

STATE FAUNA SERIES 4

# FAUNA OF MEGHALAYA

**PART 8**

(MOLLUSCA)

ZOOLOGICAL SURVEY OF INDIA

1995

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*Edited by*

The Director, Zoological Survey of India, Calcutta



सत्यमेव जयते

ZOOLOGICAL SURVEY OF INDIA

1995

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# FAUNA OF MEGHALAYA

## PART - 8

### (MOLLUSCA)

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## **MOLLUSCA**

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### **INTRODUCTION**

**Meghalaya**, which includes the Garo, Khasi and Jaintia hills, is bordered by the Himalayas to the north and the Naga and Manipur hills to the east and is a fine example of upward wrap. The Khasi and Jaintia hills are at a higher alleviation than the Garo hills. The Shillong peak situated at an altitude of 1967 mtrs. is the highest point in the Khasi hills. Moryngksih in the Jaintia hills is at 1631 mtrs. followed by Nokrek at an altitude of 1515 mtrs. in Tura range of the Garo hills. The difference in altitude results in appreciable differences in the climate thereby influencing the flora and fauna in different habitats within the state. The mountain system stretching from central Garo hills in the west to the Mikir hills in the east comprises perhaps the oldest geological formation in north-east India.

All the wide and fast flowing rivers such as Simsang (Someswari) in the Garo hills, Myngnot and Umian in the Khasi and Jaintia hills run northerly or southerly to join the Brahmaputra and its tributaries. Besides these rivers, numerous small streams, several water falls and a few lakes, enhance the scenic beauty of the hilly tracts.

Meghalaya or 'abode of clouds' is enveloped by a thick mantle of cloud and mist from late April to late September and the rainfall is measured in feet rather than in inches. The exceptional rainfall of Cherrapunji, once known as the heaviest, during the south-east monsoon is partly due to the physical configuration of the hills. The climate is favourable for the growth of rich vegetation, which in its turn provides ideal habitats for the land molluscs to thrive. About thirty five percent of the area of the state is under forest. In the northern tract of the state, slash and burn system has resulted in a drastic reduction in the forest cover but, in the south fruit crops are commercially cultivated to provide a more permanent green cover.

The present work is based on the named and unnamed material present in the National Zoological Collections of Zoological Survey of India and also on the records mentioned in the Fauna of British India : Mollusca by Blanford and Godwin-Austen (1908) and Gude (1914, 1921). The classification followed here is adopted from Subba Rao (1989) for freshwater molluscs and that of Taylor and Sohl (1962) for land molluscs.

#### **A glimpse of earlier works**

Benson (1813-1870) was the first author to describe new species of land molluscs from Meghalaya. He described 22 new species under 12 families of which 10 species are restricted endemic to Meghalaya. Blanford (1832-1905) described 13 species under 9 families of which 10 species are restricted endemic to Meghalaya.

Our knowledge on the early collections and studies of land molluscs from Meghalaya is limited. Some informations are however, available from Blanford (1868). While bulk of the material studied by Benson (1851, 1857, 1859a, 1859b) came from the collections made by W. Theobald in the year 1856, some of the species were collected by J. T. Pearson, H.H. Godwin-Austen and

also Benson himself. Blanford's studies (Blanford, 1862, 1865, 1868, 1870), were primarily based on collections made by H.H. Godwin-Austen, though it also included a few of W. Theobald's collections. Major contributions to our knowledge on Meghalaya molluscs were by Godwin-Austen (1834-1932) who made collections from the Garo and Khasi hills. He described 59 species (Godwin-Austen, 1870, 1875, 1876, 1892, 1893, 1922 and Godwin-Austen & Beddome, 1894) under different families like Cyclophoridae, Diplommatinidae, Corillidae, Helicarionidae, Subulinidae, Ariophantidae etc. In addition, Blanford & Godwin-Austen (1908), Godwin-Austen (1882-1888), Gude (1914, 1921) and Nevill (1878) are major contributors, who added to our knowledge on the molluscs of the north-eastern region.

Forty-five species of land molluscs described by Godwin-Austen are restricted endemic to Meghalaya. Interestingly out of a total of 188 species reported by different authors from Meghalaya, 153 species of land molluscs are described by the three malacologists mentioned above (Godwin-Austen, 81; Benson, 49 and Blanford, 23). Most of the species described by them as new to science were tiny. Some types and other material studied by Benson are in the possession of British Museum and U.S. National Museum, whereas Blanford's collections are preserved in British Museum and a few in Cardiff Museum. The entire material studied by Godwin-Austen including types described by him are now in the possession of British Museum. Out of a total of 81 species reported by Godwin-Austen we could physically examine only 31 species and the rest are included on the basis of his published works. With regard to Benson and Blanford, the position is better as we could examine material belonging to 39 and 11 species respectively. A total of 71 species described by these three authors were not examined by us.

As remarked earlier, being smaller in size these are prone to be overlooked in a general faunistic survey. Land molluscs are represented by small populations and are quite sensitive to habitat changes. A few of the species might have become extinct. However it is difficult to ascertain the status of the species for which we do not have any collection for study.

### SYSTEMATIC LIST

#### A. FRESHWATER MOLLUSCS

- |   |                               |                               |
|---|-------------------------------|-------------------------------|
| Class                                       | Gastropoda                    |                               |
| Order                                       | Mesogastropoda                |                               |
| Family                                      | Viviparidae                   |                               |
| Genus                                       | <i>Bellamyia</i>              | Jousseaume                    |
| 1. <i>Bellamyia bengalensis</i>             | f. <i>typica</i> (Lamarck)    | EKH, SGH, WGH                 |
|   | f. <i>annandalei</i> (Kobelt) | EGH, EKH, JH, WGH             |
|   | f. <i>balteata</i> (Benson)   | RB, SGH, WGH                  |
| 2. <i>B. crassa</i> (Benson)                |                               | JH, WGH                       |
| 3. <i>B. dissimilis</i> (Mueller)           |                               | WGH                           |
|   | Genus <i>Cipangopaludina</i>  | Hannibal                      |
| 4. <i>Cipangopaludina lecythis</i> (Benson) |                               | RB                            |
|   | Family                        | Pilidae                       |
|   | Genus                         | <i>Pila</i> Roeding           |
| 5. <i>Pila globosa</i> (Swainson)           |                               | SGH                           |
| 6. <i>P. theobaldi</i> (Hanley)             |                               | EGH, JH, RB, SGH, WGH         |
|   | Family                        | Bithyniidae                   |
|   | Genus                         | <i>Digoniostoma</i> Annandale |

7. *Digoniostoma cerameopoma* (Benson) WGH  
 Family Thiariidae  
 Genus *Thiara* Roeding  
 Subgenus *Thiara* s.str.
8. *Thiara (Thiara) scabra* (Mueller) SGH, WGH  
 Subgenus *Tarebia* H. & A. Adams
9. *Thiara (Tarebia) granifera* (Gray) EKH, WGH
10. *T. (T.) lineata* (Gray)  
 Subgenus *Melanoides* Olivier
11. *T. (Melanoides) tuberculata* (Mueller) RB, WGH  
 Genus *Brotia* H. & A. Adams  
 Subgenus *Antimelania* Crosse and Fischer
12. *Brotia (Antimelania) costula* (Rafinesque) EGH, JH, RB, SGH, WGH, WKH  
 Genus *Paludomus* Swainson
- \*13. *Paludomus abbreviata* Reeve WGH
- \*14. *P. acuta* Reeve WGH
- \*15. *P. globulosa* (Gray) WGH
- \*16. *P. nodulosa* (Dohm) WGH  
 Subgenus *Paludomus* s. str.
17. *P. (Paludomus) blanfordiana* Nevill RB, SGH, WGH
18. *P. (P.) conica* (Gray) var. *kopiliensis* Nevill EGH, JH, RB, SGH, WGH, WKH
- \*19. *P. (P.) pustulosa* Annandale EGH
20. *P. (P.) regulata* Benson EKH, SGH
21. *P. (P.) reticulata* Blanford WGH
22. *P. (P.) stephanus* (Benson) JH  
 Order Basommatophora  
 Family Lymnaeidae  
 Genus *Lymnaea* Lamarck  
 Subgenus *Pseudosuccinea* Baker
23. *Lymnaea (Pseudosuccinea) acuminata*  
 f. *typica* Lamarck EKH, JH, RB  
 f. *gracilior* Martens EKH  
 f. *chlamys* Benson EKH, JH, RB  
 f. *rufescens* Gray EKH, RB, WGH  
 Family Ancyliidae  
 Genus *Ferrissia* Walker
24. *Ferrissia verruca* (Benson) EKH, WKH  
 Genus *Gyraulus* Charpentier
25. *Gyraulus convexiusculus* (Hutton) RB  
 Family Planorbidae  
 Genus *Indoplanorbis* Annandale & Prashad

26. *Indoplanorbis exustus* (Deshayes) EGH, WGH  
 Class Bivalvia  
 Order Unionoida  
 Family Unionidae  
 Genus *Lamellidens* Simpson
27. *Lamellidens corrianus* (Lea) EGH, JH  
 28. *L. marginalis* (Lamarck) WGH  
 Genus *Parreysia* Conrad  
 Subgenus *Parreysia* s.str.
29. *Parreysia (P.) favidens* (Benson) EKH, WGH, WKH  
 Subgenus *Radiatula* Simpson
30. *P. (Radiatula) caerulea* (Lea) EGH, WGH  
 31. *P. (R.) occata* (Lea) WGH  
 32. *P. (R.) olivaria* (Lea) WGH  
 33. *P. (R.) pachysoma* (Benson) EGH  
 Order Veneroida  
 Family Corbiculidae  
 Genus *Corbicula* Megerle von Muehlfeld
34. *Corbicula striatella* Deshayes JH  
 Family Pisidiidae  
 Genus *Pisidium* Pfeiffer
35. *Pisidium atkinsonianum* Theobald EKH, JH

## B. LAND MOLLUSCS

- Order Archaeogastropoda  
 Family Helicinidae  
 Genus *Pleuropoma* Moellendorff
36. *Pleuropoma arakanensis* Blanford SGH  
 Order Mesogastropoda  
 Family Cyclophoridae  
 Genus *Alycaeus* Gray  
 Subgenus *Alycaeus* s. str.
37. *Alycaeus (Alycaeus) conicus* Godwin-Austen EKH, WKH  
 \*38. *A. perplexus* Godwin-Austen EKH, WKH  
 39. *A. pusillus* Godwin-Austen EKH, WKH  
 Subgenus *Chamalycaeus* Kobelt & Moellendorff
- \*40. *A. (Chamalycaeus) canaliculus* Godwin-Austen EKH, WKH  
 \*41. *A. (C) nitidus* Blanford EKH, WKH  
 42. *A. (C) sculptilis* Benson EKH, WKH  
 Subgenus *Dicharax* Kobelt & Moellendorff
- \*43. *A. (Dicharax) birugosus* Godwin-Austen EKH, JH, WKH  
 44. *A. (D) crenatus* Godwin-Austen EKH, WKH

45. *A. (D.) crispatus* Godwin-Austen EKH, WKH  
     \*var. *makarsae* Godwin-Austen SGH, WGH  
     \*var. *rywukensis* Godwin-Austen
- \*46. *A. (D.) habiangensis* Godwin-Austen WKH  
     \*var. *minimus* Godwin-Austen EGH, WKH
47. *A. (D.) hebes* Benson EKH, WKH  
     EGH, SGH, WGH, WKH
48. *A. (D.) jainticus* Godwin-Austen JH
49. *A. (D.) khasiacus* Godwin-Austen EKH, WKH
- \*50. *A. (D.) mangutensis* Godwin-Austen JH
51. *A. (D.) nongtunensis* Godwin-Austen JH
- \*52. *A. (D.) obscurus* Godwin-Austen EKH
53. *A. (D.) prosectus* Benson EKH, SGH, WKH
- \*54. *A. (D.) teriaensis* Godwin-Austen WKH
55. *A. (D.) theobaldi* Blanford EKH, WKH  
     var. *solida* Godwin-Austen EGH, SGH, WGH  
     Subgenus *Cycloryx* Godwin-Austen
- \*56. *A. (Cyclorynx) generosus* Godwin-Austen EKH, WKH
57. *A. (C.) graphicus* Blanford WGH
58. *A. (C.) otiphorus* Benson EKH, WKH  
     Genus *Dioryx* Benson
59. *Dioryx umula* Benson EKH, WKH  
     \*var. *pisum* Godwin-Austen JH  
     Genus *Cyclophorus* Montfort  
     Subgenus *Cyclophorus* s.str.,
60. *C. affinis* Theobald RB, SGH  
     Subgenus *Glossostylus* Kobelt and Moellendorff
61. *C. bensoni* (Pfeiffer) EKH, WKH
62. *C. himalayanus* Pfeiffer EKH, WKH
63. *C. pearsoni* (Benson) EKH, JH, RB, SGH, WGH, WKH  
     \*var. *fuscicolor* Nevill EKH, WKH
- \*64. *C. stenomphalus* Pfeiffer EKH, WKH  
     Subgenus *Salpingophorus* Kobelt & Moellendorff
65. *C. (Salpingopherus) fultoni* Godwin-Austen EKH, WKH
66. *C. (S.) khasiensis* Nevill WKH
- \*67. *C. (S.) sublaevigatus* Blanford var. *assamensis* Nevill EKH, WKH,
68. *C. (S.) zebrinus* Benson EKH, WKH  
     Genus *Cyathopoma* Blanford  
     Subgenus *Pseudojerdonia* Kobelt
69. *Cyathopoma (Pseudojerdonia)*  
     *garoense* Godwin-Austen WGH
70. *C. (P) jawaiense* Godwin-Austen JH

- \*71. *C. (P) nevilli* Godwin-Austen EKH, WKH  
 Genus *Lagochilus* Blanford
72. *Lagochilus tomotrema* Benson EKH, WKH  
 Genus *Leptopoma* Pfeiffer
73. *Leptopoma aspirans* Benson EKH, WKH  
 Genus *Pearsonia* Kobelt
74. *Pearsonia assamensis* (Fulton) EKH
75. *P. hispidum* Pearson EKH, SGH, WGH, WKH  
 Genus *Pterocyclus* Benson
- \*76. *Pterocyclus albersi* Pfeiffer WKH
77. *P. parvus* Pearson EKH, RB, SGH, WGH  
 \* *var. assamensis* Hanley & Theobald EKH, WKH  
 Genus *Scabrina* Blanford
78. *Scabrina pinnulifera* Benson JH  
 Genus *Theobaldius* G. Nevill
79. *Theobaldius orites* Nevill SGH
80. *T. phaenotopicus* (Benson) EKH  
 Family Pupinidae  
 Genus *Pupina* Vignard
81. *Pupina Imbricifera* Benson EGH, SGH, WGH, WKH  
 Genus *Pseudopomatias* Moellendorff
82. *Pseudopomatias pleurophorus* Benson EKH, WKH  
 Genus *Schistoloma* Kobelt
83. *Schistoloma funiculatum* (Sowerby) EKH  
 Family Diplommatinidae (Cochlostomatidae)  
 Genus *Diplommatina* Benson
84. *Diplommatina austeni* Blanford EKH
85. *D. depressa* Godwin-Austen EKH, WKH
86. *D. diplocheilus* Benson EKH, WKH
- \*87. *D. garoensis* Godwin-Austen EGH, SGH, WGH
- \*88. *D. gibberosa* Godwin-Austen JH
89. *D. gibbosa* Blanford EKH, WKH
90. *D. jaintiaca* Godwin-Austen EKH, WKH
- \*91. *D. labiosa* Blanford EGH, EKH, SGH, WGH, WKH
92. *D. oligopleuris* Blanford WGH
93. *D. parvula* Godwin-Austen EKH
94. *D. polypleuris* Benson EKH, WKH
95. *D. scalaria* Blanford EKH, WKH
96. *D. tumida* Godwin-Austen EKH, WKH  
 Genus *Gastroptychia* Kobelt and Moellendorff

97. *Gastroptychia insignis* Godwin-Austen SGH  
 Family Assimineidae  
 Genus *Acmella* Blanford
- \*98. *Acmella milium* Benson EKH  
 99. *A. tersa* Benson EKH, WKH  
 Order Stylommatophora  
 Family Enidae  
 Genus *Ena* Turton
100. *Ena nilagrica* (Pfeiffer) EKH  
 \*101. *Ena vicaria* (Blanford) EGH, EKH, SGH, WGH, WKH  
 Family Clausiliidae  
 Genus *Clausilia* Draparnaud
- \*102. *Clausilia asaluensis* Blanford EKH, WKH  
 Genus *Phaedusa* H. & A. Adams
103. *Phaedusa bacillum* Hanley and Theobald EKH, WKH  
 104. *P. loxostoma* (Benson) WKH  
 Family Corillidae  
 Genus *Plectopylis* Benson  
 Subgenus *Chersaecia* Gude
105. *Plectopylis (Chersaecia) brahma* Godwin-Austen WGH  
 Subgenus *Endothyra* Gude
106. *P. (Endothyra) affinis* Gude EKH  
 \*107. *P. (E) fultoni* Godwin-Austen EKH, WKH  
 \*108. *P. (E) macromphalus* Blanford EKH, WKH  
 109. *P. (E) minor* Godwin-Austen EKH  
 110. *P. (E) plectostoma* (Benson) EKH, RB, WGH, WKH  
 \*var. *exerta* Gude EKH, WKH  
 \*var. *tricarinata* Gude EKH, WKH
- \*111. *P. sowerbyi* Gude EKH, WKH  
 Family Succineidae  
 Genus *Succinea* Draparnaud
112. *Succinea rutilans* Blanford EKH, WKH  
 Family Subulinidae  
 Genus *Bacillum* Theobald
113. *Bacillum daflaensis* Godwin-Austen EKH  
 114. *B. orthoceras* Godwin-Austen EKH, WGH, WKH  
 Genus *Curvella* Chaper
115. *Curvella khasiana* Godwin-Austen SGH, WGH  
 Genus *Glessula* von Martens
- \*116. *Glessula baculina* Blanford EKH, WKH  
 \*117. *G. crassilabris* Benson WKH  
 118. *G. crassula* (Reeve) EKH, WGH, WKH

- \*119. *G. garoense* (Godwin-Austen) EGH, JH, SGH, WGH  
 120. *G. gemma* (Reeve) RB, WGH  
 121. *G. naja* Pilsbry SGH, WGH  
 \*122. *G. jerdoni* (Reeve) EKH  
 \*123. *G. pertenuis* (Blanford) EGH, SGH, WGH  
 \*124. *G. pyramis* (Benson) WKH  
 \*125. *G. subaculina* Godwin-Austen RB  
 \*126. *G. subhastula* Godwin-Austen EGH, EKH, JH, WGH, WKH  
 127. *G. tenuispira* (Benson) SGH  
     Genus *Lamellaxis* Strebel  
 128. *Lamellaxis cavernicola* (Annandale & Chopra) RB, SGH  
 129. *L. gracile* (Hutton) WGH  
 \*130. *L. latebricola* Reeve EKH, WKH  
     Family Achatindae  
     Genus *Achatina* Lamarck  
 131. *Achatina fulica fulica* (Bowdich) RB  
     Family Streptaxidae  
     Genus *Streptaxis* Gray  
 132. *Streptaxis theobaldi* Benson EKH, WGH  
     Genus *Ennea* H. & A. Adams  
 133. *Ennea stenopylis* Benson EKH, WKH  
 134. *E. vara* Benson EKH, WKH  
     Family Trochomorphidae  
     Genus *Sivella* Blanford  
 135. *Sivella castra* (Benson) EGH, SGH, WGH  
     Family Helicarionidae  
     Genus *Cryptaustenia* Cockerell  
 \*136. *Cryptaustenia nongsingirensis* Godwin-Austen EKH, WKH  
 137. *C. ovata* H. Blanford SGH  
 \*138. *C. papillaspira* Godwin-Austen EKH, WKH  
 139. *C. silcharensis* Godwin-Austen RB, SGH, WGH  
 140. *C. succinea* Reeve WGH  
     Genus *Durgella* Blanford  
 \*141. *Durgella falcata* Pfeiffer EKH, WKH  
 \*142. *D. khasiaca* Godwin-Austen WKH  
 \*143. *D. mairangensis* Godwin-Austen RB  
 \*144. *D. salius* Benson EKH, WKH  
     Genus *Parmarion* P. Fischer  
 145. *Parmarion martensi* Simroth SGH  
     Genus *Ibycus* Heynemann  
 \*146. *Ibycus minutus* Godwin-Austen JH  
     Family Ariophantidae  
     Genus *Austenia* Nevill

- \*147. *Austenia gigas* Benson EKH, WKH  
 Genus *Bensonia* Pfeiffer
148. *Bensonia mainwaringi* (Godwin-Austen) EKH  
 Genus *Girasia* Gray
149. *Girasia crocea* Godwin-Austen WKH
- \*150. *G. hookeri* var. *shillongensis* Godwin-Austen EKH  
 Genus *Kaliella* Blanford
- \*151. *Kaliella animula* Godwin-Austen EKH, WKH
- \*152. *K. cherraensis* Godwin-Austen EGH, EKH, SGH, WGH, WKH
- \*153. *K. elongata* Godwin-Austen JH
- \*154. *K. jaintiaca* Godwin-Austen JH
- \*155. *K. khasiaca* Godwin-Austen EKH, WKH
- \*156. *K. lailanokotensis* Godwin-Austen EKH, WKH
- \*157. *K. nongsteinensis* Godwin-Austen RB
- \*158. *K. resinula* Godwin-Austen EKH, WKH
- \*159. *K. shillongensis* Godwin-Austen EKH
- \*160. *K. subcostulata* Godwin-Austen RB
- \*161. *K. teriaensis* Godwin-Austen EKH, WKH  
 Genus *Khasiella* Godwin-Austen
- \*162. *Khasiella austeni* Blanford EGH, WGH, WKH
163. *K. climacterica* Benson RB, WKH
164. *K. falcata* Blanford SGH
- \*165. *K. serrula* Benson EKH
- \*166. *K. vidua* Hanley & Theobald EGH, EKH, SGH, WGH, WKH  
 Genus *Macrochlamys* Benson
- \*167. *Macrochlamys andersoniana* Nevill EKH, WKH
168. *M. atricolor* Godwin-Austen WKH
169. *M. castaneolabiata* Godwin-Austen
170. *M. consepta* Benson EKH, WKH
171. *M. decussata* Benson EKH, WKH
- \*172. *M. dorani* Benson RB
173. *M. extraria* Godwin-Austen EKH
- \*174. *M. garoensis* Godwin-Austen EGH, SGH, WGH
- \*175. *M. hepatizon* Godwin-Austen EGH, SGH, WGH
- \*176. *M. hookeri* Godwin-Austen EKH, JH
177. *M. lata* Godwin-Austen SGH, WKH
- \*178. *M. longicauda* Godwin-Austen EKH, JH
179. *M. lubrica* Benson WGH
180. *M. molecula* Benson RB
181. *M. petasus* Benson EKH, SGH
182. *M. petrosa* (Hutton) SGH
183. *M. plicifera* Blanford JH
- \*184. *M. rubellocincta* Blanford EGH, SGH, WGH
- \*185. *M. rusticula* Godwin-Austen RB
- \*186. *M. saltus* Godwin-Austen EKH, WKH

- \*187. *M. scyphus* Godwin-Austen WKH  
 188. *M. sequax* Benson EKH, RB, SGH, WKH, WGH  
 \*189. *M. shisha* Godwin-Austen RB  
 \*190. *M. spherica* Godwin-Austen EKH, WKH  
 191. *M. terminus* Godwin-Austen EKH  
 \*192. *M. uda* Godwin-Austen EGH, EKH, SGH  
 193. *M. vesica* Godwin-Austen WGH, WKH  
 \*  
     var. *anomala* Godwin-Austen EKH  
     Genus *Oxytes* Godwin-Austen EKH  
 194. *Oxytes castor* (Theobald) EKH  
 195. *O. cycloplax* (Benson) EKH, WGH, WKH  
 196. *O. oxytes* (Benson) EGH, SGH, WGH  
 197. *O. pollux* Theobald EKH, WKH  
     Genus *Rahula* Godwin-Austen  
 198. *Rahula bascauda* Benson JH, RB  
 199. *R. munipurensis* Godwin-Austen JH  
 \*  
     var. *teriai* Ray and Rajagopalaiengar WKH  
     Genus *Sesara* Albers  
 200. *Sesara diplodon* (Benson) EKH, WGH, WKH  
 \*201. *S. galea* Benson EKH, WKH  
 \*202. *S. hermeri* Gude EKH, WKH  
     Genus *Sitala* H. Adams  
 \*203. *Sitala crenicincta* Godwin-Austen EKH, JH, WKH  
 \*204. *S. gromatica* Godwin-Austen EKH, WKH  
 \*205. *S. intonsa* Godwin-Austen EKH, WKH  
 \*206. *S. phulongensis* Godwin-Austen EKH  
 \*207. *S. placita* Godwin-Austen EKH, WKH  
 \*208. *S. recondita* Godwin-Austen EKH, RB  
 209. *S. rimicola* Benson EKH, WKH  
 \*210. *S. uvida* Godwin-Austen EKH, WKH  
     Genus *Taphrospira* Godwin-Austen  
 211. *Taphrospira compluvialis* Blanford EKH, WKH  
 \*212. *T. excavata* Blanford EKH, WKH  
     Family Camaenidae  
     Genus *Camaena* (Albers) Pilsbry  
 213. *Camaena ochthoplax* Benson EKH, WKH  
     Genus *Amphidromus* Albers  
 214. *Amphidromus sinensis* Benson EKH, WKH  
 215. *A. sylheticus* Reeve SGH  
     Genus *Chloritis* Beck SGH  
 216. *Chloritis delibrata* Benson EKH, WKH  
     " var. *fasciata* Godwin-Austen EKH, WGH  
 \* " var. *khasiensis* Nevill EKH, WGH

- \*217. *C. gabata* Gould WKH, WKH  
 Genus *Ganesella* Blanford
- \*218. *Ganesella acris* Benson
- \*219. *G. galea* Benson WKH  
 Family Bradybaenidae  
 Genus *Aegista* von Martens
- \*220. *Aegista catostoma* Blanford EKH, WKH  
 Genus *Plectotropis* von Martens
- \*221. *Plectotropis nutans* Gude EGH, SGH, WGH, WKH  
 222. *P. tapeina* Benson EKH, WGH, WKH  
 Order Soleolifera  
 Family Veronicellidae  
 Genus *Laevicaulis* Simroth
223. *Laevicaulis alte* Ferussac RB

Abbreviations used

|         |                  |
|---------|------------------|
| Coll.   | Collector        |
| EGH     | East Garo hills  |
| EKH     | East Khasi hills |
| Ex. (s) | Example (s)      |
| JH      | Jaintia hills    |
| RB      | Ri-Bhoi          |
| SGH     | South Garo hills |
| WGH     | West Garo hills  |
| WKH     | West Khasi hills |

