left valve) inflated; nacreous (13)
 - Right valve without foramen; byssus absent; attachment by left valve only; non nacreous (14)
13. Shell thin, partially attached or adapted to sessile attachment; left valve with three muscle scars on central area ANOMIIDAE
 - Shell regularly orbicular to saddle shaped, compressed; non sessile; resilium buttressed by long ridges or cura PLACUNIDAE
14. Muscle scar rounded, close to hinge; shallow umbonal groove with radial plications GRYPHAEIDAE
 - Muscle scar reniform, not close to hinge; deep umbonal groove without plications OSTREIDAE
15. Shell less inequilateral, subequivalve; wings less prominent, equal; interior not nacreous (16)
 - Shell highly inequilateral, equivalve; wings more prominent, unequal; interior nacreous (19)
16. Shell thin, higher than long, compressed; auricle less prominent; byssal gape well developed; gaping extends downward along margin LIMIDAE
 - Shell thick, not compressed; auricle prominent; byssal gape less developed; no gaping along the margin (17)
17. Shell heavy, inequivalve; usually attached by umbonal area by right valve; hinge with two large teeth and corresponding cavities on opposite valve; resilium in deep pit; sculpture with irregular spines on both valves SPONDYLIDAE
 - Shell light, equivalve; usually free; hinge without teeth and corresponding cavities; resiliacal pit shallow; sculpture with radial ribs or smooth (18)
18. Shell smooth or finely sculptured externally; internally with radial riblets PROPEAMUSSIDAE
 - Shell with radial ribs or folds or with concentric sculpture of raised lamellae; internally without radial riblets PECTINIDAE
19. Shell irregular shape, more elongated dorsoventrally; ligament with multiple grooves; left

- valve strongly convex; pallial line discontinuous, broken into small pits; monomyarian ISOGNOMONIDAE
- Shell regular shape, obliquely ovate to suborbicular; ligament without grooves; left valve more inflated; pallial line continuous; dimyarian PTERIIDAE
20. Shell very thick, irregular; hinge with single cardinal and weak laterals; muscle scar subequal, large; ornamented with flattened spines either radial or concentric CHAMIDAE
- Shell moderately thick or thin, regular; hinge with more than one cardinal, laterals not weak; not ornamented with spines (21)
21. Hinge with three cardinals in each valves (22)
- Hinge with less than three cardinals in each valves (23)
22. Shell elongate, thin with conspicuous periostracum; lateral teeth absent; lunule and escutcheon not well developed GLAUCONOMIDAE
- Shell trigonal, ovate or rounded, thick; surface smooth or sculptured; lateral teeth generally present; lunule and escutcheon well developed VENERIDAE
23. Sculpture with strong radial ribs (24)
- Sculpture without strong radial ribs (25)
24. Equilateral, hinge with two non bifid cardinals in each valve; laterals one anterior and one posterior in left valve and two anterior and one posterior in right valve CARDIIDAE
- Inequilateral, hinge with faint 3a and then 5b; anterior laterals tuberculiform CARDITIDAE
25. Shell with internal ligament in a socket behind cardinal (26)
- Shell without internal ligament; hinge normal, without socket (28)
26. Hinge with inverted v shaped cardinal teeth in left valve MACTRIDAE
- Hinge without inverted v shaped cardinal teeth in left valve (27)
27. Shell subquadangular to trigonal, rounded anterior and truncated posterior end; concentrically ribbed or smooth CRASSATELLIDAE
- Shell oval or rounded; ligament socket elongate or oblique, extended backward and downward SEMELIDAE
28. Equivalve, not fit into other valve (29)
- Inequivalve, fit sometimes into other valve (37)

29. Shell elongate, subcylindrical or flattened; gaping at both ends (30)
 - Shell less elongate, neither subcylindrical nor flattened; gaping at one end (31)
30. Shell subcylindrical, straight; beaks terminal or nearly so; hinge with only one tooth in either valve SOLENIDAE
 - Shell flattened more wide and compressed than earlier; beaks mostly not terminal; hinge with one to three cardinal teeth CULTELLIDAE
31. Shell suborbicular to ovoid, concentrically sculptured; hinge with typical tooth formula 3a, 3b/2, 4b but 3a may be obliterated LUCINIDAE
 - Shell elongate, non suborbicular to ovoid,; smooth or fine concentric and radial striae; hinge teeth not 3a,3b/2, 4b (32)
32. Shell wedge or trigonal shape; umbo placed far behind; oblique keel or angulation runs from umbo to posterior ventral part DONACIDAE
 - Shell not wedge or trigonal shape, elongate, ovate or oblong; keel or angulation absent (33)
33. Anterior part widely gaping; shell sometimes with accessory plates PHOLADIDAE
 - Anterior part not widely gaping; shell without accessory plates (34)
34. Shell gaping at posterior end (35)
 - Shell without gaping at posterior end (36)
35. Hinge without regular heterodont dentition but hinge margin variously reinforced by buttress or denticles LATERNULIDAE
 - Hinge with one to three cardinal teeth, lateral weak or wanting PSAMMOBIIDAE
36. Elongate with beaks near anterior end; cardinals two, one posterior and one small anterior lateral in each valve TRAPEZIIDAE
 - Rotund to cardiform; beaks prosogyrate or gyrate; hinge with two lamellar cardinals, variable, lateral inconstant GLOSSIDAE
37. Shell non procullenous to chalky; hinge margin with two cardinals tending to be bifid and well developed lateral teeth TELLINIDAE
 - Shell procullenous to chalky, with thin periostracum; hinge margin without teeth; moderate size sturdy shells with resilifer in one valve CORBULIDAE

Subclass PTERIOMORPHIA

Order ARCOIDA

Superfamily ARCOIDEA

Family ARCIDAE

Key to the subfamilies

Byssal gape present, ventral border not crenulate, ribs irregular ARCINAE

Byssal gape absent, ventral border crenulate, ribs regular ANADARINAE

Subfamily ARCINAE

Key to the genera

Shell inequivalve, twisted *Trisidos* RoedingShell equivalve, not twisted *Barbatia* GrayGenus *Barbatia* Gray, 18421842. *Barbatia* Gray, *Syn. Cont. Brit. Mus.*, ed. 44 : 81.Type species : *Arca barbata* Linnaeus; subsequent designation, Gray, 1857.*Barbatia obliquata* (Gray)1828. *Arca obliquata* Gray in Wood, *Index Test. Suppl.*, tab. 2, fig. 4.

Material Examined : i) 3 exs., Visakhapatnam; xv) 2 valves, Visakhapatnam, 17.02.1916, Coll. H. Hosten; ii) 1 ex., Lawson's Bay, Visakhapatnam, 23/01/1921, iii) 3 exs., Visakhapatnam, 24/01/1921, Coll. S.W. Kemp; iv) 1 ex., Lawson's Bay, Visakhapatnam, 12/02/1947, v) 2 exs., Bheemunipatnam, Visakhapatnam, 18/02/1947, vi) 1 ex., Palam beach, Vishakapatnam, Feb. 1947, Coll. K.B. Rao and Party; vii) 2 exs., Uppateru, Kakinada, 21/02/1948, Coll. Mahesh Chandra and G. Ramakrishna; viii) 3 exs., Bandaruvanipeta, Srikakulam, 14/02/1955, Coll. ?; ix) 6 exs., 2 valves, Manginipudi, Machilipatnam, 05/12/1964, Coll. N.V.Subba Rao and Party; x) 1 valve, Rocky coast, Visakhapatnam, 05/03/1966, xi) 2 exs., 2 valves, Rishikunda, Visakhapatnam, 09/03/1966, Coll. A.S. Rajagopal and Party; xii) 4 exs., Visakhapatnam, 28/02/1995, xiii) 3 valves, Bheemunipatnam, Visakhapatnam, 01/03/1995, Coll. D.R.K. Shastry and Party; xiv) 1 valve, Chinnatapally, Vizianagram, 02/05/2001, Coll. S. Barua and Party.

Measurements (in mm) :

Length	Width	Depth
55.00–19.10	28.50–10.55	24.00–5.90

Diagnosis : Shell mytiliform, with naced anterior end than the posterior; Umbo anterior; Sculpture with many riblets, more prominent posteriorly; periostracum of brown/black depressed lamellar bristles.

Distribution : India : Andhra Pradesh.

Elsewhere : South African coast, Gulf of Arabia.

Genus *Trisidos* Roeding, 1798

1798. *Trisidos* Roeding, *Mus. Bolten.*, p. 175.

Type species : *Arca tortuosa* Linnaeus, 1758.

Trisidos tortuosa (Linnaeus)

1758. *Arca tortuosa* Linnaeus, *Syst. Nat.*, ed. 10 : 693.

Material Examined : i) 1 ex., Vitapalem, Chirala, 21/04/2000, Coll. S.C. Mitra and Party; ii) 4 valves, Mahalakshampuram, Nellore, 17/01/2002, iii) 1 ex., Kottapatnam, Ongole, 12/02/2002, iv) 1 valve, Ravanappasalov, 22/02/2002, Coll. S. Barua and Party.

Measurements (in mm) :

Length	Width	Depth
90.70–19.10	42.50–11.00	28.50

Diagnosis : Shell strongly twisted, anterior end short, posterior expanded and squarely truncated with an oblique diagonal keel; median sinuous deep; posterior keel on the left valve acute, on the right valve rounded; sculpture with strong radiating ribs decussated by concentric striae; teeth convergent, gradually larger distally.

Distribution : India : Andhra Pradesh, Andaman and Nicobar Islands, Gujarat, Kerala, Maharashtra, Tamil Nadu.

Elsewhere: Persian Gulf, Gulf of Aden, Malagasy, Zanzibar, Sri Lanka, Singapore, New Guinea, Philippines, China and Japan.

Subfamily ANADARINAE

Genus *Anadara* Gray, 1847

1847. *Anadara* Gray, *Proc. zool. Soc. Lond.*, 15 : 198, 206.

Type species : *Arca antiquata* Linnaeus, 1758.

Key to the species

1. Beaks with 1/3 rd anterior; interstices narrow *A. antiquata* (Linnaeus)
- Beaks more than 1/3 rd anterior, or almost equal; interstices broader (2)

2. Shell squarely heart shaped, posterior umbonal carina prominent; ribs more than 22 in number *A. rhombea* (Born)
- Shell orbiculate-ovate, posterior umbonal carina not prominent; ribs 22 or less *A. granosa* (Linnaeus)

***Anadara antiquata* (Linnaeus)**

1758. *Arca antiquata* Linnaeus, *Syst. Nat.*, ed 10 : 1114.

Material Examined : i) 1 ex. Nellore, 10/08/1918, Coll. ?; ii) 2 exs., Kalingapatnam, Srikakulam, 17/04/2001, iii) 1 ex., Ethamukkala, Ongole, 13/02/2002, iv) 1 valve, Maypadu, Nellore, 18/02/2002, Coll. S. Barua and Party.

Measurements (in mm) :

Length	Width	Depth
69.30–37.05	26.00–13.20	5.90–4.70

Diagnosis : Shell thin, elongately compressed, elliptical, gaping at both the ends; umbo anterior, beaks slightly in front of midline; anterior side short, excavated near umbone; posterior elongated; dorsal margin almost straight; ventral margin convex, arched, sloping upward towards the end of both sides; internal ribs almost straight; brown to lilac with four white radial rays.

Distribution : India : Andhra Pradesh, Andaman and Nicobar Islands, Goa, Gujarat, Kerala, Maharashtra, Orissa, Tamil Nadu.

Elsewhere : Sri Lanka, Myanmar, Indonesia, Philippines.

***Anadara granosa* (Linnaeus)**

1758. *Arca granosa* Linnaeus, *Syst. Nat.*, ed. 10 : 694.

Material Examined : i) 1 valve, Rishikunda, Visakhapatnam, 09/03/1966, Coll. A.S. Rajagopal and Party; ii) 1 valve, Chinnatapally, Vizianagaram, 02/05/2001, iii) 1 valve, Pulicat Lake, 21/02/2002, Coll. S. Barua and Party.

Measurements (in mm) :

Length	Width	Depth
65.20–37.05	48.70	–

Diagnosis : Shell orbiculate-ovate, rather ventricose; sculpture with 18-20 equal radial ribs with broad interstices, ribs tuberculose-crenulated; hinge plate straight, teeth smaller centrally but inclined and larger distally.

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

Elsewhere : Throughout Indo-Pacific.

***Anadara rhombea* (Born)**

1780. *Arca rhombea* Born, *Test. Mus. Cae. Vinodob.*, 1780 : 90.

Material Examined : i) 1 valve, Rocky coast, Visakhapatnam, 16/02/1947, Coll. H.C. Ray and Party; ii) 2 valves, Visakhapatnam, 24/02/1995, Coll. D.R.K.shastri and Party; iii) 1 valve, Kakinada beach, 12/04/2000, Coll. Ramakrishna and Party; iv) 1 valve, Machilipatnam, 16/04/2000, v) 1 valve, Vadarevu beach, Chirala, 18/04/2000, Coll. S.C. Mitra and Party; vi) 2 valves, Chinnatapally, Vizianagaram, 02/05/2001, vii) 1 ex., Kottapatnam, Ongole, 12/02/2002, viii) 1 valve, Ethamukkala, Ongole, 13/02/2002, ix) 2 exs., 1 valve, Krishnapatnam, Nellore, 15/02/2002, Coll. S. Barua and Party.

Measurements (in mm) :

Length	Width	Depth
22.70–31.75	20.35–28.20	28.90

Diagnosis : Shell gibbous, squarely heart shaped; sculpture with 24-26 equal radial ribs with broad interestices, anterior ribs nodulose; hinge plate slightly arched, teeth gradually larger towards extremities.

Remarks : This species can be distinguished from *A. granosa* having more number of nodulosed ribs except the posterior slope and posterior ventral margin angulate.

Distribution : India : Andhra Pradesh, Andaman and Nicobar Islands, Gujarat, Maharashtra, Orissa, Tamil Nadu.

Elsewhere : African coast, Sri Lanka, Maynmar, Malaysia, Philippines, China Sea.

Subgenus *Scapharca* Gray, 1847

1847. *Scapharca* Gray, *Proc. zool. Soc. Lond.*, 15 : 198 (as *Scapharea*).

Type species : *Arca inaequalvis* Bruguiere, 1798.

Key to the species

- Umbo elevated, cardinal area broad with chevron shaped ligamental groove
..... *A. (S) inaequalvis* (Bruguiere)
- Umbo low, cardinal area narrow *A. (S) deyrollei* Jousseaume

***Anadara (Scapharca) deyrollei* Jousseaume**

1883. *Scapharca deyrollei* Jousseaume, *Le Natura liste, Islamnae*, p. 191.

Material Examined : i) 1 valve, Machilipatnam, 06/12/1964, ii) 2 valves Vadarevu beach, Chirala, 20/12/1964, Coll. N.V. Subba Rao and Party; iii) 4 valves, Visakhapatnam, 24/02/

1995, Coll. D.R.K. Shastry and Party; iv) 4 valves, Kakinada beach, 12/04/2000, Coll. Ramakrishna and Party; v) 3 valves, Vadarevu beach, Chirala, 18/04/2000, Coll. S.C. Mitra and Party; vi) 3 valves, Suryalanka, Chirala, 19/04/2000, vii) 5 valves, Chinnatapally, Vizianagaram, 02/05/2001, viii) 2 valves, Ethamukkala, Ongole, 13/02/2002, ix) 4 valves, Krishnapatnam, Nellore, 15/02/2002, x) 2 valves, Maypadu, Nellore, 16/2/2002, xi) 3 valves, Tuplipalem, 19/2/2002, xii) 3 valves, Ravanappasalov, 22/2/2002, Coll. S. Barua and Party.

Measurements (in mm) :

Length	Width	Depth
40.45–23.65	22.15–14.90	—

Diagnosis : Shell elongately ovate, inequivalve, side angulated at the dorsal margin, posterior side extended; sculpture with 32-35 radial ribs; umbone elevated.

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

Elsewhere : Sri Lanka, Maynmar, Malaysia, Indonesia, China Sea.

***Anadara (Scapharca) inaequalvis* (Bruguiere)**

1792. *Arca inaequivalvis* Bruguiere, *Encyl. Meth. Vers.*, 1 : 106, pl. 305.

Material Examined : i) 1 ex., Vadarevu beach, Chirala, 20/12/1964, Coll. N.V. Subba Rao and Party; ii) 1 valve, Rishikunda, Visakhapatnam, 00/03/1966, A.S. Rajagopal and Party; iii) 2 valves, Kakinada beach, 12/04/2000, iv) 1 valve, Suryalanka, Chirala, 19/04/2000, Coll. Ramakrishna and Party; v) 2 valves, Vadarevu beach, Chirala, 18/04/2000, Coll. S.C. Mitra and Party; vi) 3 valves, Kottapatnam, Ongole, 12/02/2002, vii) 7 valves, Ethamukkala, Ongole, 13/02/2002, viii) 5 valves, Maypadu, Nellore, 16/02/2002, ix) 1 valve, Tuplipalem, 19/02/2002, x) 1 valve, Ravanappasalov, 22/02/2002, Coll. S. Barua and Party; xi) 2 exs., Visakhapatnam, Reg. No. 4588.

Measurements (in mm) :

Length	Width	Depth
56.20–32.00	42.80–26.50	—

Diagnosis : Shell inequivalve, subquadrateside; sculpture with 34-35 flat, radial ribs, interestices laticed with raised lines; hinge plate linear, distal teeth larger than central; white, brown periostracum of dense short bristles.

Distribution : India : Andhra Pradesh, Andman Islands, Goa, Gujarat, Kerala, Maharashtra, Orissa, Tamil Nadu.

Elsewhere : Persian Gulf, Maynmar, Singapore, Indonesia, Philippines, China and Japan.

Family NOETIIDAE

Key to the subfamily

Shell ovoid, subequilateral, posterior umbonal ridge not present; beaks prosogyrate to slight opisthogyrate; ligament amphedetic short to long bounded by ligament free cardinal area STRIARCINAE

Shell ovoid to trigonal, posterior umbonal ridge well developed; beaks opisthogyrate tends to prosogyrate; ligament elongate and broad with half or more of cardinal area NOETIINAE

Subfamily NOETIINAE

Genus *Noetia* Gray, 1857

1857. *Noetia* Gray, *Ann. Mag. Nat. Hist.*, (2) **19** : 371.

Type species : *Noetia triangularis* Gray = *Arca reversa* Sowerby, 1833.

Noetia martinii (Reeve)

1852. *Arca (Byssarca) martinii* Recluz, *J. de Conchly.*, **3** : 409.

Material Examined : i) 5 valves, Visakhapatnam, Reg. No 4534, Coll. ?.

Measurements (in mm) :

Length	Width	Depth
28.20–13.95	15.20–8.50	–

Diagnosis : Shell inequivalve, oblong, transverse, globose, posterior lateral angulated; anterior rounded, ventral margin compressed, sulcate, sulci 25-26, simple transverse, striated, cancellate.

Distribution : India : Andhra Pradesh.

Elsewhere : Indo-Pacific.

Subfamily STRIARCINAE

Key to the species

Umbo posterior, subrectangular, posterior end subovate *S. lactea* (Linnaeus)

Umbo almost centre, subquadrate, posterior end obliquely truncated
..... *S. afra* (Gmelin)

Genus *Striarca* Conrad, 18621862. *Striarca* Conrad, *Proc. Acad. nat. Sci. Philad.*, **14** : 290.Type species : *Arca centenaria* Say, 1824.*Striarca afra* (Gmelin)1791. *Arca afra* Gmelin, *Syst. Nat.*, ed. **13** :

Material Examined : i) 1 ex., 1 valve, Waltair (Visakhapatnam), Don. T. Vedavati, Reg. No. M 22331/4; ii) 3 exs., Rishikunda, Visakhapatnam, Don. Babu Rao; iii) 1 ex., Nizampatnam, Guntur, 13/12/1964, Coll. N.V. Subba Rao and Party.

Measurements (in mm) :

Length	Width	Depth
11.70–9.20	7.50–5.50	7.00–5.50

Diagnosis : Shell slightly inequivalve, subquadrate; umbo elevated and almost central; anterior margin rounded, posterior margin obliquely truncate with a distinct keel from umbo to posterior end; sculpture with low radial ribs; lunule equal in both the valve.

Distribution : India : Andhra Pradesh, Mahaashta.*Elsewhere* : Indo-Pacific.*Striarca lactea* (Linnaeus)1758. *Arca lactea* Linnaeus, *Syst. Nat.*, ed. **10** : 694.

Material Examined : i) 1 ex., Palm beach, Visakhapatnam, 09/03/1966, Coll. A.S. Rajagopal and Party; ii) 1 valve, Tuplipalem, 19/2/2002, Coll. S. Barua and Party.

Measurements (in mm) :

Length	Width	Depth
24.50–20.00	15.40–15.20	11.20–10.10

Diagnosis : Shell compressed, subrectangular, umbo elevated and posterior in position; anterior area more expanded than posterior; anterior margin rounded, posterior subovate; sculpture of narrow riblets.

Distribution : India : Andhra Pradesh.*Elsewhere* : Indo-Pacific.

Family CUCULAEIDAE

Genus *Cucullaea* Lamarck, 18011801. *Cucullaea* Lamarck, *Syst. Anim. Sans. Vert.*, (1)**6** : 116.Type species : *Cucullaea auriculifera* Lamarck = *Arca cucullata* Roeding, 1798.

Key to the species

Beak anterior, posterior end acutely angular; posterior adductor scars butresses very much raised *C. concamerata* Martini

Beak almost centre, posterior end subacute; posterior adductor scars butresses not very much raised *C. labiata* (Lightfoot)

Cucullaea (C.) *concamerata* Martini

Arca concamerata Martini, *Beschaef. Berl. Naturefr.*, 3 : 292, t. 7, figs. 15 & 16.

Material Examined : i) 3 valves, Kottapatnam, Ongole, 12/02/2002, Coll. S. Barua and Party.

Measurements (in mm) :

Length	Width	Depth
81.40–78.10	60.20–57.40	63.30

Diagnosis : Shell thick, trapezoidal, oblong, ventricose; umbone elevated, angular; sculpture rayed with flattened very minute decussated riblets; anterior side subquadrate, rather short, posterior side acutely angular; ventral margin straight; central teeth minute, irregular, striated, posterior terminal teeth three, anterior two parallel; internal septum auricle of middle size; white, variegated with spots and little flames, brown purplish toward ventral margin.

Distribution : India : Andhra Pradesh.

Elsewhere : Isle of France.

Cucullaea (C.) *labiata* (Lightfoot)

1786. *Arca labiata* Lightfoot, *Catalogue of Portland Museum*, p. 185.

Material examined : i) 1 valve, Tuplipalem, 19/02/2002, ii) 1 valve, Ravanappasalov, 22/02/2002, Coll. S. Barua and Party.

Measurements (in mm) :

Length	Width	Depth
52.20–51.10	41.90–41.70	—

Diagnosis : Shell inequivalve, subtrapezoidal; umbo median, hinge straight, teeth numerous, differentiated into a few small central teeth and transverse and divergent teeth on anterior and posterior; sculpture with flat radial ribs, ornamented with close coarse spaced costae, some of the ribs are finely grooved; strong oblique keel extends from umbo to posterior; anterior adductor muscle scars elongately ovate, posterior adductor muscle scar with strong longitudinal self, from umbo to posterior margin; inner margin finely crenulate.

Distribution : India : Andhra Pradesh, Andaman Islands, Orissa, Tamil Nadu.

Elsewhere : China, Japan.

Superfamily LIMOPSOIDEA

Family GLYCYMERIDIDAE

Genus *Glycymeris* Da Costa, 1778

1778. *Glycymeris* Da Costa, *Brit. Conch.*, p. 168.

Type species : *Arca orbicularis* Da Costa = *Arca glycymeris* Linnaeus, 1758.

Key to the species

1. Sculpture with less than 40 ridial ribs (2)
 - Sculpture with more than 40 ridial ribs (3)
2. Shell white with reddish brown to dark brown tesselete markings or area *G. arabica* (H. Adams)
 - Shell reddish brown to dark brown with whitish markings area more on posterior end *G. castaneus* (Lamarck)
3. Shell with whitish semicircular bands (4)
 - Shell without whitish semicircular bands *G. taylori* (Angus)
4. Anterior adductor scar oval, radial ribs more *G. lividus* (Reeve)
 - Anterior adductor scar semilunar, radial ribs less *G. tenuicostatus* (Reeve)

Glycymeris arabica (H. Adam)

1871. *Pectunculus arabica* H. Adams, *Gen. Rec. Shell*, 2 : 542.

Material Examined : i) 3 valves, Bheemunipatnam, Visakhapatnam, 12/03/1996, ii) 2 valves, Visakhapatnam, 05/03/1966, Coll. A.S. Rajagopal and Party.

Measurements (in mm) :

Length	Width	Depth
26.50–20.00	24.60–18.60	–

Diagnosis : Shell subcircular, slightly oblique; sculpture of about 30 low closely spaced radial ribs all incised by radial grooves; hinge strongly arched; teeth small with maximum 12 anterior and 14 posterior; inner margin crenulated.

Distribution : Andhra Pradesh.

Elsewhere : Persian Gulf.

Glycymeris castaneus (Lamarck)

1819. *Pectunculus castaneus* Lamarck, *Hist. nat. Anim.Sans. Vert.*, 6(1) : 53.