*List of Collecting localities*

- |                |               |
|----------------|---------------|
| 1. Baghmara    | 12. Damra     |
| 2. Balat       | 13. Darugiri  |
| 3. Balphakram  | 14. Dawki     |
| 4. Barapani    | 15. Doggiri   |
| 5. Berengapara | 16. Dudhvai   |
| 6. Bymihat     | 17. Garampani |
| 7. Cherrapunji | 18. Garobadha |
| 8. Dahigiri    | 19. Jawai     |
| 9. Dainadubi   | 20. Lailad    |
| 10. Dalu       | 21. Lailad    |
| 11. Damalgiri  | 22. Nongkhlaw |
| 23. Nongpoh    | 33. Shillong  |
| 24. Nongstoin  | 34. Simsang   |
| 25. Phulbari   | 35. Siju      |

- |                |                        |
|----------------|------------------------|
| 26. Rajabala   | 36. Sinsenseng         |
| 27. Rangbagiri | 37. Someshwari         |
| 28. Rongengiri | 38. Songsok            |
| 29. Rongjeng   | 39. Teriaghat          |
| 30. Rongram    | 40. Thadleskein        |
| 31. Sebalgiri  | 41. Tura               |
| 32. Shella     | 42. Umshing : Shillong |

## SYSTEMATIC ACCOUNT

### A. FRESHWATER

#### *Key to the families*

1. Shell univalve ..... (2)  
Shell with two valves ..... (8)
2. Shell operculate ..... (3)  
Shell nonoperculate ..... (6)
3. Operculum with concentric growth lines ..... (4)  
Operculum with spiral growth lines ..... (5)
4. Operculum calcareous; shell globose; aperture ovate ..... Pilidae  
Operculum horny; shell pyramidal; aperture subcircular ..... Viviparidae
5. Shell above 10 mm in length, turreted or globose, sculptured, animal with a  
brood pouch ..... Thiaridae  
Shell below 10 mm in length, ovate, nonsculptured, animal without a  
brood pouch ..... Bithyniidae
6. Shell limpet shaped, without spiral coils ..... Ancyliidae  
Shell spirally coiled ..... (7)
7. Shell discoidal; columellar axis not twisted ..... Planorbidae  
Shell extended and dextrally coiled; columellar axis twisted ..... Lymnaeidae
8. Shell subrhomboid or transversely elongate, without concentric sculpture ..... (9)  
Shell ovately trigonal, with concentric sculpture ..... (10)
9. Shell thick, hinge straight, lateral teeth serrated ..... Corbiculidae  
Shell thin, hinge curved, lateral teeth smooth ..... Pisidiidae
10. All four gills marsupial, beak sculpture radial and well developed ..... Amblemidae  
Only the outer two gills marsupial, beak sculpture concentric-radial  
and rudimentary ..... Unionidae

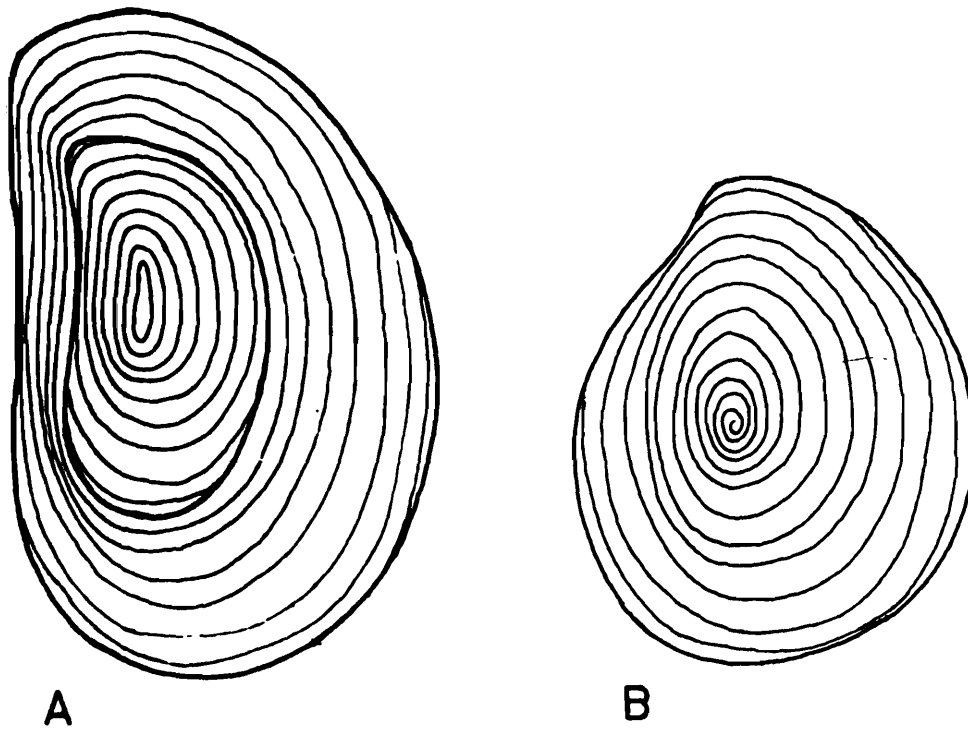


Figure : 1. Operculum A. with concentric growth lines B. with spiral growth lines

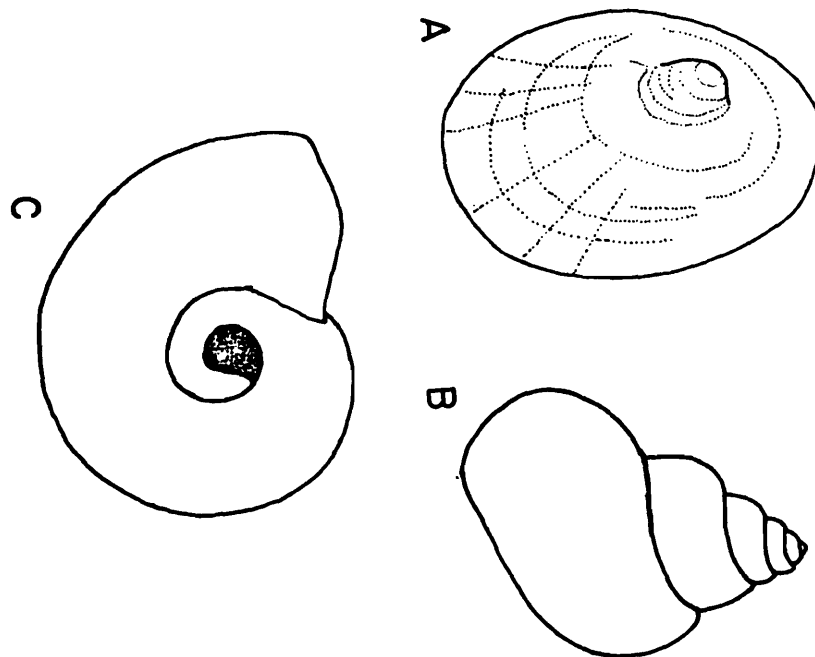


Figure : 2. Shell shapes A. limpet shape B. spirally coiled C. discoidal

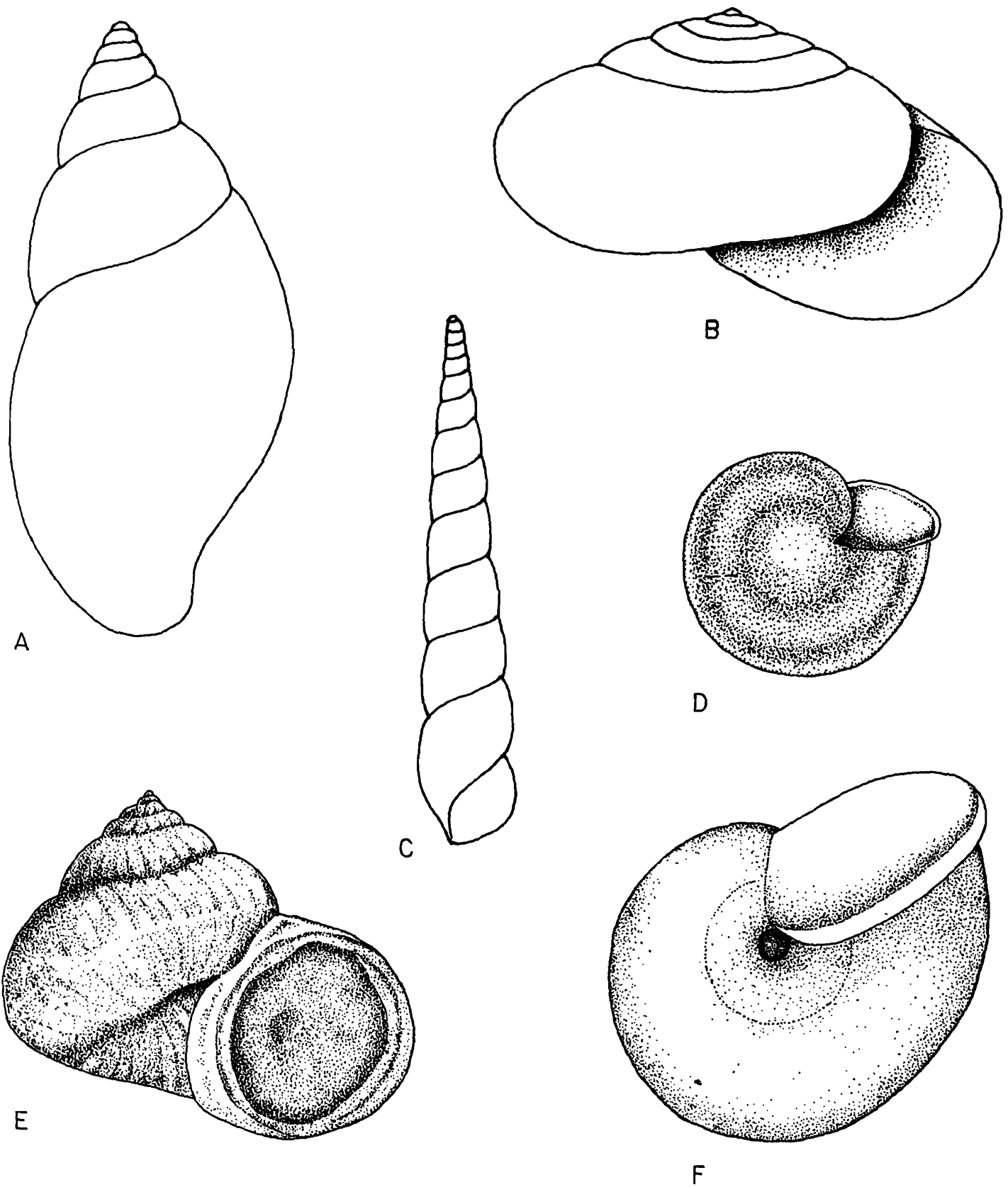


Figure 3. Shell shapes (Contd.) A. ovately conical B. simple peristome C. turreted shell  
D. umbilicus closed by callous E. strongly reflected peristome F. widely umbilicate

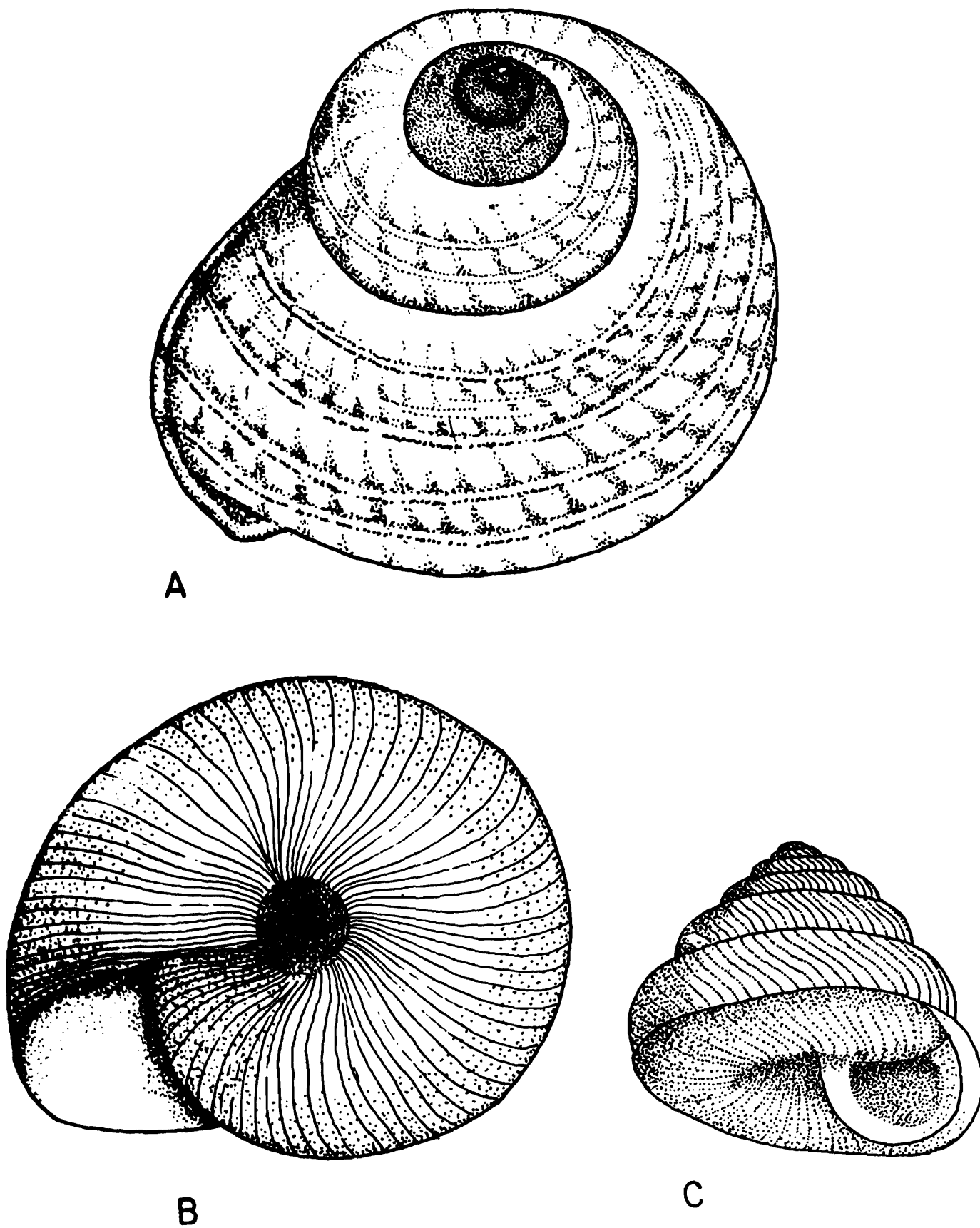


Figure : 4. Shell sculpture A. spiral sculpture B. finely sculptured C. coarsely sculptured

## CLASS GASTROPODA

|           |                |
|-----------|----------------|
| Order     | MESOGASTROPODA |
| Family    | VIVIPARIDAE    |
| Subfamily | BELLAMYINAE    |

*Key to the genera*

Shell medium, with or without coloured bands, when bands absent the shell feebly ridged or keeled, edge of mantle not so thickened and without a conspicuous sphincter..... *Bellamyia*

Shell large, without coloured band, or ridge, edge of mantle thickened with a conspicuous sphincter muscle .....*Cipangopaludina*

Genus ***Bellamyia*** Jousseaume

1886. *Bellamyia* Jousseaume, *Bull. Soc. zool. France*, 2 : 478.

1989. *Bellamyia* : Subba Rao, *Handbook Freshwater Molluscs of India*, p. 44.

*Key to the species*

1. Suture not deep, shell with dark coloured spiral bands .....*B. bengalensis*  
Suture deep, shell without dark coloured spiral bands .....(2)
2. Shell globose, spire short, body whorl rounded ..... *B. crassa*  
Shell ovate conical, spire elongate, body whorl subangulate .....*B. dissimilis*

***Bellamyia bengalensis f. typica*** (Lamarck)

1822. *Paludina bengalensis* Lamarck, *Hist. nat. Anim. sans. Vert.*, 6 (2) : 174.

1989. *Bellamyia bengalensis f. typica* : Subba Rao, *Hand book Freshwater Molluscs of India*, p. 45, fig. 55.

*Material examined* : i) 88 exs., Pune-Ke-Men John stream, Cherrapunji, 28.10.21 - Coll. S. L. Hora; ii) 1 ex., Tura market, 4.11.78 - Coll. K. P. Singh and party; iii) 7 exs., Bongai river, Dalu, W. Garo hills, 25.8.83 - Coll. A. Hussain and party; iv) 6 exs., Tura market, 21.4.91; v) 5 exs., Damalgiri, Tura, vi) 7 exs., Siju, 27.4.91 - Coll. D. K. Thakur and Party.

*Measurements* (In mm.) :

| Length      | Diameter    | Height of the aperture |
|-------------|-------------|------------------------|
| 27.00-14.00 | 16.55-10.65 | 11.90-7.50             |

*Diagnosis* Shell ovately conoid, thin, body whorl as high as the spire; whorls tumid; umbilicus narrow; aperture subcircular with a narrow black margin; dark bands variable and irregular with alternating broad and narrow bands.

**Distribution :** India : Meghalaya : Garo hills (South and West), Khasi hills (East). Common throughout India. Elsewhere : Bangladesh, Myanmar, Sri Lanka.

**Remarks :** A sinistral shell of *Bellamyia bengalensis typica* (pl. I. figs. 1 & 3) was collected from a ditch at Damalgiri, Tura. Out of approximately 200 individuals observed at different habitats in Meghalaya including a population comprising about 25 at Damalgiri, only one such shell could be collected. Incidentally, it is the first record of a sinistral form in this family from India.

form *annandalei* (Kobelt)

1908. *Vivipara annandalei* Kobelt, *Nachr. Malak. Ges.*, 60 : 161.

1989. *Bellamyia bengalensis* form *annandalei* : Subba Rao, *Handbook Freshwater Molluscs of India*, p. 46, fig. 57.

**Material examined :** i) 5 exs., Stream near Garampani, 14.12.63; ii) 14 exs., road side Phulbari, W. Garo hills, 17.2.65 - Coll. A. S. Rajagopal; iii) 26 exs., Cherrapunji, 5.1.71; iv) 5 exs., Barbul river near Rajabala, 13.2.71 - Coll. G. M. Yazdani and party; v) 2 exs., Damra, E. Garo hills, 10.4.71; vi) 5 exs., Daina Dubi, E. Garo hills, 12.4.71 - Coll. R.S. Pillai and party; vii) 31 exs., Damalgiri, Tura, 21.4.91 - Coll. D. K. Thakur and party; viii) 6 exs., Garobadha, 8.10.91 - Coll. P. K. Das and party.

**Measurements (in mm) :**

| Length      | Diameter     | Height of the aperture |
|-------------|--------------|------------------------|
| 32.00-16.42 | 25.8 - 11.36 | 17.65-8.70             |

**Diagnosis :** Shell thin, whorls gradually increasing, less rounded and with rather straight sides; suture shallow; aperture sub-rhomboidal and subangulate anteriorly.

**Distribution :** India : Meghalaya : Garo hills (East and West), Khasi hills (East), Jaintia hills; Andhra Pradesh, Tamil Nadu, West Bengal.

form *balteata* (Benson)

1836. *Vivipara balteata* Benson, *J. Asiat. Soc. Beng.*, pt. 2, 745.

1989. *Bellamyia bengalensis* form *balteata* : Subba Rao, *Handbook Freshwater Molluscs of India*, p. 46, fig. 63.

**Material examined :** i) 1 ex., Damal giri, 21.4.91, ii) 10 exs., Baghmara, 26.4.91, iii) 17 exs., Nongpoh, 7.5.91, iv) 1 ex., Byrnihat, 9.5.91 - Coll. D. K. Thakur and party.

**Measurements (in mm) :**

| Length      | Diameter    | Height of the aperture |
|-------------|-------------|------------------------|
| 23.40-18.20 | 17.40-15.10 | 12.5-9.75              |

**Diagnosis :** Shell narrow, whorls contracted with ovoid aperture; umbilicus closed.

**Distribution :** India : Meghalaya : Garo hills (South and West), Ri-Bhoi; Assam. Elsewhere: Bangladesh.

*Bellamyia crassa* (Benson)

1836. *Paludina crassa* (Hutton MS) Benson, *J. Asiat. Soc. Beng.*, 5 745.

1989. *Bellamyia crassa* Subba Rao, *Handbook Freshwater Molluscs of India*, p. 48, figs. 61 & 62.

*Material examined* : i) 3 exs., Spring near Garampani, 14.12.63, ii) 63 exs., Phulbari, W. Garo hills, 17.2.65 - Coll. A. S. Rajagopal, iii) 1 ex., Tura market, 4.11.78 - Coll. K. P. Singh and party.

*Measurements* (in mm)

| Length     | Diameter   | Height of the aperture |
|------------|------------|------------------------|
| 14.55-9.18 | 11.85-8.60 | 8.78-5.90              |

*Diagnosis* : Shell thick, olive brown, with fine transverse striations, spire short, apex blunt; umbilical opening prominent, suture deep, often canaliculate; aperture suboval.

*Distribution* : India Meghalaya : Garo hills (West), Jaintia hills; Assam, Orissa, Uttar Pradesh, West Bengal. Elsewhere Bangladesh.

Recorded for the first time from Meghalaya.

*Bellamyia dissimilis* (Mueller)

1774. *Nerita dissimilis* Mueller, *Hist. Verm. Pest.*, pt. 2: 184.

1989. *Bellamyia dissimilis* : Subba Rao, *Handbook Freshwater Molluscs of India*, p.48, figs. 64-67.

*Material examined* : i) 1 ex., Phulbari, W. Garo hills, 17.2.65 - Coll. A. S. Rajagopal; ii) 1 ex., Tura market, 4.11.78-Coll. R. S. Pillai and party.

*Measurements* (in mm) :

| Length      | Diameter    | Height of the aperture |
|-------------|-------------|------------------------|
| 16.40-14.55 | 12.60-10.26 | 7.75-7.16              |

*Diagnosis* Shell broadly ovate; spire swollen; suture deeply impressed; body whorl indistinctly angulate, greenish with blackish peristome.

*Distribution* : India Meghalaya : Garo hills (West); Common throughout. Elsewhere : Bangladesh, Malaysia, Myanmar, Pakistan, Sri Lanka.

Genus *Cipangopaludina* Hannibal

1912. *Cipangopaludina* Hannibal, *Proc. malac. Soc. Lond.*, 10 : 194.

1989. *Cipangopaludina* Subba Rao, *Handbook Freshwater molluscs of India*, p. 49.

*Cipangopaludina lecythis* (Benson)

1836. *Paludina lecythis* Benson, *J. Asiat. Soc. Beng.*, 5 : 745.

1989. *Cipangopaludina lecythis* : Subba Rao, *Handbook Freshwater molluscs of India*, p. 50, fig.73.

*Material examined* : i) 3 exs., Nongpoh, 20.2.71 - Coll. K. P. Singh.

*Measurements* (in mm.) :

| Length      | Diameter    | Height of the aperture |
|-------------|-------------|------------------------|
| 37.80-28.15 | 34.50-27.90 | 23.35-18.10            |

**Diagnosis** : Shell with conical spire, apex acuminate; whorls tumid and flattened; suture deep; aperture large and broadly oval; columella arched; olive greenish in fresh condition.

**Distribution** : India : Meghalaya : Ri Bhoi; Manipur. Elsewhere Myanmar, Vietnam. Recorded for the first time from Meghalaya.

Family PILIDAE

Genus *Pila* Roeding

1798. *Pila* (Bolten) Roeding *Mus. Bolten*, pl. 2, p. 145.

1989. *Pila* : Subba Rao, *Handbook Freshwater Molluscs of India*, p. 57.

*Key to the species*

Shell globose, upper surface of whorls obliquely flattened; suture not deep; spire depressed .....*P. globosa*

Shell subglobose; suture deep; spire elevated .....*P. theobaldi*

*Pila globosa* (Swainson)

1882. *Ampullaria globosa* Swainson, *Zool. Illustrations*, 2, pl. 119.

1989. *Pila globosa* : Subba Rao, *Handbook Freshwater Molluscs of India*, p. 58, figs. 80-82.

**Material examined** : i) 1 ex., Baghmara, 3.3.65 - Coll. A. S. Rajagopal.

**Measurements** : (in mm.) :

| Length | Diameter | Height of the aperture |
|--------|----------|------------------------|
| 43.48  | 39.05    | 32.85                  |

**Diagnosis** : Shell globose with an inflated bodywhorl and depressed spire, suture shallow, coloured bands present inside the aperture. It shows remarkable variation in shape and elevation of the spire and body whorl.

**Distribution** : India : Meghalaya : Garo hills (South); Assam, Bihar, Maharashtra, Madhya Pradesh, Orissa, Uttar Pradesh and West Bengal.

Recorded for the first time from Meghalaya.

*Pila theobaldi* (Hanley)

1875. *Ampullaria theobaldi* Hanley, *Proc. zool. Soc. Lond.*, p. 608.

1989. *Pila theobaldi* : Subba Rao, *Handbook Freshwater Molluscs of India*, p. 60, fig. 84.

**Material examined** : i) 3 exs., Paddyfield, Garampani, 17.12.63, ii) 1 ex., Phulbari, W. Garo hills, 12.2.65, iii) 2 exs., Baghmara, 3.3.65 - Coll. A. S. Rajagopal; iv) 2 exs., Rongjeng, E. Garo hills, 12.4.71, v) 1 ex., Daina Dubi, E. Garo hills, 14.4.71 - Coll. R. S. Pillai and party; vi) 3 exs., Nongpoh, Ri Bhoi, 11.4.78, vii) 3 exs., Goka pond, Garo hills, 9.11.78 - Coll. K. P. Singh and party; viii) 3 exs., Nongpoh 19.10.82 - Coll. R. Mathew and party; ix) 3 exs., Bongai river, W. Garo hills, 28.8.83 - Coll. A. Hussain and party; x) 6 exs., Damalgiri, Tura, 21.4.91, xi) 2 exs., Simsong river, Baghmara, 26.4.91, xii) 6 exs., Nongpoh, 7.4.91 - Coll. D. K. Thakur and party.

*Measurements* (in mm) :

| Length      | Diameter    | Height of the aperture |
|-------------|-------------|------------------------|
| 37.70-21.85 | 34.55-19.65 | 27.55-15.45            |

*Diagnosis* Shell large, whorls globose; suture more impressed; umbilicus widely open; aperture without colour bands.

*Distribution* : India : Meghalaya : Garo hills (East, South and West), Jaintia hills, Ri-Bhoi. Elsewhere : Myanmar.

This species was hitherto known from Myanmar (Prashad, 1925). It is recorded for the first time from India where it is restricted to Meghalaya. It is more common than the other species *P. globosa*, which is however common in other parts of India.

Family BITHYNIIDAE

Genus *Digoniostoma* Annandale

1920. *Digoniostoma* Annandale, Indian J. Med. Res., 7 104.

*Digoniostoma cerameopoma* (Benson)

1930. *Paludina cerameopoma* Benson, *Gleanings in Science, Calcutta*, 2 125.

1989. *Digoniostoma cerameopoma*: Subba Rao, *Handbook Freshwater Molluscs of India*, p. 79, fig. 121.

*Material examined* : i) 1 ex., Damalgiri, Tura, 21.4.91 - Coll. D. K. Thakur and Party.

*Measurements* (in mm)

| Length | Diameter | Height of the aperture |
|--------|----------|------------------------|
| 7.40   | 4.90     | 3.85                   |

*Diagnosis* : Shell ovate, oblong, with blunt apex, deeply umbilicate with distinct oblique channel, lip at the base of columella strongly reflected.

*Distribution* : India : Meghalaya : Garo hills (West); Assam, Bihar, Madhya Pradesh, Punjab, Rajasthan and West Bengal. Elsewhere : Pakistan.

Family THIARIDAE

*Key to the genera*

- Shell ovately conical; aperture ovate and proportionately large ..... *Paludomus*  
Shell elongate or turreted; aperture more or less vertical and  
proportionately small ..... (2)
- Shell moderately elongate, with less than 12 whorls; mantle margin  
with 14 or more papillae ..... *Thiara*  
Shell much elongate, usually with more than 12 whorls; mantle margin smooth ..... *Brotia*

Genus **THIARA** Roeding1798. *Thiara* Roeding, *Mus. Bolten*, 2 : 109.1989. *Thiara* Subba Rao, *Handbook Freshwater Molluscs of India*, p. 94.*Key to the subgenera*

1. Spire proportionately larger than body whorl sculpture with axial and spiral ridges but devoid of spine ..... *Melanoides*
- Spire proportionately less large than body whorl; sculpture with conspicuous nodules, granules or axial ridges ..... (2)
2. Shell generally spinous or sharply nodulose; whorls angular between suture and periphery; whorls descending in steps ..... *Thiara* s. str
- Shell granulose or tessellated with nodules or with contrasting sculpture on the bodywhorl, whorls gradually increasing ..... *Tarebia*

Subgenus ***Thiara*** s. str.***Thiara (T.) scabra*** (Mueller)1774. *Buccinum scabrum* Mueller, *Hist. Verm. Terr. Fluv.*, 2 : 136.1989. *Thiara (Thiara) scabra* : Subba Rao, *Handbook Freshwater Molluscs of India*, p. 96, figs. 185, 186, 189.**Material examined** : i) 2 exs., Phulbari, W. Garo hills, 17.2.65 - Coll. A. S. Rajagopal; ii) 24 exs., Stream near Siju Cave, 27.4.91-Coll. D. K. Thakur and party.**Measurements** (in mm) :

| Length      | Diameter  | Height of the aperture |
|-------------|-----------|------------------------|
| 15.50-14.45 | 7.32-6.80 | 6.74-5.30              |

**Diagnosis** : Whorls regularly increasing in size; suture distinct; sculpture with characteristic vertical ribs bearing prominent spines directed obliquely onward, surface with rough spiral striations, striations of umbilical region form strong ridges.**Distribution** : India : Meghalaya : Garo hills (South and West). Throughout India except Kashmir. Elsewhere : Indonesia, Java, Mauritius, Seychelles, Timor.*Key to the species*Subgenus ***Tarebia*** H & A. Adams

- Shell narrower with spiral rows of nodules ..... *T. granifera*
- Shell broader with raised spiral lines ..... *T. lineata*

***Thiara (T.) granifera*** (Gray)1822. *Melania granifera* Lamarck, *Hist. nat. Anim. sans. Vert.*, 6 (2) : 167.1989. *Thiara (Tarebia) granifera* : Subba Rao, *Handbook Freshwater Molluscs of India*, p. 101, figs. 212, 213.

*Material examined* : i) 7 exs., Phulbari, W. Garo hills, 17.2.65-Coll. A. S. Rajagopal; ii) 8 exs., Balat river, 8.12.77-Coll. K. R. Rao.

*Measurements* (in mm)

| Length      | Diameter  | Height of the aperture |
|-------------|-----------|------------------------|
| 16.55-13.95 | 7.12-6.40 | 7.85-6.45              |

*Diagnosis* : Shell elongately conical; spire sharp; whorls flat; sculptured with distinct spiral rows of nodules; height of the body whorl more than half of the total height of the shell.

*Distribution* India : Maghalaya Garo hills (West), Khasi hills (East); Bihar, Madhya Pradesh, West Bengal. Elsewhere : Madagascar, Malaysia, Philippine and Pacific Islands, Taiwan.

The species was introduced to U.S.A. (Abbott, 1952).

### ***Thiara (T.) lineata* (Gray)**

1828. *Helix lineata* Gray, in Wood's *Index Test. Suppl.*, p. 24, fig. 68.

1989. *Thiara (Tarebia) lineata* Subba Rao, *Handbook Freshwater Molluscs of India*, p. 101, fig. 191.

*Material examined* : i) 15 exs., Teriaghat, W. Khasi hills, 25.2.23 - Coll. R. Hodgart.

*Measurements* (in mm) :

| Length      | Diameter  | Height of the aperture |
|-------------|-----------|------------------------|
| 18.85-11.05 | 8.48-5.00 | 4.45-4.05              |

*Diagnosis* Very much resembles *T. granifera* but is distinguished by the absence of rows of nodules and presence of distinct dark spiral lines.

*Distribution* : India Meghalaya : Khasi hills (West) : Assam, Bihar, Madhya Pradesh, Maharashtra, Uttar Pradesh, West Bengal. Elsewhere : Bhutan, Myanmar, Sri Lanka.

Subgenus ***Melanoides*** Olivier

### ***Thiara (M.) tuberculata* (Mueller)**

1774. *Nerita tuberculata* Mueller, *Verm. Terr. Flur. Hist.*, 2 191.

1989. *Thiara (Melanoides) tuberculata* : Subba Rao, *Handbook Freshwater Molluscs of India*, p. 103, figs. 183, 184.

*Material examined* : i) 25 exs., Phulbari, W. Garo hills, 17.2.65-Coll. A. S. Rajagopal; ii) 17 exs., Byrnihat, 9.5.91-Coll. D. K. Thakur & Party.

*Measurements* (in mm) :

| Length      | Diameter  | Height of the aperture |
|-------------|-----------|------------------------|
| 20.20-10.65 | 7.50-4.00 | 5.90-2.90              |

*Diagnosis* : Shell elongate with moderately large body whorl and high spire; whorls almost rounded with dark red brown dots and flames; sculptured with vertical ribs and spiral striae, distinct and raised on upper whorls.

**Distribution** : India : Meghalaya : Garo hills (West), Ri-Bhoi. Throughout India, except Kashmir. Elsewhere : Australia, Malaya Archipelago, Malaysia, North and South Africa, South China, South-east Asia and various Pacific Islands.

Genus ***Brotia*** H. and A. Adams

1866. *Brotia* H. Adams, *Proc. zool. Soc. Lond.*, p. 50.

1989. *Brotia* : Subba Rao, *Handbook Freshwater Molluscs of India*.

Subgenus ***Antimelania*** Crosse and Fischer

***Brotia (A.) costula*** (Rafinesque)

1833. *Melania costula* Rafinesque, *Atlantic J.*, 5 : 166.

1989. *Brotia (Antimelania) costula* : Subba Rao, *Handbook Freshwater Molluscs of India*, p. 108, figs. 192-194, 197, 198.

**Material examined**: i) 65 exs., Teriaghat W. Khasi hills, 25.2.23-Coll. H. Hodgart; ii) 61 exs., Garampani, 30.11.56-Coll. H. Khajuria; iii) 7 exs., Stream near Garampani, 14.12.63, iv) 2 exs., Kopili falls, 18.12.83, v) 6 exs., Bhelb, Garo hills, 17.2.65, vi) 10 exs., River near Phulbari, W. Garo hills, 21.2.65, vii) 1 ex., Tura, 23.2.65-Coll. A.S. Rajagopal, viii) 2 exs., Ramback R., Garo hills, 15.2.71-Coll. G.M. Yazdani; ix) 9 exs., Rongjeng, E. Garo hills, 12.4.71, x) 3 exs., Darugiri, Garo hills, 17.4.71-Coll. R. S. Pillai and party; xi) 2 exs., Songsak, 12.4.73-Coll. S. Biswas and party; xii) 2 exs., Garampani, 27.1.75-Coll. A. K. Ghosh and Party; xiii) 2 exs., Tura, 4.11.78, xiv) 3 exs., Nongpoh, 11.4.78-Coll. K. P. Singh and party; xv) 5 exs., Dawki, Muktapus road, 3.1.84-Coll. Rani Singh and party; xvi) 6 exs., Nongpoh, 6.12.86-Coll. R. Mathew and party; xvii) 5 exs., Nongstain, 8.4.87-Coll. J.R.B. Alfred and party; xviii) 1 ex., Lailad, Tasku hill, 22.4.88-Coll. A. K. Karmakar and party; xix) 3 exs., Balphakram, 27.11.86-Coll. C. Radhakrishnan & Party; xx) 7 exs., Tura market, 24.4.91, xxi) 3 exs., Simsong river, Baghmara, 26.4.91, xxii) 4 exs., Nongpoh, 8.4.91, xxiii) 3 exs., Byrnihat, 9.5.91-Coll. D. K. Thakur and party; xxiv) 4 exs., Mustoh; xxv) 2 exs., Garo badha, 8.10.91-Coll. P. K. Das and party.

**Measurements** (in mm) :

| Length      | Diameter   | Height of the aperture |
|-------------|------------|------------------------|
| 50.00-17.85 | 17.05-9.30 | 13.70-6.55             |

**Diagnosis** : Shell elongate with 12 to 14 regularly increasing whorls; sculptured with spiral ridges or nodules; axial ribs prominent, often with spines.

**Distribution** : India : Meghalaya : Garo hills (East, South and West), Khasi hills (West), Jaintia hills, Ri-Bhoi; Assam, Manipur, West Bengal. Elsewhere : Indonesia Myanmar.

Genus ***Paludomus*** Swainson

1840. *Paludomus* Swainson, *Treatise on Malacology*, p. 340.

1989. *Paludomus* : Subba Rao, *Handbook Freshwater Molluscs of India*, p. 140.

Subgenus ***Paludomus*** s.str.

*Key to the species*

1. Shell bearing a crown of short pointed spines .....*P. stephanus*  
Shell without spines .....(2)

2. Shell with reticulate spiral striae, forming axial granules.....*p. reticulata*  
 Shell with only spiral striae without reticulations or axial granules.....(3)
3. Shell with prominent spiral grooves.....*P. regulata*  
 Shell with microscopic spiral striae.....(4)
4. Shell smaller (upto 15 mm in length), globosely inflated, usually yellowish  
 in colour.....*P. blanfordiana*  
 Shell larger (above 15 mm in length), globosely conical, usually brownish  
 in colour.....*P. conica*

***Paludomus (P.) blanfordiana* Nevill**

1877. *Paludomus blanfordiana* Nevill, *J. Asiat Soc. Beng.*, 46 (2) : 37.

1989. *Paludomus (Paludomus) blanfordiana* : Subba Rao, *Handbook Freshwater Molluscs of India*, p. 112, figs. 222, 239.

*Material examined* : i) 14 exs., Somesweri R., 4 miles, Siju, 25.8.22-Coll. S. W. Kemp; ii) 4 exs., Siju cave entrance, 7.3.65-Coll. A.S. Rajagopal; iii) 2 exs., W. Naga, Meghalaya, 21.11.78-Coll. A. Pardha Saradhi; iv) 32 exs., Doggiri, Tura, 23.4.91, v) 16 exs., Stream near Siju cave, 27.4.91, vi) 1 ex., Nongpoh, 7.5.91, vii) 6 exs., Byrnihat, 9.5.91-Coll. D. K. Thakur and party; viii) 2 exs., Rongkhon stream, Tura, Coll. P. K. Das and party.

*Measurements* (in mm)

| Length     | Diameter  | Height of the aperture |
|------------|-----------|------------------------|
| 11.62-7.89 | 9.72-5.90 | 7.30-4.82              |

*Diagnosis* : Ovately globose with inflated body whorls; sculptured with fine spiral striae and transverse growth lines, aperture oval; margin of columellar callus fringed with chocolate brown colour; dark yellow, often coated with black encrustation, body whorl with three chocolate brown broad bands.

*Distribution* India : Meghalaya : Garo hills (South and West), Ri-Bhoi; Assam, West Bengal. Elsewhere : Myanmar.

***Paludomus (P.) conica* (Gray)**

1934. *Melania conica* Gray, *Giffith Cuvier Moll.*, p1. 14, fig. 5.

1989. *Paludomus (Paludomus) conica* : Subba Rao, *Handbook Fresh. water Molluscs of India*, p. 113, figs. 227, 228.

*Material examined* : i) 50 exs., Teriaghat, W. Khasi hills, 25.2.23-Coll. R. Hodgart; ii) 93 exs., Garampani, 30.11.56, iii) 39 exs., Nongpoh, 5.12.56, iv) 3 exs., Rangrengiri, 5.1.57-Coll. H. Khajuria; v) 16 exs., Garampani, 14.12.63, vi) 102 exs., Umrong nala, Garampani, 15.12.63; vii) 15 exs., Stream by the side of Phulbari Rongsujiri road, 21.2.65-Coll. A.S. Rajagopal; viii) 2 exs., Rongjeng, 12.4.71, ix) 52 exs., Darugiri, 13.4.71, x) 5 exs., Darugiri, 17.4.71-Coll. R. S. Pillai and party; xi) 3 exs., Ranghthan, Garo hills, 11.4.73-Coll. S. Biswas and party; xii) 6 exs., Garampani, 27.1.75- A. K. Ghosh and party; xiii) 9 exs., Rambagiri, Simsang, 5.11.78, xiv) 15 exs.,

Garampani, 9.3.78 - Coll. K. P. Singh and party; xv) 1 ex., Lailad, Ri Bhoi, 23.1.82-Coll. C. Radhakrishna and party; xvi) 2 exs., Nongpoh, 6.12.86-Coll. R. Mathur and party; xvii) 1 ex., Nongkhlaw, W. Khasi hills, 8.4.87-Coll. A. K. Karmakar and party; xviii) 34 exs., Nongstoin, 8.4.87-Coll. J.R.B. Alfred and party; xix) 3 exs., Mustoh, xx) 2 exs., Edenbari, Garo hills-Coll. P.K. Das and party.

*Measurements* (in mm) :

| Length      | Diameter    | Height of the aperture |
|-------------|-------------|------------------------|
| 24.70-12.62 | 18.80-10.40 | 14.40-9.35             |

*Diagnosis* : Shell globose, conical; smooth except 3-4 spiral ridges near the suture; whorls five; dark brown to yellowish brown, often ornamented with dark spiral bands.

*Distribution* : India : Meghalaya : Garo hills (East, South and West), Khasi hills (West), Jaintia hills, Ri-Bhoi; Assam. Elsewhere : Bangladesh, Bhutan.

*Remarks* : Shell shows much variations and depending upon this several subspecific forms were named. Among the material studied, we have come across a few shells which, with a little more inflated and subangulate body whorl agree well with the holotype of *P. conica* var. *kopiliensis* Nevill.

***Paludomus (P.) regulata* Benson**

1856. *Paludomus regulata* Benson, *Ann. Mag. nat. Hist.*, (2) 17 : 496.

1989 *Paludomus (Paludomus) regulata* : Subba Rao, *Handbook Freshwater Molluscs of India*, p. 118, fig. 236.

*Material examined*: i) 2 exs., Shella, 3.9.86-Coll. K. P. Singh and Party; ii) 18 exs., Singsong river, Baghmara, 26.4.91-Coll. D. K. Thakur and party.

*Measurements* (in mm) :

| Length      | Diameter    | Height of the aperture |
|-------------|-------------|------------------------|
| 19.15-15.90 | 12.50-10.80 | 12.00-9.50             |

*Diagnosis* : Shell large, globose; spire sharp and pointed; whorls five; body whorl with four dark brown bands, the second from the top broader than the others; sculptured with groove like spiral ridges; suture deep.

*Distribution* : India : Meghalaya : Garo hills (South), Khasi hills (East); West Bengal. Elsewhere : Myanmar.

***Paludomus (P.) reticulata* Blanford**

1870. *Paludomus reticulata* Blanford, *J. Asiat. Soc. Beng.*, 39 (2) : 9, p. 13, fig. 1.

1989. *Paludomus (Paludomus) reticulata* : Subba Rao, *Handbook Freshwater Molluscs of India*, p. 117, fig. 237.

*Material examined* : i) 55 exs., Rangram, 4.11.78 - Coll. K. P. Singh and party.

*Measurements (in mm)*

| Length      | Diameter   | Height of the aperture |
|-------------|------------|------------------------|
| 19.65-12.90 | 14.10-8.75 | 11.55-7.80             |

*Diagnosis* : Shell globose with 3 to 4 whorls; sculptured with reticulate spiral striations, which form axial granules or reticulation; suture impressed.

*Distribution* : India Meghalaya : Garo hills (West); Assam.

*Remarks* : It is restricted to North-eastern India only.

***Paludomus (P.) stephanus* (Benson)**

1836. *Melania stephanus* Benson *J. Asiat. Soc. Beng.*, 36 : 747.

1989. *Paludomus (Paludomus) stephanus* Subba Rao, *Handbook Freshwater molluscs of India*. p. 117, figs. 240 & 241.

*Material examined*: i) 8 exs., Teriaghat, W. Khasi hills, 16.5.1909 - Coll. B. Wassen; ii) 136 exs., Teriaghat, W. Khasi hills, 25.2.23 - Coll. R. Hodgart; iii) 86 exs., Garampani, 20.11.56, iv) 8 exs., Garampani, 30.11.56 Coll. H. Khajuria; v) 3 exs., Kopili falls, 18.12.63 - Coll. A. S. Rajagopal; vi) 2 exs., Mustoh - Coll. P. K. Das and party.

*Measurements (in mm) :*

| Length     | Diameter   | Height of the aperture |
|------------|------------|------------------------|
| 25.00-8.78 | 23.00-6.50 | 16.30-10.70            |

*Diagnosis*: Shell ovately conical with inflated body whorl; spire short; whorls conspicuously shouldered bearing a crown of short and pointed spines; aperture oval; outer lip regularly arched.

*Distribution*:- India : Meghalaya Khasi hills-(East and West); Jaintia hills. Elsewhere : Bangladesh.

Order BASOMMATOPHOR.

Family LYMNAEIDAE

Genus ***Lymnaea*** Lamarck

1799. *Lymnaea* Lamarck, *Prodr. Nouv. Class. Cog.*, p. 75.

1989. *Lymnaea* : Subba Rao, *Handbook Freshwater Molluscs of India*. p. 124.

Subgenus ***Pseudosuccinea*** Baker

***Lymnaea (P.) acuminata f. typica* Lamarck**

1822. *Limnaea acuminata* Lamarck, *Hist. nat. Anim. sans. Vert.*, 6 (2) : 160.

1989. *Lymnaea (Pseudosuccinea) acuminata f. typica* : Subba Rao, *Handbook Freshwater Molluscs of India*, p. 126, figs. 258, 259.

*Material examined* : i) 67 exs., Barapani, 24.2.62 - Coll-S. N. Prashad; ii) 39 exs., Mawphlang, 26.4.72-Coll. S. Biswas and party; iii) 73 exs., Barapani, 16.5.78 - Coll, S. G. Patil

and Party; iv) 3 exs., Jowai, 5.1.88 - Coll. A. K. Karmakar and party; v) 10 exs., Nongpoh, 9.5.91 - Coll. D. K. Thakur and party.

**Measurements (in mm) :**

| Length      | Diameter   | Height of the aperture |
|-------------|------------|------------------------|
| 22.85-13.40 | 13.28-8.90 | 17.75-9.95             |

**Diagnosis :** Shell ovate; spire short, acuminate; body whorl much inflated and a little angular above, aperture large.

**Distribution :** India : Meghalaya : Khasi hills (East), Jaintia hills, Ri-Bhoi. Common throughout. Elsewhere : Pakistan, Bangladesh, Myanmar.

form *chlamys* Benson

1836. *Limnaea chlamys* Benson, *J. Asiat. Soc. Beng.*, 5 : 744.

1989. *Lymnaea (Pseudosuccinea) acuminata* f. *chlamys* : Subba Rao, *Handbook Freshwater Molluscs of India*, p. 127.

**Material examined :** i) 37 exs., Paddy field, Jowai, 21.11.30, ii) 25 exs., Chongpung - Jowai bridge path, Jaintia hills, 24.11.30, iii) 47 exs., Myntang Valley, Nartiang, 29.11.30, iv) 78 exs., Mowlahar, Shillong, 4.12.30 - Coll. H. S. Rao; v) 180 exs., Barapani, 24.2.62 - Coll. S. N. Prasad.

**Measurements (in mm) :**

| Length      | Diameter   | Height of the aperture |
|-------------|------------|------------------------|
| 22.40-12.00 | 13.05-7.15 | 16.75-8.35             |

**Diagnosis :** Spire a little larger than in the form *typica* : columella more twisted; colour golden yellow.

**Distribution :** India : Meghalaya : Khasi hills (East), Jaintia hills, Ri-Bhoi. Widely distributed. Elsewhere : Bangladesh, Myanmar.

form *gracilior* Martens

1881. *Limnaea acuminata* var. *gracilior* Martens, *Conch. Mitthiel*, 1 : 77.

1989. *Lymnaea (Pseudosuccinea) acuminata* f. *gracilior* : Subba Rao, *Handbook Freshwater Molluscs of India*, p. 127, figs. 262, 265.

**Material examined :** i) 1 ex., Malki road, Shillong, 19.5.75 - Coll. M. S. Jyrwa.

**Measurements (in mm) :**

| Length   | Diameter | Height of the aperture |
|----------|----------|------------------------|
| 17.6-9.8 | 7.8-4.5  | 11.6-6.8               |

**Diagnosis :** Shell linear with long narrow spire, colour of the shell varies from greyish to light pink.

**Distribution :** India : Meghalaya : Khasi hills (East) ; Fairly common throughout. Elsewhere : Myanmar.

f. *rufescens* Gray

1820. *Limnaea rufescens* Gray, *Genera of Shells*, 1 : pl, 178, fig. 2.

1989. *Limnaea (Pseudosuccinea) acuminata* f. *rufescens* : Subba Rao, *Hand book Freshwater Molluscs of India*, p. 127, figs. 254, 255.

*Material examined* i) 2 exs., Pologround, Shillong, 9.11.60, ii) 8 exs., Barapani, 15.6.61, iii) 3 exs., Pologround, Shillong, 9.10.61, (iv) 15 exs., Fruit garden, Shillong, 10.11.61, v) 30 exs., Barapani 24.2.62 - Coll. S. N. Prashad; vi) 70 exs., Mawroh, Shillong, 25.9.63-Coll. M. Rynth; vii) 6 exs., Umshing, Shillong, 7.11.63 - Coll. V. D. Srivastava; viii) 15 exs., Damalgiri, Tura, 21.4.91 - Coll. D. K. Thakur and party.

*Measurements* (in mm)

| Length      | Diameter   | Height of the aperture |
|-------------|------------|------------------------|
| 20.20-13.45 | 12.56-9.70 | 14.73-10.00            |

*Diagnosis* : Shell narrow with a large spire; aperture shorter and uniformly less expanded; colour, reddish.

*Distribution* : India : Meghalaya : Khasi hills (East), Garo hills (West), Ri-Bhoi, Common throughout.

Family ANCYLIDAE

Genus *Ferrissia* Walker

1903. *Ferrissia* Walker, *Nautilus*, 17 : 15.

1989. *Ferrissia* : Subba Rao, *Handbook Freshwater Molluscs of India*, p. 139.

*Ferrissia verruca* (Benson)

1855. *Ancylus verruca* Benson, *Ann. Mag. nat. Hist.*, (2) 15 : 12.

1989. *Ferrissia verruca* : Subba Rao, *Handbook Freshwater Molluscs in India*, p. 139, figs. 311-313.

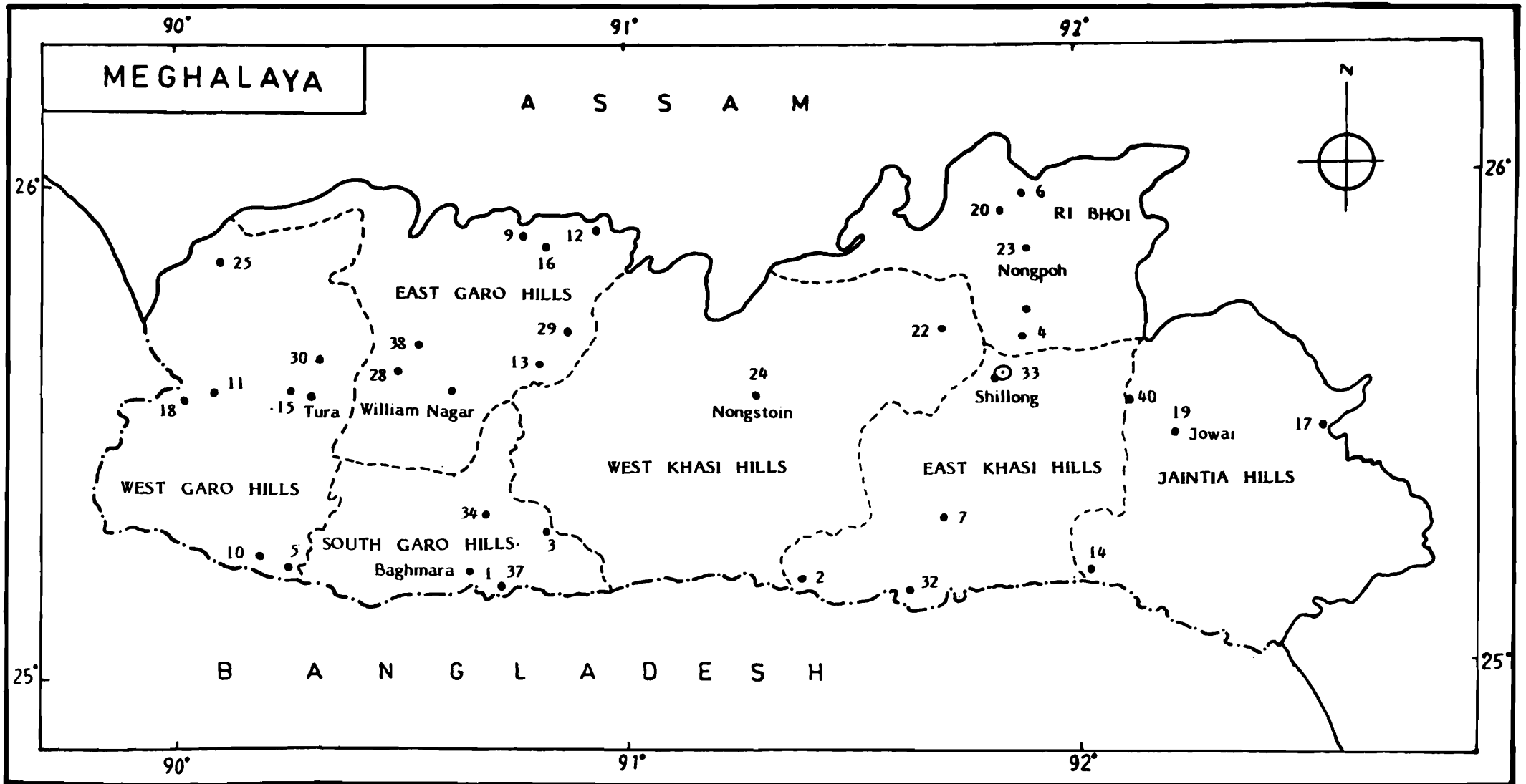
*Material examined*: i) 15 exs., Khasi hills, - Coll. H. H. Godwin-Austen; ii) 153 exs., Shillong, 15.11.30 - Coll. H. S. Rao.