Material Examined : i) 1 valve, Manginipudi, Machilipatnam, Visakhapatnam, 15/04/2000, Coll. Ramakrishna and Party; ii) 1 valve, Maypadu beach, Nellore, 16/02/2002, Coll. S. Barua and Party.

Measurements (in mm) :

Length	Width	Depth
15.95–9.55	14.85–9.10	–

Diagnosis : Shell ovoid, posterior margin subtruncate to subangular; umbo slightly anterior; sculpture with 35 or more weak radial ribs all cut by numerous radial grooves; hinge weakly arched, teeth upto 12 in each side, inner margin crenulated, deep brown with irregular white patches, more on posterior part.

Distribution : Andhra Pradesh, Andaman and Nicobar Islands.

Elsewhere : Indo-Pacific.

Glycymeris lividus (Reeve)

1843. *Pectunculus lividus* Reeve, *Proc. zool. Soc. Lond.*, 1843 : 190.

Material Examined : i) 1 ex., Lawson's Bay, Visakhapatnam, 17/02/1947, Coll. ?.

Measurements (in mm) :

Length	Width	Depth
31.15	29.80	19.60

Diagnosis : Shell orbicular, inequilateral, angulated on the anterior side, longitudinally rayed, ray broad, rather elevated, very finely striated, reddish brown, livid blue towards margin; umbones slightly incurved, a very few white specks scattered around; interior white, middle deeply stained and spotted with purple black.

Distribution : India : Andhra Pradesh, Andaman and Nicobar Islands.

Elsewhere : Red sea.

Glycymeris taylori (Angus)

1843. *Pectunculus lividus* Reeve, *Proc. zool. Soc. Lond.*, 1843 : 190.

Material Examined : i) 2 valves, Bheemunipatnam, Visakhapatnam, 18/02/1947, ii) 1 valve, Visakhapatnam, Feb. 1947, Coll.?, iii) 1 valve, Manginipudi, Machilipatnam, Visakhapatnam, 15/04/2000, Coll. Ramakrishna and Party; iv) 4 valves, Tuplipalem, 19/02/2002, v) 5 valves, Ravanappasalov, 22/02/2002, Coll. S. Barua and Party.

Measurements (in mm) :

Length	Width	Depth
18.50–8.50	16.90–7.90	–

Diagnosis : Shell subcircular, orbicular, inequilateral; sculpture with more than 40 weakradial ribs. Shell very much similar with *G. castaneus* in shape, but differs by sculpture with more weak radial ribs and whitish with brown patches.

Distribution : Andhra Pradesh, Orissa.

Elsewhere : Indo-Pacific.

***Glycymeris tenuicostatus* (Reeve)**

1843. *Pectunculus tenuicostatus* Reeve, *Proc. zool. Soc. Lond.*, 1843 : pt. 2 : 80.

Material Examined : i) 3 valves, Bheemunipatnam, Visakhapatnam, 18/02/1947, Coll.?
ii) 4 valves, Tuplipalem., 19/02/2002, Coll. S. Barua and Party.

Measurements (in mm) :

Length	Width	Depth
28.95–16.20	–	–

Diagnosis : Shell subcircular, inequilateral; umbone slightly incurved; sculpture with many weak radial ribs, very finely striated; hinge weakly arched; uniformly reddish brown.

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

Elsewhere : South Africa, Indonesia, Australia.

Order MYTILOIDA

Superfamily MYTILOIDEA

Family MYTILIDAE

Key to the subfamilies

Beak anterior MYTILINAE

Beak not anterior MODIOLINAE

Subfamily MYTILINAE

Key to the genera

Anterior end bridged within by a shelly septum *Septifer* Recluz

Anterior end open within *Perna* Philipsson

Genus *Perna* Philipsson, 1788

1788. *Perna* Philipsson, *Diss. Nova. Test. Gen.*, 1788 : 20.

Type species : *P. magellanica* Linnaeus = *Mya perna* Linnaeus; subsequent designation, Soot-Ryen, 1955

Perna viridis (Linnaeus)

1758. *Mytilus viridis* Linnaeus, *Syst. Nat.*, ed 10 : 706.

Material Examined : i) 1 ex., Visakhapatnam, ii) 9exs., 2 valves, Bheemunipatnam, Visakhapatnam, Coll. J. Woodmason; iii) 2 exs., Nellore, 10/08/1918, Coll. N. Annandale; iv) 2 exs., Dolphin's nose, Visakhapatnam, 03/11/1941, v) 7 valves, Chitivalsa river, Bheemunipatnam, Vishakapatnam, 19/02/1947, vi) 4 valves, Bheemunipatnam, Visakhapatnam, 22/02/1947, Coll. ?; vii) 4 valves, Manginipudi, Machilipatnam, Visakhapatnam, 09/12/1964, Coll. N.V. Subba Rao and Party; viii) 3 valves, Chinnatapally, Vizianagaram, 02/05/2001, ix) 5 valves, Krishnapatnam, Nellore, 15/02/2002, x) 11 valves, Tuplipalem, 19/02/2002, xi) 2 exs., Ravanappasalov, 22/02/2002, Coll. S. Barua and Party.

Measurements (in mm) :

Length	Width	Depth
169.40–16.50	58.45–10.10	40.80–5.70

Diagnosis : Shell thick, elongate, triangularly-ovate, inequilateral; umbo terminal; lunule bent inwards forming 1–2 tooth like ridges; sculpture smooth and only with growth lines; ligament thick; anterior adductor scar absent, posterior adductor scar large, cylindrical and located at the posterior half of the shell; greenish or ochre brown.

Distribution : India : Andhra Pradesh, Andman Islands, Goa, Gujrata, Karnataka, Kerala, Maharashtra, Orissa, Tamil Nadu, West Bengal.

Elsewhere : Red sea, Pakistan coast, Thailand, Indonesia, Philippnes, China.

Genus *Septifer* Recluz, 1848

1848. *Septifer* Recluz, *Rev. Zool. Soc. Cuv.*, 11 : 275.

Type species : *Mytilus bilocularis* Linnaeus; subsequent designation, Stoliczka, 1871

Septifer bilocularis (Linnaeus)

1758. *Mytilus bilocularis* Linnaeus, *Syst. Nat.*, ed. 10 : 705.

Material Examined : i) 1 valve, Lawson's Bay, Visakhapatnam, 24/02/1948, Coll. Mahesh Chandra and G. Ramakrishna.

Measurements (in mm) :

Length	Width	Depth
37.10	18.70	—

Diagnosis : Shell moderate, ovate, fairly thick and variable in outline; umbonal end strong, angular, slightly curved and beak link; Sculpture with fine well developed radial ridges, more or less distinctly granular or crenulated, bifurcating here and there and diverging fan like manner towards the posterior margin; greenish blue, tinged with red towards the lower margin, inner surface bluish grey.

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

Elsewhere : South African coast, Red sea, Philippines, Japan.

Subfamily MODIOLINAE

Key to the genera

Shell thick, hinge line smooth ***Modiolus*** Lamarck

Shell thin, hinge line not smooth ***Amygdalum*** Megerle von Muehlfeld

Genus ***Modiolus*** Lamarck, 1799

1799. *Modiolus* Lamarck, *Mem. Soc. Hist. nat. Paris*, p. 87.

Type species : *Mytilus modiolus* Linnaeus, 1758.

Key to the species

1. Shell with radiating ridges on the posterior end (2)
 - Shell without radiating ridges on the posterior end (3)
2. Shell deep colour; ventral margin more depressed in the middle; radiating ridges prominent and present half of the body ***M. striatulus*** (Hanley)
 - Shell lighter colour; ventral margin almost straight; radiating ridges not so prominent and only a few ***M. undulatus*** (Dunker)
3. Shell width half or more of length, umbonal ridge not prominent ... ***M. metcalfei*** Hanley
 - Shell width 1/3rd or less of length, umbonal ridge prominent ***M. philippinarum*** Hanley

Modiolus metcalfei Hanley

1844. *Modiola metcalfei* Hanley, *Proc. zool. Soc. Lond.*, **1844** : 14.

Material Examined : i) 2 valve, Maypadu, Nellore, 16/02/2002, ii) 1 ex., Mahalakshampuram, Nellore, 17/02/2002, Coll. S. Barua and Party.

Measurements (in mm) :

Length	Width	Depth
66.70–56.50	26.80–22.50	19.90

Diagnosis : Shell more or less triangularly oblong, narrow ventricose, smooth or very finely striated; posterior side straight, a little contracted, anterior angularly produced into compressed wing; periostracum hairy, yellow chestnut, with a bluish purple band, radiately descending from the umbo.

Distribution : India : Andhra Pradesh.

Elsewhere : Philippines.

***Modiolus philippinarum* Hanley**

1843. *Modiola philippinarum* Hanley, *Recent Biv. Shells*, 1843 : 235, pl. 24, fig. 26.

Material examined : i) 2 exs., Kakinada Harbour, 13/04/2000, Coll. Ramakrishna and Party; ii) 1 valve, Suryalanka, Chirala, 19/04/2000, iii) 5 valves, Krishnapatnam, Nellore, 15/02/2002, iv) 1 valve, Tuplipalem, 19/2/2002, v) 1 ex., Ravanappasalov, 22/2/2002, Coll. S. Barua and Party.

Measurements (in mm) :

Length	Width	Depth
52.70–16.90	27.00–8.30	22.60–15.30

Diagnosis : Shell modioliform, wedge shaped; anterior end pointed, prominent; dorsal and ventral margins divergent; posterior margin subtruncate; periostracum hairy, yellow-orange brown, umbonal ridge paler, internally white with dark, reddish brown, posterior dorsal area.

Distribution : India : Andhra Pradesh, Andman and Nicobar Islands, Lakshadweep.

Elsewhere : Indo-Pacific.

***Modiolus striatulus* Hanley**

1844. *Modiolus striatulus* Hanley, *Proc. zool. Soc. Lond.*, 1844 : 14.

Material examined : i) 4 exs., Visakhapatnam, 18/02/1947, Coll. ?; ii) 56 exs., Eatimoga village, Kakinada, 20/11/1984, Coll. N.V. Subba Rao and Party; iii) 11 exs., Machilipatnam, Visakhapatnam, 17/02/2001, Coll. S. Barua and Party.

Measurements (in mm) :

Length	Width	Depth
28.90–14.15	12.90–6.90	9.50–5.15

Diagnosis : Shell elongately trapezoid with gibbous in the middle; sculpture with radiating ridges, wide and more distinct on the anterior margin; olive colour with pale towards the margin.

Distribution : India : Andhra Pradesh, Andman and Nicobar Islands, Kerala, Maharashtra, Orissa, Tamil Nadu, West Bengal.

Elsewhere : Sri Lanka, Myanmar, Singapore, Gulf of Thailand, Philippines, China and Japan.

Modiolus undulatus (Dunker)

1856. *Valsella undulata* Dunker, *Proc. zool. Soc. Lond.*, **26** : 363.

Material examined : i) Many exs., Bandar Canal, Machilipatnam, Visakhapatnam, 07/12/1964, Coll. N.V. Subba Rao and Party.

Measurements (in mm) :

Length	Width	Depth
25.20–13.60	10.00–6.95	7.00–4.40

Diagnosis : Shell gibbous, oblong, thin, inequivalve, right more convex than left; umbo not prominent and anteriorly in position; anterior end acuminate rounded, fan shaped, obtusely angulated in the middle; yellowish brown, shiny.

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

Elsewhere : Indonesia : Moluccas.

Genus *Amygdalum* Megerle, 1811

1811. *Amygdalum* Megerle, *Mag. Ges. Nat. Fr. Berlin*, **5** : 69.

Type species : *Amygdalum dentriticum* Megerle, 1811.

Amygdalum watsoni (E.A.Smith)

1885. *Modiola watsoni* Smith, *Lamellibranchiata Challenger Rep*, **13** : 275, pl. 16, figs. 5-5C.

Material Examined : i) 2 exs., Andhra Pradesh, Stn. 133, Marine Survey.

Measurements (in mm) :

Length	Width	Depth
23.30–21.20	13.10–12.40	9.80–9.10

Diagnosis : Shell thin, modioliform, shining; umbos almost terminal; anterior end short; posterior end broad; ventral margin almost straight; dorsal margin inclined; sculpture smooth, glossy with fine thread like growth lines; an umbonal ridge situated almost middle of the shell; ashy-greenish above umbonal ridge, greenish or whitish in the lower part.

Distribution : India : Andhra Pradesh, Andaman Islands, Kerala, Orissa, Tamil Nadu.

Elsewhere : Gulf of Oman, Sri Lanka, Myanmar, Indonesia.

Order PTERIOIDA

Suborder PTERIINA

Superfamily PTERIOIDEA

Family PTERIIDAE

Key to the genera

Shell less thick and obliquely ovate, inequivalve; elongate posterior wing; hinge with 1 or 2 tooth like processes below umbo and longitudinal posterior lamina
.....***Pteria*** Scopoli

Shell thick, subquadrate, slightly higher than long; nearly equivalve; posterior wing and indentation of posterior margin lacking or nearly so; on hinge teeth
.....***Pinctada*** Roeding

Genus ***Pteria*** Scopoli, 1777

1777. *Pteria* Scopoli, *Introd. Hist. nat.*, p. 397.

Type species : *Mytilus hirundo* Linnaeus, 1758

Pteria smithi (Preston)

1910. *Avicula smithi* Preston, *Rec. Indian Mus.*, **5** : 35, fig. 4.

Material Examined : i) 2 valves, Vadarevu beach, Chirala, 18/04/2000, Coll. S.C. Mitra and Party; ii) 13 exs., Kottapatnam, Ongole, 12/02/2002, Coll. S. Barua and Party.

Measurements (in mm) :

Length	Width	Depth
67.20–47.45	29.75–21.95	13.30–10.10

Diagnosis : Shell thin, subquadratre, inequivalvis; the left valve convex and flattened right valve; dorsal margin straight; ventral rounded; anterior obliquely curved; posterior concavely sloping; wings present in both valves, anterior wing broader and longer than posterior; grayish white tessellated with golden brown, tained in places with bright yellow and blotched with deep blackish ourple; interior nacreous.

Distribution : Andhra Pradesh, Orissa.

Elsewhere : Sri Lanka.

Genus *Pinctada* Roeding, 1798

1798. *Pinctada* Roeding, *Mus. Bolten.*, p. 166.

Type species : *Mytilus margaritiferus* Linnaeus, 1758.

Key to the species

Shell large, thick, heavy; dorsal margin shorter than body of shell; sculpture lamellose with radial rows of broad, appressed scales; internally vividly lustrous with a narrow greyish margin *P. margaritifera* (Linnaeus)

Shell medium, thin, not heavy; dorsal margin longer than body of shell; sculpture not lamellose; internally lustrous with non lustrous broad margin *P. anomioides* (Reeve)

Pinctada anomioides (Reeve)

1857. *Avicula anomioides* Reeve, *Conch. Icon.*, **10** : pl. 9, fig. 26.

Material examined : i) 4 exs., Lowson's Bay, Visakhapatnam, 17/02/1947, ii) 1 ex., Visakhapatnam, Reg. No. M 22333/4, Coll. T. Vedavati; ii) 2 exs., Chinnatapally, Vizianagaram, 22/05/2001, iii) 1 valve., Ethamukkla, Ongole, 13/02/2002, Coll. S. Barua and Party.

Measurements (in mm) :

Length	Width	Depth
35.40–19.20	32.50–14.60	8.95–4.45

Diagnosis : Shell nearly circular, somewhat Pecten shaped, thin, smooth, transparent white, faintly rayed with pale green, obsoletely roughly laminated at the margin.

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

Elsewhere : Gulf of Aden, Sri Lanka, Myanmar, Indonesia.

Pinctada margaritifera (Linnaeus)

1758. *Mytilus margaritifera* Linnaeus, *Syst. Nat.* ed. **10** : 704.

1817. *Margaritifera vulgaris* Schumacher, *Essai Nouv. Syst* **1817** : 108, pl. 20, figs. 39, b.

Material examined : i) 2 exs., Visakhapatnam, 16.06.1916, M 14225/2, Coll. Rev. H. Hosten; ii) 1 valve, Kakinada, 12/04/2000, Coll. Ramakrishna and Party; iii) 3 exs., 1 valve, Kottapatnam, Ongole, 12/02/2002, iv) 3 valves, Ravanappasalov, 22/02/2002, Coll. S. Barua and Party.

Measurements (in mm) :

Length	Width	Depth
78.40–41.50	73.15–47.90	23.15–9.20

Diagnosis : Shell somewhat pecten shaped, thick, with concave left valve and slightly flattened right valve; wings short and broad, the posterior wing larger than anterior, muscle scar well impressed; interior of shell nacreous iridescent.

Distribution : India : Andhra Pradesh, Andaman and Nicobar Islands.

Elswhere : East coast of Africa, Zanzibar, Persian Gulf, Red sea, Indonesia, Australia.

Family ISOGNOMONIDAE

Genus *Isognomon* Solander in Lightfoot, 1786

1786. *Isognomon* Lightfoot, *Catal. Portland. Mus.*, pp. 9, 41, 52, 115, 137.

Type species : *Ostrea perna* Linnaeus, 1758

Isognomon legumen (Gmelin)

1791. *Ostrea legumen* Gmelin, *Syst. Nat.*, ed 13 : 3339.

Material Examined : i) 2 exs., Lawson's Bay, Visakhapatnam, Jan.1921, Coll. S. W. Kemp;
ii) 4 exs., 1 valve, Waltair (Visakhapatnam) Coast, 10/09/1985, M 22332/4, Coll. T. Vedavati.

Measurements (in mm) :

Length	Width	Depth
14.85–12.00	8.30–5.90	5.65–4.45

Diagnosis : Shell small with variable outline, narrowly spatulate, irregular crescent shaped to tailed; hinge line shorter than width with multiple ligament pits; sculpture flaky or with weak radial lines or threads; non nacreous margin wider than nacreous area.

Distribution : Andhra Pradesh, Andaman Island.

Elswhere : Indo-Pacific.

Suborder PINNINA

Superfamily PINNOIDEA

Family PINNIDAE

Genus *Pinna* Linnaeus, 1758

1758. *Pinna* Linnaeus, *Syst. Nat.*, ed. 10 : 707.

Type species : *Pinna rudis* Linnaeus, 1758

Key to the species

Shell narrow, attenuated; uniformly light horn colour; posterior marginal lobes of nacreous layer, slope, sharply obliquely towards dorsal and ventral margin..... *P. incurva* Gmelin

Shell broad to attenuated triangular shape; dark purplish brown, often with radiating bands; nacreous area iridescent, occupying the anterior half of the shell, with separated dorsal and ventral lobe *P. bicolor* Gmelin

Pinna bicolor Gmelin

1791. *Pinna bicolor* Gmelin, *Syst. Nat.*, ed. 13 : 3366.

Material Examined : i) 3 valves, Krishnapatnam, Nellore, 15/02/2002, Coll. S. Barua and Party.

Measurements (in mm) :

Length	Width	Depth
226.95–170.00	86.40–75.65	–

Diagnosis : Shell thick, broadly to attenuated triangular, posterior margin truncate dorsally convex and sloping ventrally; radial sculpture with 8-17 radiating ribs, obsolete; concentric sculpture with fine growth lines towards posteriorly and slope anteriorly towards the ventral margin; interior of valves light smoky horn to dark purplish brown in colour, with radiating bands of alternating dark and light, surface smooth glossy, nacreous area iridescent; adductor adductor scar small, subapical; posterior adductor scar large, subterminal.

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

Elsewhere : South African coast, Mocambique, Malagasy, Mauritius, Tanzania, Persian Gulf, Sri Lanka, Thailand, Indonesia, New Guinea, Philippines, China, Australia, New Caledonia, Hawaii.

Pinna incurva Gmelin

1791. *Pinna incurva* Gmelin, *Syst. Nat.*, ed. 13 : 3366.

Material Examined : i) 3 exs., Chinnatapally, Vizianagaram, 02/05/2001, Reg. No. M 24986/5; ii) 1 ex., Tuplipalem, 18/02/2002, M 25186/5, Coll. S. Barua and Party.

Measurements (in mm) :

Length	Width	Depth
169.40–115.20	39.20–33.10	12.35–11.90

Diagnosis : Shell thin, fragile, narrowly attenuated and wedge shaped out line; posterior margin extremely arcuate; subinflated, with weak longitudinal keel on the anterior half; sculpture

with obsolete radiating ribs; radial sculpture hardly observable; dorsal and ventral margins straight; nacreous layer iridescent occupying most of anterior half; Anterior adductor moderately small, posterior adductor scar medium; primary hinge ligament very thin.

Distribution : India : Andhra Pradesh, Tamil Nadu.

Elsewhere : Indonesia, Philippines, Australia.

Order LIMOIDA

Superfamily LIMOIDEA

Family LIMIDAE

Genus *Lima* Bruguiere, 1797

1797. *Lima* Bruguiere, *Encyl. Meth. Tabl. Vers.*, 2 : pl. 206.

Type species : *Lima alba* Cuvier, = *Ostrea lima* Linnaeus, 1758.

Key to the species

Shell thick, not gaping at the ends, sculpture with 18-24 radial ribs all with erect flat scales *L. lima* (Linnaeus)

Shell thin, gaping at the ends, sculpture with numerous radial riblets
..... *L. fragilis* (Gmelin)

Lima fragilis (Gmelin)

1791. *Ostrea fragilis* Gmelin, *Syst. Nat.*, ed. 13 : 3332.

Material examined : i) 3 valves, Bheemunipatnam, Visakhapatnam, 20/02/1947, Coll. H. C. Ray and Party.

Measurements (in mm) :

Length	Width	Depth
31.30–23.60	18.10–15.10	—

Diagnosis : Shell obliquely ovate, thin, fragile, translucent, valves almost flat, with wide gaping at anterior and posterior ends; hinge line narrow; ears small; sculpture with numerous radial riblets. Shells white.

Distribution : India : Andhra Pradesh, Andaman and Nicobar Islands.

Elsewhere : Indo-Pacific.

Lima lima (Linnaeus)

1758. *Ostrea lima* Linnaeus, *Syst. Nat.*, ed. 10 : 699.

Material examined : i) 2 valves, Bheemunipatnam, Visakhapatnam, 20/02/1947, Coll. H. C. Ray and Party.

Measurements (in mm) :

Length	Width	Depth
28.50–27.50	21.20–21.00	–

Diagnosis : Shell solid, obliquely oval, not gaping, anterior margin very long, straight; anterior slope vertical; ears small; sculpture prominent 18-24, radial ribs with erect flat scales.

Distribution : India : Andhra Pradesh, Andaman and Nicobar Islands.

Elsewhere : Indo-Pacific.

Order OSTREOIDA
Suborder OSTREINA
Superfamily OSTREOIDEA
Family OSTREIDAE
Subfamily CRASSOSTREINAE

Key to the genera

Umbonal cavity well developed in left valve; chomata absent; slender spatulate form..
..... *Crassostrea* Sacco

Umbonal cavity deeper; chomata strong; conical rudistiform or cornupia like sha
..... *Saccostrea* Dalfus and Dautzenber

Genus *Crassostrea* Sacco, 1897

1897. *Crassostrea* Sacco in Bellardi and Sacco, *Moll.Terr. terz. Piemonie e Liguria*, **23** : 15.

Type species : *Ostrea virginica* Gmelin, 1791.

Crassostrea cuttackensis (Newton and Smith)

1912. *Crassostrea graphoides* var. *cuttackensis* Newton and Smith, *Rec. Geol. Surv. India*, **42**(1) : 13, pl. 7 & 8, figs. A & B.

Material Examined : i) 1 ex., Visakhapatnam, March, 1915, M 21639/4, ii) 3 exs., 3 valves, Visakhapatnam, March, 1915, M 21640/4, iii) 1 ex., 1 valve, Visakhapatnam, March, 1915, M 19919/3, Coll. B.L. Chowdhury; iv) 3 valves, Visakhapatnam, 17/06/1916, Coll. Rev. H. Hosten; v) 7 valves, Visakhapatnam, 19/02/1947, vi) 6 valves, Bheemunipatnam, Visakhapatnam, 24/02/1947, M 22253/4, Coll. ?; vii) 2 valves, Uppateru, Kakinada, 21/02/1948, Coll. Mahesh Chanda and G. Ramakrishna; viii) 10 exs., Kakinada harbour, 21/07/1963, Coll. A. Daniel and

Party; ix) 11 valves, Eatimoga village, Kakinada, 20/11/1964, Coll. N.V. Subba Rao and Party; x) 1 valve, Bheemunipatnam, Visakhapatnam, 01/10/1978, Coll. Fisherman.

Measurements (in mm) :

Length	Width	Depth
70.10–31.40	57.10–21.90	22.50–13.95

Diagnosis : Shell very heavy, bulky, irregularly subcircular to elongate; externally whitish, internally lustrous white; sculpture smooth or weakly lamellate, without postules; nodularchomata present near the hing; postulose chomata often in right valve.

Distribution : India : Andhra Pradesh, Andaman and Nicobar Islands, Goa, Gujarat, Karnataka, Kerala, Maharashtra, Orissa, Tamil Nadu.

Elsewhere : Bangladesh, Myanmar, Malaysia, Indonesia, Philippines.

Genus *Saccostrea* Dollfus and Dautzenberg, 1920

1920. *Saccostrea* Dollfus and Dautzenberg, *Mem. Soc. geol. France Paleont. Mem.*, **27** : 471.

Type species : *Ostrea cucullata* Born.

Saccostrea cucullata (Born)

1778. *Ostrea cucullata* Born, *Index Rerum Naturalism Musei Cae. Vindob.*, **1778** : 100, t.6, figs. 11-12.