*Measurements* (in mm) :

| Length    | Width     | Height    |
|-----------|-----------|-----------|
| 4.05-2.35 | 2.20-1.45 | 2.75-1.65 |

*Diagnosis* : Shell small, limpet like less than 5 mm in length, widest at the middle; bilaterally asymmetrical; apex blunt, reflected to the right.

*Distribution* : India : Meghalaya : Khasi hills (East and West). Throughout but sporadic. Elsewhere Sri Lanka.



## Family PLANORBIDAE

*Key to the genera*

Shell large, (above 5 mm in diameter) whorls rounded at periphery ..... *Indoplanorbis*

Shell small (upto 5 mm in diameter), whorls

angular or carinate at periphery ..... *Gyraulus*

Genus *Gyraulus* Charpentier

1837. *Gyraulus* (Agassiz Ms) Charpentier *Neue Denkschr. Allg. Schwcg. Gessell*, 1 No. 2:21.

1989. *Gyraulus* : Subba Rao, *Handbook Freshwater Molluscs of India*, p. 153.

*Gyraulus convexiusculus* (Hutton)

1849. *Planorbis convexiusculus* Hutton, *J. Asiat. Soc. Beng.*, 18 (2) : 657.

1989. *Gyraulus convexiusculus* : Subba Rao, *Handbook Freshwater Molluscs of India*, p. 154, figs. 362-364.

*Material examined* : i) 17 exs., Nongpoh, 7.5.91 - Coll. D. K. Thakur and party.

*Measurements* (in mm) :

| Diameter  | Thickness |
|-----------|-----------|
| 5.00-3.75 | 1.50-1.25 |

*Diagnosis* : Shell small, discoidally flattened, whorls 4-5, last whorl subangulate at the periphery.

*Distribution* : India : Meghalaya : Ri Bhoi; common Throughout. Elsewhere : Iran to Philippines.

Genus *Indoplanorbis* Annandale and Prashad

1921. *Indoplanorbis* Annandale and Prashad, *Rec. Indian Mus.*, 22(4) : 578.

1989. *Indoplanorbis* : Subba Rao, *Handbook Freshwater Molluscs of India*, p. 142.

*Indoplanorbis exustus* (Deshayes)

1834. *Planorbis exustus* Deshayes, in Belanger, *Voy. Indes. Orientales*, p. 417, pl. 1, figs. 11-13.

1989. *Indoplanorbis exustus* : Subba Rao, *Handbook Freshwater Molluscs of India*, p. 142, figs. 326, 327.

*Material examined* : i) 1 ex., Dainadubi, 12.4.71—Coll. R. S. Pillai and party; ii) 5 exs., Tura, 4.11.78—Coll. K.P. Singh and party; iii) 4 exs. Damalgiri, Tura, 21.4.91—Coll. D.K. Thakur and party.

*Measurements* (in mm) :

| Length    | Diameter   | Height or the aperture |
|-----------|------------|------------------------|
| 4.30-4.55 | 10.90-6.90 | 4.30-4.20              |

*Diagnosis* : Shell depressedly coiled, large, thick, sinistral, suture deeply impressed; aperture ear shaped.

*Distribution* India Meghalaya Garo hills (East and West). Throughout. Elsewhere : Celebes, Indo-China, Java, Malaya, Myanmar, Pakistan, Persia, Sumatra, Thailand.

Class BIVALVIA  
Order UNIONOIDA  
Family UNIONIDAE

*Key to the genera*

Shell elongate, comparatively broad, cardinal elon ..... gate *Lamellidens*  
Shell ovate to subrhomboidal; cardinal vertically striate ..... *Parreysia*

Genus ***Lamellidens*** Simpson

1900. *Lamellidens* Simpson, *Proc. U.S. nat. Mus.*, 22 : 854.

1989. *Lamellidens* Subba Rao, *Handbook Freshwater Molluscs of India*, p. 164.

*Key to the species*

Shell broad, umbo prominent, colour brown  
with a lighter band along the margin ..... *L. marginalis*  
Shell less broad, umbo less prominent, colour uniformly dark ..... *L. corrianus*

***Lamellidens marginalis*** (Lamarck)

1819. *Unio marginalis*, *Hist. nat. Anim. Sans. Vert.*, 4 : 79.

1989. *Lamellidens marginalis* : Subba Rao, *Handbook Freshwater Molluscs of India*, p. 168, figs. 404 & 405.

*Material examined* : i) 7 exs., Canal at Damalgiri, Tura, 21.4.91—Coll. D.K. Thakur and party.

*Measurements* (in mm) :

| Length      | Width       | Height     |
|-------------|-------------|------------|
| 93.90-35.60 | 43.55-18.90 | 22.60-9.15 |

*Diagnosis* : Shell oblong ovate, smooth, periostracum blackish brown; posterior side broad, roundly angular, produced, wing narrow; dorsal margin a little curved; ventral margin slightly contracted; hinge with two cardinals in the right valve.

*Distribution* : India : Meghalaya : Garo hills (West); Throughout. Elsewhere : Bangladesh, Myanmar, Sri Lanka.

***Lamellidens corrianus*** (Lea)

1834. *Unio corrianus* Lea, *Trans. Amer. Phil. Soc.*, 6(2) : 65, pl. 9, fig. 25.

*Material examined* : i) 1 ex., Dawki, 13.9.89, ii) 4 exs., Damra, 15.9.83—Coll. A. Hussain and party.

*Measurements* (in mm) :

| Length | Width | Height |
|--------|-------|--------|
| 63.10  | 31.95 | 18.70  |

*Diagnosis* : Shell elongate, elliptical; umbone slightly inflated; periostracum smooth and dark brown; dorsal margin almost straight and long; cardinals two in each valve.

*Distribution* : India Meghalaya : Garo hills (East), Jaintia hills. Throughout. Elsewhere : Bangladesh, Myanmar.

Genus ***Parreysia*** Conrad

1853. *Parreysia* Conrad, *Proc. Acad. nat. Sci. Philad.*, 6 : 267.

1969. *Parreysia* : Subba Rao, *Handbook Freshwater Molluscs of India*, p. 176.

*Key to the species*

1. Centre of ventral margin swollen, thick, strong beak sculpture ..... *P. favidens*  
Ventral margin almost straight, comparatively thin, beak sculpture not strong ..... (2)
2. Shell with prominent posterior umbonal carina, beak cavity less prominent ..... *P. occata*  
Shell without prominent posterior umbonal carina,  
beak cavity more prominent ..... (3)
3. Shell with divaricate ridges throughout upper half of the shell ..... *P. caerulea*  
Shell without divaricate ridges, if present restricted to umbonal region only ..... (4)
4. Shell narrow, more elongate; umbone more pronounced  
with stronger hinge ..... *P. pachysoma*  
Shell broad, less elongate, umbone not pronounced, hinge line not so strong .... *P. olivaria*

Subgenus *Parreysia* s. str.

*Parreysia* (P) *favidens* (Benson)

1862. *Unio favidens* Benson, *Ann. Mag. nat. Hist.*, (3)10 : 188.

1969. *Parreysia favidens* : Subba Rao, *Handbook Freshwater Molluscs of India*, p.180, figs. 466, 467, 484, 485.

*Material examined* : i) 2 exs. Lauglai R., Khasi hills, ii) 3 exs., 1 valve, Phulbari, W. Garo hills, 17.2.65—Coll. A.S. Rajagopal.

*Measurements* (in mm) :

| Length | Width | Height |
|--------|-------|--------|
| 46.45  | 32.00 | 21.85  |

*Diagnosis* : Shell inequilateral, thick, angulate at both ends; cardinal teeth strong and broad.

*Distribution* : India : Meghalaya : Garo hills (West), Khasi hills (East and West); Andhra Pradesh, Assam, Bihar, Maharashtra, Orissa, Tamil Nadu, Uttar Pradesh, West Bengal. Elsewhere : Bangladesh, Pakistan.

Recorded for the first time from Meghalaya.

Subgenus *Radiatula* Simpson, 1900

*Parreysia* (R.) *caerulea* (Lea)

1831. *Unio caerulea* Lea, *Trans. Amer. Phil. Soc.*, 4 : 95, pl. 13, fig. 25.

1969. *Parreysia (Radiatula) caerulea* : Subba Rao, *Handbook Freshwater Molluscs of India*, p. 188, figs. 516, 517.

*Material examined* : i) 1 ex., Phulbari, W. Garo hills, 17.2.65—Coll. A.S. Rajagopal; ii) 2 exs., Shella, 3.9.86—Coll. K.P. Singh and Party.

*Measurements* (in mm) :

| Length | Width | Height |
|--------|-------|--------|
| 25.65  | 14.85 | 8.60   |

*Diagnosis* : Shell variable in shape and sculpture; posterior umbonal carina very distinct; sculpture with zig-zag ribs at the umbonal region extending to the upper half of the valve.

*Distribution* : India : Meghalaya : Garo hills (West), Khasi hills (East); Assam, Bihar, Orissa, Punjab, Uttar Pradesh, West Bengal. Elsewhere : Bangladesh, Myanmar, Nepal,

Pakistan.

Recorded for the first time from Meghalaya.

***Parreysia (R.) occata* (Lea)**

1860. *Unio occata* Lea, *Proc. Acad. nat. Sci. Philad.*, 4 : 307.

1989. *Parreysia (Radiatula) ocata* : Subba Rao, *Handbook Freshwater Molluscs of India*, p. 191, figs. 426, 427, 526, 527.

*Material examined* : i) 1 ex., Phulbari, W. Garo hills, 17.2.65—Coll. A. S. Rajagopal.

*Measurements* (in mm)

| Length | Width | Height |
|--------|-------|--------|
| 31.85  | 18.60 | 12.00  |

*Diagnosis* Shell rather rhomboidal and typically sculptured with granular ridges throughout the surface.

*Distribution* : India : Meghalaya Garo hills (West); Assam, Madhya Pradesh, Uttar Pradesh, West Bengal. Elsewhere : Bangladesh, Myanmar.

Recorded for the first time from Meghalaya.

***Parreysia (R.) olivaria* (Lea)**

1831. *Unio olivarius* Lea, *Trans. Amer. Phil. Soc.*, 4 : 108, pl. 16, fig. 38.

1989. *Parreysia (Radiatula) olivaria* : Subba Rao, *Hand book Freshwater Molluscs of India*, p. 191, figs. 534, 535.

*Material examined* : i) 7 exs., Tura, 4.11.87—Coll. K. P. Singh and party.

*Measurements* (in mm) :

| Length      | Width       | Height    |
|-------------|-------------|-----------|
| 27.95-23.00 | 16.10-13.10 | 9.40-7.75 |

*Diagnosis* : Comparatively small, thin, devoid of any sculpture; umbo prominent and middle; olive green in colour.

*Distribution* : India : Meghalaya Garo hills (West); Assam, Uttar Pradesh, West Bengal.

Recorded for the first time from Meghalaya.

***Parreysia (R.) pachysoma* (Benson)**

1862. *Unio pachysoma* Benson, *Ann. Mag. nat. Hist.*, (3) 10 : 186.

1989. *Parreysia (Radiatula) pachysoma* : Subba Rao, *Handbook Freshwater Molluscs of India*, p. 540, 541.

*Material examined* : i) 4 exs., Dudhnai, 10.4.71-Coll. R.S. Pillai and party.

*Measurements* (in mm) :

| Length      | Width       | Height      |
|-------------|-------------|-------------|
| 42.80-32.65 | 21.82-20.80 | 17.40-15.25 |

*Diagnosis* : Shell more elongate, more inflated; umbo pronounced, with much stronger hinge, radial sculpture absent.

*Distribution* : India : Meghalaya : Garo hills (East); Assam, West Bengal. Elsewhere : Bangladesh, Myanmar.

Family CORBICULIDAE

Genus ***Corbicula*** Megerle van Muehlfeld

1811. *Corbicula* Megerle van Muehlfeld, *Mag. Gesell Naturf. Berlin*, 5 : 56.

1989. *Corbicula* : Subba Rao, *Handbook Freshwater Molluscs of India*, p. 200.

***Corbicula striatella* Deshayes**

1854. *Corbicula striatella* Deshayes, *Proc. zool. Soc. Lond.*, 22 : 344.

1989. *Corbicula striatella* : Subba Rao, *Handbook Freshwater Molluscs of India*, p. 204, figs. 575, 576.

**Material examined** : i) 3 exs., Garampani, 14.12.63—Coll. A.S. Rajagopal; ii) 4 exs., Garampani, 16.12.75—Coll. S.K. Chanda and party.

**Measurements** (in mm) :

| Length      | Width       | Height     |
|-------------|-------------|------------|
| 28.85-15.65 | 23.50-13.20 | 16.85-9.40 |

**Diagnosis** : Shell thick, tumid, triangular to ovate, dorsal margin arched, more on anterior side than posterior; umbones prominent, periostracum shining, lemon yellow in young, dark and often brownish in adult; sculpture with concentric raised striae.

**Distribution** : India : Meghalaya : Jaintia hills. Throughout. Elsewhere : Bangladesh, Myanmar, Pakistan.

Family PISIDIIDAE

Genus *Pisidium* Pfeiffer

***Pisidium atkinsonianum* Theobald**

1876. *Pisidium atkinsonianum* Theobald, *J. Asiat. Soc. Beng.*, 45(2) : 189.

1989. *Pisidium (Odhneripisidium) atkinsonianum* : Subba Rao, *Handbook Freshwater Molluscs of India*, p. 216, figs. 625 & 626.

**Material examined** : i) Many (few hundred), Simar, 20 kms. from Shillong, 3.5.91; ii) 43 exs., Stream side of the Thadalskein lake, Jawai, 5.5.91,—Coll. D.K. Thakur and party.

**Measurements** (in mm) :

| Length    | Width     | Height    |
|-----------|-----------|-----------|
| 4.60-3.05 | 4.25-2.10 | 2.90-1.05 |

**Diagnosis** : Shell medium, orbiculate to ovate, not much swollen, striate in the young; umbone slightly tumid, dorsal margin sloping; anterior margin subtruncate, broadly arched; posterior margin short, rounded dirty olive in colour.

**Distribution** : India : Meghalaya : Khasi hills (East); Jaintia hills; Sikkim and West Bengal (Darjeeling).

Recorded for the first time from Meghalaya.

**Remarks** : These small bivalves were collected from habitats at above 1000 m altitude. At Simar (20 kms. south of Shillong) these were collected from a small pool with vegetations, surrounded by paddy fields. At Thadalskein lake the collection was made from a particular point at which water from a stream flows into the lake. Incidentally *P. atkinsonianum* was the only species of molluscs found in Thadalskein lake.

**B. LAND MOLLUSCS**

*Key to the families*

- Animal without external shell ..... Veronicellidae
- Animal with external shell ..... (2)
- Shell without operculum ..... (3)
- Shell with an operculum ..... (13)
- Shell with simple peristome ..... (4)
- Shell with strongly reflected peristome ..... (8)

4. Shell higher than broad, imperforate ..... (5)  
 Shell broader than high, perforate ..... (6)
5. Shell elongately turreted, spire longer than body whorl ..... Subulinidae  
 Shell oval or ovately conical, spire shorter than body whorl ..... Succineidae
6. Shell narrowly perforate, animal with a caudal gland at the extremity of foot ..... (7)  
 Shell more or less widely umbilicate, animal without  
 caudal gland at the extremity of foot ..... Trochomorphidae
7. Shell thin, peristome not thick; dart sac usually lacking ..... Helicarionidae  
 (*Parmarion* has an internal shell)  
 Shell thick, peristome often thick inside; dart sac large ..... Ariophantidae
8. Shell higher than broad ..... (9)  
 Shell broader than high ..... (11)
9. Shell with apertural process ..... (10)  
 Shell without apertural process ..... Enidae
10. Shell sinistral ..... Clausilidae  
 Shell dextral ..... Streptaxidae
11. Shell sinistral, with spiral sculpture ..... Corillidae  
 Shell dextral, without spiral sculpture ..... (12)
12. Shell very coarsely sculptured without any band ..... Bradybaenidae  
 Shell finely sculptured, with bands ..... Camaenidae
13. Shell higher than broad ..... (14)  
 Shell broader than high ..... (16)
14. Shell smooth with peristomal canals ..... Pupinidae  
 Shell sculptured without peristomal canals ..... (15)
15. Shell cylindrical turreted, with strong ribbings ..... Diplommatinidae  
 Shell ovately conical without ribbings ..... Assimineidae
16. Umbilicus closed by a callus, aperture triangularish ..... Helicinidae  
 Umbilicus open, aperture circular ..... Cyclophoridae

Class           GASTROPODA  
 Order          ARCHAEOGASTROPODA  
 Family        HELICINIDAE  
 Genus         *Pleuropoma* Moellendorff

1893. *Pleuropoma* Moellendorff, *Ber. Senckenb. naturf. Ges.*, p. 140.

1991. *Pleuropoma* Subba Rao, and Mitra, *Rec. zool. Surv. India*, Occ. pap. no. 126 10.

***Pleuropoma arakanensis* Blanford**

(Pl. 1 figs. 5, 6)

1865. *Helicina arakanensis* Blanford, *J. Asiat. Soc. Beng.*, 35 : 85.

1921. *Helicina arakanensis* : Gude, *Fauna British India, Mollusca* 3 : 367.

*Material examined* : i) 1 ex., Siju, 27.4.91—Coll. D.K. Thakur and party.

*Measurements* (in mm) :

| Length | Diameter | Height of the aperture |
|--------|----------|------------------------|
| 4.00   | 5.55     | 2.40                   |

*Diagnosis* Shell depressedly turbinata, sublenticular, rather thin, obliquely striate, flesh coloured with one darker red band in the centre of whorl above, and another on the last whorl just

below the periphery; whorls 4, last compressed and sharply keeled; aperture diagonal, triangular; peristome white slightly expanded. Operculum thin, calcareous, greyish, ovately triangular acutely angled above, with a lateral nucleus.

*Distribution* : India : Meghalaya : Garo hills (South); Elsewhere : Myanmar. Recorded for the first time from mainland of India.

Order MESOGASTROPODA  
Family CYCLOPHORIDAE

*Key to the genera*

1. Sutural tube present..... (2)  
Sutural tube absent ..... (4)
2. Bodywhorl irregularly inflated and constricted, sutural tube closed at both ends ..... (3)  
Bodywhorl regularly rounded, sutural tube open at one end ..... *Pearsonia*
3. Shell more conical (nearly as broad as high), constriction and sutural tube closer to the aperture, aperture vertical ..... *Dyorix*  
Shell depressed (broader than high), constriction and sutural tube distant from the aperture, aperture oblique ..... *Alycaeus*
4. Shell minute, less than 10 mm in diameter ..... (10)  
Shell larger always above 10 mm in diameter ..... (6)
5. Shell with an incision in the peristome, close to suture ..... *Lagochilus*  
Shell without an incision in the peristome ..... *Cyathopoma*
6. Shell discoid, whorls visible on both sides ..... (7)  
Shell conoid, whorls not visible on both sides ..... (9)
7. Shell with a scabrous epidermis ..... *Scabrina*  
Shell without a scabrous epidermis ..... (8)
8. Peristome with a wing like protrusion ..... *Pterocyclus*  
Peristome without any such protrusion ..... *Theobaldius*
9. Shell larger, thick with continuous peristome ..... *Cyclophorus*  
Shell smaller, thin with discontinuous peristome ..... *Leptopoma*

Genus *Alycaeus* Gray

1850. *Alycaeus* Gray, *Nomencl. Moll. Brit. Mus.*, i : 27.

1948. *Alycaeus* : Van Benthem Jutting, *Treubia*, 19 (3) : 567.

*Key to the subgenera*

1. Sutural tube extremely short, often club shaped ..... *Cyclorix*  
Sutural tube long linear ..... 2
2. Shell with an internally hollow ridge present between constriction and aperture ... *Dicharax*  
Shell without any such ridge ..... 3
3. Shell depressed and broad (nearly twice as broad as high), umbilicus wider *Chamalycaeus*  
Shell more conoid (marginally broader than high), umbilicus narrower ..... *Alycaeus* s. str.

Subgenus *Alycaeus* s.str.

*Key to species*

Coarsely sculptured on inflated portion, whorls 4<sub>2</sub><sup>1</sup> ..... *A. conicus*

Microscopically sculptured on inflated portion, whorls  $3\frac{1}{2}$  ..... *A. pusillus*

***Alycaeus (A.) conicus*** Godwin Austen  
(Text. fig. 5D)

1871. *Alycaeus conicus* Godwin Austen, *J. Asiat. Soc. Beng.*, 40 (2) : 87, pl. 3. figs. 1. la. & 1b.

1921. *Alycaeus (Alycaeus) conicus* : Gude, *Fauna Brit. India, Mollusca*, 3 : 208.

*Material examined* : i) 11 exs., Khasi hills.

*Measurements* (in mm) :

| Length    | Diameter  | Height of the aperture |
|-----------|-----------|------------------------|
| 3.05-2.20 | 3.00-2.10 | 1.00-0.60              |

*Diagnosis* : Shell turbate, thick; umbilicus narrow with indistinct ribbing; coarsely sculptured on inflated portion, spire conoid, apex obtuse; suture impressed; whorls 4 to  $4\frac{1}{2}$ ; aperture slightly oblique, circular, peristome double, thick, the inner continuous; operculum horny, multispiral, externally concave, almost smooth inside.

*Distribution* : India Meghalaya Khasi hills (East and West) ; Assam, Nagaland.

***Alycaeus (A.) pusillus*** Godwin-Austen  
(Text fig. 5B)

1871. *Alycaeus pusillus* Godwin-Austen, *J. Asiat. Soc. Beng.*, 46 (2) : 89, pl. 3, figs. 3, 3a & 3b.

1921. *Alycaeus (Alycaeus) pusillus* : Gude, *Fauna Brit. India, Mollusca*, 3, p. 215.

*Material examined* : i) 26 exs., Khasi and Jaintia hills.

*Measurements* (in mm) :

| Length    | Diameter  | Height of the aperture |
|-----------|-----------|------------------------|
| 2.20-1.95 | 3.45-2.60 | 1.60-1.45              |

*Diagnosis* : Shell thin, depressedly turbate, moderately umbilicate; finely and distantly sculptured on inflated portion, spire depressedly conoid; apex blunt; suture moderately impressed; whorls nearly  $3\frac{1}{2}$ ; sutural tube short and thick; aperture oblique, round, peristome double; operculum thin, horny, nearly transparent, multispiral without central boss inside.

*Distribution* : India Meghalaya : Khasi hills (East and West), Jaintia hills; Restricted endemic to Meghalaya.

Subgenus ***Chamalycaeus*** Kobelt and Moellendorff

1897. *Chamalycaeus* Kobelt and Moellendorff, *Nachr. Deuts. Malak. Ges.* : 29 : 151.

1921. *Chamalycaeus* : Gude, *Fauna Brit. India Mollusca*, 3 : 223.

***Alycaeus (C.) sculptilis*** Benson  
(Text fig. 5A)

1856. *Alycaeus sculptilis* Benson, *Ann. Mag. nat. Hist.*, (2) 17 : 226.

1921. *Alycaeus (Chamalycaeus) sculptilis* : Gude, *Fauna Brit. India, Mollusca*, 3 : 233.

*Material examined* : 17 exs., Khasi hills.

*Measurements* (in mm) :

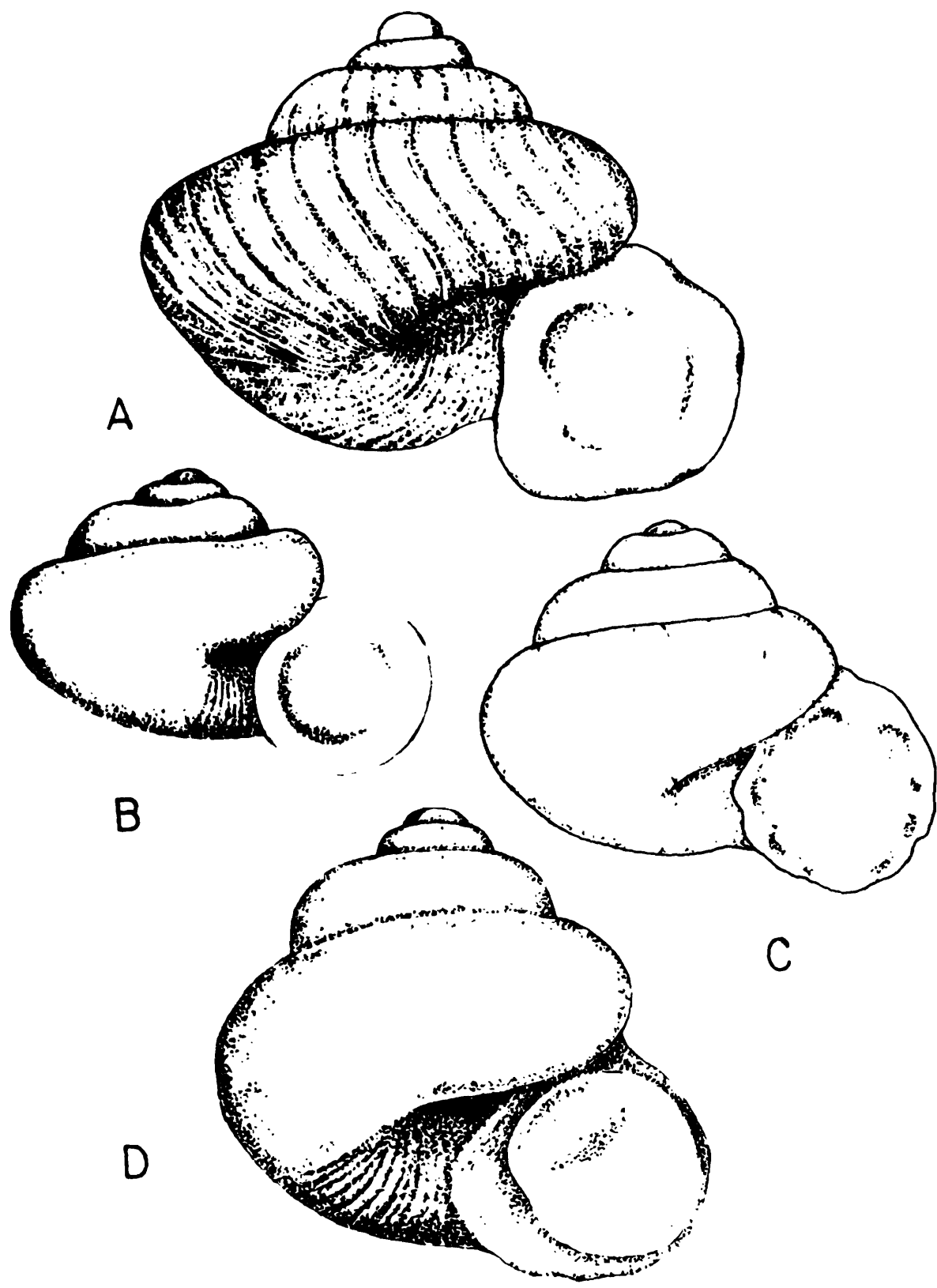


Figure : 5. *Alycaeus conicus* Godwin-Austen 5A. *A. pusillus* Godwin-Austen  
5B. *A. sculptilis* Benson 5C. *A. crispatus*

| Length    | Diameter  | Height of the aperture |
|-----------|-----------|------------------------|
| 3.20-2.80 | 4.80-3.85 | 2.60-2.45              |

*Diagnosis* : Shell narrowly umbilicate, turbinate, subtrochiform, strongly costulate; spire conical, apex pointed; whorls 5. Bodywhorl obsolete subangulate, closely costulate on inflated portion; sutural tube moderately long; aperture oblique, peristome double, reflected, edge of umbilicus angulate.

*Distribution* : India : Meghalaya : Khasi hills (East and West), Nagaland. Elsewhere : Myanmar.

Subgenus ***Dicharax*** Kobelt & Moellendorff

1859. *Dicharax* Kobelt and Moellendorff, *Nachr. Deuts. Malak. Ges.*, 32 : 186.

1921. *Dicharax* : Gude, *Fauna Brit. India, Mollusca*, 13 : 236.

#### Key to the species

1. Peristome with crenulations ..... 2  
Peristome without crenulations ..... 4
2. Umbilicus partly covered by the expanded columella ..... *A. jaintiacus*  
Umbilicus not covered by the columella ..... 3
3. Shell smaller (upto 3 mm in diameter), smooth at base ..... *A. crispatus*  
Shell bigger (above 25 mm in diameter), ribbed at base ..... *A. crenatus*
4. Shell larger (above 6 mm in diameter), outer lip with wing-like projections both above and below ..... *A. prosectus*  
Shell smaller (below 6 mm in diameter), outer lip without wing-like expansions ..... 5
5. Shell coarsely sculptured, ribbing extending inside the umbilicus ..... 6  
Shell microscopically sculptured, smooth at base ..... 7
6. Shell distantly costulate, ridge less developed and parallel to the peristome ..... *A. theobaldi*  
Shell closely costulate, ridge well developed and recurved ..... *A. hebes*
7. Ridge very feebly developed, aperture round ..... *A. nongtunensis*  
Ridge well developed and double, aperture angulate above ..... *A. khasiacus*

#### ***Alycaeus (D.) crenatus*** Godwin-Austen

(Pl. 1, fig. 4)

1871. *Alycaeus crenatus* Godwin-Austen, *J. Asiat. Soc. Beng.*, 40 (2) : 90, pl. 3, figs. 5, 5a, 5b.

1921. *Alycaeus (Dicharax) crenatus* Gude, *Fauna Brit. India, Mollusca*, 3 : 241.

*Material examined* : i) 20 exs., Khasi hills.

*Measurements* (in mm)

| Length    | Diameter  | Height of the aperture |
|-----------|-----------|------------------------|
| 4.55-3.15 | 5.77-4.10 | 3.60-2.30              |

*Diagnosis* Shell moderately umbilicate, depressedly turbinate; spire depressed, apex blunt; suture well impressed; whorls 4, rounded; sutural tube with a subvertical ridge just behind the mouth; aperture oblique; peristome round, wavy except on columellar margin. Operculum,

multispiral, externally concave, with a small projecting boss inside.

*Distribution* : India : Meghalaya : Khasi hills (East and West); Nagaland.

***Alycaeus (D.) crispatus*** Godwin-Austen  
(Text fig. 5C)

1871. *Alycaeus crispatus* Godwin-Austen, *J. Asiat Soc. Beng.*, 40 (2) : 91, pl. 4, figs. 1. 1a, 1b.

1921. *Alycaeus (Dicharax) crispatus* : Gude, *Fauna Brit. India, Mollusca*, 3 : 242.

*Material examined* : i) 5 exs., Khasi hills

*Measurements* (in mm) :

| Length    | Diameter  | Height of the aperture |
|-----------|-----------|------------------------|
| 3.60-2.50 | 3.70-3.40 | 2.20-1.95              |

*Diagnosis* : Shell umbilicate, turbinata, with fine, subdistant plicate costulation on the upper part of the whorl near the suture; spire conoid, apex acute, suture well impressed; whorls 4, rounded; sutural tube moderate; peristome thickened, double, expanded with 4 to 5 undulations on the right side. Operculum a little thickened, slightly convex inside.

*Distribution* : India : Meghalaya : Garo hills (East, South and West), Khasi hills (East and West), Jaintia hills; Arunachal Pradesh.

***Alycaeus (D.) hebes*** Benson  
(Pl. 1, fig. 2)

1857. *Alycaeus hebes* Benson, *Ann. Mag. nat. Hist.*, (2) 19 : 204.

1921. *Alycaeus (Dicharax) hebes* : Gude *Fauna Brit. India, Mollusca*, 3 : 255.

*Material examined* : i) 35 exs., Khasi hills - Coll. H.H. Godwin-Austen.

*Measurements* (in mm) :

| Length    | Diameter  | Height of the aperture |
|-----------|-----------|------------------------|
| 3.80-2.50 | 5.50-4.00 | 2.70-2.20              |

*Diagnosis* : Shell depressedly conoid, sculptured; sculpture prominent on sutural region and also on the inflated portion of the body whorl; the ridge on the constricted portion of the bodywhorl is recurved and hoof-like.

*Remarks* : It is found attached to rocks (Gude, 1921).

*Distribution* : India : Meghalaya : Khasi hills (East and West)

***Alycaeus (D.) jaintiacus*** Godwon-Austen  
(Pl. 2, fig. 4)

1871. *Alycaeus jaintiacus* Godwin-Austen, *J. Asiat. Soc. Beng.*, 40 (2) : 92 pl. 5. figs. 3. 3a, 3b.

1921. *Alycaeus (Dicharax) jaintiacus* : Gude *Fauna Brit. India, Mollusca*, 3 : 256.

*Material examined* : i) 3 exs., Jaintia hills.

*Measurements* (in mm) :

| Length    | Diameter  | Height of the aperture |
|-----------|-----------|------------------------|
| 3.10-2.80 | 3.80-3.60 | 2.40-2.30              |

*Diagnosis* Shell subobtusate, perforate, turbinate; spire conoid, apex blunt, suture impressed; whorls 4, rounded, the last one slightly smaller; constrictions smooth; sutural tube rather short; aperture subvertical, round; peristome deeply waved inner lip continuous, outer reflected near the umbilicus.

*Distribution* India : Meghalaya : Jaintia hills.

***Alycaeus (D.) khasiacus*** Godwin-Austen

(Pl. 2, fig. 3)

1871. *Alycaeus khasiacus* Godwin-Austen, *J. Asiatic Soc. Beng.*, 40 (2) : 90, pl. 3, figs. 4, 4a, 4b.

1921 *Alycaeus (Dicharax) khasiacus* : Gude, *Fauna Brit. India, Mollusca*, 3 : 257.

1985. *Alycaeus khasiacus* : Dey, Barua and Mitra, *Rec. zool. Surv. India*, 82 (1-4) : 264.

*Material examined* : i) 3 exs., Khasi hills.

*Measurements* (in mm) :

| Length    | Diameter  | Height of the aperture |
|-----------|-----------|------------------------|
| 3.40-3.10 | 4.60-4.50 | 2.40-2.35              |

*Diagnosis* : Shell subturbinately depressed, openly umbilicate; spire depressed, conoid, apex very blunt; suture impressed, whorls 4, rounded, last whorl moderately smaller; aperture oblique, round, slightly angulate above; peristome double, the inner continuous, outer slightly expanded. Operculum distinctly concave externally, convex and smooth inside.

*Distribution* : India : Meghalaya : Khasi hills (East and West); Arunachal Pradesh, Assam, Manipur. Elsewhere : Myanmar.

***Alycaeus (D.) nongtunensis*** Godwin-Austen

(Pl. 2, fig. 6)

1914. *Alycaeus nongtunensis* Godwin-Austen, *Land and freshwater Moll. India*, 2 : 378, pl. 138, figs. 5, 5a.

1921. *Alycaeus (Dicharax) nongtunensis* : Gude, *Fauna Brit. India, Mollusca*, 3 : 261.

*Material examined* : 13 exs., Jaintia hills - Coll. F. Stoliczka.

*Measurements* (in mm) :

| Length    | Diameter  | Height of the aperture |
|-----------|-----------|------------------------|
| 3.25-2.50 | 3.35-2.90 | 2.20-2.00              |

*Diagnosis* : Shell globose, tumid, turbinate, umbilicate; sculptured with distant costulation on first whorl, spire conical, low, sides slightly convex, suture impressed, sutural tube short; whorls 4, rounded, slightly constricted on bodywhorl, aperture circular slightly angulate above; peristome double, continuous, the inner expanded; columellar margin rounded.

*Distribution* : India : Meghalaya : Jaintia hills.

***Alycaeus (D.) prosectus* Benson**

(Pl. 2, fig. 8)

1857. *Alycaeus prosectus* Benson, *Ann. Mag. nat. Hist.*, (2) 19 : 203.1921. *Alycaeus (Dicharax) prosectus* Gude, *Fauna Brit. India, Mollusca*, 3 : 266.**Material examined:** i) 13 exs., Khasi hills; ii) 16 exs., Teria Ghat, Coll. H.H. Godwin-Austen; iii) 1 ex., Siju, 27.4.91, Coll. D. K. Thakur and party.**Measurements (in mm) :**

| Length    | Diameter  | Height of the aperture |
|-----------|-----------|------------------------|
| 5.60-4.90 | 9.20-5.00 | 4.50-3.00              |

**Diagnosis :** Shell rather large, sculptured with distant raised striae, whorls 4. Sutural tube rather long; peristome double, simple; outer lip outwardly reflected, angularly dilated, both above and below. Operculum multispiral, externally concave.**Distribution :** India : Meghalaya : Garo hills (South), Khasi hills (East and West).***Alycaeus (D.) theobaldi* Blanford**

(Pl. 2, fig. 7)

1862. *Alycaeus theobaldi* Blanford, *J. Asiat. Soc. Beng.*, 31 : 142.1921. *Alycaeus (Dicharax) theobaldi* : Gude, *Fauna Brit. India, Mollusca*, 3 : 272.**Material examined :** i) 23 exs., Khasi hills.**Measurements (in mm) :**

| Length    | Diameter  | Height of the aperture |
|-----------|-----------|------------------------|
| 4.50-3.20 | 5.50-4.50 | 3.00-2.40              |

**Diagnosis :** Shell depressed, conoid, globose, openly umbilicate; sculpture very distant, strong; sutural tube short; spire conoid, depressed; suture well impressed; whorls 4, rounded, aperture circular; peristome double; columellar margin rounded. Operculum thin, multispiral with a central nucleus and a prominent boss inside.**Distribution :** India : Meghalaya : Khasi hills (East and West)Subgenus ***Cycloryx*** Godwin-Austen1914. *Cycloryx* Godwin and Austen, *Land and Freshwater molluscs of India*, 2 : 334.1921. *Cycloryx* : Gude, *Fauna Brit. India, Mollusca*, 3 : 280.**Key to the species**

Umbilicus partially covered by the reflected columella ..... *A. graphicus*  
 Umbilicus completely covered by a columellar process ..... *A. otiphorus*

***Alycaeus (C.) graphicus* Blanford**

(Pl. 2, fig. 5)

1862. *Alycaeus graphicus* Blanford, *J. Asiat. Soc. Beng.*, 31 : 137.1921. *Alycaeus (Cycloryx) graphicus* : Gude, *Fauna Brit. India, Mollusca*, 3 : 280.

*Material examined* : i) 32 exs., Tura Peak, 28.2.65 Coll. A. S. Rajagopal.

*Measurements* (in mm)

| Length    | Diameter  | Height of the aperture |
|-----------|-----------|------------------------|
| 4.85-3.45 | 4.65-2.60 | 3.30-1.40              |

*Diagnosis* : Shell ovately globose, turbinate; umbilicus covered by the extension of the outer lip; spire conical, moderately high; whorls 4, well rounded; aperture circular, peristome double, expanded and slightly reflected.

*Distribution* India : Meghalaya : Garo hills (West), Assam, Nagaland, West Bengal, Elsewhere : Myanmar.

### ***Alycaeus (C.) otiphorus* Benson**

(Pl. 2 fig. 1)

1859. *Alycaeus otiphorus* Benson, *Ann. Mag. nat. Hist.*, (3) 3 : 178.

1921. *Alycaeus (Cyclorix) otiphorus* : Gude, *Fauna Brit. India, Mollusca*, 3 : 283.

*Material examined* : i) 4 exs., Khasi hills - Coll. W.T Blanford.

*Measurements* (in mm) :

| Length    | Diameter  | Height of the aperture |
|-----------|-----------|------------------------|
| 4.60-4.20 | 3.85-2.90 | 2.00-1.70              |

*Diagnosis* : Shell ovately globose, more conical, slightly higher than broad, spire conical, suture deeply impressed; sutural tube short, umbilicus completely covered by an expanded process of the columella.

*Distribution* : India : Meghalaya : Khasi hills (East and West); Nagaland, Sikkim, West bengal. Elsewhere : Myanmar.

Recorded for the first time from Meghalaya.

Genus ***Dioryx*** Benson

1859. *Dioryx* (Part) Benson, *Ann. Mag. nat. Hist.*, (3) 3 : 177.

1921. *Dioryx* : Gude *Fauna Brit. India, Mollusca*, 3 : 201.

### ***Dioryx urnula* (Benson)**

(Pl. 2, fig. 2)

1853. *Alycaeus urnula* Benson, *Ann. Mag. nat. Hist.*, (2) 6 : 284.

1921. *Dioryx urnula* : Gude, *Fauna Brit. India, Mollusca*, 3 : 201.

*Material examined* : 1 ex., Khasi hills.

*Measurements* (in mm)

| Length | Diameter | Height of the aperture |
|--------|----------|------------------------|
| 5.30   | 3.85     | 1.35                   |

*Diagnosis* : Shell globose, conical, narrowly perforate, with very fine striae; body whorl tumid, wide, equal being more than half, the total length, constricted near the aperture; Sutural tube close to the aperture. Operculum calcareous, flat; widely spiral with distant sutures, nucleus central.

*Distribution* : India : Meghalaya : Khasi hills (East and West), Arunachal Pradesh, Sikkim,

West Bengal. Elsewhere : Myanmar.

Genus ***Cyclophorus*** Montfort

1810. *Cyclophorus* Montfort, *Conchyl. Syst.*, 2 : 290.

1991. *Cyclophorus* : Subba Rao and Mitra, *Rec. zool. Surv. India, Occ. paper.*, 126 :15.

*Key to the subgenera*

1. Body whorl dilated in front ..... *Salpingophorus*  
Body whorl not dilated in front ..... 2
2. Peristome with a wing-like expansion ..... *Glossostylus*  
Peristome without wing-like expansion ..... *Cyclophorus*

Subgenus ***Cyclophorus*** s.str.

***Cyclophorus (C.) affinis*** Theobald

(Pl. 3, figs. 1 & 2)

1857. *Cyclophorus affinis* Theobald, *J. Asiat. Soc. Beng.*, 26 : 246.

1921. *Cyclophorus (Cyclophorus) affinis* : Gude, *Fauna Brit. India, Mollusca*, 3 : 88.

*Material examined* : i) 4 exs., Siju Cave, 17.2.22 - Coll. S. W. Kemp & B. chopra; ii) 1 ex., Umling, (580 m); 22.9.91 - Coll. R. K. Varshney, I. J. Gupta, S. K. Ghosh.

*Measurements* (in mm) :

| Length      | Diameter    | Height of the aperture |
|-------------|-------------|------------------------|
| 30.70-18.30 | 35.80-25.50 | 19.65-12.90            |

*Diagnosis* : Shell subglobosely turbinate, openly umbilicate, subangulate at the periphery; whorls 5; spire conical, apex acuminate; suture deep, peristome widely reflected and thickened. Operculum thin, calcareous, multispiral, scarcely concave externally. Nucleus central.

*Distribution* : India : Meghalaya : Garo hills (South), Ri-Bhoi. Elsewhere : Myanmar, Pegu.

Subgenus ***Glossostylus*** Kobelt & Moellendorff

1897. *Glossostylus* Kobelt and Moellendorff, *Nachr. Deuts. Malak. Ges.*, 29 : 106.

1921. *Glossostylus* : Gude, *Fauna Brit. India, Mollusca*, 3 : 56.

*Key to the species*

1. Shell conspicuously sculptured with raised spiral keels ..... *C. himalayanus*  
Shell finely striate ..... 2
2. Shell granularly sculptured below ..... *C. pearsoni*  
Shell finely decussate below ..... *C. bensoni*

***Cyclophorus (G.) bensoni*** (Pfeiffer)

(Pl. 3, figs 3 & 4)

1852. *Cyclostoma (Cyclophorus) bensoni* Pfeiffer, *Proc. zool. Soc. Lond.*, p. 158.

1921. *Cyclophorus (Glossostylus) bensoni* : Gude, *Fauna Brit. India, Mollusca*, 3 : 57.

*Material examined* : i) 7 exs., Khasi hills, Coll - W. T. Blanford.

*Measurements* (in mm) :

|             |             |                        |
|-------------|-------------|------------------------|
| Length      | Width       | Height of the aperture |
| 41.70-29.20 | 49.70-42.65 | 22.75-18.45            |

**Diagnosis** : Shell subglobose, narrowly but deeply umbilicate, conspicuously sculptured with prominent spiral striae criss crossed by transverse lines; whorls 5, convex, body whorl large with a chocolate band at the periphery, a few more bands at the base; peristome thickened and reflected. Operculum thin, a little concave, multispiral with 8 whorls.

**Distribution** : India : Meghalaya Khasi hills (East and West); Assam. Elsewhere : Myanmar.

***Cyclophorus (G.) himalayanus* (Pfeiffer)**

(Pl. 3, figs. 5 & 6)

1851. *Cyclostoma himalayanus* Pfeiffer, *Proc. zool. Soc. Lond.*, p. 42.

1921. *Cyclophorus (Glossostylus) himalayanus* : Gude, *Fauna Brit. India, Mollusca*, 3 : 63.

**Material examined** : i) 1 ex., Khasi hill.

**Measurements** (in mm) :

|        |          |                        |
|--------|----------|------------------------|
| Length | Diameter | Height of the aperture |
| 42.55  | 51.70    | 23.10                  |

**Diagnosis** : Shell globosely turbinate with spiral keels 10-12 of which are prominent; body whorl and edge of umbilicus angulate; spire conoid, apex acuminate; whorls 4; peristome reflected but not thickened. Operculum multispiral with 7-8 whorls, edges of whorls thread-like.

**Distribution** : India : Meghalaya : Khasi hills (East and West); Assam, West Bengal. Elsewhere : Bhutan.

***Cyclophorus (G.) pearsoni* (Benson)**

(Pl. 4, figs. 1 & 2)

1871. *Cyclostoma pearsoni* Benson, *Ann. Mag. nat. Hist.*, (2) 8 : 185.

1921. *Cyclophorus (Glossostylus) pearsoni* : Gude, *Fauna Brit. India, Mollusca*, 3 : 65.

**Material examined** : i) 1 ex., Tura, Aug.-Sept., 1917 - Coll. S. W. Kemp; ii) 5 exs., Phulbari, W. Garo hills, 17.2.65, iii) 17 exs., Tura peak, 27.2.65 - Coll. A.S. Rajagopal; iv) 1 ex., Dawki, 18.5.72 - Coll. S. Biswas and party; v) 1 ex., Rambagiri, 5.11.78; vi) 3 exs., Nongkhyllum, 24.9.82 - Coll. K. P. Singh and Party; vii) 3 exs., Dawki, 21.8.80 - Coll. A. Singh; viii) 3 exs., Balat, 5.8.81 - Coll. M. R. Rynth and party; ix) 2 exs., Nongkhyllum (Nongpoh), 19.10.82 - Coll. R. Mathew and party; x) 1 ex., Anogiri, 17.10.83 - Coll. J.R.B. Alfred and party; xi) 10 exs., Siju, 7.4.91 - Coll. D. K. Thakur and party.

**Measurements** (in mm) :

|             |             |                        |
|-------------|-------------|------------------------|
| Length      | Diameter    | Height of the aperture |
| 35.00-16.85 | 40.35-17.30 | 19.35-10.80            |

**Diagnosis** : Shell depressedly turbinate, narrowly umbilicate; spire conoid, apex acuminate, whorls 5, carinate, decussately sculptured with spiral and transverse striae; peristome reflected. Head and tentacles dark coloured, feet comparatively lighter. Tentacles, single pair, brownish with dark rings.

**Distribution** : India : Meghalaya : Garo hills (South and West), Khasi hills (East and West),

Jaintia hills, Ri-Bhoi; Assam. Elsewhere : Bangladesh.

**Remarks :** Nevill (1878) refers to a 'var. minor' from Khasi hills as smaller with less open umbilicus and more angulate periphery. It is quite likely that the present material may belong to this form. On the other hand, these specimens have similarity with *C. nagaensis*, interestingly Godwin-Austen and Beddome, mentioned about a form of the species *C. nagaensis* which was *C. pearsoni* (Gude, 1921). But nothing is mentioned about the locality of that form.

Subgenus ***Salpingophorus*** Kobelt and Moellendorff

1897. *Salpingophorus* (Part) Kobelt and Moellendorff, *Nachr. Deuts. Malak Ges.*, 29 : 108.

1921. *Salpingophorus* : Gude, *Fauna British India, Mollusca*, 3 : 69.

*Key to the species*

Shell smaller (upto 30 mm in diameter) keeled at the periphery ..... *C. zebrinus*

Shell longer (above 70 mm in diameter) rounded at the peiphery ..... *C. khasiensis*

***Cyclophorus (S.) khasiensis* Nevill**

(Pl. 4, figs. 3 & 4)

1818. *Cyclophorus Khasiensis* Nevill, *Hand list.*, 1 : 273.

1850. *Cyclostoma siamensis* Sowerby, *Thes. conch.*, 1 : 158, pl. 31, figs. 392 393.

1921. *Cyclophorus (Salpingophorus) Khasiensis* : Gude, *Fauna Brit. India, Mollusca*, 3 : 80.

**Material examined :** i) 1 ex., Teria Ghat.

**Measurements** (in mm) :

| Length | Diameter | Height of the aperture |
|--------|----------|------------------------|
| 39.95  | 49.65    | 22.40                  |

**Diagnosis :** Shell globose, somewhat depressed; spire conical, acuminate, whorls 4, rounded, with a distinct linear suture; colour white with angular markings and streaks of chestnut colour, peristome thickened. Operculum multispiral with 6-7 whorls and a central nucleus, interspaces with oblique growth striae.

**Distribution :** India : Meghalaya : Khasi hills (West).

***Cyclophorus (S.) zebrinus* Benson**

(Pl. 4, figs. 5 & 6)

1836. *Cyclophorus zebrinus* Benson, *J. Asiat. Soc. Beng.*, 5 : 353.

1921. *Cyclophorus (Salpingophorus) zebrinus* : Gude, *Fauna Brit. India, Mollusca*, 3 : 86.

**Material examined :** i) 21 exs., Khasi hills.

**Measurements** (in mm) :

| Length      | Diameter    | Height of the aperture |
|-------------|-------------|------------------------|
| 22.90-12.40 | 26.00-12.95 | 11.05-6.50             |

**Diagnosis :** Shell rather small, thin, conoid, acutely carinate at the periphery, distinctly sculptured with distant, raised ridges; whorls 5, flattened; spire acuminate; peristome greatly reflected obliterating the umbilicus.

**Distribution :** India : Meghalaya : Khasi hills (East and West) ; Arunachal Pradesh, Assam, Manipur, Mizoram. Elsewhere : Bangladesh, China, Merqui Archipelago; Myanmar.

Genus **Cyathopoma** Blanford

1861. *Cyathopoma* Blanford, *J. Asiat. Soc. Beng.*, 30 : 348.

1921. *Cyathopoma* : Gude, *Fauna British India, Mollusca*, 3 : 130.

Subgenus **Pseudojerdonia** Kobelt

1902. *Pseudojerdonia* Kobelt, *Das Tierreich, Lj*, 16 : 227.

*Key to the species*

Body whorl with 6 raised spiral ribs ..... *C. garoense*

Body whorl with 4 raised spiral ribs ..... *C. jawaiense*

***Cyathopoma (P) garoense*** Godwin-Austen

(Text fig. 6C)

1876. *Cyathopoma garoense* Godwin-Austen, *J. Asiat. Soc. Beng.*, 45(2) 183.

1921. *Cyathopoma (Pseudojerdonia) garoense* : Gude, *Fauna Brit. India, Mollusca*, 3 : 153.

*Material examined* : i) 1 ex., Garo hills.

*Measurements* (in mm) :

| Length | Diameter | Height of the aperture |
|--------|----------|------------------------|
| 2.05   | 2.25     | 0.95                   |

*Diagnosis* : Shell turbinate, openly umbilicate, white; whorls five, rounded; body whorl with six well marked longitudinal ribs; spire conoid, apex high; peristome simple, circular. Operculum calcareous, thick, flat, multispiral.

*Distribution* : India : Meghalaya Garo hills (South) Jaintia hills; Assam.

***Cyathopoma (P) jawaiense*** Godwin-Austen

(Text fig. 6D)

1876. *Cyathopoma jawaiense* Godwin-Austen, *J. Asiat. Soc. Beng.*, 45(2) 182, pl. 8A, fig. 6.

1921. *Cyathopoma (Pseudojerdonia) jawaiense* : Gude, *Fauna Brit. India, Mollusca*, 3 : 154.

*Material examined* : i) 7 exs., Jawai.

*Measurements* (in mm)

| Length    | Diameter  | Height of the aperture |
|-----------|-----------|------------------------|
| 2.00-1.85 | 1.40-1.30 | 0.95-0.90              |

*Diagnosis* Shell turbinate, narrowly umbilicate; whorls 4½ rounded, with four well raised longitudinal ribs on the last whorl; spire conical, apex papillate; peristome simple, thin; aperture circular, operculum with many whorls. Operculum close to the margin of aperture, a little concave, externally multispiral, nucleus central.

*Distribution* : India : Meghalaya : Jaintia hills, Assam, Nagaland.

Genus **Lagochilus** Blanford

1864. *Lagochilus* Blanford, *Ann. Mag. nat. Hist.*, 3(3) 452.