Material examined : i) 3 exs., 10 valves, Visakhapatnam, 22.05.1926, M 19968/3, Coll. H.S. Rao and G. Varugis; ii) 5 valves, Scandal point, Visakhapatnam, 11/01/1941, iii) 4 exs., Visakhapatnam, 17/01/1941, Coll. H.A. Hafiz; iv) 7 valves, Dolphin's nose, Visakhapatnam, 08/02/1947 v) 4 exs., Lawson's Bay, Visakhapatnam, 09/02/1947, vi) 15 exs., Bheemunipatnam, Visakhapatnam, 18/02/1947, Coll. ?; vii) 9 valves, Goastani, Bheemunipatnam, Visakhapatnam, M 19953/3, 19/02/1947, viii) 5 exs., Chittivalsa, Bheemunipatnam, Visakhapatnam, 20/02/1947, M 19954/3, Coll. H.C. Ray and Party; ix) 2 exs., Bheemunipatnam, Visakhapatnam, 08/07/1963, Coll. A. Daniel and Party; x) 5 exs., Jalariepet hut, Visakhapatnam, xi) 10 exs., opposite Lighthouse, Visakhapatnam, Coll. A. S. Rajagopal and Party; xii) 3 valves, Kakinada Harbour, 13/04/2000, Coll. Ramakrishna and Party; xiii) 7 valves, Chinnatapally, Vizianagaram, 12/02/2002, xiv) 5 valves, Kottapatnam, Ongole, 02/05/2002, Coll. S. Barua and Party.

Measurements (in mm) :

Length	Width	Depth
62.65–32.90	33.30–31.40	25.60–19.15

Diagnosis : Shell, trigonal, solid, plaited angular, generally large, white near the apex and purple towards the margin, striped with deeper bands; lower valve heavy, overlapping the

other valve at the margin, hooded under the hinge margin, hinge elevated, much produced at the apex; plaited elongated, sometimes rounded and imbricated; upper valve flat in the middle, plaited towards the margin.

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

Elsewhere : Indo-Pacific.

Suborder PECTININA

Superfamily PECTINOIDEA

Family PECTINIDAE

Subfamily CHLAMYDINAE

Genus *Chlamys* Roeding, 1798

1798. *Chlamys* Roeding, *Mus. Bolten.*, p. 161.

Type species : *Pecten islandicus* Mueller; subsequent designation, Herrmannsen, 1847

Key to the species

Sculpture with 22-26 low rounded ribs, almost smooth in large shells but sparsely scaled in young *C. senatoria* (Gmelin)

Sculpture with less than 20 smooth raised somewhat square ribs, minutely serrated on the sides *C. tranquebaria* (Gmelin)

Chlamys senatoria (Gmelin)

1791. *Ostrea senatoria* Gmelin, *Syst. Nat.*, ed. 13 : 3327.

Material examined : i) 6 exs., Krishnapatnam, Nellore, 15/02/2002, ii) 12 exs., Māypadu, Nellore, 16/02/2002, iii) 6 exs., Mahalakshipuram, Nellore, 17/02/2002, iv) 2 valves Tuplipalem, 18/02/2002, iii) 2 valves, Ravanappasalov, 22/02/2002, Coll. S. Barua and Party.

Measurements (in mm) :

Length	Width	Depth
36.40–11.60	35.00–14.40	—

Diagnosis : Shell moderately large, height almost equal to length, both valves equally convex; sculpture with elevated and rounded 22-26 axial ribs, arranged concentrically, convergent at umbo; ribs often smooth but scales often persists along edges of ribs; reddish brown, red, mauve either uniformly or mottling or zigzag bands:

Distribution : India : Andhra Pradesh, Andaman and Nicobar Islands.

Elsewhere : Throughout Indo-Pacific.

Subgenus *Argopecten* Monterosato, 1889

1889. *Argopecten* Monterosato, *J. Conch. Paris*, **37** : 20.

Type species: *Pecten solidulus* Reeve, 1853

Chlamys (Argopecten) tranquebaria (Gmelin)

1791. *Ostrea tranquebaria* Gmelin, *Syst. Nat.*, ed **13** : 3328.

Material examined : i) 1 valve, Vadarevu beach, Chirala, 18/04/2000, Coll. S.C. Mitra and Party; ii) 3 valves, Kottapatnam, Ongole, 12/02/2002, iii) 1 valves, Krishnapatnam, Nellore, 15/02/2002, iv) 2 valves Tuplipalem, 18/02/2002 Coll. S. Barua and Party.

Measurements (in mm) :

Length	Width	Depth
41.20–32.50	42.50–31.230	15.6–

Diagnosis : Shell moderately, length almost equal to height, left valves more convex than right; sculpture with 20-24 rounded broad radial ribs, gradually narrow towards umbo, almost smooth; Anterior ear larger than posterior one, byssal orifice prominent; ligament small central and triangular; variable in colour, cream, reddish brown, red mauve with white irregular patches.

Distribution : India: Andhra Pradesh, Andaman and Nicobar Islands, Gujarat, Maharashtra, Orissa, Tamil Nadu.

Elsewhere : Sri Lanka, Indonesia, New Guinea, North Australia, South China, Philippines.

Family PROPEAMUSSIDAE

Genus *Amusium* Roeding, 1798

1798. *Amusium* Roeding, *Mus. Bolten.*, p. 165 (*Amussium*-error).

Type species : *Amusium pleuronectes* Linnaeus; subsequent designation, Herrmannsen, 1846.

Amusium pleuronectes (Linnaeus)

1758. *Ostrea pleuronectes* Linnaeus. *Syst. Nat.*, ed. **10** : 696.

Material examined : i) 1 valve, Bheemunipatnam, Visakhapatnam, 20/12/1947, Coll. H.C. Ray and Party.

Diagnosis : Shell almost circular with almost equal anterior and posterior ear, valves almost flat to slightly convex; sculpture with fine circular striae exterior and interior with 35-46 raised radial ribs; shell gray to purpleish gray with radiating externally to left valve and white internally except outer edge, right valve white.

Distribution : India : Andhra Pradesh, Andaman Islands.

Elsewhere : Japan to Australia.

Family SPONDYLIDAE

Genus *Spondylus* Linnaeus, 1758

1758. *Spondylus* Linnaeus, *Syst. Nat.*, ed. 10 : 690.

Type species : *Spondylus garderopus* Linnaeus, subsequent designation, Schmidt, 1818

Key to the species

1. Shell deformed; without armed radiating ridges or radial rows of spines.....
..... *S. microlepus* Lamarck
Shell not deformed; sculpture with armed radiating ridges or radial rows of spines.....
..... (2)
2. Shell triangularly ovate; width more than length; sculpture with armed radiating ridge
..... *S. layardi* Reeve
Shell irregular, discoid; width less than length; sculpture with radial rows of semi erected
spines *S. hystrix* Roeding

Spondylus hystrix Roeding

1798. *Spondylus hystrix* Roeding, *Mus. Bolten.*, p. 195.

Material examined : i) 4 exs., Kottapatnam, Ongole, 12/02/2002, ii) 1 valve, Ethamukkla, Ongole, 13/02/2002, Coll. S. Barua and Party.

Measurements (in mm) :

Length	Width	Depth
34.30–24.10	30.90–20.00	–

Diagnosis : Shell medium, irregular, discoid with large attachment area; sculpture with numerous radial rows, with semi erected spines; shell externally white with purple markings, internally more white with yellow around the margin.

Distribution : India : Andhra Pradesh, Andaman and Nicobar Islands, Orissa, Maharashtra.

Elsewhere : Indonesia.

Spondylus layardi Reeve

1836. *Spondylus layardi* Reeve, *Conch. Icon.*, **9** : *Spondylus* sp. no. 66, pl. 18, fig. 66.

Material examined : i) 6 valves, Visakhapatnam, M 22495/4; ii) 3 exs., Jalaripeta, Visakhapatnam, Coll. D.R.K. Shastry and Party.

Measurements (in mm) :

Length	Width	Depth
38.60–21.40	45.25–22.40	–

Diagnosis : Shell triangularly ovate; sculpture with radiate ridges and striations, ridges armed with prickles; margin crenulate; shell purple red, boarded with purple brown; interior white.

Distribution : India: Andhra Pradesh, Andaman and Nicobar Islands, Gujarat, Lakshadweep, Maharashtra, Orissa, Tamil Nadu.

Elsewhere : Indo-Pacific.

Spondylus microlepus Lamarck

1819. *Spondylus microlepus* Lamarck, *Hist. nat. Anim. Sans. Vert.*, **6** : 192.

Material examined : i) 1 valve, Manginipudi, Machilipatnam, 05/12/1964, Coll. N.V. Subba Rao and Party; ii) 1 valve, Visakhapatnam, 05/03/1966, Coll. A.S. Rajagopal and Party; iii) 1 valve, Visakhapatnam, 24/02/1995, Coll. D.R.K. Shastry and Party.

Measurements (in mm) :

Length	Width	Depth
27.95–20.60	32.40–26.50	–

Diagnosis : Shell somewhat deformed species, has a very reduced type of sculpture consisting of radiating ridges and striae, irregularly beaded with few short spines or scales near the margin.

Distribution : India : Andhra Pradesh, Andaman Islands.

Elsewhere : Indonesia.

Superfamily ANOMIOIDEA

Family ANOMIIDAE

Genus *Anomia* Linnaeus, 1758

1758. *Anomia* Linnaeus, *Syst. Nat.*, ed. **10** : 700.

Type species : *Anomia ephippium* Linnaeus.

Key to the species

Shell irregularly circular, yellowish orange, sculpture with irregular concentric lines and radial striae *A. ephippium* Linnaeus

Shell broadly ovate, golden yellow, left valve tumid and hooked towards umbo, right valve radially striated *A. achaeus* Gray

Anomia achaeus Gray

1849. *Anomia achaeus* Gray, *Proc. zool. Soc. Lond.*, **1849** : 116.

Material examined : i) 5 valves, Manginapudi, Machilipatnam, 04/12/1964, ii) 1 valve, Kottapalem, Nizampatnam, 18/12/1964, iii) 8 valves, Vadarevu, Chirala, 22/12/1964, Coll. N.V. Subba Rao and Party; iv) 3 exs., Waltair (Visakhapatnam), 07.03.1985, M 22259/4, Coll. T. Vedavati; v) 3 valves, Kakinada Harbour, 13/04/2000, vi) 6 valves, Maginapudi, Machilipatnam, 15/04/2000, Coll. Ramakrishna and Party; vii) 4 valves, Krishnapatnam, Nellore, 15/02/2002, viii) 3 valves, Maypadu, Nellore, 16/02/2002, Coll. S. Barua and Party.

Measurements (in mm) :

Length	Width	Depth
34.30–24.10	30.90–20.00	–

Diagnosis : Shell broadly ovate, golden yellow; left valve convex, tumid and hooked towards the umbo; right valve radially striated.

Distribution : India : Andhra Pradesh, Gujarat, Kerala, Maharashtra, West Bengal

Elsewhere : Persian Gulf, Gulf of Aden, Pakistan coast, West coast of Ceram.

Anomia ephippium Linnaeus

1758. *Anomia ephippium* Linnaeus, *Syst. Nat.*, ed. **10** : 700.

Material examined : i) 1 valve, Eatimoga, Kakinada, 20/11/1964, Coll. N.V. Subba Rao and Party; ii) 1 valve, Rishikuhda, Visakhapatnam, 09/03/1966, Coll. A.S. Rajagopal and Party; iii) 1 valve, Mahalakshmiapuram, Nellore, 17/02/2001, Coll. S. Barua and Party.

Measurements (in mm) :

Length	Width	Depth
38.20	35.20	–

Diagnosis : Shell irregularly circular, rather flat to deeply convex; left valve well developed and convex, the right valve very thin and almost flat; sculpture with irregular concentric lines and radial striae; yellowish orange or cream white, lustre.

Distribution : India : Andhra Pradesh, Andaman Islands.

Family PLACUNIDAE

Genus *Placuna* Solander in Lightfoot, 1786

1786. *Placuna* Solander in Lightfoot, *Catal. Portland Mus.*, p. 16.

Type species : *Anomia placenta* Linnaeus; subsequent designation, Schmidt, 1818

Placuna placenta Linnaeus

1758. *Placuna placenta* Linnaeus, *Syst. Nat.*, ed. 10 : 703.

Material examined : i) 8 valves, Kakinada, 27/02/1948, Coll. Mahesh Chanda and G. Ramakrishna; ii) 5 valves, Vadarevu beach, Chirala, 20/12/1964, iii) 16 valves, Uppateru canal, Kakinada, 22/12/1964, iv) 10 valves, Eatimoga village, Kakinada, 24/12/1964, Coll. N.V. Subba Rao and Party; v) 1 ex., Kalingapatnam, 29/04/2001, vi) 1 ex., Ethamukkala, Ongole, 13/02/2002, Coll. S. Barua and Party.

Measurements (in mm) :

Length	Width	Depth
123.50–53.25	136.50–53.20	9.00–3.90

Diagnosis : Shell flat, thin, subventricular, very compressed, rather fragile, inner surface smooth, glossy and brilliant pearly appearance; outer surface with prominent growth lines and radial striae; adductor central; umbo small, inconspicuous; cardinal teeth two, ridge like, diverging from the umbo at a narrow angle; unequal and the posterior larger.

Distribution : India : Andhra Pradesh, Andaman and Nicobar Islands, Tamil Nadu, West Bengal.

Elsewhere : Gulf of Aden, Malaya, China, Borneo, Philippines.

Subclass HETERODONTA

Order VENEROIDA

Superfamily LUCINOIDEA

Family LUCINIDAE

Genus *Anodontia* Link, 1807

1807. *Anodontia* Link, *Beschr. Nat. Samml. Univ. Rostock*, (3) : 156.

Type species : *Venus edentula* Linnaeus, 1758.

Anodontia edentula (Linnaeus)

1758. *Venus edentula* Linnaeus, *Syst. Nat.*, ed. 10 : 689.

Material examined : i) 2 valves, Ethamukkala, Ongole, 13/02/2002, ii) 3 valves, Mahalakshmiapuram, Nellore, 17/02/2002, Coll. S. Barua and Party.

Measurements (in mm) :

Length	Width	Depth
46.50–16.50	44.50–14.20	-14.50

Diagnosis : Shell circular, globose; anterior excavately angles; umbo elevated and slightly anterior; sculpture with concentric striae; hinge with indistinct cardinal teeth; shell covered with dark brown epidermis externally and white interiorly.

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

Elsewhere : Indo-Pacific.

Superfamily CARDITOIDEA

Family CARDITIDAE

Key to the genera

Shell subovate or modioliform; radial ribs nodulose; hinge with long 3b and obsolete lateral *Cardita* Bruguiere

Shell trapezoidal to rounded; radial ribs striate or squamose; hinge with arched 3a and 3b *Cardites* Link

Subfamily CARDITINAE

Genus *Cardita* Bruguiere, 1792

1792. *Cardita* Bruguiere, *Encycl. Meth. Vers.*, 1(2) : 401.

Type species : *Chama calyculata* Linnaeus, 1758.

Key to the species

Shell modioliform; beaks subterminal; sculpture with 18-20 acute ribs increasing in size posteriorly *C. variegata* Bruguiere

Shell subovate; beaks not subterminal; sculpture with 20-22 broad, flat topped radial ribs (anterior with cross bars) *C. antiquata* (Linnaeus)

Cardita antiquata (Linnaeus)

1758. *Chama antiquata* Linnaeus, *Syst. Nat.*, ed. 10 : 691.

Material examined : i) 1 ex., Dolphin Nose, Visakhapatnam, Coll.?, ii) 1 valve, Kottapatnam,

Ongole, 12/02/2002, iii) 1 valve, Ethamukkala, Ongole, 13/02/2002, iv) 1 valve, Mahalakshmiapuram, Nellore, 17/02/2002, Coll. S. Barua and Party.

Measurements (in mm) :

Length	Width	Depth
42.10–17.85	32.70–15.95	–

Diagnosis : Shell heavy, subovate, equivalve; umbone elevated, anterior; sculpture with 20-22 radially ribbed, tuberculately crenulated; hinge with long arching posterior cardinal; muscle scars well impressed, anterior semilunate, posterior rectangular; pallial line entire; ventral margin with strong teeth; white with various amount of brown blotching.

Distribution : India : Andhra Pradesh, Goa, Gujarat, Maharashtra, Nicobar Islands, Orissa, Pondicherry, Tamil Nadu.

Elsewhere : Myanmar, Sri Lanka.

Cardita variegata Bruguiere

1792. *Cardita variegata* Bruguiere, *Encyl. Meth. Vers.*, 1 : 404, pl. 223, fig. 6.

Material examined : i) 3 exs., 1 valve, Visakhapatnam, Coll. ?; ii) 1 valve, Visakhapatnam, 07/03/1966, Coll. A.S. Rajagopal and Party; iii) 1 valve, Chinnatapally, Vizianagaram, 02/03/2001, Coll. S. Barua and Party.

Measurements (in mm) :

Length	Width	Depth
28.90–12.65	18.30–8.80	15.60–8.00

Diagnosis : Shell thick, solid, elongately modioliform not expanded posterior; sculpture with 18-20 acute ribs increasing in size posteriorly, ribs scaly; white to buff with variable amounts of brown black spots and blotches.

Distribution : India : Andhra Pradesh, Andaman and Nicobar Islands, Lakshadweep, Maharashtra, Tamil Nadu.

Elsewhere : Widely distributed in Indo-Pacific.

Subfamily CARDITESTINAE

Genus *Cardites* Link, 1807

1807. *Cardites* Link, *Beschr. Nat. Samml. Univ. Rostock*, (3) : 153.

Type species : *Chama antiquata* Linnaeus, 1758

Cardites bicolor (Lamarck)

1819. *Cardita bicolor* Lamarck, *Hist. nat. Anim. Sans. Vert.*, 6 : 427.

Material examined : i) 2 valves, Lawson's Bay, 14/02/1947, ii) 1 valve, Bheemunipatnam, Visakhapatnam, 22/02/1947, Coll. ?; iii) 1 valve, Bandar canal, Machilipatnam, Visakhapatnam, 07/12/1964, iv) 1 valve, Vadarevu, Chirala, 20/12/1964, Coll. N.V. Subba Rao and Party; v) 1 valve, Kakinada Harbour, 12/04/2000, vi) 1 valve, Manginapudi, Machilipatnam, 15/04/2000, Coll. Ramakrishna and Party; vii) 1 valve, Suryalanka, Chirala, 19/04/2000, Coll. S. C. Mitra and Party; viii) 1 valve, Ravanappasalov, 12/02/2002, ix) 1 valve, Kottapatnam, Ongole, 12/02/2002, x) 3 valves, Krishnapatnam, Nellore, 15/02/2002, xi) 3 valves, Maypadu, Nellore, 16/02/2002, xii) 2 valves, Tuplipalem, 19/02/2002, Coll. S. Barua and Party.

Measurements (in mm) :

Length	Width	Depth
51.70–40.50	41.55–31.15	37.60–26.60

Diagnosis : Shell heavy, sub ovate with high inflated umbones; sculpture with 20-22 broad, flat topped radial ribs, anterior ribs with cross bars, posterior ribs less developed; inner margin deeply crenulated; pallial line entire, white with various amount of brown black blotching.

Distribution : India : Andhra Pradesh, Goa, Pondicherry.

Elsewhere : Sri Lanka, Myanmar.

Superfamily CHAMOIDEA

Family CHAMIDAE

Genus *Chama* Linnaeus, 1758

1758. *Chama* Linnaeus, *Syst. Nat.*, ed. 10 : 691.

Type species : *Chama lazarus* Linnaeus, 1758.

Key to the species

- Sculpture with broad, fluted interrupted lamellae (2)
- Sculpture with dense array of narrow flat spines with a weak or obsolete posterior sulcus *C. reflexa* Reeve
- Adductor muscle scar deep; interior margin with purple colour *C. isotoma* Conrad
- Adductor muscle scar not deep; interior margin with pale tinge of mauve colour *C. brassica* Reeve

Chama brassica Reeve

1847. *Chama brassica* Reeve, *Conch. Icon.*, 4, *Chama*, sp. no. 32, pl. 6, fig. 31.

Material examined : i) 8 valves, Mahalakshmpuram, Nellore, 17/02/2002, Coll: S. Barua and Party.

Measurements (in mm) :

Length	Width	Depth
16.90–14.70	16.95–13.10	–

Diagnosis : Shell roughly circular to oval; upper valve usually worn but posterior sulcus apparent; sculpture broad, fluted, interrupted lamellae; dirty white with pale tinged of mauve internally.

Distribution : India : Andhra Pradesh, Andaman and Nicobar Islands.

Elsewhere : Tropical Pacific.

***Chama isotoma* Conrad**

1837. *Chama isotoma* Conrad, *J. Acad. nat. Sci. Philad*, 7 : 256.

Material examined : i) 2 valves, Bheemunipatnam, Visakhapatnam, 18/02/1947, Coll. ?.

Measurements (in mm) :

Length	Width	Depth
37.25–37.10	51.55–51.40	–

Diagnosis : Shell externally with concentric and radial ridges, interior smooth, white, margin deep purple.

Distribution : India : Andhra Pradesh, Lakshadweep.

Elsewhere : Indo-Pacific.

***Chama reflexa* Reeve**

1846. *Chama reflexa* Reeve, *Conch. Icon.*, 4, *Chama*, sp. no.16, pl. 4, fig.16.

Material Examined : i) 1 ex., Visakhapatnam, 21/01/1929, Coll. ?; ii) 9 exs., Kottapatanam, Ongole, 12/02/2002, Coll. S. Barua and Party.

Measurements (in mm) :

Length	Width	Depth
23.70–17.50	24.40–16.70	–12.50

Diagnosis : Shell medium, circular to oval; upper valve dense array of narrow flat spines with a weak or obsolete posterior sulcus; shell white tinged purple, marginal spines yellow to orange; internally tinged with deep purple. Offshore on rocks, moderately common (Abbott and Dance, 1982).

Distribution : India : Andhra Pradesh, Gujarat, Maharashtra, Orissa, Tamil Nadu.

Elsewhere : Indo-Pacific.

Superfamily CRASSATELLOIDEA

Family CRASSATELLIDAE

Genus *Eucrassatella* Iredale, 1924

1924. *Eucrassatella* Iredale, *Proc. Linn. Soc. N.S. Wales*, **49** : 181, 202.

Type species : *Crassatella kingicola* Lamarck, 1805.

Eucrassatella rostrata (Lamarck)

1819. *Crassatella rostrata* Lamarck, *Hist. nat. Anim. Sans. Vert.*, **6** : 110.

Material examined : i) 2 exs., Kottapatanam, Ongole, 12/02/2002, ii) 1 valve, Mahalakshimpuram, Nellore, 17/02/2002, Coll. Coll. S. Barua and Party.

Measurements (in mm) :

Length	Width	Depth
64.20–53.30	41.50–34.60	26.25–23.80

Diagnosis : Shell thick, ovately triangular with rostrate posterior; umbo elevated, pointed; sculpture with fine concentric striae, more prominent on anterior and posterior ends and a number of straight lines diverging from umbones to the margin; covered with a thin brown polished epidermis; anterior dorsal margin steeper; posterior dorsal concave, rostrum truncate; inner ventral margin denticulate; reddish brown with white interior.

Distribution : India : Andhra Pradesh.

Elsewhere : Indo-Pacific.

Superfamily CARDIOIDEA

Family CARDIIDAE

Key to the genera

Shell obliquely quadrate; height not greater than length; cardinal teeth in left valve partially fused at base *Acanthocardia* Gray

Shell ovate; height greater than length; cardinal teeth in left valve not fused at base...
..... *Trachycardium* Moersch

Subfamily CARDIINAE

Genus *Acanthocardia* Gray

1851. *Acanthocardia* Gray, *List. Brit. Anim. Coll. Brit. Mus.*, (7) : 23.

Type species : *Cardium aculeatum* Linnaeus, 1758; subsequent designation Stoliczka, 1870.

Key to the Species

Shell obliquely oval, umbone anterior, radial ribs imbricate and projecting scales, longer on posterior *A. lata* (Born)

Shell suborbicular, umbone central, radial ribs low, bearing calcareous raised flange on posterior margin *A. coronata* (Schumacher)

***Acanthocardia coronata* (Schroeter)**

1786. *Cardium coronatum* Schroeter, *Encl. Conchyl.*, 3 : 53, sp. 4, pl. 7, fig. 13.

Material examined : i) 3 valves, Rocky coast, Visakhapatnam, 05/03/1966, Coll. A. S. Rajagopal and Party; ii) 6 valves, Kakinada Harbour, 12/04/2000, Coll. Ramakrishna and Party; iii) 1 valve, Suryalanka, Chirala, 19/04/2000, Coll. S. C. Mitra and Party; iv) 3 valves, Kottapatnam, Ongole, 12/02/2002, v) 2 valves, Ethamukkala, Ongole, 13/02/2002, vi) 9 valves, Maypadu, Nellore, 16/02/2002, Coll. S. Barua and Party.

Measurements (in mm) :

Length	Width	Depth
51.70–40.50	41.55–31.15	37.60–26.60

Diagnosis : Shell suborbicular margin nearly rounded, umbo central, elevated; sculpture with 34-38 very low, radial ribs, bearing calcareous raised flanged on their posterior margins, interdigitate at the end; white saffroned with weak shades of orange pink posteriorly.