1991. *Lagochilus* : Subba Rao, and Mitra, *Rec. zool. Surv. India, Occ. Paper*, 126 : 20.

***Lagochilus tomotrema*** Benson

(Text fig. 6B)

1857. *Cyclophorus ? tomotrema* Benson, *Ann. Mag. nat. Hist.*, (2) 19 : 206.

1921 *Japonia (Lagochilus) tomotrema* Gude, *Fauna Brit. India, Mollusca*, 3 : 12.

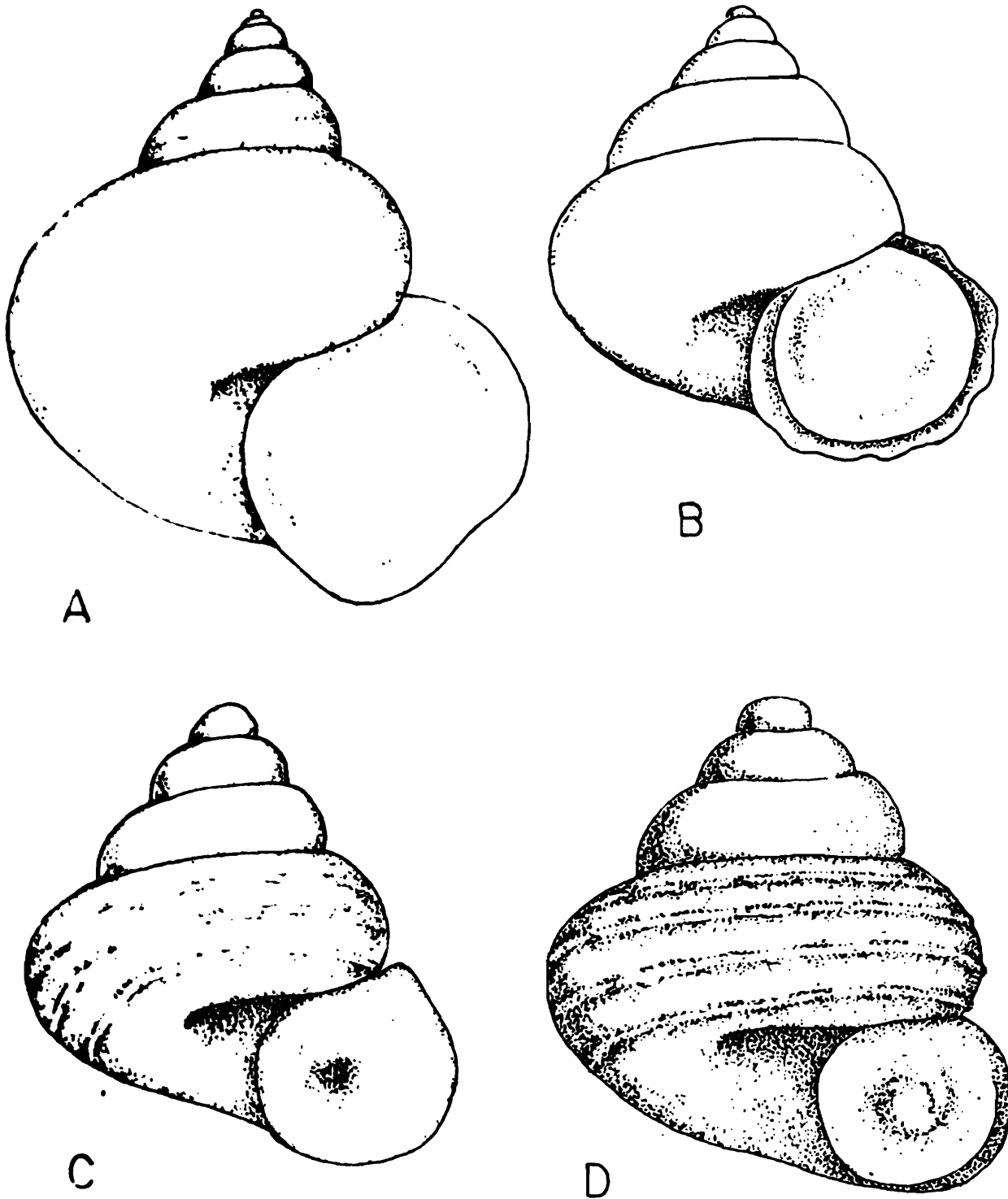


Figure : 6A. *Leptopoma aspirans* Benson 6B. *Lagochilus tomotrema* Benson  
6C. *Cyathopoma garoense* Godwin-Austen 6D. *C. jawaiense* Godwin-Austen

*Material examined* : i) 2 exs., Khasi hills.

*Measurements* (in mm) :

| Length    | Diameter  | Height of the aperture |
|-----------|-----------|------------------------|
| 5.70-4.10 | 4.10-3.40 | 3.40-2.60              |

*Diagnosis* Shell pyramidal, narrowly unbilicate, coarsely sculptured with raised spiral lirae; spire conical; whorls six convex; body whorl subcarinate; aperture oblique, circular with an incision at the upper angle, peristome double. Operculum thin, horny multispiral with a central nucleus.

*Distribution* : India : Meghalaya Khasi hills (East and West); Arunachal Pradesh, Nagaland, West Bengal.

Genus ***Leptopoma*** Pfeiffer

1847. *Leptopoma* Pfeiffer, *Zeits. Malak.*, 4 : 108.

1991. *Leptopoma* : Subba Rao and Mitra, *Rec. zool. Surv. India, Occ. Paper*, 126 : 23.

***Leptopoma aspirans*** Benson

(Text fig. 6A)

1856. *Leptopoma aspirans* Benson, *Ann. Mag. nat. Hist.*, (2)17 : 229.

1921. *Leptopoma aspirans* Gude, *Fauna Brit. India, Mollusca* 3 : 3.

*Material examined* : i) 5 exs., Khasi hills.

*Measurements* (in mm)

| Length      | Diameter  | Height of the aperture |
|-------------|-----------|------------------------|
| 13.60-10.90 | 9.05-8.45 | 7.00-6.20              |

*Diagnosis* Shell ovately conical, thin, perforate; apex acute; shell whitish with oblique brown streaks, sculptured with both oblique and spiral striae, six elevated spiral ridges in each whorl; whorls convex, body whorl large, obsolete carinate at the periphery; aperture circular, margins joined with thin callous, operculum, thin, horny, flat, multispiral, nucleus central.

*Distribution* : India : Meghalaya : Khasi hills (East and West). Elsewhere : Myanmar.

Genus ***Pearsonia*** Kobelt

1902. *Pearsonia* Kobelt, *Das Tierreich, Liof.*, 16 : 171.

1921. *Pearsonia* : Gude, *Fauna Brit. India, Mollusca*, 3 : 112.

*Key to the species*

Sutural tube very close to the aperture (approx 2 mm away) ..... *P. assamensis*

Sutural tube farther from the aperture (approx. 5 mm away) ..... *P. hispida*

***Pearsonia assamensis*** (Fulton)

(Pl. 5, figs. 1 & 2)

1900. *Spiraculum assamensis* Fulton, *Nautilus*, 14 : 87.

1921. *Pearsonia assamensis* Gude, *Fauna Brit. India, Mollusca*, 3 : 113, fig. 18.

*Material examined* : i) 16 exs., Cherrapunji—Coll. B. Warren,

*Measurements* (in mm) ;

| Length    | Diameter   | Height of the aperture |
|-----------|------------|------------------------|
| 4.35-3.65 | 12.00-9.15 | 4.50-3.35              |

**Diagnosis :** Shell discoidal, flat, broadly umbilicate, dark brown with a few oblique stripes of lighter colour; whorls 4½ slightly convex above; tube erected, short, declined towards the apex; peristome white, thickened, aperture oblique, circular; operculum with five whorls, horny, multispiral with a central nucleus, a little concave internally.

**Distribution :** India : Meghalaya : Khasi hills (East); Assam.

***Pearsonia hispidum* Pearson**

(Pl. 5, figs, 3 & 4)

1833. *Spiraculum hispidum* Pearson, *J. Asiat. Soc. Beng.*, 2: 592.

1921. *Pearsonia (Pearsonia) hispida* : Gude, *Fauna Brit. India, Mollusca*, 3 : 118.

**Material examined :** i) 4 exs., Tura, Garo hill, July-August, 1917-Coll. S.W. Kemp; ii) 5 exs., Teriaghat, Khasi hills, 25.2.23-Coll. R. Hodgart; iii) 2 exs., Tura peak, W. Garo hills, 26.2.65-Coll. A.S. Rajagopal; iv) 1 ex., Balat, E. Khasi hills, 9.9.86-Coll. M.R. Rynth and Party; v) 8 exs., Siju, 27.4.91-Coll. D.K. Thakur and party.

**Measurements (in mm) :**

| Length    | Diameter    | Height of the aperture |
|-----------|-------------|------------------------|
| 9.10-4.00 | 21.10-12.70 | 6.70-5.15              |

**Diagnosis :** Shell white, sub-diaphanous with brownish patch on the upper surface of the body whorl; whorls five, breathing tube, conical, compressed, pointed backward and inward; aperture circular, peristome thickened and reflected. Operculum corneous, formed by several spiral layers externally, internally deeply excavated, polished, nucleus central.

**Remarks :** Judging by the measurements of the shells these may belong to the var. *minor* mentioned by Godwin-Austen (1876).

**Distribution :** India : Meghalaya : Garo hills (South and West), Khasi hills (East and West); Bihar.

Genus ***Pterocyclus* Benson**

1832. *Pterocyclos* Benson, *J. Asiat. Soc. Beng.*, 2 : 11.

1921. *Pterocyclus* : Gude, *Fauna Brit. India, Mollusca*, 3 : 97.

***Pterocyclus parvus* (Pearson)**

(Pl. 6, figs. 1 & 2)

1833. *Spiraculum parvum* Pearson, *J. Asiat. Soc. Beng.*, 2 : 592, pl. 20, fig. 7.

1921. *Pterocyclus parvum* : Gude, *Fauna Brit. India, Mollusca*, 3 : 108.

1985. *Pterocyclus parvus* : Dey, Barua and Mitra, *Rec. zool. Surv. India*, 82(1-4) : 265.

**Material examined :** i) 3 exs., North Khasi hills, -C. ii) 25 exs., Khasi hills-Coll. Godwin-Austen; iii) 6 exs., Tura Peak, W. Garo hills, 28.2.65-Coll. A.S. Rajagopal, iv) 2 exs., Khasi hill; v) 5 exs., Doipgiri, 23.4.91, vi) 10 exs., Siju, 27.4.91, vii) 1 ex., Nongpoh, 7.5.91-Coll. D.K. Thakur and Party.

**Measurements (in mm) :**

| Length    | Diameter   | Height of the aperture |
|-----------|------------|------------------------|
| 8.70-2.65 | 20.28-6.00 | 8.85-1.80              |

**Diagnosis :** Shell subdiaphanous, white, encircled with a dark brown line along the circumference of whorl, striated above with brown zig-zag striae; an incomplete breathing tube situated near the aperture; aperture circular, peristome thickened and reflected; umbilicus widely open, operculum fairly thick, flat externally, internally concave; multispiral, whorls with rough edges, nucleus central. Tentacles 2, brownish with darker rings; head dark brownish, foot light

brown.

*Distribution* : India : Meghalaya : Garo hills (South and West), Khasi hills (East), Ri-Bhoi; Arunachal Pradesh, Assam, Mizoram, Nagaland. Elsewhere : Bangladesh, Myanmar.

Genus ***Scabrina*** Blanford, 1863

1863. *Scabrina* Blanford, *J. Asiat. Soc. Beng.*, 32 : 322.

1921. *Scabrina* : Gude, *Fauna Brit. India Mollusca*, 3 : 26.

***Scabrina pinnulifera*** Benson

(Pl. 6, figs. 3 & 4)

1857. *Cyclophorus pinnulifera* Benson, *Ann. Mag. nat. Hist.*, (2) 19 : 205.

1921. *Scabrina pinnulifera* : Gude, *Fauna Brit. India, Mollusca*, 3 : 30.

*Material examined* : i) 8 exs., Jaintia hills, -Coll. W.T Blanford.

*Measurements* (in mm) :

| Length    | Diameter    | Height of the aperture |
|-----------|-------------|------------------------|
| 9.95-4.50 | 16.00-10.85 | 6.50-4.10              |

*Diagnosis* Shell small, openly umbilicate, depressedly orbiculate, radiately striate, decussated by fine microscopic spiral striae, whorls  $4\frac{1}{2}$ , rounded; aperture oblique, peristome incompletely double and expanded in adults. Operculum multispiral with about 7 whorls, edges of whorls free and rough, internally a little concave, nucleus central, projecting.

*Distribution* : India : Meghalaya : Jaintia hills; Nagaland.

Genus ***Theobaldius*** G. Nevill.

1878. *Theobaldius* Nevill, *Hand list.*, 1 : 275.

1921. *Theobaldius* : Gude, *Fauna Brit. India Mollusca*, 3 : 31.

*Key to the species*

Shell narrowly umbilicate, with spiral sculpture ..... *T. phaenotopicus*  
 Shell broadly umbilicate, without spiral sculpture ..... *T. orites*

***Theobaldius orites*** Nevill

(Pl. 6, figs. 5 & 6)

1881. *Cyclophorus (Theobaldius) orites* Nevill, *J. Asiat. Soc. Beng.*, 1(2) : 147, pl. 6, fig. 4.

1921. *Theobaldius orites* Gude, *Fauna Brit. India, Mollusca*, 3 : 38.

*Material examined* : i) 2 exs., Siju, 27.4.91-Coll. D.K. Thakur and party.

*Measurements* (in mm) :

| Length    | Diameter    | Height of the aperture |
|-----------|-------------|------------------------|
| 4.85-4.75 | 12.80-12.75 | 4.50-4.45              |

*Diagnosis* : Shell solid, depressed, subdiscoidal, broadly and openly umbilicate; spire flat, suture excavate; whorls 4, the last one perfectly rounded, increasing unusually rapidly in size; aperture circular, peristome double. Operculum thin, horny, flat, with about 6 whorls, edges of whorls sharp; nucleus central.

*Distribution* : India : Meghalaya : Garo hills (South); Sikkim. Recorded for the first time from Meghalaya. It is the first subsequent record of this species after it was described from Sikkim.

***Theobaldius phaenotopicus* (Benson)**

(Pl. 7, figs. 1 &amp; 4)

1851. *Cyclostoma phaenotopicus* Benson, *Ann. Mag. nat. Hist.*, (2) 8 : 190.1985. *Theobaldius phaenotopicus* : Dey, Barua and Mitra, *Rec. zool. Surv. India*, 82 (1-4) : 265.*Material examined* : i) 1 ex., Shillong, 31.7.73, ii) 1 ex., Lumparing, Shillong, 9.3.76, iii) 1 ex., Motinagar, Shillong, 15.9.76-Coll. Gyrwa and party.*Measurements* (in mm) :

| Length | Diameter | Height of the aperture |
|--------|----------|------------------------|
| 5.40   | 8.88     | 3.20                   |

*Diagnosis* : Shell subdiscoid, narrowly umbilicate, scabrously sculptured with close radiate striae and spiral lines, whorls close to the sutures; peristome double, the outer little reflected. Operculum thin, flat multispiral with about 7 whorls, edges of whorls sharp and raised, nucleus central.*Distribution* : India : Meghalaya : Khasi hills (East); Arunachal Pradesh, Sikkim, West Bengal.

Family PUPINIDAE

*Key to the genera*Shell smooth, shining with peristomal canals ..... *Pupina*Shell sculptured, without peristomal canals ..... *Schistoloma*Genus ***Pupina*** Vignard1829. *Pupina* Vignard, *Ann. Sci. Nat.*, 18 : 4391921. *Pupina* : Gude, *Fauna Briti. India, Mollusca*, 3 : 1921991. *Pupina* : Subba Rao and Mitra, *Rec. zool. Surv. India Occ. Paper*, 126 : 27.***Pupina imbricifera* Benson**

(Pl. 7 figs. 2 &amp; 3)

1856. *Pupina imbricifera* Benson, *Ann. Mag. nat. Hist.*, (2) 17 : 230.1921. *Pupina (Tylotoechus) imbricifera* : Gude, *Fauna Brit. India, Mollusca*, 3 : 195.*Material examined* : i) 12 exs., Garo hills, June-July, 1917-Coll. S.W. Kemp; ii) 5 exs., Teriaghat.*Measurements* (in mm) :

| Length    | Diameter  | Height of the aperture |
|-----------|-----------|------------------------|
| 9.25-8.20 | 4.60-4.40 | 2.40-1.80              |

*Diagnosis* : Shell imperforate, ovate, rather inflated, smooth, polished; spire conical, apex acute; whorls six, rounded, aperture circular, with two canals, one parietal, another at the columella, peristome double, expanded. Operculum flat, thick, multispiral with about 4 whorls, nucleus central slightly projecting inside.*Distribution* : India : Meghalaya : Garo hills (East, South and West), Khasi hills (West). Elsewhere : Bangladesh.Genus ***Schistoloma*** Kobelt1902. *Schistoloma* Kobelt, *Das Tierreich, Lief.* 16 : 2781921. *Schistoloma* Gude, *Fauna Brit. India, Mollusca* 3 : 168.***Schistoloma funiculatum* (Sowerby)**

(Pl. 7, figs. 5 &amp; 6)

1850. *Cyclostoma funiculatum* Sowerby, *Thes. Conch.* 1 : 1661921. *Schistoloma funiculatum* : Gude, *Fauna Brit. India, Mollusca* 3 : 169.*Material examined* : 3 exs. Shillong*Measurements* (in mm) :

| Length | Diameter | Height of the aperture |
|--------|----------|------------------------|
| 23.30  | 8.90     | 7.80                   |

*Diagnosis* : Shell cylindrically turreted, with whorls 7, body whorl decussately sculptured; thickened and reflected edge of umbilicus carinate. Operculum thin, flat, multispiral, edge of whorls irregularly wavy; nucleus central.

*Distribution* India : Meghalaya : Khasi hills (East); West Bengal (Darjiling).

Family DIPLOMMATINIDAE

*Key to the genera*

Umbilical region with a raised spiral ridge, columellar margin with a blunt tooth ..... *Gastroptychia*  
 Umbilical region without a raised ridge, columellar margin with an entering lamella ..... *Diplommatina*

Genus ***Diplommatina*** Benson1840. *Diplommatina* Benson, *Ann. Mag. nat. Hist.*, (2) 4 : 1931948. *Diplommatina* : Van Benthem Jutting, *Treubia*, 19 (3) : 589.*Key to species*

1. Columellar margin straight ..... 2  
 Columellar margin rounded ..... 8
2. Shell sinistral ..... *D. gibbosa*  
 Shell dextral ..... 3
3. Shell less than 2 mm in length ..... *D. parvula*  
 Shell more than 2 mm in length ..... 4
4. Shell above 5 mm in length ..... *D. tumida*  
 Shell below 5 mm in length ..... 5
5. Shell microscopically sculptured, lower whorls smooth ..... *D. austeni*  
 Shell conspicuously sculptured throughout ..... 6
6. Whorls 5, closely costulate ..... *D. depressa*  
 Whorls more than 5, distantly costulate ..... 7
7. Outer pristome sinuate at the columellar side ..... *D. scalaria*  
 Outer peristome not sinuate ..... *D. oligopleuris*
8. Shell sinistral ..... *D. jaintiaca*  
 Shell dextral ..... 9
9. Finely striate throughout ..... *D. polypleuris*  
 Faintly striate on apical whorls ..... *D. diplochilus*

***Diplommatina austeni*** Blanford

(Pl. 8, fig. 8)

1868. *Diplommatina austeni* Blanford, *J. Asiat. Soc. Beng.*, 37 : 81, pl. 3, figs. 2, 2a.

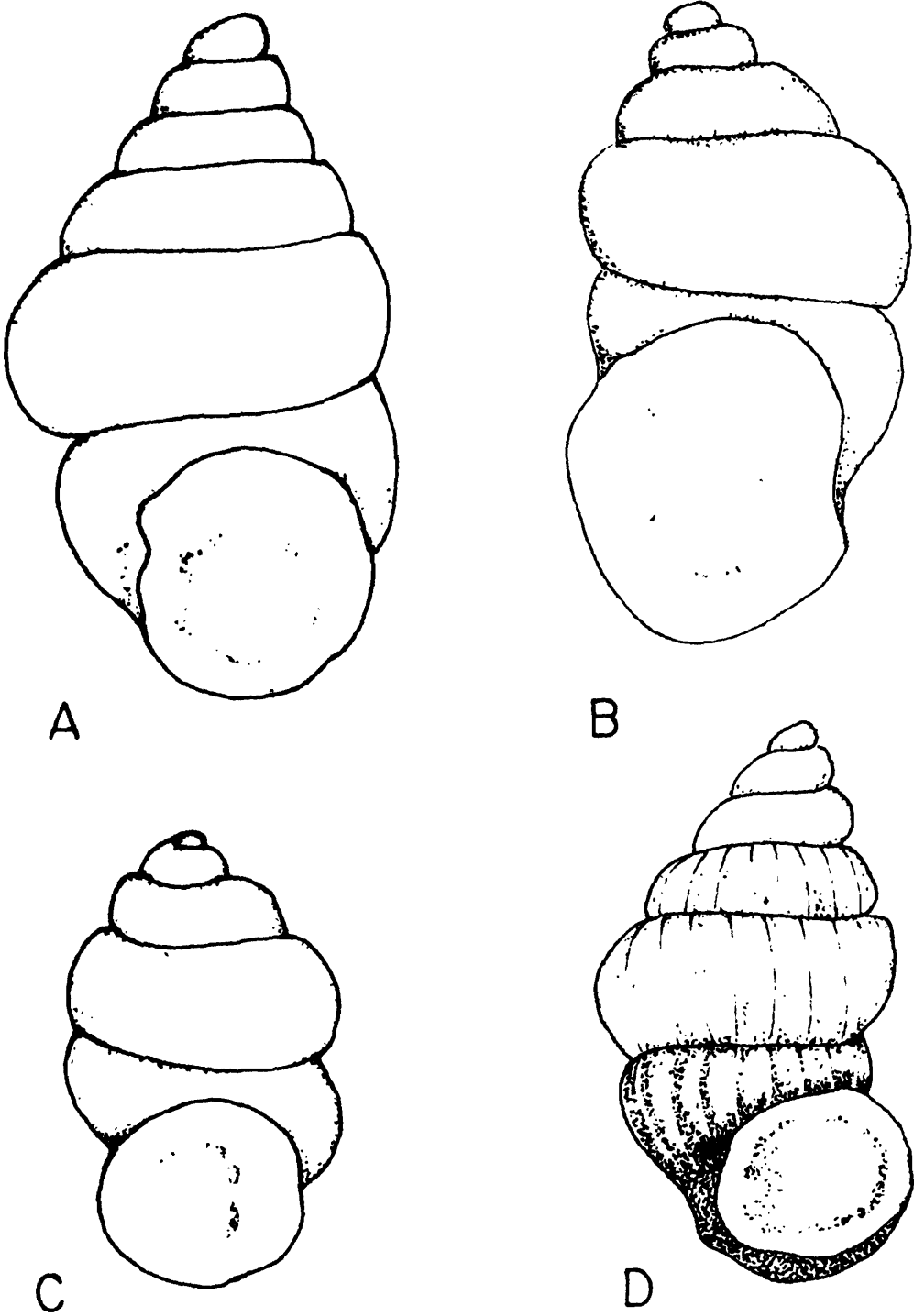


Figure : 7A. *Diplommatina diplochilus* Benson 7B. *D. gibbosa* Blanford  
7C. *D. jaintiaca* Godwin-Austen 7D. *D. oligopleuris* Blanford

1921. *Diplommatina austeni* Gude, *Fauna Brit. India, Mollusca*, 3 : 303.

*Material examined* : i) 90 exs., Cherrapunji

*Measurements* (in mm) :

| Length    | Diameter  | Height of the aperture |
|-----------|-----------|------------------------|
| 4.00-3.10 | 1.90-1.70 | 1.00-0.95              |

*Diagnosis* Shell dextral, imperforate, conically ovate; apex obtuse, whorls 8, bodywhorl absolutely costulate, slightly ascending in front; aperture vertical, peristome double, columellar margin vertical, with a moderately developed tooth. Operculum, situated well inside the aperture, thin, horny, flat, multispiral.

*Distribution* India : Meghalaya : Khasi hills (East); Arunachal Pradesh.

### ***Diplommatina depressa* Godwin-Austen**

(Pl. 8, fig. 1)

1870. *Diplommatina depressa* Godwin-Austen, *J. Asiat. Soc. Beng.*, 39(2) 2, pl. 1, fig. 2.

1921. *Diplommatina (Diplommatina) depressa* Gude, *Fauna Brit. India, Mollusca*, 3 : 310.

*Material examined* : i) Several examples, Khasi hills.

*Measurements* (in mm) :

| Length  | Diameter | Height of the aperture |
|---------|----------|------------------------|
| 3.0-2.5 | 1.5-1.0  | 7.80                   |

*Diagnosis* : Shell dextral, depressed, ovate, not sinuate; costulation close throughout but sharply defined and more distinct on body whorl; spire conoid, apex blunt; suture deeply impressed; whorls five; aperture vertical, broadly auriculate; peristome solid, double, outer lip thick and strong, inner continuous.

*Distribution* India Meghalaya Khasi hills (East and West).

### ***Diplommatina diplochilus* Benson**

(Text fig. 7A)

1857. *Diplommatina diplocheilus* Benson, *Ann. Mag. nat. Hist.*, (2) 19 : 202.

1921. *Diplommatina diplochilus* : Gude, *Fauna Brit. India, Mollusca*, 3 : 311.

*Material examined* : i) 4 exs., Khasi hills

*Measurements* (in mm) :

| Length    | Diameter  | Height of the aperture |
|-----------|-----------|------------------------|
| 3.00-2.95 | 2.00-1.96 | 0.95-0.90              |

*Diagnosis* : Shell dextral, ovately conical, whitish; whorls 6-7, convex, apical whorl costulate; aperture vertical; peristome double, columellar margin rounded. Operculum horny, flat, multispiral with a central nucleus.

*Distribution* : India : Meghalaya Khasi hills (East and West). Restricted endemic to Meghalaya.

### ***Diplommatina gibbosa* Blanford**

(Text fig. 7B)

1868. *Diplommatina gibbosa* Blanford, *J. Asiat. Soc. Beng.*, 37 : 80, pl. 2, figs. 4, 4a, 4b.

1921. *Diplommatina (Diplommatina) gibbosa* Gude, *Fauna Brit. India Mollusca* 3, p. 316.

*Material examined* : i) 9 exs., Khasi hills

*Measurements* (in mm) :

| Length    | Diameter  | Height of the aperture |
|-----------|-----------|------------------------|
| 3.72-3.65 | 2.40-2.35 | 1.20-1.15              |

**Diagnosis** : Shell sinistral, rimate, inflatedly ovate; spire conoid, apex obtuse; whorls five, rounded, penultimate widest; suture impressed, oblique; aperture subelliptical, plicate, peristome double, thickened. Operculum thin, flat, multispiral.

**Distribution** : India : Meghalaya : Khasi hills (East and West). Restricted endemic to Meghalaya.

***Diplommatina jaintiaca* Godwin-Austen**

(Text fig. 7C)

1868. *Diplommatina* n. sp. Godwin-Austen, *J. Asiat. Soc. Beng.*, 37 (2) : 84, pl. 3, figs. 3, 3a, 3b.

1870. *Diplommatina jaintiaca* Godwin-Austen, *J. Asiat. Soc. Beng.*, 39 (2) : 4.

1921. *Diplommatina (Diplommatina) jaintiaca* : Gude, *Fauna Brit. India, Mollusca*, 3, p. 320.

**Material examined** : i) 14 exs., Khasi hills.

**Measurements** (in mm) :

| Length    | Diameter  | Height of the aperture |
|-----------|-----------|------------------------|
| 2.20-2.00 | 1.45-1.40 | 0.5-0.45               |

**Diagnosis** : Shell dextral, ovate, fusiform, sharply costulate on the four whorls near the apex; spire conical, apex rather acute; whorls 7 to 7½, penultimate whorl slightly constricted at ¼ turn behind the peristome; peristome solid, double, columellar margin straight; aperture sub-vertical, broadly auriculate; inner slightly expanded; parietal callus thin, moderately expanded; columellar tooth blunt.

**Distribution** : India : Meghalaya : Khasi hills (East and West). Restricted endemic to Meghalaya.

***Diplommatina oligopleuris* Blanford**

(Text fig. 7D)

1868. *Diplommatina oligopleuris* Blanford, *J. Asiat. Soc. Beng.*, 37, p. 82, pl. 3, figs. 4-4c.

1921. *Diplommatina (Diplommatina) oligopleuris* : Gude, *Fauna Brit. India, Mollusca*, 3, p. 325.

**Material examined** : i) 3 exs., Tura peak, 28.2.65-Coll. A.S. Rajagopal.

**Measurements** (in mm) :

| Length    | Diameter  | Height of the aperture |
|-----------|-----------|------------------------|
| 2.20-1.90 | 1.65-0.90 | 0.45-0.30              |

**Diagnosis** : Shell dextral, conical, distantly costulate; spire conical, apex obtuse, whorls six, rounded, penultimate thickest; aperture vertical with a tooth on columella; peristome double, thickened, suture impressed.

**Distribution** : India : Meghalaya : Garo hills (West); Assam, Nagaland.

***Diplommatina parvula* Godwin-Austen**

(Text fig. 8C)

1870. *Diplommatina parvula* Godwin-Austen, *J. Asiat. Soc. Beng.*, 39, (2) : 5, pl. 1, figs. 5, 5a, 5b.

1921. *Diplommatina parvula* : Gude, *Fauna Brit. India, Mollusca*, 3 : 327.

**Material examined** : i) 5 exs., Khasi hills.

**Measurements** (in mm) :

| Length    | Diameter | Height of the aperture |
|-----------|----------|------------------------|
| 1.50-1.40 | 1.00-0.9 | 0.45-0.40              |

**Diagnosis** : Shell dextral, ovate, translucent, finely but distinctly costulate, apex blunt,

whorls 5, narrow, body whorl slightly ascending near the aperture; suture deeply impressed; aperture circular, a little oblique, without tooth; operculum thin, flat, multispiral with a central nucleus.

*Distribution* : India : Meghalaya Khasi hills (East).

***Diplommatina polypleuris* Benson**

(Pl. 8, fig. 9)

1857. *Diplommatina polypleuris* Benson, *Ann. Mag. nat. Hist.*, (2) 19 : 263.

1927. *Diplommatina polypleuris* : Gude, *Fauna Brit. India, Mollusca*, 3 : 528.

*Material examined* : i) 8 exs., Khasi hills.

*Measurements* (in mm) :

| Length    | Diameter  | Height of the aperture |
|-----------|-----------|------------------------|
| 2.05-1.80 | 1.05-0.95 | 0.95-0.90              |

*Diagnosis* Shell dextral, imperforate, oblong ovate, finely costulate; whorls 6; aperture vertical, subcircular peristome double. Operculum thin, horny, flat, multispiral, nucleus central.

*Distribution* : India : Meghalaya : Khasi hills (East and West); Assam, Arunachal Pradesh, Sikkim, West Bengal. Elsewhere : Myanmar.

***Diplommatina scalaria* Blanford**

(Pl. 8, fig. 6)

1868. *Diplommatina scalaria* Blanford, *J. Asiat. Soc. Beng.*, 37(2) 79, pl. 2, fig. 2.

1921. *Diplommatina (Diplommatina) scalaria* : Gude, *Fauna Brit. India, Mollusca*, 3 : 332.

*Material examined* : i) 2 exs., Khasi hills.

*Measurements* (in mm) :

| Length    | Diameter  | Height of the aperture |
|-----------|-----------|------------------------|
| 3.95-3.55 | 2.55-2.45 | 1.20-1.15              |

*Diagnosis* : Shell dextral, ovately acuminate, distantly costulate, spire conical, apex blunt; suture impressed; whorls seven, rounded, penultimate thickest, body whorl rather ascending near the aperture; aperture circular, denticulate, peristome double, expanded.

*Distribution* India : Meghalaya Khasi hills (East and West). Restricted endemic to Meghalaya.

***Diplommatina tumida* Godwin-Austen**

(Pl. 8, fig. 7)

1870. *Diplommatina tumida* Godwin-Austen, *J. Asiat. Soc. Beng.*, 39 (2) : 6, pl. 2, fig. 2.

1921. *Diplommatina tumida* : Gude, *Fauna Brit. India, Mollusca*, 3 : 337.

*Material examined* : i) 6 exs., Khasi hills.

*Measurements* (in mm) :

| Length    | Diameter  | Height of the aperture |
|-----------|-----------|------------------------|
| 5.90-4.70 | 3.50-2.65 | 2.50-2.05              |

*Diagnosis* : Shell dextral, ovately tumid; spire attenuate, rather pointed; whorls eight, lower tumid, sides rounded below; suture impressed; aperture vertical, circular, columellar margin straight; tooth large; peristome double. Operculum horny, multispiral.

*Distribution* : India : Meghalaya Khasi hills (East and West); Assam. Recorded for the first time from Meghalaya.

Genus ***Gastroptychia*** Kobelt & Moellendorff

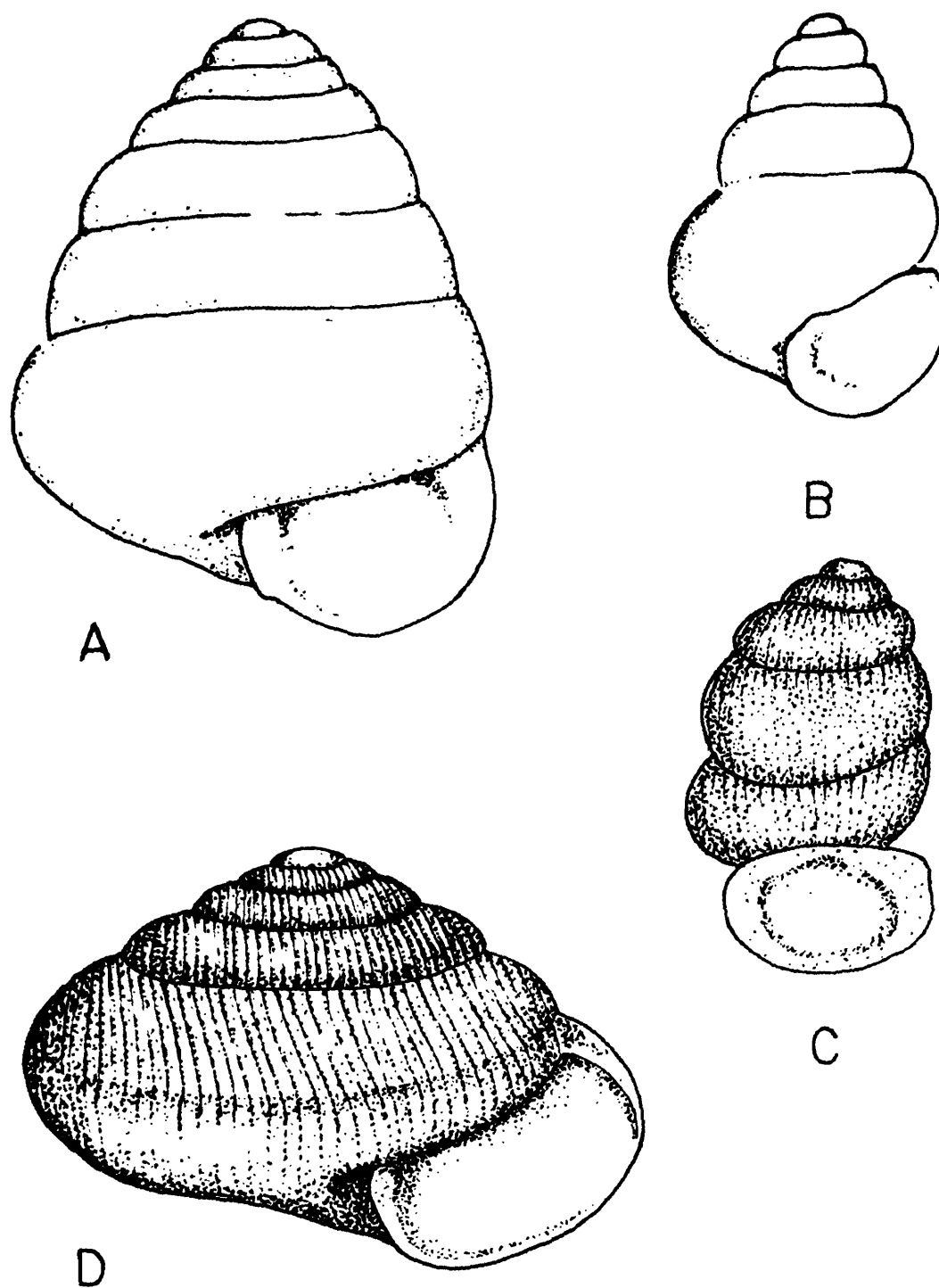


Figure : 8. A. *Kaliella Khasiaca* Godwin-Austen B. *Acmella tersa* (Benson)  
C. *Diplommative parvula* Godwin-Austen 8D. *Khasiella falcata* Blanford

1900. *Gastroptychia* Kobelt and Moellendorff, *Nachr. Deuts. Malak. Ges.*, 32 : 186.

1921. *Gastroptychia* : Gude, *Fauna Brit. India, Mollusca*, 3 : 349.

***Gastroptychia insignis*** (Godwin-Austin)

(Pl. 8, figs. 2 & 3)

1870. *Diplommatina insignis* Godwin-Austin, *J. Asiat. Soc. Beng.*, 39 (2) 6, pl: 2, fig. 1.

1921. *Gastroptychia insignis* : Gude, *Fauna Brit. India, Mollusca*, 3, p. 349.

*Material examined* : i) 2 exs. (damaged) Garo hills, ii) 2 exs., Siju, 27.4.91-Coll. D.K. Thakur and party.

*Distribution* : India Meghalaya Garo hills (South). Restricted endemic to Meghalaya.

Family ASSIMINEIDAE

Genus ***Acmella*** Blanford

1869. *Acmella* Blanford, *Ann. Mag. nat. Hist.*, (4) 3 : 178.

1921. *Acmella* : Gude, *Fauna Brit. India, Mollusca*, 3 : 361.

***Acmella tersa*** (Benson)

(Text fig. 8B)

1853. *Cyclostoma tersum* Benson, *Ann. Mag. nat. Hist.*, (2) 9 : 285.

1921. *Acmella tersa* : Gude, *Fauna Brit. India, Mollusca*, 3 : 363.

*Material examined* : i) 10 exs., Khasi hills.

*Measurements* (in mm) :

| Length   | Diameter  | Height of the aperture |
|----------|-----------|------------------------|
| 2.0-1.65 | 1.25-1.00 | 0.95-0.65              |

*Diagnosis* : Shell minute, subperforate, conically ovate with fine striae; apex obtuse; whorls five, convex; aperture ovate, vertical, margins joined by a thin callous.

*Distribution* : India : Meghalaya : Khasi hills (East and West); Assam.

*Remarks* : This species was recorded from Moss (Gude, 1921)

Order STYLOMMATOPHORA

Family ENIDAE

Genus ***Ena*** (Leach MS) Turton

1831. *Ena* (Leach MS) Turton, *Manual*, p. 80.

1972. *Ena* : Rajagopal and Subba Rao, *Rec. zool. Surv. India*, 66 (1-4) : 202.

***Ena nilagirica*** (Pfeiffer)

(Pl. 8, figs. 4 & 5)

1846. *Bulimus nilagiricus* Pfeiffer, *Proc. zool. Soc. London*, p. 41.

1914. *Ena nilagirica* : Gude, *Fauna Brit. India, Mollusca*, 2 : 231.

*Material examined* : i) 2 exs., Shillong peak, 6.4.71-Coll. R.K. Vershney & Party.

*Measurements* (in mm) :

| Length      | Diameter  | Height of the aperture |
|-------------|-----------|------------------------|
| 18.45-18.10 | 7.40-7.15 | 8.80-7.00              |

*Diagnosis* : Shell oblongly turreted, apex obtuse, obsolete striated with oblique whitish marking and close spiral striae; whorls seven, convex; aperture subvertical, oval; peristome expanded and reflected.

**Distribution** : India : Meghalaya : Khasi hills (East); Assam, Tamilnadu. Elsewhere : Myanmar.

Family CLAUSILIDAE

Genus *Phaedusa* H & A. Adams, 1855

1855. *Phaedusa* H. and A. Adams, *Fauna Brit. India, Mollusca*, 2 : 305.

1991. *Phaedusa* : Subba Rao and Mitra, *Rec. zool. Surv. India Occ. Paper*, 126 : 38.

*Key to the species*

Aperture with 2 palatal plicae ..... *P. bacillum*  
 Aperture with 5-6 palatal plicae ..... *P. loxostoma*

***Phaedusa bacillum* (Hanley & Theobald)**

(Pl. 9, figs. 1 & 2)

1870. *Cyclostoma bacillum* (Benson) Hanley and Theobald, *Conch. Indica*, pl. 24, fig.1.

1914. *Clausilia (Phaedusa) bacillum* : Gude, *Fauna Brit. India Mollusca*, 2 : 305.

**Material Examined** : i) 6 exs., Khasi hills.

**Measurements** (in mm) :

| Length      | Diameter  | Height of the aperture |
|-------------|-----------|------------------------|
| 16.00-13.62 | 3.30-3.10 | 2.50--2.48             |

**Diagnosis** : Shell sinistral, fusiform, subrimate, obsoletely striated; spire attenuate, apex obtuse; suture impressed, rather crenulate; whorls ten, convex; aperture vertical, oblong, compressed; palatal plicae two.

**Distribution** : India : Meghalaya : Khasi hills (East and West); Assam, Nagaland. Elsewhere : Bangladesh, Myanmar.

***Phaedusa loxostoma* (Benson)**

(Pl. 9, figs. 3 & 4)

1836. *Clausilia loxostoma* Benson, *J. Asiat. Soc. Bengal*, 5 : 353.

1914. *Clausilia (Phaedusa) loxostoma* : Gude, *Fauna Brit. India, Mollusca*, 2 : 324.

**Material examined** : i) 12 exs., Teria Ghat,

**Measurements** (in mm) :

| Length      | Diameter  | Height of the aperture |
|-------------|-----------|------------------------|
| 26.85-21.00 | 5.25-5.55 | 5.80-5.60              |

**Diagnosis** : Shell sinistral, fusiform, obsoletely striate on the spire, distinctly so on the body whorl; whorls 9-10, convex; suture oblique and rather distinctly crenulate; aperture elongate, oblique, dilated below; outer lip reflected; palatal folds 5.

**Distribution** : India : Meghalaya : Khasi hills (West); Assam, Nagaland, West Bengal. Endemic to Eastern Himalayas.

Family CORILLIDAE

Genus *Plectopylis* Benson

1860. *Plectopylis* Benson, *Ann. Mag. nat. Hist.*, (3) 5 : 244.

1914. *Plectopylis* : Gude, *Fauna Brit. India, Mollusca*, 2 : 69.

Subgenus *Chersaecia* Gude

1899. *Chersaecia* Gude, *Sci. Gossip*, 6 : 148

***Plectopylis brahma*** (Godwin-Austen)

(Pl. 9, figs. 7 &amp; 8)

1879. *Helix (Plectopylis) brahma* Godwin-Austen, *J. Asiat Soc. Beng.*, 48: 3, pl. 1, fig. 3.1914. *Plectopylis brahma* : Gude, *Fauna Brit. India*, Mollusca, 2: 113, fig. 54.*Material examined* : i) 6 exs., Garo Hills, 28.2.65 - Coll. A. S. Rajagopal.*Measurements* (in mm) :

| Length    | Diameter  | Height of the aperture |
|-----------|-----------|------------------------|
| 4.95-3.40 | 9.45-5.50 | 3.85-2.55              |

*Diagnosis* : Shell sinistral, closely umbilicate, discoidal, finely and regularly striate; apex flat, slightly convex; whorls seven, body whorl angular above and rounded below; aperture lunate, oblique; peristome slightly reflected and thickened.

*Distribution* : India : Meghalaya Garo hills (West); Arunachal Pradesh, Assam.

Recorded for the first time from Meghalaya.

Subgenus ***Endothyra*** Gude1899. ***Endothyra*** Gude, *Sci. Gossip*, 6: 148*Key to the species*

1. Shell small, seldom exceeding 5mm in diameter ..... *P. minor*  
Shell larger, exceeding 9 mm in diameter ..... 2
2. Shell with decussating sculpture below ..... *P. plectostoma*  
Shell without decussating sculptures below ..... *P. affinis*

***Plectopylis affinis*** Gude

(Pl. 10, figs. 3 &amp; 4)

1897. *Plectopylis affinis* Gude, *Science Gossip*, M. S. 3:276, fig. 41.1914. *Plectopylis affinis* Gude, *Fauna Brit. India* Mollusca, 2: 84.1984. *Plectopylis affinis* : Dey, Barua and Mitra, *Rec. zool. Surv. India*, 82 (1-4) : 266.*Material examined* : i) 4 exs., Khasi hills in deep valley, east of Cherapoonji.*Measurements* (in mm) :

| Length    | Diameter  | Height of aperture |
|-----------|-----------|--------------------|
| 5.75-4.55 | 9.55-7.40 | 4.00-3.10          |

*Diagnosis* : Shell sinistral, widely umbilicate, disc shaped, radiately plicate, decussated by spiral lines above; whorls 7, narrow, increasing slowly; umbilicus deep and moderately wide; peristome white; thickened and reflected, aperture ear shaped, elongate vertically.

*Distribution* : India : Meghalaya : Khasi hills (East); Arunachal Pradesh.

Restricted to North-eastern India only.

***Plectopylis minor*** (Godwin-Austen)

(Pl. 9, figs. 5 &amp; 6)

1879. *Helix (Plectopylis) minor* Godwin-Austen, *Ann. Mag. nat. Hist.*, (5) 4 : 164.1914. *Plectopylis minor* : Gude, *Fauna Brit. India*, Mollusca, 2: 75.*Material examined* : i) 1 ex., Happy valley, Shillong, 16.11.30 - Coll. H. S. Rao.*Measurements* (in mm) :

| Length | Diameter | Height of the apperture |
|--------|----------|-------------------------|
| 2.50   | 5.15     | 1.65                    |

**Diagnosis** : Shell sinistral, openly umbilicate, discoidal; sculpture coarse, with irregular transverse ribbing; spire flat; suture shallow, whorls five, subangular on the periphery; aperture oblique, slightly descending; peristome lunate, slightly flattened on the upper outer margin.

**Distribution** : India : Meghalaya : Khasi hills (East); Manipur, Nagaland, Sikkim, West Bengal.

***Plectopylis plectostoma* (Benson)**

(Pl. 10, figs. 1 & 2)

1836. *Helix plectostoma* Benson, *J. Asiat. Soc. Beng*, 5 : 351.

1914. *Plectopylis plectostoma* : Gude, *Fauna Brit. India, Mollusca*, 2 : 81.

**Material examined** : i) 2 exs., Khasi hills - Coll. H.A. Godwin-Austen; ii) 6 exs., Tura Peak, 28.2.65 - Coll. A. S. Rajagopal; iii) 1 ex., 4 kms. away from Lailad on the Forest Road to Pathar Khanh 24 kms. Umling, 1100 ft, Coll. A. K. Karmakar and party; iv) 4 exs., Nogpoh, 8.5.91 - Coll. D. K. Thakur & Party.

**Measurements (in mm)**

| Length    | Diameter  | Height of the aperture |
|-----------|-----------|------------------------|
| 5.00-3.15 | 9.42-5.60 | 3.40-1.70              |

**Diagnosis** : Shell sinistral, lenticular with conical spire deeply but narrowly umbilicate; whorls 6-7, narrow, body whorl a little descending in front, coarsely sculptured with radial plicae and spiral striae, giving a granular appearance; aperture ear shaped, peristome thickened and reflected, parietal and palatal armature present.

**Distribution** : India : Meghalaya : Garo hills (West), Khasi hills (East and West), Ri Bhoi; Himachal Pradesh, Mizoram, Nagaland, Sikkim, West Bengal. Elsewhere : Bangladesh, Myanmar.

Family SUCCINEIDAE

Genus *Succinea* Draparnaud, 1801

1801. *Succinea* Draparnaud, *Publ. Moll. Terr. fluv. France*, p. 55.

1914. *Succinea* : Gude, *Fauna British India, Mollusca*, 2 : 445.

***Succinea rutilans* Blanford**

(Pl. 10, figs. 5 & 6)

1870. *Succinea rutilans* Blanford, *J. Asiat. Soc. Beng.*, 39 : 23, pl. 3, fig. 23.

1914. *Succinea rutilans* : Gude, *Fauna Brit. India, Mollusca*, 2 : 48.

**Material examined** : i) 6 exs., Khasi hills.

**Measurements (in mm) :**

| Length    | Width     | Height of the aperture |
|-----------|-----------|------------------------|
| 7.65-5.60 | 4.90-3.60 | 5.90-3.65              |

**Diagnosis** : Shell small, thin, subovate, obliquely striate, whorls 2½; aperture ovate, oblique.

**Distribution** : India : Meghalaya : Khasi hills (East and West); Assam, Manipur. Elsewhere: Singapore.

Family SUBULINIDAE

**Key to the genera**

1. Shell imperforate, columella truncate at base ..... 2  
    Shell narrowly perforate, columella rounded at base ..... 3
2. Spire a little contracted below the apex, length of last

- whorl less than half of total length of shell ..... *Bacillum*  
 Spire not contracted below the apex, length of last  
 whorl equal or more than the total length of shell ..... *Glessula*
3. Shell ovately turreted, above 3 mm in width, columella  
 sinuate below ..... *Curvella*  
 Shell narrowly elongate, below 3 mm in width, smooth,  
 columella not sinuate below ..... *Lamellaxis*

Genus ***Bacillum*** Theobald. 1870

1870. *Bacillum* Theobald in Hanley and theobald, *Conch. Ind.*, p.17.

1921. *Bacillum* : Gude, *Fauna Brit. India Mollusca*, 2 : 343

*Key to the species*

- Shell obliquely striate, with 11 whorls ..... *B. daflaensis*  
 Shell regularly ribbed with 13-14 whorls ..... *B. orthoceras*

***Bacillum daflaensis*** (Godwin-Austen)

(Pl. 11, figs 12)

1876. *Glessula daflaensis* Godwin-Austen, *J. Asiat. Soc. Beng.*, 45-316, P. 8. fig. 10.

1914. *Bacillum daflaensis* : Gude, *Fauna Brit. India, Mollusca*, 2 : 343.

*Material examined* : i) 3 exs., Upper Shillong, 11.6.64 - Coll. M. Rynth.

*Measurements* (in mm) :

| Length      | Diameter  | Height of the aperture |
|-------------|-----------|------------------------|
| 31.50-12.00 | 9.60-4.90 | 7.15-4.00              |

*Diagnosis* : Shell elongately turreted, thick, obliquely striate; spire turreted, slightly convex, apex blunt; whorls eleven, rather flat; suture well marked; aperture oblique, suboval; peristome acute, columellar margin slightly curved.

*Distribution* : India : Meghalaya : Khasi hills (East); Arunachal Pradesh.

It is recorded for the first time from Meghalaya.

***Bacillum orthoceras*** Godwin-Austen

(Pl. 11, figs. 3 & 4)

1876. *Glessula orthoceras* Godwin-Austen, *J. Asiat. Soc. Beng*, 44 : 2. pl. 1, fig. 4.

1914. *Bacillum orthoceras* Gude, *Fauna Brit. India, Mollusca*, 2 : 348.

*Material examined* : i) 1 ex., Phulbari, W. Garo hills, 17.2.65, ii) 66 exs., Tura peak, W. Garo hills, 26.2.65, iii) 16 exs., Tura peak, W. Garo hills, 27.2.65 - Coll. A. S. Rajagopal; iv) 10 exs., Khasi hills.

*Measurements* (in mm) :

| Length      | Diameter   | Height of the aperture |
|-------------|------------|------------------------|
| 58.30-21.10 | 12.00-6.50 | 11.50-5.40             |

*Diagnosis* : Shell very slender and elongate with fine regular ribs, apex blunt; whorls 13-14, slightly rounded, suture well impressed; aperture oblique, rounded, outer lip sharply edged.

*Distribution* : India : Meghalaya : Garo hills (West), Khasi hills (East and West); Arunachal Pradesh. Elsewhere : Myanmar.

Genus ***Curvella*** Chaper

1885. *Curvella* Chaper, *Bull, Sec. zool. France*, 10 : 49.

1921. *Curvella* : Gude, *Fauna British India, Mollusca*, 2 : 348.

***Curvella Khasiana* (Godwin-Austen)**

(Pl. 11, figs. 6 &amp; 7)

1872. *Bulinus (Harpalus) Khasiana* Godwin-Austen, *Proc. zool. Soc. Lond.*, p. 516, pl. 36, fig. 7.1914. *Curvella Khasiana* : Gude, *Fauna Brit. India, Mollusca*, 2 : 353.**Material examined** : i) 2 exs., Dakopgiri, Tura, 22.4.91; ii) 1 ex., Siju, 27.4.91, -Coll. D. K.