Distribution : India : Andhra Pradesh, Gujarat, Maharashtra, Nicobar Islands, Orissa, Tamil Nadu.

Elsewhere : Persian Gulf, Iran, Sri Lanka, Myanmar, Indonesia.

***Acanthocardia lata* (Born)**

1778. *Cardium latum* Born, *Testacea Musi Caes. Vinod.*, pl. 3, fig. 9.

Material examined : i) 1 valve, Visakhapatnam, Reg. No. M20162/3; ii) 1 valve, Dolphin nose and Scandelapoint, Visakhapatnam, 17/06/1916, M 20156/3, Coll. H. Hosten; iii) 5 exs., Bheemunipatnam, Visakhapatnam, 18/02/1947, iv) 11 valves, Bheemunipatnam, Visakhapatnam, 20/02/1947, Coll. H. C. Ray and Party; v) 1 valve, Bandar canal,

Machilipatnam, Visakhapatnam, 06/12/1964, vi) 2 valves, Vadarevu beach, Chirala, 20/12/1964, Coll. N.V. Subba Rao and Party; vii) 2 valve, Palm beach, Visakhapatnam, 04/03/1966, viii) 1 ex., Jalaripet, Visakhapatnam, 06/03/1966, ix) 5 valves, Rishikunda, Visakhapatnam, 09/03/1966, Coll. A. S. Rajagopal and Party; x) 3 valves, Kakinada, 29/05/1955, xi) 5 valves, Lowson's Bay, Visakhapatnam, Coll. ?.

Measurements (in mm) :

Length	Width	Depth
60.50–22.40	46.50–16.10	–

Diagnosis : Shell obliquely oval almost modiliform, but roundly angulate, posterior expanded, margin long, almost straight; umbone anteriorly elevated and pointed; sculpture with 36-38 narrow, thin, radial ribs, imbricate and projecting scales, longer on posterior; white, yellow, covered with brown and heavy periostracum.

Distribution : India : Andhra Pradesh, Andaman and Nicobar Islands, Gujarat, Maharashtra, Orissa, Tamil Nadu.

Elsewhere : Sind, Myanmar, Philippnes, Australia.

Subfamily TRACHYCARDIINAE

Genus *Trachycardium* Moerch

1853. *Trachycardium* Moerch, *Cat. Conch. Yoldi.*, (2) : 34.

Type species : *Cardium isocardia* Linnaeus, 1758; subsequent designation, von Martens, 1870.

Trachycardium asiaticum (Bruguere)

1792. *Cardium asiaticum* Bruguere, *Encyl. Meth. Vers.*, 1 : 224.

Material examined : i) 1 ex., Dolphin nose, Visakhapatnam, 18/02/1916, Coll. H. Hosten; ii) 4 valves, Vadarevu beach, Chirala, 18/04/2000, Coll. S.C. Mitra and Party; iii) 1 valve, Ravanappasalov, 12/02/2002, iv) 7 exs., Krishnapatnam, Nellore, 15/02/2002, v) 3 valves, Tuplipalem, 19/02/2002, Coll. S. Barua and Party.

Measurements (in mm) :

Length	Width	Depth
40.00–21.50	38.90–22.00	–

Diagnosis : Shell globose, umbone anterior, elevated; sculpture with 34-36 close set radial ribs, smooth around umbo but lamelliferous towards the posterior margins; Hinge condense anteriorly, laterals close to the cardinals, margin crenulated; white with a posterior pink area internally and umbo extenally.

Distribution : India : Andhra Pradesh, Nicobar Islands, Tamil Nadu, West Bengal.

Elsewhere : Indo-Pacific.

Superfamily MACTROIDEA

Family MACTRIDAE

Key to the subfamily

Shell subequilateral, nearly closed; hinge well developed, two cardinals in right valve somewhat jointed MACTRINAE

Shell inequilateral, widely gaping; hinge irregular, concentrated, laterals tending to be obsolete LUTARIINAE

Subfamily MACTRINAE

Genus *Mactra* Linnaeus, 1767

1767. *Mactra* Linnaeus, *Syst. Nat.*, ed. 12 : 1125.

Type species : *Cardium sultorium* Linnaeus, 1758; subsequent designation Fleming, 1818.

Key to the species

1. Shell sub-inequilateral and inflated; smooth or finely striated; posterior slope without Keeled (2)
 - Shell inequilateral and compressed; concentrically plicated; posterior slope ridged or Keeled (6)
2. Lunule and escutcheon separated by groove (3)
 - Lunule and escutcheon not separated by groove (5)
3. Shell violet colour, thin, less inflated *M. violacea* Gmelin
 - Shell white or dull colour, thick, more inflated (4)
4. Shell white with pink umbonal region; sculpture with prominent growth lines; lateral teeth wing like *M. turgida* Gmelin
 - Shell dull with brown or dark umbonal region; sculpture with fine concentric striae; lateral Teeth small and reduced *M. attenuata* Deshayes
5. Shell triangular wedge shaped; compressed; anterior margin broadly rounded; posterior angulate *M. cuneata* Gmelin
 - Shell transversly triangular; inflated; anterior margin narrowly rounded; posterior obtuse *M. luzonica* Deshayes

6. Concentric plications through the shell *M. plicartaria* Linnaeus
 – Concentric plications restricted to the upper part only *M. laevis* Chemnitz

Subgenus *Macra* s. st.

Macra attenuata Deshayes

1854. *Macra attenuata* Deshayes, *Proc. zool. Soc. Lond.*, 1854 : 62.

Material examined : i) 1 valves, Krishnapatnam, Nellore, 15/02/2002, Coll. S. Barua and Party.

Measurements (in mm) :

Length	Width	Depth
37.05	26.80	–

Diagnosis : Shell ovately triangular, thin, inequilateral, transversely irregularly thickly striated; globose, umbone anterior, elevated; sculpture with 34-36 close set radial ribs, smooth around umbo but lamelliferous towards the posterior margins; Hinge condense anteriorly, laterals close to the cardinals, margin crenulated; white with a posterior pink area internally and umbo externally.

Distribution : India : Andhra Pradesh.

Elsewhere : Indo-Pacific.

Macra cuneata Gmelin

1791. *Macra cuneata* Gmelin, *Syst. Nat.*, ed 13 : 3260.

Material examined : i) 1 ex., Visakhapatnam, 24/01/1921, Coll. S.W. Kemp; ii) 2 valves, Bheemunipatnam, Visakhapatnam, 28/02/1947, Coll. ?; iii) 1 valve, Uppateru, Kakinada, 21/02/1948, Coll. Mahesh Chandra and G. Ramakrishna; iv) 1 valve, Chinnatapally, Vizianagaram, 02/03/2004, Coll. S. Barua and Party.

Measurements (in mm) :

Length	Width	Depth
25.70–17.60	21.10–14.00	9.90–

Diagnosis : Shell thin, ovately triangular, inequilateral; whitish yellow with violet at the umbone or livid violet; umbo anterior; anterior dorsal margin short and slightly rounded, posterior dorsal margin straight slanting, ventral margin convex; sculpture with fine concentric striae; lunule well developed; hinge narrow; lateral teeth lamellous prominent and anterior much shorter; sinus broad.

Distribution : India : Andhra Pradesh, Andaman and Nicobar Island, Orissa, Tamil Nadu.

Elsewhere : South African Coast, Malagasy, Sri Lanka.

***Macra luzonica* Deshayes**

1854. *Macra luzonica* Deshayes, *Proc. zool. Soc. Lond.*, 1854 : 64.

Material examined : i) 10 exs., Kakinada, 19/11/1964, ii) 7 valve, Manginapudi, Machilipatnam, Visakhapatnam, 05/12/1964, iii) 3 valves, Machilipatnam, Visakhapatnam, 06/12/1964, iv) 2 valves, Vadarevu beach, Chirala, 23/12/1964, Coll. N.V. Subba Rao and Party; v) 1 valve, Kakinada Bay, 13/04/2000, Coll. Ramakrishna and Party; vi) 1 valve, Vadarevu beach, Chirala, 18/04/2000, vii) 1 valve, Suryalanka, Chirala, 19/04/2000, Coll. S. C. Mitra and Party.

Measurements (in mm) :

Length	Width	Depth
40.45–20.00	28.30–23.30	18.10–16.10

Diagnosis : Shell transversely triangular, equilateral, rather symmetrically swollen, slanting equally on both the side; umbones small, sharp; lunule equal, irregularly plicated; anterior side faintly grooved; grooves more or less fading in the middle, shining, pale brown or whitish red, chestnut on the posterior side, apex of the umbones violet.

Distribution : India: Andhra Pradesh, Andman and Nicobar Islands, Goa, Maharashtra, Orissa, Tamil Nadu, West Bengal.

Elsewhere : Sri Lanka, Myanmar, Indonesia, Philippnes, Australia.

***Macra mera* Deshayes**

1853. *Macra mera* Deshayes, *Proc. zool. Soc. Lond.*, 1853 : 16.

Material examined : i) 1 valve, Vadarevu beach, Chirala, 23/12/1964, Coll. N.V. Subba Rao and Party; ii) 4 valves, Kakinada Bay, 13/04/2000, Coll. Ramakrishna and Party; iii) 11 valves, Vadarevu beach, Chirala, 18/04/2000, iv) 2 valves, Suryalanka, Chirala, 19/04/2000, Coll. S. C. Mitra and Party; v) 7 valves, Kalingapatnam, Srikakulam, 29/04/2001, vi) 3 valves, Kottapatnam, Ongole, 12/02/2002, vii) 2 valves, Ethamukala, Ongole, 13/02/2002, viii) 3 valves, Krishnapatnam, Nellore, 15/02/2002, ix) 9 valves, Maypadu, Nellore, 16/02/2002, x) 4 valves, Tuplipalem, 18/02/2002, Coll. S. Barua and Party.

Measurements (in mm) :

Length	Width	Depth
39.75–23.90	30.50–18.40	23.60–20.60

Diagnosis : Shell ovately triangular, inequilateral, rather swollen, smooth, shining; umboes depressed, a little oblique; lunule area ovate, rather swollen, regularly plaited; anterior side shorter, obtuse, slanting, rather convex at the upper part; posterior side attenuated very slanting, rather convex towards umboes; horny yellowish, reddish at the umboes, distantly interrupted with darker transverse zones, interior horny red.

Distribution : India : Andhra Pradesh.

Elsewhere : China sea.

Subgenus *Coelomactra* Dall, 1895

1895. *Coelomactra* Dall, *Proc. malac. Soc. Lond.* **1** : 211.

Type species : *Mactra violacea* (Gmelin).

Mactra (Coelomactra) violacea Gmelin

1791. *Mactra violacea* Gmelin, *Syst. Nat.*, ed. **13** : 3260.

Material examined : i) 12 valves, Kakinada, 19/11/1964, ii) 16 valves, Manginapudi, Machilipatnam, Visakhapatnam, 05/12/1964, Coll. N.V. Subba Rao and Party; iii) 2 valves, Manginapudi beach, Machilipatnam, Visakhapatnam, 15/04/2000, Coll. S. C. Mitra and Party.

Measurements (in mm) :

Length	Width	Depth
59.35–55.60	45.30–43.50	–

Diagnosis : Shell thin, fragile, ovately triangular, equilateral, a little gaping at the posterior end; umboes close; lunule area lanceolately ovate; very finely striated, with a slight epidermis towards margin; deep violet.

Distribution : India : Andhra Pradesh, Andaman and Nicobar Islands;

Elsewhere : Indian ocean to Philippines.

Mactra (Coelomactra) turgida Gmelin

1791. *Mactra turgida* Gmelin, *Syst. Nat.*, ed. **13** : 3260.

Material examined : i) 1 valve, Bheemunipatnam, Visakhapatnam, 20/02/1947, Coll. H. C. Ray and Party; ii) 2 valves, Vadarevu beach, Chirala, 20.12.1964, Coll. N.V. Subba Rao and Party; iii) 1 valve, Vadarevu beach, Chirala, 18/04/2000, Coll. S.C. Mitra and Party; iv) 1 valve, Maypadu, Nellore, 16/02/2002, Coll. S. Barua and Party.

Measurements (in mm) :

Length	Width	Depth
80.00	63.80	–

Diagnosis : Shell ovately triangular, extremely ventricose, swollen, rather thin; sculpture with irregularly transversely striated, umboes smooth, angled at the extremities, anteriorly a little obtuse; umboes heart shaped, rather approximated; whitish yellow cast, tinged at the umboes with violet.

Distribution : India : Andhra Pradesh, Goa, Orissa, Tamil Nadu.

Elsewhere : Indonesia, Philippines.

Subgenus *Mactrinula* Gray

1853. *Mactrinula* Gray, *Ann. Mag. Nat. Hist.*, (2) 11 : 41.

Type species : *Mactra plicataria* Linnaeus, 1767.

Mactra (Mactrinula) laevis Chemnitz

1782. *Mactra laevis* Chemnitz, *Conch. Cab.*, 6 : 214, pl. 21, figs. 205 & 206.

Material examined : i) 1 valve, Rishikunda, Visakhapatnam, 09/03/1966, Coll. A. S. Rajagopal and Party; ii) 2 valves, Kakinada Bay, 13/04/2000, Coll. Ramakrishna and Party; iii) 2 valves, Kalingapatnam, Srikakulam, 29/04/2001, iv) 2 valves, Krishnapatnam, Nellore, 15/02/2002, v) 3 valves, Maypadu, Nellore, 16/02/2002, vi) 2 valves, Mahalakshmiapuram, Nellore, 17/02/2002, Coll. S. Barua and Party.

Measurements (in mm) :

Length	Width	Depth
65.20-47.30	56.20-39.50	—

Diagnosis : Shell ovately triangular, inequilateral; anterior side rather produced, rounded, posterior truncated, plicated angled; lunule lanceolate, ovate, excavated; sinus of the middle very short, obtuse at the top, obliquely triangular; white, shining, irregularly transversely, minutely striated, plaited at the umboes, broadly plaited anteriorly and posteriorly, smooth in the middle.

Distribution : India : Andhra Pradesh, Goa, Orissa, Tamil Nadu.

Elsewhere : Indonesia, Philippines.

Mactra (Mactrinula) plicataria Linnaeus

1767. *Mactra plicataria* Linnaeus, *Syst. Nat.* ed. 12 : 1125.

Material examined : i) 12 valves, Manginapudi, Machilipatnam, Visakhapatnam, 05/12/1964, ii) 7 valves, Bandar canal, Machilipatnam, Visakhapatnam, 07/12/1964, Coll. N.V. Subba Rao and Party; iii) 1 valve, Manginapudi, Machilipatnam, Visakhapatnam, 15/04/2000, iv) 2 valves, Vadarevu beach, Chirala, 18/04/2000, Coll. S. C. Mitra and Party; v) 8

valves, Mahalakshmpuram, Nellore, 17/02/2002, vi) 2 valves, Tuplipalem, 17/02/2002, Coll. S. Barua and Party.

Measurements (in mm) :

Length	Width	Depth
28.40–17.4	20.05–12.30	–

Diagnosis : Shell transversely subtriangular, compressed, inequilateral; umboes small; anterior side rather produced, rounded, posterior angulated, plicately keeled; lunule lanceolately ovate, area very large, both smooth; sculpture with concentrically plicated ribbed, obliquely very minutely striated, transparent; white, diaphanous, covered towards the margin with a thin brown epidermis.

Distribution : India : Andhra Pradesh, Andaman and Nicobar Islands, Goa, Maharashtra, Orissa, Tamil Nadu.

Elsewhere : Myanmar, Indonesia : Sumatra.

Subfamily LUTRARIINAE

Key to the genera

- Shell elongate, gaping at each end; without radiating sculpture; no lunule or escutcheon
 *Lutraria* Lamarck
- Shell ovate, gaping at one end; with radiating sculpture; lunule or escutcheon present
 *Meropesta* Lamarck

Genus *Lutraria* Lamarck, 1799

1799. *Lutraria* Lamarck, *Mem. Soc. H.N. Paris*, p. 85.

Type species : *Mya lutraria* Linnaeus, 1758

Lutraria planata (Chemnitz)

1782. *Macra planata* Chemnitz. *Conch. Cab.*, 6 : 238, tab 24, figs. 238-239.

Material examined : i) 1 valve, Chirala, 22/12/1964, Coll. N. V. Subba Rao and Party; ii) 10 valves, Kottapatnam, Ongole, 12/02/2002, iii) 8 valves, Krishnapatnam, Nellore, 14/02/2002, iv) 2 valves, Maypadu, Nellore, 16/02/2002, v) 1 valve, Mahalakshmpuram, Nellore, 17/02/2002, Coll. S. Barua and Party.

Measurements (in mm) :

Length	Width	Depth
84.50	47.50	–

Diagnosis : Shell thick, oblong; periostracum thin; umbo well anterior in position; anterior margin roundedly pointed; anterior dorsal margin gradually sloping; posterior dorsal margin almost straight; ventral margin concave; posterior margin broadly rounded; adductor muscle scars well impressed.

Distribution : India : Andhra Pradesh.

Elsewhere : Indonesia : Moluccas.

Genus *Meropesta* Iredale, 1929

1929. *Meropesta* Iredale, *Mem. Queensland Mus.*, 9(3) : 268.

Type species : *Mactra nicobarica*. Gmelin, 1791.

Meropesta pellucida (Gmelin)

1782. *Mactra pellucida* Chemnitz, *Conch. Cab.*, 6 : 235, pl. 34, fig. 234.

1791. *Mactra pellucida* Gmelin, *Syst. Nat.*, ed. 13.

Material Examined : i) 2 valves, Lawson's Bay, Visakhapatnam, 24/02/1948, Coll. Mahesh Chandra and G. Ramakrishna; ii) 6 valves, Kakinada Bay, 16.04.1978, Coll. N.V. Subba Rao and A. Dey; iii) 1 ex., Kakinada Bay, 12/04/2000, Coll. Ramakrishna and Party; iv) 10 valves, Krishnapatnam, Nellore, 15/02/2002, v) 1 valve, Mahalakshmipuram, Nellore, 17/02/2002, Coll. S. Barua and Party.

Measurements (in mm) :

Length	Width	Depth
55.50–29.40	36.15–17.50	-15.85

Diagnosis : Shell transversely oblong, inequilateral, compressed, gaping at the both ends; umboes small, close; anterior side rounded, posterior rather produced; sculpture with very finely decussately striated, covered towards the margin with a thin yellowish epidermis.

Distribution : India : Andhra Pradesh.

Elsewhere : Philippines.

Superfamily SOLENOIDEA

Family SOLENIDAE

Genus *Solen* Linnaeus, 1758

1758. *Solen* Linnaeus, *Syst. Nat.*, ed. 10 : 672.

Type species : *Solen vagina* Linnaeus; subsequent designation, Schumacher, 1817.

Key to the species.

1. Shell with broad posterior end; anterior margin with distinct exterior furrow *S. vagina* Linnaeus
..... (2)
- Shell with equal or narrow posterior end; anterior margin without distinct exterior furrow (2)
2. Posterior end equal to anterior end *S. annandalei* Preston
– Posterior end narrow than anterior end (3)
3. Anterior end more broad and posterior end slightly narrow; anterior adductor scar slightly elongated; posterior adductor scar much broad *S. brevis* Gray
– Anterior not much broad and slightly larger than posterior; anterior adductor scar very much elongated; posterior adductor scar small and broad *S. kempfi* Preston

***Solen annandalei* Preston**

1915. *Solen annandalei* Preston, *Rec Indian Mus.*, **11** : 305, fig. 17.

Material examined : i) 1 ex., Krishna estuary, 17/10/1965, Coll. K.P. Rao.

Measurements (in mm) :

Length	Width	Depth
31.15	6.10	4.22

Diagnosis : Shell almost straight, cylindrical thin, fragile with flattened tapering posterior end; posterior margin subtruncate, anterior margin distinctly angled; Sculpture with smooth lines; glossy olive to brown.

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

***Solen brevis* Gray**

1842-56. *Solen brevis* Gray in Hanley's *Rec. Bivalves*, p. 12, pl. 13, fig. 42.

Material examined : i) 4 valves, Bandar canal, Machilipatnam, 06/12/1964, Coll. N.V. Subba Rao and Party.

Measurements (in mm) :

Length	Width	Depth
68.80–49.30	11.95–10.15	5.75

Diagnosis : Shell medium, straight, cylindrical with tapering at posterior end; anterior margin angled; posterior margin subtruncated; sculpture externally smooth, shining with fine

growth lines; olive-brown externally, white internally; posterior adductor scar broader, anterior adductor scar, elongated.

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

Elsewhere : Philippines.

***Solen kempi* Preston**

1915. *Solen kempi* Preston, *Rec. Indian Mus.*, **11** : 305, fig.18.

Material examined : i) 1 valve, Chinnatapally, Vizianagaram, 02/05/2001, ii) 10 valves, Krishnapatnam, Nellore, 15/02/2002, iii) 1 valve, Mahalakshampuram, Nellore, 17/02/2002, Coll. S. Barua and Party.

Measurements (in mm) :

Length	Width	Depth
32.00–71.30	13.20–6.40	–

Diagnosis : Shell almost straight, cylindrical with flattened tapering posterior end; posterior margin subtruncate, anterior margin distinctly angled; Sculpture with smooth lines; glossy olive to brown.

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

Elsewhere : Philippines.

***Solen vagina* Linnaeus**

1758. *Solen vagina* Linnaeus, *Syst. Nat.*, ed **10** : 1113.

Material examined : i) 4 valves, Bheemunipatnam, Visakhapatnam, 20/02/1947, Coll. ?; ii) 2 valves, Kakinada, 12/04/2000, Ramakrishna and Party; iii) 1 valve, Chinnatapally, Vizianagaram, 02/05/2002, Coll. S. Barua and Party.

Measurements (in mm) :

Length	Width	Depth
76.25–29.00	19.00–4.50	–3.45

Diagnosis : Shell upto 80 mm, straight, long; anterior end with weak angled with rounded ventral junction; posterior end straight, wider than anterior; anterior margin with distinct exterior furrow.

Distribution : India : Andhra Pradesh.

Elsewhere : Great Britain.

Family CULTELLIDAE

Genus *Siliqua* Megerle, 1811

1811. *Siliqua* Megerle, *Mag. Ges. Nat. Fr. Berlin*, **5** : 44.

Type species : *Solen radiata* Linnaeus, 1758.

Siliqua radiata (Linnaeus)

1758. *Solen radiata* Linnaeus, *Syst. Nat.*, ed. **10** : 1114.

Material examined : i) 3 valves, Uppateru, Kakinada, 19/07/1963, Coll. A. Danial and Party; ii) 5 exs., 14 valves, Kakinada Bay, 19/11/1964, M 22252/4, iii) 1 ex., Vadarevu beach, Chirala, 20/12/1964, Coll. N.V. Subba Rao and Party; iv) 2 exs., Kalingapatnam, Srikakulam, 17/04/2001, v) 1 ex., Ethamukkala, Ongole, 13/02/2002, vi) 1 valve, Maypadu, Nellore, 18/02/2002, Coll. S. Barua and Party.

Measurements (in mm) :

Length	Width	Depth
69.30–37.05	26.00–13.20	5.90–4.70

Diagnosis : Shell thin, elongately compressed, elliptical, gaping at both the ends; umbo anterior, beaks slightly in front of midline; anterior side short, excavated near umbone; posterior elongated; dorsal margin almost straight; ventral margin convex, arched, sloping upward towards the end of both sides; internal ribs almost straight; brown to lilac with four white radial rays.

Distribution : India : Andhra Pradesh, Andaman and Nicobar Islands, Goa, Gujarat, Kerala, Maharashtra, Orissa, Tamil Nadu.

Elsewhere : Sri Lanka, Maynmar, Indonesia, Philippines.

Superfamily TELLINOIDEA

Family TELLINIDAE

Key to the subfamilies

Sculpture various, lateral teeth present at least in one of the valves TELLININAE

Sculpture generally more subdued than the previous, lateral teeth are not present in either of the valves MACOMINAE

Subfamily TELLININAE

Genus *Tellina* Linnaeus, 1758

1758. *Tellina* Linnaeus, *Syst. Nat.*, ed. **10** : 674.

Type species : *Tellina radiata* Linnaeus, subsequent designation, Children, 1823.

Key to the subgenera

1. Lateral teeth two in the right valve (2)
 - Lateral teeth one in the right valve (3)
2. Pallial sinus close or touching anterior adductor scar (4)
 - Pallial sinus not close or touching anterior adductor scar (5)
3. Shape of the shell elongate to sub rectangular..... *Tellinides* Lamarck
 - Shape of the shell ovate to elliptical..... *Angulus* Muehlfeld
4. Only half of ventral margin coalescent with pallial line..... *Dallitellina* Afshar
 - More than half of ventral margin coalescent with pallial line *Pharaonella* Lamy
5. Umbone central *Serratina* Pallary
 - Umbone posterior to mid length *Moerella* Fischer

Subgenus *Angulus* Megerle, 1811

1811. *Angulus* Megerle, *Mag. Ges. Nat. Fr. Berlin*, 5 : 47.

Type species : *Tellina lanceolata* Gmelin, 1791; subsequent designation, Gray, 1847

Tellina (Angulus) lanceolata Gmelin

1791. *Tellina lanceolata* Gmelin, *Syst. Nat.*, ed. 13 : 3236.

Material examined : i) 2 valves, Mahalakshmiapuram, Nellore, 17/02/2002, Coll. S. Barua and Party.

Measurements (in mm) :

Length	Width	Depth
35.80–30.00	17.90–13.65	–

Diagnosis : Shell medium, elongate, oblong, thin, sublateral, more compressed, inequivalve, slightly gaping at the ends; umbo central, pointed and slightly elevated; ligament small, dark brown; lunule absent; muscle scars moderately developed; sculpture with closed concentric striae, radial striae almost absent; white with suffused rose colour.

Distribution : India : Andhra Pradesh, Goa, Gujarat, Karnataka, Kerala, Orissa, Pondicherry, Tamil Nadu, West Bengal.

Elsewhere : Republic of South Africa, Sri Lanka, Myanmar, China.

Subgenus *Dallitellina* Afshar, 1969

1969. *Dallitellina* Afshar, *Mem. Geol. Soc. Am.*, 119 : 38.

***Tellina (Dallitellina) rostrata* Linnaeus**

1758. *Tellina rostrata* Linnaeus, *Syst. Nat.*, ed. 10 : 675.

Material examined : i) 1 valve, Mahalakshmpuram, Nellore, 17/02/2002, Coll. S. Barua and Party.

Measurements (in mm) :

Length	Width	Depth
61.40	21.10	—

Diagnosis : Shell medium, long, elongated, inequivalve, arched laterally, posterior end rostrate, bent to right and obliquely truncate with acuminate extremity; umbo trigonal, elevated and anterior; ligament short, lanceolate, dark brown; lunule narrow and elevated; sculpture with sharp concentric ridges, a few of which terminate at an angle on the posterior part of the ventral margin, dorsal margin contain a row of spines; white with some pink mark on the anterior side of umbonal region.

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

Elsewhere : Thailand, Gulf of Siam, Malaysia, Indonesia, Philippines.

Subgenus *Moerella* Fischer, 1887

1887. *Moerella* Fischer, *Manuel de Conch.*, p. 1147.

Type species : *Tellina donacina* Linnaeus, 1758.

***Tellina (Moerella) philippinarum* Hanley**

1844. *Tellina philippinarum* Hanley, *Proc. zool. Soc. Lond.*, 1844 : 69.

Material examined : i) 7 valves, Kakinda, 13/04/2000, Coll. Ramakrishna and Party; ii) 1 valve, Chinnatapally, Vizianagaram, 02/03/2001, iii) 6 valves, Krishnapatnam, Nellore, 15/02/2002, iv) 1 valve, Mahalakshmpuram, Nellore, 17/02/2002, Coll. S. Barua and Party.

Measurements (in mm) :

Length	Width	Depth
29.00–18.40	22.45–13.35	–5.50

Diagnosis : Shell ovate, thin, subequilateral; umbo pointed, elevated and middle; ligament small, shunken; lunule elongated and well developed and mostly on the right valve; sculpture with fine concentric striae closely spaced, radial striae fine of almost absent; cardinal complex with an bilobed anterior tooth and a small posterior in left valve, laterals absent, in right valve the anterior tooth laminate and unequally bilobed posterior tooth, laterals present; rose colour.

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

Elsewhere : Myanmar, Philippines.

Subgenus ***Pharanonella*** Lamy, 1918

1918. *Pharaonella* Lamy, *Bull. Mus. Natl. Hist. nat. Paris*, **24** : 31.

Type species : *Tellina pharaonis* Hanley, 1844; subsequent designation, Salisbury, 1934

Tellina (Pharanonella) iridescens (Benson)

1842. *Sanguinolaria iridescens* Benson, *Ann. Mag. Nat. Hist.*, (1) **9**: 490.

Material examined : i) 5 exs., Visakhapatnam, ii) 10 exs., Bheemunipatnam, Visakhapatnam, Coll. ?; iii) 15 exs., Kakinada Bay, 16/04/1978, M 21034/4, Coll. N.V. Subba Rao and A. Dey.

Measurements (in mm) :

Length	Width	Depth
8.30–6.45	5.40–4.00	3.00–2.20

Diagnosis : Shell small, oval, oblong, equivalve and glossy; umbo pointed, elevated and slightly posterior; ligament small; lunule moderate and almost in the left valve; sculpture with fine concentric striae, more prominent on the outer margin, radial striae absent; muscle scars moderately impressed; anterior adductor scar semilunate, posterior adductor scar more elongated; white or pink, glossy internally rather light.

Distribution : India : Andhra Pradesh, Gujarat, Orissa, West Bengal.

Elsewhere : Seychelles, Philippines, China, Japan.

Subgenus ***Serratina*** Pallary, 1922

1922. *Serratina* Pallary, *Explor. Sci. Moroe Malac.*, p. 95.

Type species : *Tellina serrata* Brocchi, 1814.

Tellina (Serratina) capsoides Lamarck

1818. *Tellina capsoides* Lamarck, *Hist. nat. Anim. Sans. Vert.*, **5** : 531.

Material Examined : i) 12 valves, Visakhapatnam, Jan. 1929, M 21351/4, Coll. H.S. Rao; ii) 3 valves, Pulicot Lake, 21/02/2002, Coll. S. Barua and Party.

Measurements (in mm) :

Length	Width	Depth
53.40–46.60	37.75–36.00	—

Diagnosis : Shell small, oval, oblong, equivalve and glossy; umbo pointed, elevated and slightly posterior; ligament small; lunule moderate and almost in the left valve; sculpture with fine concentric striae, more prominent on the outer margin, radial striae absent; muscle scars

moderately impressed; anterior adductor scar semilunate, posterior adductor scar more elongated; white or pink, glossy internally rather light.

Distribution : India : Andhra Pradesh, Andaman and Nicobar Islands.

Elsewhere : South African coast, Mocambique, Malagasy, Tanzania, Red Sea, Gulf of Aden, Persian Gulf, Pakistan coast, Sri Lanka, Malaya, Indonesia, Philippines, China, Asustralia.

Subgenus *Tellinides* Lamarck, 1818

1818. *Tellinides* Lamarck, *Hist. nat. Anim. Sans. Vert.*, **5** : 535.

Type species : *Tellina timorensis* Lamarck, 1818.

Tellina (Tellinides) sinuata Spengler

1798. *Tellina sinuata* Spengler, *Nat. Selsk. Skrivt.*, **4** : 109.

Material examined : i) 2 exs., Kakinada, 13/04.2000, Ramakrishna and Party; ii) 2 valves, Krishnapatnam, Nellore, 15/02/2002, iii) 1 valve, Maypadu beach, Nellore, 16/02/2002, Coll. S. Barua and Party.

Measurements (in mm) :

Length	Width	Depth
51.45–31.05	31.55–24.40	11.15–10.10

Diagnosis : Shell oblong, subquadrate, broad, tolerably strong, gaping in both the ends; umbo pointed, elevated and anterior; ligament moderate, prominent; lunule almost absent; sculpture with fine closely spaced concentric striae which are decussated in the front by raised oblique rather distant, radial striae fine or almost absent; muscle scars moderately impressed; white with yellowish suffused region.

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

Elsewhere : Malagasy, Pakistan coast, Sri Lanka, Indonesia, Philippines.

Subfamily MACOMINAE

Key to the genera

1. Pallial sinus discrepant in two valves *Macoma* Leach
 - Pallial sinus not discrepant in two valves (2)
2. Shell large and orbicular in shape *Apolymetis* Salisbury
 - Shell large or small but trigonal in shape *Gastrana* Schumacher

Genus *Macoma* Leach, 1819

1819. *Macoma* Leach in Ross, *Voy. Discov. Baffins Bay App.*, **2** : 52.

Type species : *Macoma tenera* = *Tellina calcarea* Gmelin, 1791

Key to the subgenera

Sculpture with concentric striae or without concentric striae and scattered granulations only *Psammacoma* Dall

Sculpture with concentric striae in the left valve and oblique scissulations on the right valve *Scissulina* Dall

Subgenus *Psammacoma* Dall, 1900

1900. *Psammacoma* Dall, *Proc. U.S. natl. Mus.*, **23** : 292.

Type species : *Psammotaea candida* Lamarck, 1818.

Macoma (Psammacoma) candida (Lamarck)

1818. *Psammacoma candida* Lamarck, *Hist. nat. Anim. Sans. Vert.*, **5** : 517.

Material examined : i) 2 valves, Vadarevu beach, Chirala, 18/04/2000, Coll. S.C. Mitra and Party; ii) 1 valve, Ethamukkala, Ongole, 13/02/2002, iii) 10 valves, Mahalakshmiapuram, Nellore, 17/02/2002, Coll. S. Barua and Party.

Measurements (in mm) :

Length	Width	Depth
49.80–23.80	34.70–14.15	9.00–6.50

Diagnosis : Shell elongately ovate, thin, subquivalve, rather compressed with slight gape on the posterior end; umbo acuminate and posterior; ligament short and situated in ligamental groove; lunule almost absent; sculpture with fine concentric striae towards the ventral margin, radial striae absent; muscle scars moderately impressed; geryish yellow externally, internally white.

Distribution : India : Andhra Pradesh, Andaman and Nicobar Islands.

Elsewhere : Philippines, China, Japan, Australia.

Subgenus *Scissulina* Dall, 1924

1924. *Scissulina* Dall, *Proc. Biol. Soc. Wash.*, **37** : 88.

Type species : *Tellina dispar* Conrad, 1837.

***Macoma (Scissulina) reticulata* (Sowerby)**

1867. *Tellina reticulata* Sowerby in Reeve, *Conch. Icon.*, **17**, *Tellina* sp. no. 252, pl. 43, fig. 252.

Material examined : i) 3 valves, Krishnapatnam, Nellore, 15/02/2002, ii) 4 valves, Mahalakshampuram, Nellore, 17/02/2002, Coll. S. Barua and Party.

Measurements (in mm) :

Length	Width	Depth
24.00–12.80	10.60–7.40	5.00–

Diagnosis : Shell subtruncate, oblong, equivalve; umbo acuminate, slightly elevated and posterior; ligament short, shunken, dark brown; lunule elongated and equal on both the valves; sculpture with very minutely reticulated oblique striae; muscle scars well impressed; white or rosy.

Distribution : India : Andhra Pradesh, Andaman and Nicobar Islands.

Elsewhere : Mauritius.

Genus *Apolymetis* Salisbury, 1929

1929. *Apolymetis* Salisbury, *Proc. malac. Soc. Lond.*, **18** : 258.

Type species : *Tellina meyeri* Philippi, 1846, ex Dunker MS.

Key to the species

Shell irregular, pallial sinus present slightly posterior to the mid length, anterior adductor scar semilunar with rough inner margin *A. papyracea* (Gmelin)

Shell somewhat oval, pallial sinus on the extreme posterior end, anterior adductor scar semilunar but without rough inner margin *A. edentula* (Spengler)

***Apolymetis edentula* (Spengler)**

1794. *Tellina edentula* Spengler, *Nat. Selsk. Ser.*, **4** : 96.

Material examined : i) 2 valve, Bheemunipatnam, Visakhapatnam, 20/02/1947, Coll. H.C.Ray and Party; ii) 1 valve, Vadarevu beach, Chirala, 20/12/1964, Coll. N.V. Subba Rao and Party; iii) 8 valves, Kakinada beach, 12/02/2000, Coll. Ramakrishna and Party; iv) 2 valves, Vadarevu beach, Chirala 18/4/2000, Coll. S.C. Mitra and Party; v) 1 valve, Kalingapatnam, Srikakulam, vi) 1 valve, Chinnatapally, Vizianagaram, 02/05/2001, vii) 2 valves, Ethamukkala, Ongole, 13/02/2002, viii) 8 valves, Krishnapatnam, Nellore, 15/02/2002, ix) 11 valves, Maypadu beach, Nellore, 16/02/2002, x) 8 valves, Mahalakshampuram, Nellore, 17/02/2002, xi) 11 valves. Ravanappaslov, 22/02/2002, Coll. S. Barua and Party.

Measurements (in mm) :

Length	Width	Depth
62.20–22.10	42.10–17.40	21.00–

Diagnosis : Shell medium to large, somewhat oval, strong, inequivalve; umbo full leaning backward, pointed posterior; ligament small, narrow, shunken; lunule elongated, narrow; sculpture with concentric striae which are more stout and prominent on the outer margin and on the posterior side; muscle scars moderately impressed; white and yellowish externally, internally more white.

Distribution : India : Andhra Pradesh, Goa, Gujarat, Karnataka, Kerala, Maharashtra, Orissa, Tamil Nadu, West Bengal.

Elsewhere : Malagasy, Red Sea, Sri Lanka, Thailand, Indonesia, Philippines, Fiji.

Apolymetis papyracea (Gmelin)

1791. *Tellina papyracea* Gmelin, *Syst. Nat.*, ed. 13 : 3231.

Material examined : i) 2 valves, Krishnapatnam, Nellore, 15/02/2002, ii) 1 valve, Tuplipalem, 18/02/2002, Coll. S. Barua and Party.

Measurements (in mm) :

Length	Width	Depth
50.90–27.00	43.95–22.40	–

Diagnosis : Shell large, subquadrate, elevated, inequivalve wrinkle shaped with large anterior end and a short posterior end; umbo angular, prominent, elevated and slightly posterior; ligament short, stout, dark brown; lunule indefinite; sculpture with wide spaced growth lines and with close fine concentric ridges; muscle scars moderately impressed; white.

Distribution : India : Andhra Pradesh, Andaman and Nicobar Islands, Goa, Gujarat, Maharashtra.

Elsewhere : Gulf of Aden, Persian Gulf, Pakistan coast, Sri Lanka, Malaya, Philippines.

Genus *Gastrana* Schumacher, 1817

1817. *Gastrana* Schumacher, *Essai. Nouv. Syst. Vers. Test.*, p. 132.

Type species : *Gastrana donacina* = *Tellina abildgaardiana* Spengler, 1798 = *Tellina matadou* Gmelin, 1791.

Gastrana polygona (Gmelin)

1791. *Tellina polygona* Gmelin, *Syst. Nat.*, ed. 13 : 3244.

Material examined : i) 1 valve, Kakinada beach, 12/04/2000, Coll. Ramakrishna and Party; ii) 1 ex., Chinnatapally, Vizianagaram, 02/05/2001, iii) 1 valve, Krishnapatnam, Nellore, 15/02/2002, iv) 1 valve, Mahalakshmiapuram, Nellore, 17/02/2002, v) 2 valves, Tuplipalem, 18/02/2002, Coll. S. Barua and Party.

Measurements (in mm) :

Length	Width	Depth
46.85–43.20	31.35–29.70	—

Diagnosis Shell medium, thick, solid, inequivalve and irregular shape with extended posterior side two prominent ridges on both the valves; umbo elevated, pointed and anterior; ligament moderate, strong, dark brown; lunule small and mostly on the left valve; sculpture with strong concentric striae and close elevated lines, radial striae fine; greyish externally, internally white.

Distribution India : Andhra Pradesh, Andaman and Nicobar Islands, Gujarat, Kerala, Maharashtra, Tamil Nadu.

Elsewhere : Pakistan coast.

Genus *Psammotreta* Dall, 1900

1900. *Psammotreta* Dall, *Proc. U.S. natl. Mus.*, **23** : 292.

Type species : *Tellina aurora* Hanley, 1844.

Psammotreta ala (Hanley)

1844. *Tellina ala* Hanley, *Proc. zool. Soc. Lond.*, **1844** : 165.

Material examined : i) 1 ex., Kakinada, 13/04/2000, Coll. Ramakrishna and Party.

Measurements (in mm) :

Length	Width	Depth
29.90	21.60	9.300

Diagnosis : Shell ovate, subtrigonal, compressed, left valve thin and less convex than right valve; umbo elevated, pointed and posterior; anterior margin rounded; ventral margin convex; anterior dorsal convex and gently sloping; posterior dorsal straight and slightly sloping; sculpture with minute close concentric striae, radial striae absent; cardinal teeth with a bilobed anterior and thin laminate posterior on left valve and a laminate anterior and bilobed posterior in right valve.

Distribution : India : Andhra Pradesh, Andaman and Nicobar Islands, Goa, Gujarat, Maharashtra, Orissa, Tamil Nadu.

Elsewhere : Indo-Pacific.

Family SEMELIDAE

Genus *Semele* Schumacher, 1817

1817. *Semele* Schumacher, *Essai. Vers. Test.*, **53** : 165.

Type species : *Semele reticulata* = *Tellina proficua* Pulteney, 1799.

Semele sinensis A. Adams

1853. *Semele sinensis* A. Adams, *Proc. zool. Soc. Lond.*, **1853** : 95.

Material examined : i) 4 valves, Scandal point, Visakhapatnam, 18/01/1916, Coll. H. Hosten; ii) 2 valves, Lawson's Bay, Visakhapatnam, 15/02/1947, iii) 1 valve, Bheemunipatnam, Visakhapatnam, 18/02/1947, Coll.?, iv) 1 valve, Visakhapatnam, 05/03/1966, Coll. A.S. Rajagopal and party.

Measurements (in mm) :

Length	Width	Depth
42.30–26.70	43.90–31.05	13.00–

Diagnosis : Shell thick, suborbicular with rounded anterior and subtruncate posterior; lunule indistinct; posterior flexure weak; sculpture with close radial striae and narrow weak usually worn concentric ridge; beige with faint orange or reddish rays, umbonal region deep pink.

Distribution : India : Andhra Pradesh.

Elsewhere : Arabian Gulf, Sri Lanka.

Family PSAMMOBIIDAE

Key to the subfamilies

Shell inequilateral and more or less inequivalve; Pallial sinus well developed
.....SANGUINOLARIINAE

Shell ovate-trapezoidal; gape small or absent; Pallial sinus less developed
.....PSAMMOBIINAE

Subfamily PSAMMOBIINAE

Genus *Gari* Schumacher, 1817

1817. *Gari* Schumacher, *Essai Vers. Test.*, **44** : 131.

Type species : *Gari vulgaris* Schumacher = *Solen amethystus* Wood, 1815.

Subgenus *Psammobia* Lamarck, 1818

1818. *Psammobia* Lamarck, *Hist. nat. Anim. Sans. Vert.*, **5** : 511.

Type species : *Tellina fervensis* Gmelin, 1791; subsequent designation, Children, 1822.

Gari (Psammobia) pulchella Lamarck

1818. *Psammobia pulchella* Lamarck, *Hist. nat. Anim. Sans. Vert.*, **6** : 177.

Material examined : i) 2 exs., Ethamukkala, Ongole, 13/02/2002, Coll. S. Barua and Party.

Measurements (in mm) :

Length	Width	Depth
22.65–20.05	12.25–11.10	5.30–4.40

Diagnosis : Shell narrowly tranverse, inequilateral, compressed, obliquely neatly elevated striated, striae abruptly terminated at the edge of the posterior area; anterior side rounded, posterior slopingly truncated, impressed superficially with a nearly smooth area from the umbo; blue purple, tinged with rust many white rayed.

Distribution : India : Andhra Pradesh.

Elsewhere : Philippines.

Gari (Psammobia) weinkauffi (Crosse)

1864. *Psammobia weinkauffi* Crosse, *J. Conchylol.*, **12** : 17, pl. 2, fig.4.

1932. *Gari (Gari) weinkauffi*: Prashad, *Siboga Exped.*, **32 C** : 301.

Material examined : i) 1 ex., Ethamukkala, Ongole, 13/02/2002, Coll. S. Barua and Party.

Measurements (in mm) :

Length	Width	Depth
22.45	12.15	5.20

Diagnosis : Shell narrow, less elongate, smaller with attenuated and broadly truncated posterior end; sculpture delicate with growth lines and oblique concentric striae with a large number of low vertical lines running in between the oblique striae; light rose colour with whitish periostracal covering; the nacre is shining.

Distribution : India : Andhra Pradesh.

Elsewhere : Indo-Pacific.

Subfamily SANGUINOLARIINAE

Genus *Sanguinolaria* Lamarck, 1799

1799. *Sanguinolaria* Lamarck, *Mem. Soc. H.N. Paris*, p. 84.

Type species : *Solen sanguinolentus* Gmelin, 1791

Subgenus *Soletellina* Blainville, 1824

1824. *Soletellina* Blainville, *Dict. Sci. nat.*, **32** : 350.

Type species: *Sanguinolaria radiata* = *Solen diphos* Linnaeus, 1771

Key to the species

Shell large, comparatively thick; anterior end broad, rounded; posterior end flexously acuminate; umbo anterior; Pallial sinus half or less than body length; periostracum blackish olive *S. acuminata* Deshayes

Shell medium, comparatively thin; anterior end rounded, narrowly lunated above; posterior end obtusely truncated and narrow; umbo almost centre; Pallial sinus more than half of body length; periostracum geryish black *S. lunulata* Deshayes

***Sanguinolaria (Soletellina) acuminata* (Deshayes)**

1857. *Soletellina acuminata* Deshayes in Reeve's, *Conch. Icon.*, **10** : *Soletellina*, sp. no. 12, pl. 3, fig. 12.

Material examined : i) 1 valve, Kakinada, 29/05/1955, Coll. ?; ii) 7 valves, Krishnapatnam, Nellore, 15/02/2002, Coll. S. Barua and Party.

Measurements (in mm) :

Length	Width	Depth
104.35–53.10	43.50–23.50	9.70

Diagnosis : Shell elongately tranverse, inequilateral; anterior side rounded, posterior obliquely flexously acuminate, forming an obtuse wrinkled angle; bluish purple, covered with a blackish-olive epidermis eroded at the umboes.

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

Elsewhere : Pakistan, Bangladesh, Sri Lanka, Myanmar, Indonesia : Molucca, Philippines, China, Japan.

***Sanguinolaria (Soletellina) lunulata* (Deshayes)**

1854. *Capsella lunulata* Deshayes, *Proc. zool. Soc. Lond.*, **1854** : 349.

Material examined : i) 6 exs., Kakinada beach, 12/04/2000, Coll. Ramakrishna and Party.

Measurements (in mm) :

Length	Width	Depth
24.40–21.30	13.30–12.20	7.00–6.90

Diagnosis : Shell elongately transverse, somewhat triangular, equilateral, thin, smooth, covered with a shining olive horny epidermis, anterior side rounded, narrowly lunuled above, posterior obliquely and obtusely truncated and narrowed.

Distribution : India : Andhra Pradesh.

Elsewhere : Philippines Islands.

Subfamily SOLECURTINAE

Genus *Solecurtus* Blainville, 1824

1824. *Solecurtus* Blainville, *Dict. Sci. nat.*, **32** : 351.

Type species : *Solen strigilatus* Linnaeus, 1758; subsequent designation, Deshayes, 1829

Solecurtis australis (Dunker)

1861. *Cultellus australis* Dunker, *Proc. zool. Soc. Lond.*, **1861** : 423.

Material examined : i) 2 valves, Kottapatnam, Ongole, 12/02/2002, ii) 1 valve, Mahalakshimpuram, Nellore, 17/02/2002, Coll. S. Barua and Party.

Measurements (in mm) :

Length	Width	Depth
74.30–53.10	31.35–22.50	–

Diagnosis : Shell thin, oblong, subpressed; anteriorly smooth near the margin, nearly all over finely very closely grooved; posterior grooves sharply angular; angles distant from the end in a radiating direction; pink, radiately white banded.

Distribution : India : Andhra Pradesh.

Elsewhere : Australia.

Genus *Azorinus* Recluz, 1869

1869. *Azorinus* Recluz, *Act. Soc. Linn. Boreaux*, **27** : 67.

Type species : *Solen coarctatus* Gmelin, 1791.

Azorinus emarginata (Spengler)

1793. *Solen emarginatus* Spengler, *Skrivt. Nat. Selsk.*, **3** : 105.

Material examined : i) 2 valves, Kottapatnam, Ongole, 12/02/2002, Coll. S. Barua and Party.

Measurements (in mm) :

Length	Width	Depth
33.40	15.90	—

Diagnosis : Shell elongate-oblong with gape at both the ends; umbos slightly anterior; anterior margin rounded; poosterior margine acute; ventral margin almost straight with depressed in the middle; sculpture with concentric growth lines; a deep ray runs obliquely across the middle of the valves; hinge without lateral tetth; pallial sinus deep.

Distribution : India : Andhra Pradesh.

Elsewhere : Indo-Pacific.

Family DONACIDAE

Genus *Donax* Linnaeus, 1758

1758. *Donax* Linnaeus, *Syst. Nat.*, ed. 10 : 682.

Type species : *Donax rugosa* Linnaeus, 1791; subsequent designation, Schumacher, 1871.

Key to the species

1. Sculpture prominent, dorsal margin with sharpe groove, posterior carination conspicuous *D. scortum* (Linnaeus)
- Sculpture smooth or fine except the posterior slopes, dorsal margin without groove. posterior carination not conspicuous (2)
2. Interior ventral margin strongly denticulate; sculpture with prominent radials, specially on the posterior part, relatively small *D. pulchella* Hanley
- Interior ventral margin not strongly denticulate; sculpture nearly smooth (3)
3. Interior margin serrated, posterior end of dorsal margin with strong concentric and radial striae *D. incarnatus* Gmelin
- Interior margin smooth, concentric striae very fine, rugose on posterior end *D. cuneatus* Linnaeus

Subgenus *Donax* s.st

Donax pulchella Hanley

1843. *Donax pulchella* Hanley, *Proc. zool. Soc. Lond.*, 1843 : 6.

Material Examined : i) 1 ex., 4 valves, Bheemunipatnam, Visakhapatnam, 19/02/1947, Coll. ?; ii) Many exs., Manginipudi, Machilipatnam, Visakhapatnam, 05/12/1964, iii) 2 exs., Bandar canal, Machilipatnam, Visakhapatnam, 07/12/1964, iv) 46 exs., Nizampatnam, Guntur, 13/12/1964, v) 37 exs., Vadarevu beach, Chirala, 22/12/1964, Coll. N.V. Subba Rao and Party; vi) 3 valves, Vadarevu beach, Chirala, 29/05/2000, Coll. vii) 2 valves, Mahalakshimpuram, Nellore, 17/02/2002, Coll. S. Barua and Party.

Measurements (in mm) :

Length	Width	Depth
14.40–6.60	7.40–4.20	4.75–2.50

Diagnosis : Shell elongately oblong, a little compressed in the middle; umbo posterior, ligament short, shunken; lunule more on the right valve; sculpture with fine or almost obsolete concentric and radial striae, more prominent at the posterior end; ash white or greyish white.

Distribution : India : Andhra Pradesh, Goa, Karnataka, Kerala, Orissa, Pondicherry, Tamil Nadu.

Elsewhere : Pakistan coast, Maynmar.

Subgenus *Hecuba* Schumacher, 1817

1817. *Hecuba* Schumacher, *Eassai Vers. Test.*, **52** : 157.

Type species: *Venus scortum* Linnaeus, 1758; subsequent designation, Herrmannsen, 1847.

Donax (Hecuba) scortum (Linnaeus)

1758. *Venus scortum* Linnaeus, *Syst. Nat.*, ed **10** : 686.

Material Examined : i) 1 valve, Bheemunipatnam, Visakhapatnam, 10/02/1947, Coll. ?; ii) 1 valve, Uppateru, Kakinada, 21.02.1948, Coll. Mahesh Chanda and G. Ramakrishna; iii) 3 valves, Kakinada Bay, 12/04/2000, Coll. Ramakrishna and Party; iv) 1 valve, Suryalanka, Chirala, 19/04/2000, Coll. S.C.Mitra and Party; v) 3 valves, Kalingapatnam, Srikakulam, 29/04/2001, vi) 2 valves, Krishnapatnam, Nellore, 15/02/2002, vii) 1 valve, Maypadu, Nellore, 16/02/2002, viii) 1 valve, Mahalakshimpuram, Nellore, 17/02/2002, ix) 1 valve, Tuplipalem, 18/02/2002, x) 2 valves, Ravanappasalov, 22/02/2002, Coll. S. Barua and Party.

Measurements (in mm) :

Length	Width	Depth
67.00–39.50	29.90–25.30	–

Diagnosis : Shell triangularly oblong; umbo posterior, elevated and pointed; ligament short; lunule very prominent, wide and equal on both the valves; sculpture with prominent concentric striae, lamellae like on the anterior end; radial striae prominent; dirty white, violet in the posterior region.

Distribution : India: Andhra Pradesh, Goa, Gujarat, Karnataka, Kerala, Orissa, Pondicherry, Tamil Nadu, West Bengal.

Elsewhere : Republic of South Africa, Sri Lanka, Myanmar, China.

Subgenus ***Latona*** Schumacher, 1817

1817. *Latona* Schumacher, *Essai Nov. Syst.*, **52** : 156.

Type species : *Donax cuneatus* Linnaeus, 1758

Donax (Latona) cuneatus Linnaeus

1758. *Donax cuneatus* Linnaeus, *Syst. Nat.*, ed. **10** : 683.

Material examined : i) 3 valves, Bheemunipatnam, Visakhapatnam, Coll.?, ii) 2 exs., Visakhapatnam, 28/01/1998, Coll. D.K. Kundu and Party; iii) 2 exs., Ethamukkala, Ongole, 13/02/2002, iv) 1 valve, Krishnapatnam, Nellore, 15/02/2002, v) 4 valves, Maypadu, Nellore, 16/02/2002, vi) 1 ex., Tuplipalem, 18/02/2002, vii) 2 exs., 3 valves, Ravanappasalov, 22/02/2002, Coll. S. Barua and Party; viii) 8 exs., Bheemunipatnam, Visakhapatnam, Don. Deptt. of Zoology, Andhra University.

Measurements (in mm) :

Length	Width	Depth
25.40–21.00	16.85–14.15	9.00–7.40

Diagnosis : Shell subtriangularly oblong, compressed, shinnig; umbo posterior and elevated; ligament short and dark brown; lunule present on both the valves; sculpture with fine concentric striae, rugose on the posterior end; purple with white banded, sometimes lead colour.

Distribution : India : Andhra Pradesh, Andaman and Nicobar Islands, Gujarat, Karnataka, Maharashtra, Pondicherry, Tamil Nadu.

Elsewhere : Sri Lanka, New Caledonia.

Donax (Latona) incarnatus Gmelin

1791. *Donax incarnatus* Gmelin, *Syst. Nat.*, ed. **13** : 3265.

Material examined : i) 1 ex., Manginapudi, Machilipatnam, Visakhapatnam, 04/12/1964, Coll. N.V. Subba Rao and Party; ii) 1 ex., Suryalanka, Chirala, 19/04/2000, Coll. S.C. Mitra and Party; iii) 2 exs., 1 valve, Kottapatnam, Ongole, 12/02/2002, Coll. S. Barua and Party.

Measurements (in mm) :

Length	Width	Depth
16.20–11.10	11.70–8.90	6.20–5.50

Diagnosis : Shell triangular, compressed; umbo posterior; ligament short, brown; lunule small and present on both the valves; sculpture with fine thread like concentric and radial striae; adductor muscle scars moderately developed; variable in colour.

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

Elsewhere : Myanmar, Singapore, Indonesia : Moluccas.

Superfamily DREISSENOIDEA

Family DRESSENIDAE

Genus *Mytilopsis* Conrad, 1758

1858. *Mytilopsis* Conrad, *Proc. Acad. nat. Sci. Philad.*, 9 : 167.

Type species : *Mytilus leucophaeatus* Conrad, 1831; subsequent designation, Dall, 1898

Mytilopsis adamsi Morrison

Material examined : i) 1 valve, Bheemunipatnam, Visakhapatnam, 20/02/1947, Coll.?

Measurements (in mm) :

Length	Width	Depth
25.00	12.75	

Diagnosis : Shell modioliform, wedge shape; anterior end prominent, pointed; dorsal and ventral margins divergent; posterior margin subtruncate; ashy-greenish externally and white internally.

Distribution : India : Andhra Pradesh.

Elsewhere : Singapore.

Superfamily ARCTICOIDEA

Family TRAPEZIIDAE

Genus *Trapezium* Megerle, 1811

1811. *Trapezium* Megerle, *Mag. Ges. Nat. Fr. Berlin*, 5 : 68.

Type species : *Trapezium perfectum* = *Chama oblonga* Linnaeus, 1758; subsequent designation, Stewart, 1930.

Subgenus *Neotrapezium* Habe, 1951

1951. *Neotrapezium* Habe, *Genera Japan Shells*, 1 : 119.

Type species : *Cardita sublaevigata* Lamarck, 1819.

***Trapezium (Neotrapezium) sublaevigatum* (Lamarck)**

1819. *Cardita sublaevigata* Lamarck, *Hist. nat Anim. Sans. Vert.* 6 : 26.

Material examined : i) 7 valves, Mahalakshimpuram, Nellore, 17/02/2001, Coll. S. Barua and Party.

Measurements (in mm) :

Length	Width	Depth
39.40–27.60	25.00–16.90	17.60–12.45

Diagnosis : Shell medium (upto 40 mm), modioliform or subrectangular; umbo subterminal and anterior; anterior end narrowly rounded; posterior subtruncate; sculpture irregular, coarse concentric lines and incremental grooves; umbonal region with trace of radial striae; ligament long; dirty white, internally white with tinges of brown or purple.

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

Elsewhere : Red Sea, Persian Gulf, Pakistan coast, Myanmar, Singapore, Philippines, Japan.

Superfamily GLOSSOIDEA

Family GLOSSIDAE

Genus *Meiocardia* H. and A. Adams, 1857

1857. *Meiocardia* H. and A. Adams, *Gen. Rec. Moll.*, 2 : 461.

Type species : *Meiocardia moltkiana* Spengler = *Chama moltkiana* Gmelin, 1791; subsequent designation. Stoliczka, 1870.

***Meiocardia lamarckii* (Reeve)**

1845. *Isocardia lamarckii* Reeve, *Conch. Icon.*, 2 : *Isocardia* sp. no. 5, pl. 1, fig. 5.

Material Examined : i) 1 valve, Maypadu, Nellore, 16/02/2002, Coll. S. Barua and Party.

Measurements (in mm) :

Length	Width	Depth
24.00	24.20	–

Diagnosis : Shell oblong-ovate, oblique with short anterior end, posterior acuminate keeled; sculpture with irregular concentric plicately ridged, terminating upon the keel, posterior end finely striated; yellowish white with rose spots posteriorly.

Distribution : India : Andhra Pradesh.

Elsewhere : Japan, China.

Superfamily VENEROIDEA

Family VENERIDAE

Subfamily VENERINAE

Genus *Periglypta* Jukes-Browne, 1914

1914. *Periglypta* Jukes-Browne, *Proc. malac. Soc. Lond.*, **11** : 72.

Type species : *Venus puerpera* Linnaeus, 1758.

Periglypta crispata (Deshayes)

1853. *Venus crispata* Deshayes, *Proc. zool. Soc. Lond.*, **1853** : 2.

Material examined : i) 1 valve, Between Dolphin Nose and Scandal point, Visakhapatnam, 17/01/1916, Coll. H. Hosten.

Measurements (in mm) :

Length	Width	Depth
27.00	23.80	—

Diagnosis : Shell moderately large, heavy, subcircular, solid and inflated ; umbo anterior; lunule elongate and almost equal in both the valves; sculpture with erect, lamellate concentric cords and crowded radial ribs in the interstices; ligament narrow, elongate; adductor muscle scars almost equal; exterior cream, buffed colour ornamented with numerous brown irregular patches, interior white.

Distribution : India : Andhra Pradesh.

Elsewhere : Malagasy, Mauritius, Scyelles, Myanmar.

Subfamily CIRCINAE

Genus *Circe* Schumacher, 1817

1817. *Circe* Schumacher, *Essai, Vers Test.*, **50** : 152.

Type species : *Circe violacea* Schumacher = *Venus scripta* Linnaeus, 1758.

Circe scripta Linnaeus

1758. *Circe scripta* Linnaeus, *Syst. Nat.*, ed. **10** : 689.

Material examined : i) 1 ex., Kottapatnam, Ongole, 12/02/2004, Coll. S. Barua and Party.

Measurements (in mm) :

Length	Width	Depth
49.35	44.50	16.90

Diagnosis : Shell suborbicular even quadrate, not inflated, compressed, posterior margin rounded or distinctly unguate; umbo anterior; sculpture consist of closely placed, strong prominent concentric ridges; yellowish or often painted with large number of zigzag v-shaped brown markings; lunule and area dark brown and there are two broad brown bands radiating from the umbones down to the ventral margin.

Distribution : India : Andhra Pradesh, Andaman and Nicobar Islands.

Elsewhere : Indo-Pacific.

Genus *Gafrarium* Roeding, 1798

1798. *Gafrarium* Roeding, *Mus. Bolten.*, 2 : 176.

Type species : *Venus pectinata* Linnacus; subsequent designation, Dall, 1902.

Key to the species

1. Shell elongately-ovate; sculpture with strong radial ribs (2)
 - Shell subovate; sculpture with fine concentric and radial ribs, beak well in front of mid line *G. divaricatum* (Gmelin)
2. Radial ribs coarser and more frequently bifid towards the ventral margin; posterior end pointed *G. tumidus* Roeding
 - Radial ribs asymmetrical, divaricate; beak slightly in front of mid line; posterior end not much pointed *G. pectinatum* (Linnaeus)

Gafrarium divaricatum (Gmelin)

1791. *Venus divaricatum* Gmelin, *Syst. Nat.*, 13 : 3277.

Material examined : i) 1 valve, Between Dolphin Nose and Scandal point, Visakhapatnam, 17/01/1916, Coll. H. Hosten; ii) 2 valves, Bheemunipatnam, Visakhapatnam, 20/02/1947, Coll. H.C. Ray and Party; iii) 7 valves, Visakhapatnam, 05/03/1966, M 21009/4, iv) 3 valves, Rocky coast, Visakhapatnam, 05/03/1966, M 21009/4, v) 2 exs., Palm beach, Visakhapatnam, 04/03/1966, vi) 1 ex., 2 valves Jolarpetai, Visakhapatnam, 06/03/1966, vii) 4 exs., Between Dolphin Nose and Scandal point, Visakhapatnam, 10/03/1966, Coll. A.S. Rajagopal and Party.

Measurements (in mm) :

Length	Width	Depth
45.40–20.30	40.10–18.40	22.40–9.15

Diagnosis : Shell moderate, solid, subovate, anterior broadly rounded, posterior subtruncate; sculpture with concentric and radial striae, divaricated, radial striae and diverging at the ventral margin, ribs prominent; cream colour tinged with lilac, zig-zag lines, inside white flushed violet; pallial line lacks pallial sinus.

Distribution : India : Andhra Pradesh, Andaman and Nicobar Islands.

Elsewhere : Indo-Pacific.

***Gafrarium pectinatum* (Linnaeus)**

1798. *Venus pectinatum* Linnaeus, *Syst. Nat.*, **10** : 689.

Material examined : i) 1 valve, Between Dolphin Nose and Scandal point, Visakhapatnam, 17/01/1916, Coll. H. Hosten; ii) 2 valves, Bheemunipatnam, Visakhapatnam, 18/02/1947, Coll. H.C. Ray and Party.

Measurements (in mm) :

Length	Width	Depth
33.80	27.50	—

Diagnosis : Shell moderate, compressed, solid, elongated-oval; umbo low; sculpture with granulose radial ribs, asymmetrical on posterior slope, rope like, obliquely placed in compressed to the main radial ribs; concentric striae from the top to bottom and concentric grooves continue into symmetrical radial ribs near the ventral margin; pallial line lack, pallial sinus developed only slightly arched posterior end; geryish white with brownish spots or blotches, some tinged pink.

Distribution : India : Andhra Pradesh, Andaman and Nicobar Islands, Karnataka, Maharashtra.

Elsewhere : Indo-Pacific.

***Gafrarium tumidum* Roeding**

1798. *Gafrarium tumidum* Roeding, *Mus. Bollen.*, p. 176.

Material examined : i) 2 valves, Visakhapatnam, 17/02/1947, Coll. ?.

Measurements (in mm) :

Length	Width	Depth
35.00–34.25	31.00–28.40	—

Diagnosis : Shell moderate size, heavy, solid, elongately-ovate; umbo low; ligament shunken; lunule heart shaped; sculpture with radial ribs coarse and frequently bifid towards the ventral margin, granules upon radial ribs are longer, more distant; concentric striae more prominent; cream colour frequently ornamented with orange brown, posterior slope purple brown, anteriorly stained with purple.

Distribution : India : Andhra Pradesh, Andaman and Nicobar Islands.

Elsewhere : Indo-Pacific.

Subfamily SUNETTINAE

Genus *Sunetta* Link, 1807

1807. *Sunetta* Link, *Beschr. Nat. Samml. Uni. Rostock*, (3) : 148.

Type species : *Donax scripta* Linnaeus; subsequent designation, Dall, 1902.

Key to the species

1. Umbo posterior (2)
 - Umbo anterior or central (3)
2. Sculpture with concentric ridges *S. meroe* (Linnaeus)
 - Sculpture without concentric ridges, smooth *S. scripta* (Linnaeus)
3. Sculpture with concentric ridges (5)
 - Sculpture smooth (4)
4. Shell suborbicular-trigonal *S. perexcavata* Fulton
 - Shell subovate *S. kurachiensis* Sowerby
5. Concentric striae more close; more than 15 *S. donacina* (Gmelin)
 - Concentric striae less close; less than 15 *S. effosa* (Hanley)

***Sunetta donacina* (Gmelin)**

1791. *Venus donacina* Gmelin, *Syst. Nat.*, ed. 13 : 3295.

Material examined : i) 1 valve, Bheemunipatnam, Visakhapatnam, M 20695/4, ii) 1 valve, Between Dolphin Nose and Scandal point, Visakhapatnam, M 23790/5, Coll. H. Hosten.

Measurements (in mm) :

Length	Width	Depth
37.70–18.00	27.40–12.90	–

Diagnosis : Shell medium, subovate, beak slightly in front of midline; sculpture with concentric striae, beige to lilac and blotches or uniformly beige.

Distribution : India : Andhra Pradesh, Karnataka, Maharashtra, Orissa.

Elsewhere : Persian Gulf, Pakistan Coast, Sri Lanka, Myanmar.

***Sunetta effosa* (Hanley)**

1842. *Cytherea effosa* Hanley, *Proc. zool. Soc. Lond.*, 1842 : 123.

Material examined : i) 1 valve, Between Dolphin Nose and Scandal point, Visakhapatnam, M 23792/5, Coll. H. Hosten.

Measurements (in mm) :

Length	Width	Depth
25.40	17.60–12.90	–

Diagnosis : Shell upto 40 mm, subovate, anterior roundly pointed, posterior broadly rounded or subtruncate; umbo almost equal, beak slightly in front of mid line; sculpture with 22–25, prominently, smooth, concentric ridges; escutcheon deeply excavated; beige to lilac with faint brown, zig-zag lines and blotches.

Distribution : India : Andhra Pradesh, Maharashtra, Orissa, Tamil Nadu.

Elsewhere : Persian Gulf, Red sea, Gulf of Aden, Myanmar, Malacca, Philippines.

Sunetta kurachensis Sowerby

1895. *Sunetta kurachensis* Sowerby, *Proc. zool. Soc. Lond.*, 1 : 216, pl. 13, fig. 1.

Material examined : i) 1 valve, Between Dolphin Nose and Scandal point, Visakhapatnam, 17/01/1916, Coll. H. Hosten.

Measurements (in mm) :

Length	Width	Depth
18.00	12.90	–

Diagnosis : Shell medium, subovate with anterior end rounded, posterior broadly rounded or subovate; sculpture with smooth concentric ridges prominent on anterior and posterior ridges; beige to lilac with faint brown, zig-zag lines and blotches.

Distribution : India : Andhra Pradesh.

Elsewhere : Sri Lanka, Myanmar.

Sunetta meroe (Linnaeus)

1758. *Venus meroe* Linnaeus, *Syst. Nat.*, 10 : 687.

Material Examined : i) 23 valves, Between Dolphin Nose and Scandal point, Visakhapatnam, 17/01/1916, M 15292/2, Coll. Rev. H. Hosten; ii) 1 valve, Chittivalsa, Bheemunipatnam, Vishakhapatnam, 02/02/1947, Coll. ?; iii) 2 exs. 1 valve, Bheemunipatnam, Visakhapatnam, 20/02/1947, Coll. H.C. Ray and Party; iv) 1 valve, Kakinada, 29/05/1955, Coll. ?; v) 3 valves, Uppateru, Kakinada, 19/07/1963, Coll. A. Daniel and Party; vi) 3 valves, Kakinada Bay, 13/04/2000, Coll. Ramakrishna and Party; vii) 1 valve, Kalingapatnam, Srikakulam, 29/04/2001, viii) 1 valves, Ravanapasalov, 12/02/2002, ix) 1 ex., 5 valves,

Krishnapatnam, Nellore, 15/02/2002, x) 1 valve, Maypadu, Nellore, 16/02/2002, Coll. S. Barua and Party.

Measurements (in mm) :

Length	Width	Depth
47.25–15.40	30.70–11.00	15.60–5.40

Diagnosis : Shell upto 50 mm, subovate, anterior end rounded, posterior subtruncate; umbo posterior, beak slightly in front of mid line; sculpture with prominent concentric ridges; more prominent in the middle; escutcheon deeply excavated; beige to lilac with dark brown or yellowish brown zig-zag lines throughout the body; inner ventral margin crenulated.

Distribution : India : Andhra Pradesh, Maharashtra, Orissa, Pondicherry, Tamil Nadu.

Elsewhere : Indian Ocean.

***Sunetta perexcavata* Fulton**

Material examined : i) 1 ex., Visakhapatnam, Coll. A.V. Raman.

Measurements (in mm) :

Length	Width	Depth
19.95	16.95	9.00

Diagnosis : Shell small upto 20 mm, subcircular-trigonal; umbo central; anterior end broadly rounded, posterior subtruncate; lunule narrow, long and more than 2/3rd of anterior end; sculpture smooth, concentric striae poorly developed; white with fulvous to brown tints.

Distribution : India : Andhra Pradesh.

***Sunetta scripta* (Linnaeus)**

1758. *Donax scripta* Linnaeus, *Syst. Nat.*, **10** : 683.

Material examined : i) 34 exs., Between Dolphin Nose and Scandal point, Visakhapatnam, 17/1/1916, M 15291/2, Coll. H. Hosten; ii) 21 valves, Visakhapatnam, M 15287/2; iii) 2 valves, Bheemunipatnam, Visakhapatnam, 22/02/1944, M 23788/5; iv) 21 valves, Bheemunipatnam, Visakhapatnam, 20/02/1947, Coll. H.C. Ray and Party; v) 5 valves, Lawson's Bay, Visakhapatnam, 24/02/1948, Coll. M. Chanda and G. Ramkrishna; vi) 12 exs., Burva beach, Andhra Pradesh, 2/8/1959; vii) 1 valve, Rishikunda, Visakhapatnam, 8/3/1966, Coll. A.S. Rajagopal and Party; viii) 1 valve, Chirala, 22/12/1964, Coll. N.V. Subba Rao and Party; ix) 5 exs., Srikakulam, 17/02/1995, M 23627/4, x) 27 exs., Kalingapatnam, 18/02/1995, M 23625/4, xi) 5 exs., Srikakulam, 19.02.1995, M M 23626/4, Coll. D.R.K. Shastry and Party; xii) 3 exs., Kakinada Bay, 13/04/2000, xiii) 3 exs., Manginipudi, Machilipatnam, Visakhapatnam, 15/04/2000, Coll. Ramakrishna and Party; xiv) 3 valves, Vadarevu beach,

Chirala, 18/04/2000, xv) 8 valves, Suryalanka, Chirala, 19/4/2000, xvi) 6 valves, Ramthirtham, Vitapalem, Chirala, 21/4/2000, Coll. S.C. Mitra and Party; xvii) 1 valve, Kottapatnam, Ongole, 12/02/2002, xviii) 5 valves, Krishnapatnam, Nellore, 15/02/2002, xix) 9 valves, Chinnatapally, Vizianagaram, 02/05/2004, Coll. S. Barua and Party.

Measurements (in mm) :

Length	Width	Depth
25.65–13.50	18.60–9.70	9.20–5.00

Diagnosis : Shell upto 30 mm, wedge shaped; umbo posterior, beak slightly in front of mid lines; anterior end rounded, posterior truncate; sculpture smooth only growth lines; escutcheon deeply excavated; variable in colour pattern, white or beige, lilac with brown violet zig-zag lines or with deep violet patches; inner ventral margin crenulated.

Distribution : India : Andhra Pradesh, Goa, Gujarat, Karnataka, Kerala, Orissa, Tamil Nadu.

Elsewhere : Sri Lanka, Indonesia, Myanmar, Philippines.

Subfamily CHIONINAE

Genus *Placamen* Iredale, 1925

1925. *Placamen* Iredale, *Rec. Australian Mus.*, **14** : 248.

Type species : *Venus placida* Philippi, 1844.

Placamen tiara (Dillwyn)

1817. *Venus tiara* Dillwyn, *Des. Cat. Rec. Shells*, **14** : 248.

Material examined : i) 3 exs., Visakhapatnam, 20/9/1996, Coll. N.V. Subba Rao; ii) 16 valves, Maypadu, Nellore, 16/02/2002, iii) 14 valves, Mahalakshmipuram, Nellore, 17/02/2002, iv) 1 valve, Tuplipalem, 19/02/2002, Coll. S. Barua and Party.

Measurements (in mm) :

Length	Width	Depth
14.50–9.00	14.50–9.30	8.80–5.30

Diagnosis : Shell small upto 20 mm, trigonal-subovate; umbo anterior, lunule small, cordate, impressed; sculpture with 9-10 stringly elevated, thin, concentric lamellae lower laterally to form anterior sulcus; white tinged with brown markings.

Distribution : India : Andhra Pradesh.

Elsewhere : Indo-Pacific.

Genus *Timoclea* Brown, 1827

1827. *Timoclea* Brown, *Conch.*, 3 : pl. 19, fig. 11.

Type species : *Venus ovata* Pennant, 1777.

Key to the species

Shell triangularly ovate; sculpture with strong, imbricated radial ribs; ventral margin slightly fluted *T. imbricata* (Sowerby)

Shell corbuloid; sculpture with concentric ridges and radial ribs more prominent on posterior end; ventral margin smooth and denticulate *T. arakana* (G. & H. Nevill)

***Timoclea arakana* (G. and H.Nevill)**

1871. *Timoclea arakana* G. and H. Nevill, *J. Asiat. Soc. Beng.*, 49 (2) : 10, pl.1, fig.16.

Material examined : i) 2 valves, Chinnatapally, Vizianagaram, 02/03/2001, ii) 2 valves, Mahalakshimpuram, Nellore, 17/02/2002, iii) 2 valves, Tuplipalem, 19/2/2002, Coll. S. Barua and Party.

Measurements (in mm) :

Length	Width	Depth
15.50–9.50	11.40–7.00	–

Diagnosis : Shell small, corbuloid shape with rounded anterior and subovate posterior end; umbo anterior, lunule narrowly cordate, impressed, upto 2/3 rd of anterior dorsal margin; sculpture with radial riblets intersecting concentric lamellae, more prominent on posterior and anterior end; muscle scars almost equal, posterior scar slightly larger.

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

Elsewhere : Indo-Pacific.

***Timoclea imbricata* (Sowerby)**

1853. *Venus imbricata* Sowerby, *Thes.Conch.*, pt. 2 : 715, pl. 156, figs. 81, 82.

Material examined : i) 5 valves, Manginipudi, Machilipatnam, Visakhapatnam, 15/04/2000, Coll. Ramakrishna and Party; ii) 3 valves, Krishnapatnam, Nellore, 15/02/2002, iii) 6 valves, Mahalakshimpuram, Nellore, 17/02/2002, iv) 3 valves, Tuplipalem, 19/02/2002, Coll. S. Barua and Party.

Measurements (in mm) :

Length	Width	Depth
12.50–12.40	14.40–12.00	7.50–7.00

Diagnosis : Shell triangularly ovate, with angulated posterior end; umbo anterior, beak attenuated; lunule heart shape and develop ½ or slightly more of anterior dorsal margin; sculpture with radiating radial ribs, ribs cuneately imbricated; ventral margin fluted; whitish, tinged with rust brown and violet umbonal region.

Distribution : India : Andhra Pradesh, Goa, Karnataka, Kerala, Maharashtra, Orissa, Tamil Nadu, West Bengal.

Elsewhere : Sri Lanka, China, Pakistan.

Subfamily MERETRICINAE

Genus *Meretrix* Lamarck, 1799

1799. *Meretrix* Lamarck, *Mem. Soc. Hist. nat. Paris*, p. 85.

Type species: *Venus meretrix* Linnaeus, 1758.

Key to the species

Shell ventricose; umbo almost central; lunule ½ of anterior dorsal margin; posterior adductor scar larger than anterior adductor scar *M. meretrix* (Linnaeus)

Shell with elongated posterior end; umbo anterior; lunule 2/3rd of anterior dorsal margin; posterior adductor scar slightly larger than anterior adductor scar..... *M. casta* (Gmelin)

Meretrix casta (Gmelin)

1791. *Venus casta* Gmelin, *Syst. Nat.*, 13 : 3278.

Material examined : i) 18 valves, Visakhapatnam, June 1918, Coll. H.S. Rao and G. Varghese; ii) 5 valves, Near Railway station, Visakhapatnam, 21/09/1918, Coll. N. Annandale; iii) 2 valves, Lawson's Bay, Visakhapatnam, 17/02/1947, iv) 1 valve, Bheemunipatnam, Visakhapatnam, 19/02/1947, v) 1 valve, Visakhapatnam, 20/2/1947, Coll. ?; vi) 9 exs., Kakinada Bay, 11/01/1957, M 21044/4, Coll. A.G.K. Menon and Party; vii) 3 exs., Kakinada Bay, 14/07/1963, M 21043/4, viii) 4 exs., Gautami River, 16.07.1963, M 21273/4, ix) 6 exs., Daralattippa, Gautami River, 17/07/1963, M 21444/4, Coll. A. Daniel and Party; x) 7 valves, Gautami River, 22.01.1964, M 21272/4, Coll. Umakutty and Party; xi) 26 valves, Kakinada Bay, 21/11/1964, Coll. N.V. Subba Rao; xii) 4 exs. 4 valves, Kakinada, 12/04/2000, Coll. Ramakrishna and party; xiii) 5 valves, Vadarevu beach, Chirala, 18/04/2000, Coll. S. C. Mitra and Party; xiv) 1 ex., 2 valves Kalingapatnam, Srikakulam, 29/04/2001, xv) 3 valves, Kottapatnam, Ongole, 12/02/2002, xvi) 2 valves, Krishnapatnam, Nellore, 15/02/2002, xvii) 7 valves, Tuplipalem, 19/02/2002, Coll. S. Barua and Party.

Measurements (in mm) :

Length	Width	Depth
42.90–37.00	37.60–12.50	24.30–7.80

Diagnosis : Shell medium, solid, but less heavy than *M. meretrix*; umbo slightly anterior, beak more attenuated; lunule well developed and about 2/3rd or more of anterior dorsal margin; variable in shape and colour; muscle scars well impressed, posterior adductor scar slightly larger than anterior; anterior cardinal teeth more strong on left valve; pallial line well impressed, pallial sinus absent.

Distribution : India : Andhra Pradesh, Karnataka, Kerala, Orissa, Pondicherry, Tamil Nadu.

Elsewhere : Sri Lanka, Myanmar, Singapore, Malaysia.

***Meretrix meretrix* (Linnaeus)**

1758. *Venus meretrix* Linnaeus, *Syst. Nat.*, 10 : 686.

Material examined : i) 2 exs., Between Dolphin Nose and Scandal point, Visakhapatnam, 17/01/1916, M10862/4, ii) 1 valve, Between Dolphin Nose and Scandal point, Visakhapatnam, 18/01/1916, Coll. H. Hosten; iii) 1 ex., Nellore, 10/08/1918, iv) 2 exs., Visakhapatnam, 20/01/1921, Coll. S.W.Kemp; v) 1 valve, Westend backwater, Visakhapatnam, June 1926, Coll. H.S. Rao and G. Varghese; vi) 6 valves, Bheemunipatnam, Visakhapatnam, 19/02/1947, vii) 5 exs., Kakinada, 25/05/1955; Coll. ?; viii) 1 ex., Rishikunda, Visakhapatnam, 24/07/1963, M 21450/4, ix) 1 ex., Kottapalem, Visakhapatnam, 28/07/1963, M 21698/4 Coll. A. Daniel and Party; x) 2 exs., Creek near light house, Kakinada, M 21602/4, Coll. N.V.Subba Rao; xi) 2 valves, Suryalanka, Chirala, 19/04/2000, Coll. S.C. Mitra and Party xii) 1 ex., Maypadu beach, Nellore, 16/02/2002, Coll. S. Barua and Party.

Measurements (in mm) :

Length	Width	Depth
71.40–29.95	60.50–27.60	47.20–19.30

Diagnosis : Shell moderately large, heavy, ventricose, compressed, hinge narrow; umbo almost central, beak attenuated; lunule heart shaped and almost ½ of anterior dorsal margin; sculpture smooth only growth lines; anterior cardinal teeth more strong on left valve; muscle scars well impressed, anterior adductor scar smaller, semilunar, posterior adductor scar large with narrow anterior end; pallial line slightly arched posteriorly; variable in colour.

Distribution : India : Andhra Pradesh, Andaman and Nicobar Islands, Goa, Gujarat, Karnataka, Kerala, Orissa, Pondicherry, Tamil Nadu.

Elsewhere : Red Sea, Gulf of Aden, Sri Lanka, Myanmar, Indonesia, Philippines, Japan.

Subfamily PITARINAE

Genus *Pitar* Roemer

1857. *Pitar* Roemer, *Krit. Untersuch Venus*, p. 15.

Type species : *Venus tumens* Gmelin, 1791.

***Pitar alabastrum* (Reeve)**

1863. *Dione alabastrum* Reeve, *Conch. Icon.*, **14**, *Dione* sp. no. 42, pl. 10, fig. 42.

Material examined : i) 1 valve, Chinnatapally, Vizianagaram, 02/05/2001, Coll. S. Barua and Party.

Measurements (in mm) :

Length	Width	Depth
33.20	27.00	—

Diagnosis : Shell moderate, thin, ovately cordate, inflated, anterior end short, posterior end elongate; umbo impressed, anterior; sculpture with irregular, wrinkle concentric striae; lunule 2/3rd of anterior-dorsal margin, pallial sinus on posterior end, developed 1/3rd distance; white scarcely tinged with rust.

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

Elsewhere : Gulf of Oman, Myanmar, Singapore.

Genus *Callista* Poli, 1791

1791. *Callista* Poli, *Test. Sicil.*, **1** : 30.

Type species : *Venus chione* Linnaeus; subsequent designation, Meek, 1876.

***Callista nivea* (Hanley)**

1843. *Cythera nivea* Hanley, *Cat. Bivalves Shells*, p. 97.

Material examined : i) 1 valve, Visakhapatnam, 21/02/1948, Coll. Mahesh Chandra and G. Ramakrishna.

Measurements (in mm) :

Length	Width	Depth
28.50	23.35	—

Diagnosis : Shell subovate trigonal, solid; umbo just in front of midline; posterior dorsal margin sloping steeply; posterior margin subacute; posterior ventral margin often sinous; sculpture of weak concentric thread and growth lines; pallial sinus large, rounded and extending to mid line; white.

Distribution : India : Andhra Pradesh, Gujarat.

Elsewhere : Persian Gulf.

Subfamily TAPETINAE

Genus *Marcia* H. and A. Adams, 1857

1857. *Marcia* H. and A. Adams, *Gen. Rec. Moll.*, 2 : 423.

Type species : *Venus pinguis* Chemnitz = *Venus opima* Gmelin; subsequent designation, Kobelt, 1881

Marcia pinguis (Schroeter)

1788. *Venus pinguis* Schroeter, *Nomen. Register*, 10 : 112.

Material examined : i) 3 ex., Westend backwater, Visakhapatnam, June 1926, Coll. H.S. Rao and G. Varghese; ii) 44 valves, Bheemunipatnam, Visakhapatnam, 19/02/1947, iii) 49 valves, Chittivalsa, Bheemunipatnam, Visakhapatnam, 19/02/1947, Coll. ?; iv) 1 valve., Kakinada, 21/11/1964, v) 1 ex., Bandar Canal, Machilipatnam, Visakhapatnam, 07/12/1964, Coll. N.V. Subba Rao; vi) 1 ex., Visakhapatnam, Coll. ?; vii) 1 valve, Manginipudi, Machilipatnam, Visakhapatnam, 15/04/2000, Coll. S.C. Mitra and Party; viii) 1 valve, Ethamukkala, Nellore, 13/02/2002, ix) 2 valves, Krishnapatnam, Nellore, 15/02/2002, Coll. S. Barua and Party.

Measurements (in mm) :

Length	Width	Depth
46.60–36.35	39.50–30.25	–

Diagnosis : Shell medium upto 50 mm, subovate, anterior rounded, posterior becoming subtruncate; umbo anterior, beak more attenuated; lunule well defined, depressed and cordate; sculpture smooth with growth lines only; adductor muscle scars almost equal; pallial line deep, pallial sinus well developed and more than ½ of the length of shell; beige with brown, grey umbonal region.

Distribution : India : Andhra Pradesh, Andaman and Nicobar Islands, Karnataka, Orissa, Pondicherry, Tamil Nadu.

Elsewhere : Indo-Pacific.

Genus *Paphia* Roeding, 1758

1798. *Paphia* Roeding, *Mus. Bolten.*, p. 175.

Type species : *Paphia alapapilionis* = *Venus rotundata* Linnaeus; subsequent designation, Dall, 1902

Key to the species

1. Shell suborbicular or subovate; sculpture with strong concentric ridges (2)
- Shell elongate-subovate, much longer than high; sculpture without strong concentric ridges (4)

2. Shell cordately ovate, pallial sinus developed vertical and more than $\frac{1}{2}$ of the width ..
 *P. malabarica* (Schroeter)
- Shell suborbicular, pallial sinus not vertical and small (3)
3. Shell smaller, less heavy, almost trigonal *P. gallus* (Gmelin)
- Shell larger, heavy, length and width almost equal *P. cor* (Sowerby)
4. Sculpture smooth only growth line present *P. textris* (Schroeter)
- Sculpture with fine concentric striae *P. undulata* (Born)

Subgenus ***Paphia*** s. st

Paphia textris (Schroeter)

1788. *Venus textris* Schroeter, *Namen. Registe.*, p. 112.

Material examined : i) 1 valve, Manginipudi, Machilipatnam, Visakhapatnam, 15/04/2000, Coll. S.C. Mitra and Party; ii) 1 valve, Chinnatapally, Vizianagaram, 02/05/2001, iii) 1 valve, Ethamukkala, Ongole, 13/02/2002, Coll. S. Barua and Party.

Measurements (in mm) :

Length	Width	Depth
41.10–39.70	23.80–22.60	—

Diagnosis : Shell elongately-subovate, much longer than high; anterior margin little narrow; umbo anterior; lunule narrow; sculpture with growth lines only; beige with dense darker zig-zag patterned lines, some uniformly brown; adductor muscle scars almost equal; pallial line well developed, pallial sinus poorly developed and present in a small area of posterior end.

Distribution : India : Andhra Pradesh, Andman Islands, Goa, Karnataka, Kerala.

Elsewhere : Indo-Pacific. Shallow, mudflats.

Paphia undulata (Born)

1778. *Venus undulata* Born, *Index Mus. Caes. Vinod.*, p. 54.

Material examined : i) 1 ex., 1 valve, Westend backwater, Visakhapatnam, June 1926, Coll. H.S. Rao and G. Varghese; ii) 1 ex., Goutami river, Andhra Pradesh, 17/03/1963, Coll. A. Daniel and Party; iii) 1 ex., Kakinada, 20/04/1995, Coll. N.V. Subba Rao; iv) 5 valve, Kakinada Bay, 13/04/2000, Coll. Ramakrishna and Party; v) 2 valves, Krishnapatnam, Nellore, 15/02/2002, vi) 1 ex., Maypadu beach, Nellore, vii) 2 valves, Mahalakshmiapuram, Nellore, 17/02/2002, Coll. S. Barua and Party.

Measurements (in mm) :

Length	Width	Depth
46.50–33.55	28.50–21.00	–

Diagnosis : Shell oblong-ovate, slightly smaller than *P. textile*, much longer than high; umbo anterior, beak well in front of mid line; lunule narrow, elongate; sculpture with concentric line, absent on umbonal region; beige with grey and darker zig-zag pattern lines, anterior adductor muscle scar smaller, posterior adductor muscle scar large; pallial line well developed. pallial sinus small and present only a small part of posterior region.

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

Elsewhere : Indo-Pacific.

Subgenus *Protapes* Dall, 1902

1902. *Protapes* Dall, *Proc. U.S. natl. Mus.*, **26** : 362.

Type species : *Venus gallus* Gmelin, 1791

Paphia (Protapes) cor (Sowerby)

1853. *Venus cor* Sowerby, *Thes. Conch.*, **pt. 14** : 727, pl. 160, fig. 184.

Material examined : i) 1 ex., Kakinada Bay, 13/04/2000, Coll. Ramakrishna and Party.

Measurements (in mm) :

Length	Width	Depth
33.10	31.60	18.00

Diagnosis : Shell trapezoiformly globose, rather thin, inflated, almost as high as long, dull white more or less rust stained; sculpture with undulating concentric ridges, ridges obtuse, numerous, very irregular; umbo anterior, beak well in front of mid line; lunule not defined and lunule margin horizontal or nearly so; off white or dirty beige.

Distribution : India : Andhra Pradesh.

Elsewhere : Pakistan: Karachi.

Paphia (Protapes) gallus (Gmelin)

1791. *Venus gallus* Gmelin, *Syst. Nat.*, **12** : 3277.

Material examined : i) 2 exs., Kakinada Bay, 16.04.1978, Coll. N.V. Subba Rao and A. Dey; ii) 1 valve, Kottapatnam, Ongole, 15/02/2002, Coll. S. Barua and Party.

Measurements (in mm) :

Length	Width	Depth
78.80–62.70	62.80–43.10	46.80–33.10

Diagnosis : Shell medium upto 50 mm, trigonal but more inflated with the posterior slope becoming flattened or sulcate; umbo anterior; beak well in front of mid line; lunule heart shape, well developed and 2/3 rd of anterior dorsal margin; sculpture with strong concentric striae gradually thinner towards umbonal region; anterior adductor muscle scar smaller, semilunar, posterior adductor muscle scar almost rectangular; pallial line developed 2/3rd length and confluent with pallial sinus.

Distribution : India : Andhra Pradesh.

Elsewhere : Indo-Pacific.

***Paphia malabarica* (Schroeter)**

1853. *Venus malabarica* Schroeter, *Namen Register*, **10** : 112.

Material examined : i) 2 ex., Between Dolphin Nose and Scandal point, Visakhapatnam, 17/01/1916, Coll. H. Hosten; ii) 1 valve, Vadarevu beach, Chirala, 18/04/2000, Coll. S.C. Mitra and Party; iii) 2 valves, Kottapatnam, 12/02/2002, iv) 5 valves, Ethamukkala, Ongole, 13/02/2002, v) 1 valve, Krishnapatnam, Nellore, 15/02/2002, vi) 5 valves, Maypadu, Nellore, 16/02/2002, vii) 3 valves, Mahalakshimpuram, Nellore, 17/02/2002 Coll. S. Barua and Party.

Measurements (in mm) :

Length	Width	Depth
47.50–12.40	33.70–12.00	—

Diagnosis : Shell cordately-ovate, arched, much longer than high; umbo anterior; beak well in front of mid line; lunule developed and 2/3rd of the length of anterior-dorsal margin; sculpture with concentric ridges, fine on umbonal region and gradually coarse and more on the posterior slope; beige to orange brown; adductor muscle scars almost equal; pallial sinus developed towards the umbo and occupy more than ½ of the width of shell.

Distribution : India : Andhra Pradesh, Andaman Islands, Gujarat, Kerala, Maharashtra, Orissa, Tamil Nadu.

Elsewhere : Persian Gulf, Gulf of Aden, Pakistan, Sri Lanka, Myanmar, Malaysia, Indonesia, Philippines, China.

Subfamily DOSINIINAE

Genus ***Dosinia*** Scopoli, 1777

1777. *Dosinia* Scopoli, *Intr. Hist. nat.*, p. 399.

Type species : *Chama dosina* Adamson, 1757 = *Venus concentrica* Born, 1778

Key to the species

1. Shell with greater height than length *D. fibula* (Reeve)
- Shell lesser height than length (2)
2. Sculpture with fine concentric striae *D. tumida* (Gray)
- Sculpture with stronger concentric striae (3)
3. Shape almost circular, adductor scars unequal; umbo anterior *D. bruguieri* Gray
- Shape trigonally circular, adductor scars almost equal; umbo equal
..... *D. excisa* (Schroeter)

Dosinia bruguieri Gray

1838. *Arthemis bruguieri* Gray, *Analyst.*, **8** : 309.

Material examined : i) 1 ex., Chinnatapally, Vizianagaram, 02/03/2001, ii) 1 valve, Kottapatnam, Ongole, 12/02/2002, iii) 1 valve, Ethamukkala, Ongole, 13/02/2002, iv) 1 ex., Maypadu beach, Nellore, 16/02/2002, vi) 1 ex., Mahalakshimpuram, Nellore, 17/02/2002, Coll. S. Barua and Party.

Measurements (in mm) :

Length	Width	Depth
51.50–18.70	54.30–17.00	17.25–7.75

Diagnosis : Shell solid, orbicular, almost circular; lunule short, cordate, impressed; sculpture with narrow, dense concentric striae, almost absent on the umbonal region; anterior muscles scar smaller, almost oval, posterior adductor scar semilunar with curved inner end; pallial sinus well developed, almost ½ of the length of the shell.

Distribution : India : Andhra Pradesh, Kerala, Tamil Nadu.

Elsewhere : Indo-Pacific.

Dosinia excisa (Schroeter)

1788. *Venus excisa* Schroeter in Martini-Chemnitz, *Conch. Cab.*, **10** : 112.

Material examined : i) 7 valves, Krishnapatnam, Nellore, 15/02/2002, ii) 6 valves, Maypadu beach, Nellore, 16/02/2002, iii) 2 valves, Mahalakshimpuram, Nellore, 17/02/2002, iv) 1 valve, Tuplipalem, 19/02/2002, Coll. S. Barua and Party.

Measurements (in mm) :

Length	Width	Depth
33.05–18.30	30.80–17.60	–

Diagnosis : Shell thicker, orbicular, height slightly smaller than the length; lunule short, shunken; sculpture with concentric striae, more prominent on outer margin and gradually finer and almost absent on the umbonal region; adductor muscle scar almost equal, posterior slightly larger; pallial sinus well developed and almost $\frac{1}{2}$ of the length of shell; white or beige with dark brown umbonal region, with some concentric patches of yellowish brown colour.

Distribution : India : Andhra Pradesh, Maharashtra, Orissa, Tamil Nadu.

Elsewhere : Myanmar.

***Dosinia fibula* (Reeve)**

1850. *Arthemis fibula* Reeve, *Conch. Icon.*, 6 : *Artemis*, sp. no. 26, pl. 5, fig. 26.

Material examined : i) 1 valve, Tuplipalem, 19/02/2002, Coll. S. Barua and Party.

Measurements (in mm) :

Length	Width	Depth
29.20	27.70	—

Diagnosis : Shell heavy, orbicular, height slightly greater than the length; lunule short, shunken and narrowly cordate; sculpture with fine dense concentric striae; pallial sinus deep narrow, $\frac{1}{2}$ of the length of shell; white, tinged with yellow, sometimes with pink.

Distribution : India : Andhra Pradesh, Nicobar Islands, Orissa, Tamil Nadu.

Elsewhere : Indian Ocean.

***Dosinia tumida* (Gray)**

1838. *Cytherea tumida* Gray, *Analst.*, 8 : 309.

Material examined : i) 1 valve, Visakhapatnam, 05/03/1966, Coll. A.S. Rajagopal and Party; ii) 1 valve, Kakinada bay, 12/04/2000, Coll. Ramakrishna and Party iii) 1 valve, Ravanappasalov, 12/02/2002, iv) 2 valves, Ethamukkala, Ongole, 13/02/2002, v) 2 valves, Maypadu beach, Nellore, 16/02/2002, vi) 2 valves., Mahalakshmpuram, Nellore, 17/02/2002, Coll. S. Barua and Party.

Measurements (in mm) :

Length	Width	Depth
31.35–22.50	31.25–23.05	—

Diagnosis : Shell solid, orbicular, height equal to the length; posterior dorsal margin sloping moderately; lunule short, cordate; sculpture with low, dense narrow ridge concentric striae; pallial sinus deep; white, some suffused pink over umbones.

Distribution : India : Andhra Pradesh, Goa, Karnataka, Kerala, Orissa, Tamil Nadu;

Elsewhere : Gulf of Aden, Sri Lanka, Myanmar, Australia, Philippines, Japan.

Genus *Tapes* Megerle, 1811

1811. *Tapes* Megerle, *Mag. Ges. Nat. Fr. Berlin*, **5** : 51.

Type species : *Venus literata* Linnaeus, 1758.

Subgenus *Ruditapes* Chiamenti, 1900

1900. *Ruditapes* Chiamenti, *Riv. Ital. Sci. nat. Siena*, **20** : 13.

Type species : *Venus decussata* Linnaeus; subsequent designation, Dall, 1902.

Tapes (Ruditapes) bruguieri (Hanley)

1845. *Venus bruguieri* Hanley, *Proc. zool. Soc. Lond.*, **1845** : 21.

Material examined : i) 17 valves, Between Dolphin Nose and Scandal point, Visakhapatnam, 17/01/1916, Coll. H. Hosten; ii) 13 valve, Bheemunipatnam, Visakhapatnam, 22/02/1947, M 21455/4, iii) 1 valve, Palm beach, Visakhapatnam, Feb. 1947, Coll. K.B. Rao and Party; iv) 21 valves, Bheemunipatnam, Visakhapatnam, Coll. J. Woodmason; v) 6 ex., 7 valves, Rocky coast, Visakhapatnam, M 20995/4, vi) 2 valves, Kakinada, 29/05/1955, Coll. ?; vii) 10 exs., 6 valves, Visakhapatnam, 05/03/1966, M 21048/4, viii) 10 ex., Opposite Jalaripet hut, Visakhapatnam, 06/03/1966, ix) 9 ex., Rishikunda, Visakhapatnam, 09/03/1966, M 21047/4, x) 2 ex., 10 valves, Between Dolphin Nose and Scandal point, Visakhapatnam, 10/03/1966; Coll. A. S. Rajagopal and Party; xi) 1 ex., Chinnatapally, Vizianagaram, 02/03/2001, Coll. S. Barua and Party.

Measurements (in mm) :

Length	Width	Depth
34.60–30.10	21.00–18.70	13.95–11.45

Diagnosis : Shell medium upto 40 mm, elongately sub ovate, oblong; umbo anterior, beak well in front of mid line; anterior end narrow rounded, posterior dorsal sloping gently, posterior end rather high, roundly truncated; sculpture with numerous radial riblets, interrupted by growth lines; cream or beige with rosy umbonal region, fur with dark brown radiating lines; inner white or rosy; pallial sinus well developed more than half of length of shell.

Distribution : India : Andhra Pradesh.

Elsewhere : Indo-Pacific.

Family GLAUCONOMIDAE

Genus *Glaucanome* Gray, 1828

1828. *Glaucanome* Gray, *Spicil. Zool.*, p. 6.

Type species : *Glaucanome chinensis* Gray, 1828

Glaucanome sculpta Sowerby

1894. *Glaucanome sculpta* Sowerby, *Proc. malac. Soc. Lond.*, **1** : 40.

Material examined : i) 1 valve, Machilipatnam, Visakhapatnam, 06/12/1964, Coll. N.V. Subba Rao and Party; ii) 1 valve, Kakinada bay, 12/04/2000, Coll. Ramakrishna and Party.

Measurements (in mm) :

Length	Width	Depth
42.50	19.10	

Diagnosis : Shell elongately-oblong, with short anterior end and angularly attenuated posterior end; sculpture with fine concentric striae and growth lines, but eroded at the umbonal region; light greenish straw colour.

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

Elsewhere : Bay of Bengal.

Order MYOIDA

Suborder MYININA

Superfamily MYOIDEA

Family CORBULIDAE

Genus *Corbula* Bruguiere, 1797

1797. *Corbula* Bruguiere, *Encycl. Meth.*, **2** : pl. 230.

Type species : *Corbula sulcata* Lamarck; subsequent designation, Schmidt, 1818.

Corbula tunicata (Hinds)

1843. *Corbula tunicata* Hinds, *Proc. zool. Soc. Lond.*, **1843** : 55.

Material examined : i) 1 valve, Suryalanka, Chirala, 29/04/2000, Coll. S.C. Mitra and Party.

Measurements (in mm) :

Length	Width	Depth
13.40	10.25	—

Diagnosis : Shell elongate, rostrate; sculpture more prominent; umbonal region depressed and right angles to the hinge line.

Distribution : India : Andhra Pradesh.

Elsewhere : Indo-Pacific.

Suborder PHOLADINA

Superfamily PHOLADOIDEA

Family PHOLADIDAE

Key to the genera

Pedal gape closed by callum; protoplax absent; shell without umbonal-vertical groove
..... ***Pholas*** Linnaeus

Pedal gape not closed by callum; protoplax present; shell with umbonal-vertical groove
..... ***Martesia*** Sowerby

Subfamily PHOLADINAE

Genus ***Pholas*** Linnaeus, 1758

1758. *Pholas* Linnaeus, *Syst. Nat.*, ed 10 : 669.

Type species : *Pholas dactylus* Linnaeus; subsequent designation, Children, 1822

Pholas orientalis Gmelin

1791. *Pholas orientalis* Gmelin, *Syst. Nat.*, ed. 13 : 3216.

Material examined : i) 26 valves, Manginipudi, Machilipatnam, Visakhapatnam, 07/12/1964, ii) 1 valve, Bandar Canal, Machilipatnam, Visakhapatnam, 07/12/1964, iii) 10 valves, Kakinada, 19.11.1964, iv) 6 valves, Vadarevu beach, Chirala, 20/12/1964, Coll. N.V. Subba Rao and Party; v) 3 valves, Kakinada 29/05/2000, vi) 2 valves, Kakinada bay, 12/04/2001, vii) 8 valves, Manginipudi, Machilipatnam, Visakhapatnam, 15/04/2001, Coll. Ramakrishana and Party; viii) 1 valve, Suryalanka, Chirala, 19/04/2001, Coll. S.C. Mitra and party; ix) 8 valves, Krishnapatnam, Nellore, 15/02/2002, viii) 5 valves, Maypadu, Nellore, 16/02/2002, ix) 1 valve, Mahalakshimpuram, 17/02/2002, Coll. S. Barua and Party.

Measurements (in mm) :

Length	Width	Depth
141.80–22.40	38.80–8.50	–

Diagnosis : Shell large, equivale, elongately-subovate, broadest across umbone and tapering posteriorly; sculpture with strong, nodular radial ribs crossed by the concentric ridges from anterior to middle region, but smooth or pustulose posterior end; white.

Distribution : India : Andhra Pradesh, Andaman and Nicobar Islands, Goa, Maharashtra, Orissa, Tamil Nadu.

Elsewhere : Indo-Pacific.

Subfamily MARTESINAE

Genus *Martesia* (Leach MS) G.B. Sowerby, 1824

1824. *Martesia* (Leach MS) G.B. Sowerby, *Gen. Shells*, (23) *Pholas* : 2, 4.

Type species : *Pholas clavata* Lamarck = *Pholas striata* Linnaeus, 1758.

Martesia striata (Linnaeus)

1758. *Pholas striata* Linnaeus, *Syst. Nat.* ed 10 : 669.

Material examined : i) 10 ex., Vadarevu beach, Chirala, 18/04/2000, Coll. S.C. Mitra and Party; ii) 11 ex., Krishnapatnam, Nellore, 15/02/2002, Coll. S. Barua and Party.

Measurements (in mm) :

Length	Width	Depth
22.55–15.00	13.10–9.00	12.40–8.80

Diagnosis : Shell small, elongate, gaping anteriorly, beaked; divided by a weak umbonal-ventral groove; anterior with closely spaced, serrated, concentric ridges; posterior with widely spaced smooth concentric ridges; mesoplax subcircular without regular sculpture.

Distribution : India : Andhra Pradesh, Goa, Karnataka, Kerala, Orissa, Tamil Nadu.

Elsewhere : Gulf of Aden, Sri Lanka, Myanmar, Australia, Philippines, Japan.

Family TEREDINIDAE

Key to the subfamilies

- Pallets segmented BANKIINAE
 Pallets non segmented TEREDININAE

Subfamily TEREDININAE

Key to the genera

- Pallets composed of numerous segments *Bankia* Gray
 Pallet single solid piece, not divided into segments *Dicyathifer* Iredale

Genus ***Bactronophorus*** Tapparone-Canefri, 1877

1877. *Bactronophorus* Tapparone-Canefri, *Ann. Mus. Stor. Nat. Geneva*, **9** : 290.

Typespecies : *Teredo thoracites* Gould, 1862.

Bactronophorus thoracites (Gould)

1856. *Teredo thoracites* Gould, *Proc. Boston Soc. nat. Hist.*, **6** : 15, plt. 65, figs. 1-6.

Material examined : i) 11 exs., Uppateru, Kakinada 14.12.1964, Coll. N.V. Subba Rao and Party.

Diagnosis : In adult the dorsal portion of anterior slope with disc and posterior portion eroded; internally the auricles from a shelf where the disc overlaps; apophysis arising from shelf from the junction slope and disc. Pallet corneous, asymmetric, basal portion almost triangular with a shallow cup, pustulose, dagger like extension.

Distribution : India : Andaman and Nicobar Islands, Andhra Pradesh, Maharashtra, Orissa, West Bengal.

Elsewhere : Indo-Pacific.

Genus ***Dicyathifer*** Iredale, 1932

1932. *Dicyathifer* Iredale in Johnson and McNeill, *Destr. Timber Port of Sydney*, p. 28.

Type species: *Teredo manni* Wright in Calman, 1920.

Dicyathifer manni (Wright)

1866. *Kuphus manni* Wright, *Trans. Linn. Soc. Lond.*, **25**(3) : 565, pl. 65, figs. 1-6.

Material examined : i) 12 exs., Madkana, Uppateru, Kakinada, 14.12.1964, M 22186/4, ii) 12 exs., Uppateru, Kakinada, 15.12.1964, M21827/4, Coll. N.V. Subba Rao and Party.

Diagnosis : Shell triangular with broad dorsal margin; anterior portion of the disc well developed with narrow median and posterior portion. Pallet large, heavy, calcareous and almost triangular. The inner face of blade flat, outer face convex, outer margin U shaped and inner margin straight and slightly curved.

Distribution : India : Andaman Islands, Andhra Pradesh, Kerala, Maharashtra, Orissa, Tamil Nadu, West Bengal.

Elsewhere : Indo-Pacific.

Subfamily BANKIINAE

Key to the genera

Blade elongate, segments septated as distinct cones ***Bankia*** Gray

Blade broadly oval or elongated, segments fused, sometimes with a papillose calcareous incrustation on the distal end..... ***Nototeredo*** Bartsch

Genus ***Bankia*** Gray, 1842

1842. *Bankia* Gray, *Syn. Cont. Brit. Mus.*, ed. 42 : 150.

Type species : *Teredobipalmulata* Lamarck; subsequent designation, Gray, 1847.

Bankia campanellata Moll and Roch

1931. *Bankia campanellata* Moll and Roch, *Proc. malac. Soc. Lond.*, 19(4) : 215, pl. 25.

Material examined : i) 12 exs., Biravapalem Yaman, 28.11.1964, M 23063/4, ii) 64 exs., Patapoguru, Uppateru, Kakinada, 06/12/1964, M 21835/4, iii) 14 exs., Uppateru, Kakinada, 07/12/1964, M 21846/4, iv) 25 exs., Uppateru, Kakinada, 11/12/1964, M.23059/4, Coll. N.V. Subba Rao and Party.

Diagnosis : Shell ridge extended from umbo to ventral margin and also from anterior disc; auricle well developed; apophyses blade, like curved; pallets with a series of spaced cones, calcareous portion of cone funnel shaped periostracal margin wide, flattened, bell shaped with a central notch in the margin of outer surface.

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

Elsewhere : Indo-Pacific.

Bankia carinata (Gray)

1827. *Teredo carinata* Gray, *Phil. Mag.*, (N.S.) 2 : 411.

Material examined : i) 10 exs., Uppateru, Kakinada, 07/12/1964, Coll. N.V. Subba Rao and Party.

Diagnosis : Shell small, median disc well marked; ribs on anterior lobe close and with coarse sculpture; pallets with a series of cones arranged on a central disc; calcareous portion U shaped and covered with brown periostracum and both the faces of margin with comb like serration; stalk of cone funnel shape, periostracal margin wide, flattened, bell shaped with a central notch in cylindrical and long.

Distribution : India : Andhra Pradesh, Kerala, Maharashtra, Tamil Nadu, West Bengal;

Elsewhere : Indo-Pacific.

Genus ***Nototeredo*** Bartsch, 1923

1923. *Nototeredo* Bartsch, *Proc. Biol. Soc. Washington*, 36 : 100.

Type species : *Teredo (Nototeredo) edax* Hedley, 1895.

***Nototerredo knoxi* (Bartsch)**

1917. *Teredo (Psiloteredo) knoxi* Bartsch, *Bull. U.S. nat. Mus.*, 122 : 51, pl. 29, fig. 2, pl. 34, fig. 2.

Material examined : i) 3 exs., Uppateru, Kakinada, 07/12/1964, Coll. N.V. Subba Rao and Party.

Diagnosis : Pallets leaf shaped; small depression at the tip of the blade. Stalk slender and short extends through the centre of the blade just like a median rib of a leaf.

Distribution : India : Andhra Pradesh, Maharashtra, Tamil Nadu, West Bengal.

Elsewhere : Indo-Pacific.

Subclass ANOMALOCARDIA

Order PHOLADOMYOIDA

Superfamily PANDOROIDEA

Family LATERNULIDAE

Genus ***Laternula*** Roeding, 1798

1798. *Laternula* Roeding, *Mus. Bolten.*, p. 155.

Type species : *Laternula anatina* Roeding = *Solen anatinus* Linnaeus; subsequent designation, Gray, 1847.

***Laternula anatina* (Linnaeus)**

1758. *Solen anatinus* Linnaeus, *Syst. Nat.*, ed. 10 : 673.

Material examined : i) 1 ex., Krishnapatnam, Nellore, 15/02/2002, Coll. S. Barua and Party.

Diagnosis : Shell elongately oblong, thin; umbo anterior; anterior dorsal margin straight; posterior dorsal concave; ventral margin almost straight; anterior end rounded with straight square; posterior end with a large gape.

Distribution : India : Andhra Pradesh.

Elsewhere : Indo-Pacific.

Superfamily CLAVAGELLOIDEA

Family CLAVAGELLIDAE

Genus ***Penicillus*** Bruguiere, 1789

1789. *Penicillus* Bruguiere, *Encycl. Meth. Vers.*, (1)15 : 126.

Type species : *Penicillus javanus* Bruguiere = *Serpula penis* Linnaeus; subsequent designation, Habe, 1952

***Penicillus penis* (Linnaeus)**

1758. *Serpula penis* Linnaeus, *Syst. Nat.*, ed. 10 :

Material examined : i) 2 exs., (broken), Chinnatapally, Vizianagaram, 02/05/2001, Coll. S. Barua and Party.

Diagnosis : Shell elongated, tubular, both valves fused into a tube and visible just above the multiperforate end; siphonal third of tube with pleated ruffles at irregular intervals; perforate end fringed.

Distribution : India : Andhra Pradesh.

Elsewhere : Indo-Pacific.

Remarks : These animals lives embedded in sand with the multiperforate end downwards. Lives in excavated burrows in rock or coral with only tube projecting. They may over look because of its rock boring habit and reduced shells.

Class SCAPHOPODA

Order DENTALIIDA

Family DENTALIIDAE

Genus *Dentalium* Linnaeus, 1758

1758. *Dentalium* Linnaeus, *Syst. Nat.*, ed. 10 : 785.

***Dentalium octangulatum* Donovan**

1804. *Dentalium octangulaqum* Donovan, *Nat. Hist. Brit. Shells*, 5 : pl. 162.

Material examined : i) 2 exs., Ravanappasalov, 22/02/2002, Coll. S. Barua and Party.

Measurements (in mm) :

Length	Width
13.10–12.50	2.60–2.30

Diagnosis : Shell solid upto 30 mm, rapidly increasing in diameter, curvature almost constant. Body with 8 strong ribs, spaces between ribs concave, flat or even slightly convex.

Distribution : India : Andhra Pradesh.

Elsewhere : Indo-West Pacific.

***Dentalium subfolium* Nevill**

1926. *Dentalium subfolium* Nevill, *Mem. Soc. H.N. Paris*, 2(2) : 352.

Material examined : i) 1 ex., Maypadu, Nellore, 16/02/2002, Coll. S. Barua and Party.

Measurements (in mm) :

Length	Width
22.60	2.30

Diagnosis : Shell upto 25 mm, solid, glossy, gradually increasing in diameter; sculpture with 12 low, flat topped ribs with a riblet, interspace concave.

Distribution : India : Andhra Pradesh, Andaman Islands.

Elsewhere : Philippines.

Subgenus *Lentigodentalium* Habe, 1963

1963. *Lentigodentalium* Habe, *Bull. Natn. Sci. Mus.*, **6** : 258.

Type species : *Dentalium variabile* Deshayes.

Dentalium (Lentigodentalium) variabile Deshayes

1926. *Dentalium variabile* Deshayes, *Mem. Soc. H.N. Paris*, **2**(2) : 352.

Material examined : i) 1 ex., Mahalakshimpuram, Nellore, 17.02.2002, Coll. S. Barua and Party.

Measurements (in mm) :

Length	Width
10.00	1.45

Diagnosis : Shell upto 25 mm, solid, glossy, gradually increased in diameter; sculpture with 12 low, flat topped ribs with a riblet, interspace concave.

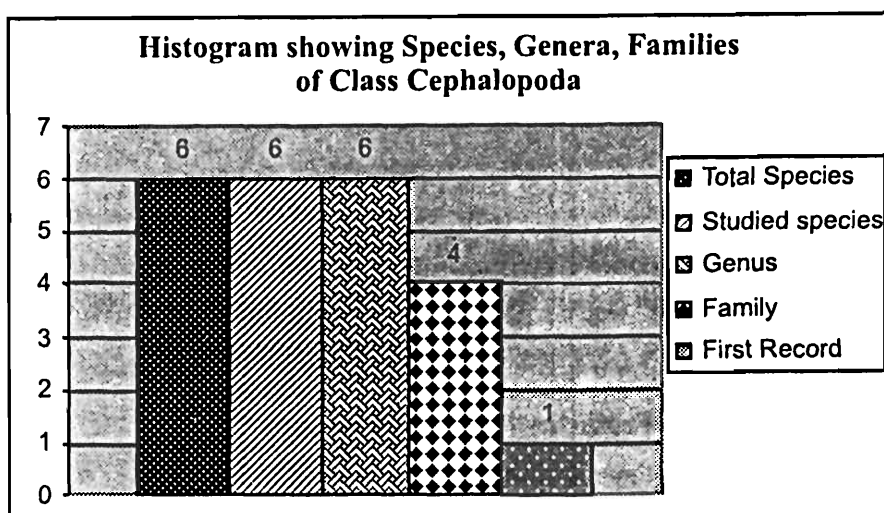
Distribution : India : Andhra Pradesh, Andaman Islands, West Bengal.

Elsewhere : Japan, Philippines.

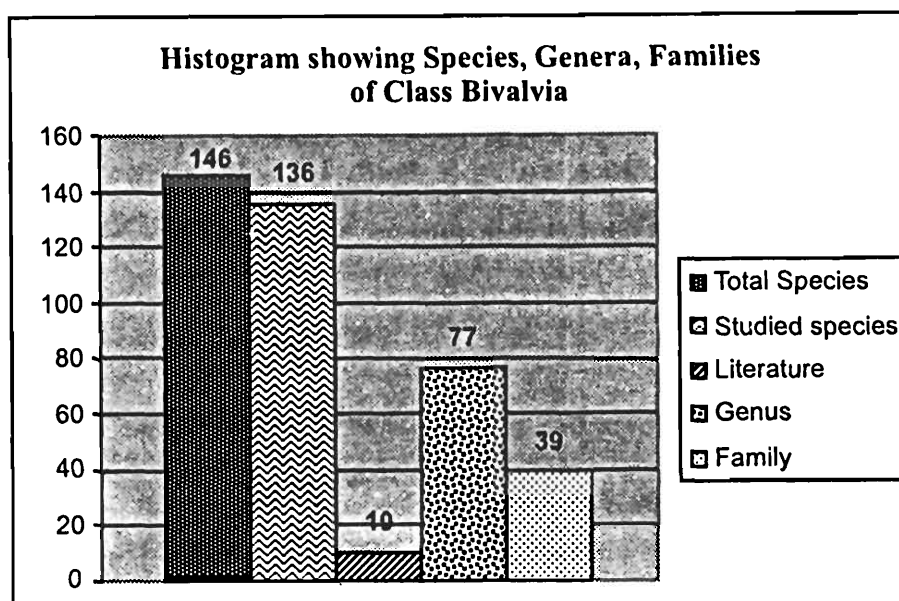
SUMMARY AND DISCUSSION

Total number of species of bivalves, cephalopods and scaphopods occurring in Andhra Pradesh is 155. Out of these 6 species of cephalopods representing 6 genera and 4 families. Bivalves representing by 146 species belongs to 77 genera and 39 families; whereas scaphopods are represented by 3 species under single genus and family.

Class Cephalopoda representing 6 species under 6 genera of which one species *Sepiella inermis* Ferrussac and d' Orbigny is recorded for the first time from the state.

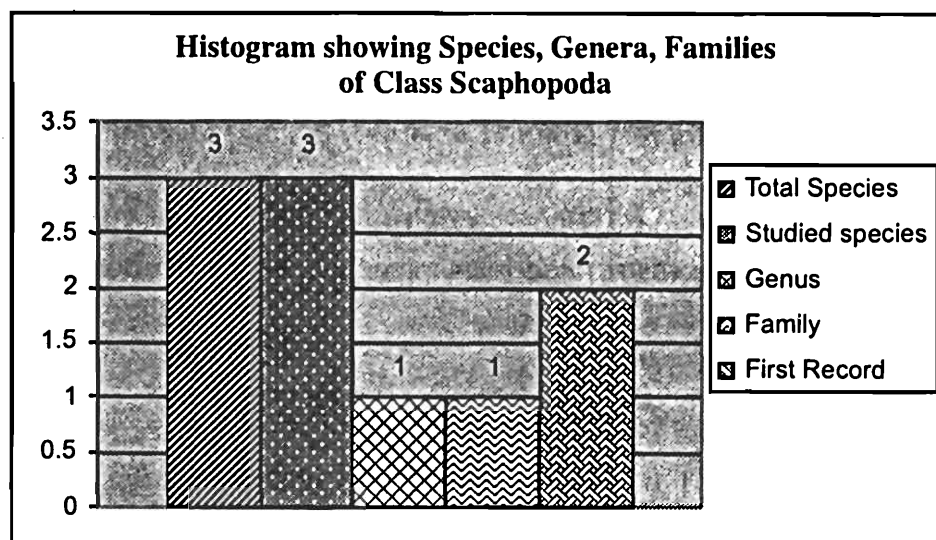


Class Bivalvia represented by 146 species, out of which 10 species recorded from literature only. Out of 136 species studied 56 reported for the first time from Andhra Pradesh of which about 41.16% of the studied species.

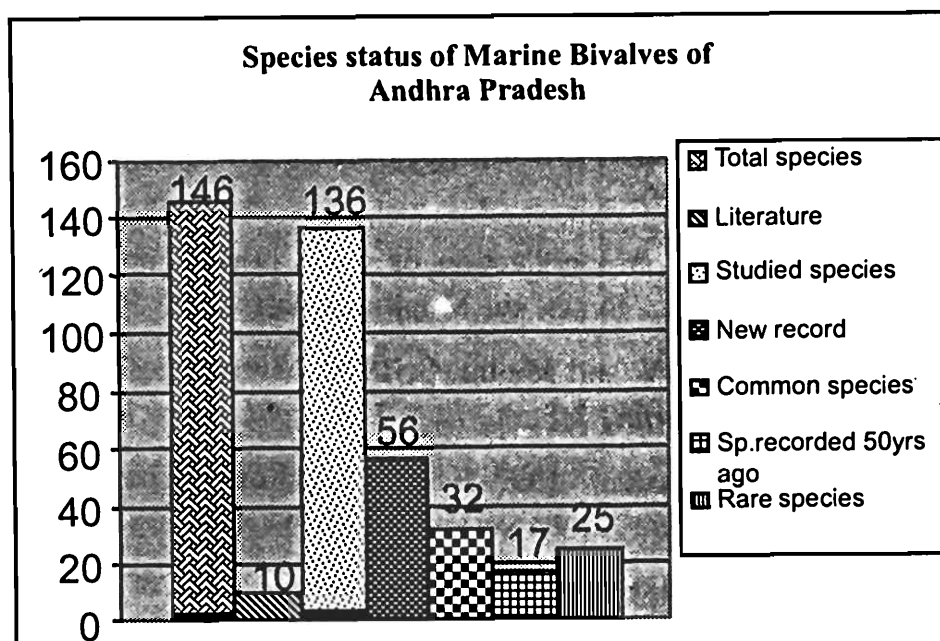


Class Scaphopoda represented by three species of which two recorded for the first time from Andhra Pradesh.

The species namely *Barbatia obliquata* (Wood), *Arca rhombea* (Born), *Arca (Scapharca) deyrollei* Jousseaume, *Arca (Scapharca) inaequalis* (Bruguiere), *Perna viridis* (Linnaeus), *Crassostrea cuttackensis* (Newton and Smith), *Saccostrea cucullata* (Born), *Anomia achaeus* Gray, *Placuna placenta* Linnaeus, *Cardites bicolor* (Lamarck), *Acanthocardia coronata* (Schroeter), *Acanthocardia lata* (Born), *Trachycardium asiaticum* (Bruguiere), *Macra luzonica* Deshayes, *Macra mera* Deshayes, *Macra (Macrinula) laevis* Chemnitz, *Macra (Macrinula) plicataria* Linnaeus, *Tellina (Moerella) philippinarum* Hanley, *Apolymetis edentula* (Spengler), *Donax pulchella* Hanley, *Donax (Hecuba) scortum* (Linnaeus), *Donax (Latona) cuneatus* Linnaeus, *Gafrarium divaricatum* (Gmelin), *Sunetta meroe* (Linnaeus), *S. scripta* (Linnaeus),



Meretrix casta (Gmelin), *Meretrix meretrix* (Linnaeus), *Marcia pinguis* (Schroeter), *Paphia undulata* (Born), *Paphia (Protapes) malabarica* (Schroeter), *Tapes (Ruditapes) brugueri* (Hanley), *Pholas orientalis* Gmelin found very common throughout the coast of the state, which forms 20.65% of the recorded species. The species like *Noetia martinni* (Reeve), *Glycymeris lividus* (Reeve), *Septifer bilocularis* (Linnaeus), *Amygdalum watsoni* (E.A. Smith), *Amusium pleruonectes* (Linnaeus), *Lima fragile* (Gmelin), *Lima lima* (Linnaeus), *Chama isotoma* Conrad, *Mytilopsis adamsi* Morrison, *Periglypta crispata* (Deshyaes), *Gafrarium pectinatum* (Linnaeus), *Gafrarium tumidum* Roeding, *Sunetta donacina* (Gmelin), *Sunetta*



effosa (Hanley), *S. kurachensis* Sowerby, *S. perexcavata* Fulton and *Callista nivea* Hanley recorded more than 50 years ago, not recorded recently, which is 13.70% of the recorded species from the state. The species namely: *Cucullaea (C.) concumorta* Martini, *C.(C.) labiata* (Lighrfoot), *Modiolus metcalfei* Hanley, *Pinna bicolor* Gmelin, *Anomia lactea*, *Anodontia edentula* (Linnaeus), *Chama brassica* Reeve, *Eucrassatella frostrata* (Lamarck), *Macra attenuata* Deshayes, *Solen brevis* Preston, *Tellina (Angulus) lanceolata* Gmelin, *Tellina*

(*Dallitellina*) *rostrata* Linnaeus, *Tellina* (*Serratina*) *capsoides* Lamarck, *Gari* (*Psammobia*) *pulchella* Lamarck, *G. (P.) weinkauffi* (Crosse), *Sanguinolaria* (*Soletellina*) *lunalata* (Deshayes), *Trapexium* (*Neotrapezium*) *sublaevigatum* (Lamarck), *Meiocardia lamarckii* Reeve, *Sunetta perexcavata* Fulton, *Pitar alabastrum* (Reeve), *Paphia* (*Protapes*) *cor* (Sowerby), *Dosinia fibula* (Reeve), *Corbula tunicata* (Hinds), *Laternula subrostrata* Lamarck and *Penicillus penis* (Linnaeus) are scarcely distributed (rare) species, which is about 16.13% of recorded species.

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