Thakur and party

**Measurements** (in mm) :

| Length    | Diameter  | Height of the aperture |
|-----------|-----------|------------------------|
| 6.40-5.60 | 4.15-3.45 | 3.60-3.50              |

**Diagnosis** : Shell ovately turreted or anteriorly ovate, subperforate, thin; spire conical, apex blunt; suture moderate; whorls 6-7, slightly convex, body whorl large and tumid; aperture vertical, semi-ovate peristome simple, sharp, rounded.**Distribution** : India : Meghalaya : Garo hills (South and West); Nagaland, Sikkim, West Bengal. Elsewhere : Myanmar.**Genus** *Glessula* Von Martens1860. *Glessula* von Martens, *Die Heliceen* ed., 2 : 254.1914. *Glessula* : Gude, *Fauna Freshwater India Mollusca*, 2 : 377.**Key to the species**

1. Shell longer above 40 mm in length, number of whorls above 10 ..... *G. tenuispira*  
Shell shorter, below 20 mm in length, number of whorls less than 10 ..... 2
2. Shell smooth, glossy without sculpture ..... *G. gemma*  
Shell with sculpture ..... 3
3. Vertical striae crowded near the sutures, number of whorls 9-10 ..... *G. naja*  
Vertical striae evenly distributed number of whorls 7 ..... *G. crassula*

***Glessula crassula* (Reeve)**

(Pl. 11, figs 5 &amp; 8)

1850. *Achatina crassula* (Benson) Reeve, *Conch. Icon.*, 5 : *Achatina*, pl. 22, fig. 120.1914. *Glessula crassula* : Gude, *Fauna Brit. India, Mollusca*, 2 : 429.**Material examined** : i) 3 exs., Teriaghat, (Alt. 190); 25.2.23 - Coll. R. Hodgart; ii) 7 exs., Tura peak, 28.2.65 - Coll. A. S. Rajagopal, iii) 4 exs., Shillong, 5.5.71, iv) 1 ex., Mallai forest, Shillong, 13.3.73 - Coll. R. S. Giri and Party.**Measurements** (in mm) :

| Length     | Diameter  | Height of the aperture |
|------------|-----------|------------------------|
| 11.00-3.80 | 5.80-2.35 | 4.50-2.05              |

**Diagnosis** : Shell pyramidically conical, whorls seven, flatly rounded, vertically striated suture deep and excavated, columella arched truncated below; aperture small.**Distribution** : India : Meghalaya : Garo hills (West), Khasi hills (East and West); Assam, Nagaland, West Bengal.***Glessula gemma* (Reeve)**

(Pl. 12, figs. 1 &amp; 2)

1850. *Achatina gemma* Reeve, *Conch. Icon.*, 5, *Achatina*, pl. 22, fig. 123.1914. *Glessula gemma* : Gude, *Fauna Brit. India, Mollusca*, 2 : 428.

*Material examined*: i) 15 exs., Dobasipara, Tura, 21.4.91, ii) 1 ex., Dopgiri, Tura, 23.3.91, iii) 14 exs., Nongpoh, 7.5.91 - Coll D. K. Thakur and party.

*Measurements* (in mm) :

| Length    | Diameter  | Height of the aperture |
|-----------|-----------|------------------------|
| 9.40-5.15 | 4.60-3.50 | 3.85-2.55              |

*Diagnosis* Shell oblong-conical, rather solid, whorls six, rounded, smooth; columella arched, abbreviated; aperture nearly round.

*Distribution* : India : Meghalaya : Garo hills (West), Ri Bhoi; Bihar, Orissa. West Bengal. Elsewhere : Bangladesh, Myanmar.

*Remarks* : This species has an enormous range of distribution, starting from gangetic plains of lower Bengal extending to the Garo hills in Meghalaya. It also occurs in Bangladesh and Myanmar. The specimens from Meghalaya slightly differ from those of gangetic plains being marginally bigger and slightly more acuminate. However they agree with typical *G. gemma* in all other respects.

***Glessula naja* Pilsbry**  
(Pl. 12, figs. 5 & 6)

1909. *Glessula naja* Pilsbry, *Manual of Conchology*, 20 : 90, p. 12 fig. 10.

*Material examined* : i) 7 exs., Dakopgiri, Tura, 21.4.91, ii) 4 exs., Dopgiri, Tura, 23.4.91, iii) 1 ex., Siju, 27.4.91-Coll. D. K. Thakur and party.

*Measurements* (in mm) :

| Length      | Diameter  | Height of the aperture |
|-------------|-----------|------------------------|
| 18.90-11.00 | 7.00-5.10 | 5.80-4.10              |

*Diagnosis* : Shell slender, turrete, thin, glossy, weakly striatulate, whorls  $9\frac{1}{2}$ , moderately convex, suture simple; aperture a little oblique; outer lip thin; columella rather long, regularly concave.

*Distribution* : India : Meghalaya : Garo hills (South and West), Assam.  
Recorded for the first time from Meghalaya.

***Glessula tenuispira* Benson**  
(Pl. 12, figs. 7 & 8)

1836. *Achatina tenuispira* Benson, *J. Asiat. Soc. Beng.*, 5 : 353.

1914. *Glessula tenuispira* : Gude, *Fauna Brit. India, Mollusca*, 2 : 378.

*Material examined* : i) 16 exs., Siju, 27.4.91 - Coll. D. K. Thakur and party.

*Measurements* (in mm) :

| Length      | Diameter  | Height of the aperture |
|-------------|-----------|------------------------|
| 26.40-10.00 | 7.75-4.60 | 6.90-3.40              |

*Diagnosis* : Shell elongate, turreted with fine vertical striate; spire long, apex long, blunt; suture impressed; whorls  $10\frac{1}{2}$ , slightly convex; aperture oval; columellar margin straight.

*Distribution* : India : Meghalaya : Garo hills (South); Arunachal Pradesh, West Bengal. Elsewhere : Bangladesh, Myanmar.

Genus ***Lamellaxis* Strebel and Pfeiffer, 1882**

1882. *Lamellaxis* Strebel and Pfeiffer, *Beilr. Mexik hand Vausw Conch.* 5 : 109.

*Key to the species*

- Whorls swollen and rounded, suture shallow.....*L. gracile*  
 Whorls flat, suture deep.....*L. cavernicola*

***Lamellaxis cavernicola* (Annandale and Chopra)**

(Pl. 12, figs. 3 &amp; 4)

1924. *Opeas cavernicola* Annandale and Chopra, *Rec. Indian Mus.*, 26 : 24-40, fig. 1a & 2 (type locality, Siju cave, types NZD, ZSI).

**Material examined :** i) 84 exs., Siju cave, 5.3.65, ii) 151 exs., Siju cave, 7.3.65 - Coll. A. S. Rajagopal, (iii) 119 exs., Siju cave, Coll. S. W. Kemp and B. N. Chopra; iv) 6 exs., Nongpoh, 7.5.91, v) 6 exs., Siju, 27.4.91 - Coll. D. K. Thakur and party.

**Measurements (in mm) :**

| Length     | Diameter  | Height of the aperture |
|------------|-----------|------------------------|
| 14.42-5.90 | 3.95-2.50 | 3.50-2.20              |

**Diagnosis :** Shell resembles that of *L. gracile* (Hutton) but whorls are less swollen, apex blunt, suture more deep, impressed; collumella straight and vertical and its fold well developed.

**Distribution :** India : Meghalaya : Garo hills (South), Ri Bhoi.

**Remarks :** Annandale and Chopra (1924) described this species along with a variety *vamana*. After examining the two lots of collections we are in the opinion that the variety *vamana* is actually the younger forms of *cavernicola*. So we treat the variety as *cavernicola*.

***Lamellaxis gracile* (Hutton)**

(Pl. 13, figs. 3 &amp; 4)

1834. No. 5 *Bulimus?* (mihi) *graciles* Hutton, *J. Asiat. Soc. Beng.*, 3 : 93.

1914. *Opea graciles* : Gude, *Fauna Brit. India, Mollusca*, 2 : 355.

**Material examined :** i) 9 exs., Dobasipara, Tura, 20.4.91 - Coll. D. K. Thakur and party.

**Measurements :** (in mm) :

| Length    | Diameter  | Height of the aperture |
|-----------|-----------|------------------------|
| 7.00-4.60 | 2.32-1.50 | 2.90-1.85              |

**Diagnosis :** Shell small, tapering, transparent; whorls rounded, last whorl equals the preceding two whorls together in width; suture deep; aperture semiovate, longer than broad, peristome thin, columellar tip straight, rounded below.

**Distribution :** India : Meghalaya : Garo hills (West) ; Common throughout India. Elsewhere: Bangladesh, China, East Africa, Japan, Malaya Peninsula, Archipelago, Myanmar, Pakistan, Philippines, Polynesia and Sri Lanka.

Family    ACHATINIDAE

Genus     *Achatina* Lamarck

1799. *Achatina* Lamarck, *Hist. nat. Anim Sans. Vert.*, 7 : 75.

1991. *Achatina* : Subba Rao and Mitra, *Rec. zool. Surv. India. Occ paper*, 126 : 39.

***Achatina fulica fulica* (Bowdich)**

(Pl. 13, figs. 7 &amp; 8)

1821. *Helix fulica* Ferussac, *Tabl. Syst. Limacens*, 49. No. 347 (nom nud).

1822. *Achatina fulica* 'Lamarck' Bowdich, *Elements of Conchology*, 1, pl. 13, fig. 1.

1950. *Achatina* (*Lissachatina*) *fulica* : Bequart, *Bull. Mus. comp. zool. Harvard*, 15(1) - 216 pl

8.

*Material examined* i) 5 exs., Noghoh, 7.5.91 Coll. D. K. Thakur and party.

*Measurements* (in mm) :

| Length      | Width       | Height of the aperture |
|-------------|-------------|------------------------|
| 94.00-56.00 | 54.50-37.15 | 44.00-35.50            |

*Diagnosis* : Shell large, ovately conical, strongly inflated, pale yellowish to whitish with brown streaks all over; whorls 8, rapidly increasing, last whorl large, more than  $\frac{1}{2}$  of the total length; suture deep with short spiral striations; aperture large, ovate, outer lip simple, columella strongly arched and truncate below.

*Distribution* : India : Meghalaya : Ri Bhoi; Assam, Andhra Pradesh, Andaman and Nicobar islands, Bihar, Gujarat, Kerala, Maharashtra, Manipur, Mizoram, Nagaland, Orissa, Tamil Nadu, Tripura, and West Bengal. Elsewhere : Madagascar, Mauritius, Seychelles, Singapore, Zanzibar.

Family STREPTAXIDAE

*Key to the species*

Shell depressedly ovate, body whorl eccentric ..... *Streptaxis*

Shell cylindrically ovate, body whorl not eccentric ..... *Ennea*

Genus ***Ennea*** H. & A. Adams

1858. *Ennea* H. & A. Adams, *Gen. Rec. Moll.*, 2 : 171

1908. *Ennea* : Blanford and Godwin-Austen, *Fauna Brit. India*, Mollusca, (Testacellidae and Zonitidae) p. 16.

*Key to the species*

Shell vertically ribbed ..... *E. vara*

Shell obliquely costulate ..... *E. stenopylis*

***Ennea stenopylis*** Benson

(Pl. 13, figs. 9 & 10)

1860. *Ennea stenopylis* Benson, *Ann. Mag. nat. Hist.*, (3) 5 : 460.

1908. *Ennea stenopylis* Blanford and Godwin-Austen, *Fauna Brit. India*, Mollusca (Testacellidae and Zonitidae), p. 17.

*Material examined* : i) 1 ex., Khasi hills.

*Measurements* (in mm) :

| Length | Diameter | Height of the aperture |
|--------|----------|------------------------|
| 3.15   | 1.75     | 0.95                   |

*Diagnosis* : Shell ovate, somewhat flexuously and obliquely costulate, white, apex obtuse; whorls  $6\frac{1}{2}$ , narrow, slightly convex; aperture vertical, without columellar plait.

*Distribution* : India : Meghalaya : Khasi hills (East and West).

***Ennea vara*** (Benson)

(Pl. 13, figs. 1 & 2)

1859. *Pupa vara* Benson, *Ann. Mag. nat. Hist.*, (3) 3 : 188.

1908. *Ennea vara* Blanford and Godwin-Austen, *Fauna Brit. India*, Mollusca (Testacellidae and Zonitidae), p. 16.

*Material examined* : i) 58 exs., Khasi hills.

**Measurements (in mm) :**

| Length    | Diameter  | Height of the aperture |
|-----------|-----------|------------------------|
| 5.50-4.40 | 2.20-1.25 | 2.20-1.40              |

**Diagnosis :** Shell elongately ovate, white, subfusiform; sculptured with strong vertical ribs, less prominent on the lower part of the bodywhorl; spire turreted, whorls eight, convex; aperture vertical with slight columellar callosity, but without columellar plait; peristome broadly expanded.

**Distribution :** India : Meghalaya : Khasi hills (East and West); Assam.

**Genus *Streptaxis* Gray**

1837. *Streptaxis* Gray, *London's Mag. nat. Hist. new Ser.*, 1 : 485.

1908. *Streptaxis* Blanford and Godwin-Austen, *Fauna Brit. India, Mollusca* (Testacellidae and Zonitidae), p. 1.

***Streptaxis theobaldi* Benson**

(Pl. 13, figs. 5 & 6)

1859. *Streptaxis theobaldi* Benson, *Ann. Mag. nat. Hist.*, (3) 3 : 187.

1908. *Streptaxis theobaldi*: Blanford and Godwin-Austen, *Fauna Brit. India, Mollusca* (Testacellidae & Zonitidae), p. 9.

**Material examined :** 3 exs., Khasi hill-Coll. A.W. Chennell & H.H. Godwin-Austen.

**Measurements (in mm) :**

| Length    | Diameter  | Height of the aperture |
|-----------|-----------|------------------------|
| 3.40-3.10 | 5.25-5.15 | 3.45-3.10              |

**Diagnosis :** Shell arcuately rimate, smooth, white; spire low, convex; whorls 5-5½ rounded; aperture subangulately semiovate, with 7 teeth inside; posteriorly expanded.

**Distribution :** India : Meghalaya : Khasi hills (East and West); Assam, Manipur. Elsewhere : Myanmar.

**Distribution :** India : Meghalaya : Khasi hills (East and West).

**Family TROCHOMORPHIDAE****Genus *Sivella* Blanford**

1863. *Sivella* Blanford, *Ann. Mag. nat. Hist.*, (3)9 : 86

***Sivella castra* (Benson)**

(Pl.14, figs.1 & 2)

1852. *Helix castra* Benson, *Ann. Mag. nat. Hist.*, (2) 10 : 349.

1985. *Trochomorpha castra* : Dey, Barua and Mitra, *Rec. zool. Surv. India*. 82I (1-4) : 267.

**Material examined :** i) 2 exs., Garo hills, 1200-1500 ft., June-July, 1917, ii) 1 ex., above Tura, Garo hills, 2500 ft. on tree trunk; July-August, 1917—Coll. S.W. Kemp, iii) 1 ex., Golaghat, Namber forest, 14.3.64—Coll. A. K. Mandal and party; iv) 4 exs., Siju, 27.4.91—Coll. D. K. Thakur and party.

**Measurements (in mm) :**

| Length    | Diameter   | Height of the aperture |
|-----------|------------|------------------------|
| 4.35-2.50 | 10.70-6.70 | 4.00-2.50              |

**Diagnosis :** Shell depressedly conoid, thin, acutely keeled, rather strongly, obliquely striate; suture shallow, whorls six.

**Distribution :** India : Meghalaya Garo hills (East, South and West); Arunachal Pradesh, Assam, Mizoram, Sikkim, West Bengal. Elsewhere : Malayasia, Myanmar, Thailand.

## Family HELICARIONIDAE

*Key to the genera*

Animal without external shell ..... *Parmarion*  
 Animal with external shell ..... *Cryptaustenia*

Genus **Cryptaustenia** Cockerell

1891. *Cryptaustenia* Cockerell, *Ann. Mag. nat. Hist.*, (3)7 : 99.

1908. *Cryptaustenia* : Blanford and Godwin-Austen, *Fauna Brit. India*, Mollusca (Testacellidae and Zonitidae), p.198

1966. *Cryptaustenia* : Solem, *Spolia zool. Mus. haun*, 24 : 56.

*Key to the species*

1. Shell whitish, body whorl slightly descending in front ..... 2  
 Shell straw-coloured, body whorl not descending in front ..... *C. silcharensis*
2. Shell thicker, apex slightly raised.....*C. ovata*  
 Shell thinner, apex flat.....*C.succinea*

***Cryptaustenia ovata*** (H. Blanford)

(Pl.14, figs. 3 & 4)

1871. *Helicarion ovata* H. Blanford, *J. Asiat. Soc. Beng.*, (2) 40 : 44, pl.2, fig. 9.

1908. *Cryptaustenia ovata* : Blanford and Godwin-Austen, *Fauna Brit. India*, Mollusca, (Testacellidae and Zonitidae) P. 182.

*Material examined* : 1 exs., Siju, West Garo hills, 27.4.91—Coll. D.K. Thakur and party.

*Measurements* (in mm) :

| Length | Diameter | Height of the aperture |
|--------|----------|------------------------|
| 6.85   | 10.9     | 6.5                    |

*Diagnosis* : Shell depressed comparatively thick, whitish smooth, polished, spire rather flat, apex slightly raised, whorls 3<sup>1</sup>/<sub>2</sub>, last whorl descending in front; aperture oblique, ovately lunate, columellar margin subvertical.

*Distribution* : India : Meghalaya Garo hills (South); West Bengal (Darjiling).

For the first time recorded from Meghalaya.

***Cryptaustenia silcharensis*** (Godwin-Austen)

(Pl.14, figs. 5 & 6)

1907. *Austenia silcharensis* : Godwin-Austen, *Land Freshwater Moll. India*, 2 : 107, figs. 1-30.

1908. *Cryptaustenia silcharensis* : Blanford and Godwin-Austen, *Fauna Brit. India* Mollusca (Testacellidae and Zonitidae) p.186.

*Material examined* : i) 3 exs., above Tura, Garo hills, 3500-3900 ft., July-August, 1917, Coll. S.W.Kemp; ii) 3 exs. Dobasipara, Tura, 20.4.91, iii) 1 ex., Siju, 27.4.91, iv) 8 exs., Nongpoh, 7.5.91—Coll. D. K. Thakur and party.

*Measurements* (in mm) :

| Length    | Diameter  | Height of the aperture |
|-----------|-----------|------------------------|
| 5.20-4.60 | 8.00-7.95 | 4.70-4.35              |

*Diagnosis* : Shell depressed, thin, finely striated, bright shining, straw coloured; spire scarcely raised, obtuse; suture slightly impressed; whorls three, flattened; peristome simple, thin, margin converging, the upper slightly curved forward.

*Distribution* : India : Meghalaya : Garo hills (South and West), Ri Bhoi; Assam.

**Remarks :** The size mentioned by Blanford & Godwin-Austen (1908) may be a misprint.

***Cryptaustenia succinea* (Reeve)**

(Pl.15, figs.1&2)

1862. *Vitrina succinea* Reeve, *Conch.Icon*; 2. *Vitrina*, Pl.2, fig.B.

1908. *Cryptaustenia succinea* : Blanford and Godwin-Austen, *Fauna Brit. India*, Mollusca (Testacellidae and Zonitidae), p.180, fig.63.

**Material examined:** i) 17 exs., Turra, W. Garo hills, 3500-3900 ft., July-August, 1917, Coll. S.W.Kemp.

**Measurements** (in mm) :

| Length    | Diameter   | Height of the aperture |
|-----------|------------|------------------------|
| 7.10-3.45 | 10.00-3.00 | 5.10-3.05              |

**Diagnosis :** Shell ovately depressed, periphery roundly oval, thin, smooth, and highly polished; spire convex, flat above, suture shallow; whorls three, rapidly increasing; aperture ovately lunate.

**Distribution :** India : Meghalaya Garo hills (West); Sikkim. Elsewhere : Bhutan, Myanmar.

**Genus** *Parmarion* P. Fischer, 1856

1856. *Parmarion* Fischer, *Act. Soc. Linn. Bordeaux*, 20 : 395.

***Parmarion martensi* Simroth**

(Pl.15, figs.4&5)

1893. *Parmarion martensi* Simroth, *Erg. Weber.*, 3 : 107, pl.7, fig. 8, Pl.8, figs. 20-22.

1950. *Parmarion mertensi* : Van Benthem Jutting, *Treubia*, 20 (3) : 438, figs. 54-55.

**Material examined :** 2 exs., Siju, W. Garo hills, 24.4.91-Coll. D. K. Thakur and party.

**Measurements** (in mm) :

| Length     |              |
|------------|--------------|
| 22.35-22.0 | (Animal)     |
| 7.8        | 0.45 (Shell) |

**Diagnosis :** Animal slug—like, greyish yellow, with brownish spots on the mantle. A mantle shield covers the back anterior to the intestinal sac, which is encircled by a horseshoe shaped keel. Posterior to the visceral hump the body is dorsally keeled and tapering to the tail ending in a mucous gland and an overhanging process. Mantle lobe and shield minutely wrinkled. Pedal margin marked by vertical grooves. Foot narrow with an indistinctly tripartite sole.

Shell is thin and flat lying dorsally on the visceral hump, covered completely by the mantle lobe except a very small area.

**Distribution :** The genus *Parmarion* was hitherto known from South China, Amman, Malaya and Indonesia. It is now recorded first time from India.

**Remarks :** These slugs were collected from under stones at the slope of a hill at Siju, 152 kms. from Shillong.

Family ARIOPHANTIDAE

*Key to the genera*

1. Shell internal, membranous ..... *Girasia*  
Shell external, calcareous ..... (2)
2. Shell conical, nearly as broad as high ..... (3)  
Shell depressed, distinctly broader than high ..... (6)

3. Shell spirally striated above ..... (5)  
 Shell obliquely striated above ..... (4)
4. Shell convex around umbilicus; narrowly perforate or imperforate ..... *Kaliella*  
 Shell angulate around umbilicus; deeply perforate ..... *Rahula*
5. Shell with denticulate aperture ..... *Sesara*  
 Shell with simple aperture ..... *Sitala*
6. Shell usually above 30 mm in diameter ..... (7)  
 Shell below 30 mm in diameter ..... (8)
7. Peristome internally thickened; caudal gland with an over hanging lobe ..... *Bensonia*  
 Peristome not thickened internally; caudal gland  
 without an over hanging lobe ..... *Oxytes*
8. Shell strongly sculptured ..... *Khasiella*  
 Shell smooth ..... (9)
9. Shell with a deep groove outside the suture ..... *Taphrospira*  
 Shell without a deep groove outside the suture ..... *Macrochlamys*

Genus ***Bensonia*** Pfeiffer

1855. *Bensonia* Pfeiffer, *Mal. Bl.*, p.119.

1908. *Bensonia* Blanford and Godwin-Austen, *Fauna Brit. India*, Mollusca (Testacellidae and Zonitidae)

***Bensonia mainwaringi*** (Godwin-Austen)

(Pl.15, figs.7&8)

1882. *Macrochlamys mainwaringi* Godwin-Austen, *J. Asiat. Soc. Beng.*, 51 : 69, Pl.5, fig.3.

1908. *Macrochlamys mainwaringi* Blanford and Godwin-Austen, *Fauna Brit. India*, Mollusca (Testacellidae and Zonitidae) p.83.

*Material examined* : i) 2 exs., Motinagar, Malki, Shillong, 24.10.77—Coll. M.S. Jyrwas.

*Measurements* (in mm) :

| Length      | Diameter    | Height of the aperture |
|-------------|-------------|------------------------|
| 15.10-12.50 | 22.45-19.10 | 11.20-9.40             |

*Diagnosis* : Shell thin, perforate, subturbinate, sculptured with fine, oblique striations; whorls seven, regularly increasing, the last rounded at the periphery; aperture moderately oblique, broad, lunate; peristome sharp, with a white labiation inside.

*Distribution* : India : Meghalaya : Khasi hills (East); Sikkim, West Bengal. It is recorded for first time from Meghalaya.

Genus ***Girasia*** Gray

1855. *Girasia* Gray, *Cat. Pulm. Brit. Mus.*, p.61.

1908. *Girasia* : Blanford and Godwin-Austen, *Fauna Brit. India*, Mollusca (Testacellidae and Zonitidae), p.198.

***Girasia crocea*** (Godwin-Austen)

(Pl.18, figs.5&8)

1872. *Helicarion (Hoplites) crocea*, Godwin-Austen, *Proc. zool. Soc. Lond.*, p.517, pl. 30, figs.9, 9a.

1908. *Girasia crocea* : Blanford and Godwin-Austen, *Fauna Brit. India* Mollusca (Testacellidae and Zonitidae), p.201.

*Material examined* : i) 1 ex., and 6 internal shell, khasi hills; ii) 1 ex., Mawphlong, 17.9.91—

Coll. R.K. Vershney, I.J. Gupta and S.K. Ghosh; iii) 4 exs. Siju, 27.4.91—Coll. D.K. Thakur and Party/

**Measurements (in mm)**

|             |            |
|-------------|------------|
| Length      | Diameter   |
| 47.40-22.20 | 19.00-6.50 |

**Diagnosis** : Animal with saffron yellow colour, outside edge of foot pale yellow and almost white.

Shell very thin, flat, rudimentary, with a broad band of dark green from apex to peristome; apex pointed; peristome convex.

**Distribution** : India : Meghalaya : Garo hills (South), Khasi hills (West).

Genus ***Kaliella*** Blanford

1863. *Kaliella* Blanford. *Ann. Mag. nat. Hist.*, (3) 9 : 83

***Kaliella khasiaca*** Godwin-Austen

(Text fig. 8A)

1882. *Kaliella khasiaca* Godwin-Austen, *Land and Freshwater Moll. India*, 1 : 5, pl.1, fig.8.

1908. *Kaliella khasiaca* : Blanford and Godwin-Austen *Fauna Brit. India*, Mollusca (Testacellidae and Zonitidae), p.261.

**Material examined** : i) 1 ex., Khasi hills

**Measurements (in mm) :**

|        |          |                        |
|--------|----------|------------------------|
| Length | Diameter | Height of the aperture |
| 3.10   | 2.20     | 1.20                   |

**Diagnosis** : Shell highly trochiform, imperforate, brownish; spire conical, sides rather convex; whorls seven, the last angulate, slightly tumid beneath; aperture subquadrately lunate; peristome thin, columellar margin vertical.

**Distribution** : India : Meghalaya : Khasi hills (East and West).

Genus ***Khasiella*** Godwin-Austen,

1899. *Khasiella* Godwin-Austen, *Moll. Ind.*, 2 : 129.

1908. *Khasiella* : Blanford and Godwin-Austen, *Fauna Brit. India Mollusca*, (Testacellidae and Zonitidae) p.157.

*Key to the species*

Shell imperforate, keeled at the periphery ..... *K. climacterica*  
 Shell perforate, subangulate at the periphery ..... *K. falcata*

***Khasiella climacterica*** (Benson)

(Pl. 15, figs.3&6)

1836. *Helix climacterica* Benson, *J. Asiat. Soc. Beng.*, 5 : 352.

1908. *Khasiella climacterica* : Blanford and Godwin-Austen, *Fauna Brit. India*, Mollusca (Testacellidae and Zonitidae), p. 160.

**Material examined** : i) 1 ex., Teria Ghat, ii) 1 ex., Pather Khonch, Umling-Coll. A. K. Karmakar and party.

**Measurements (in mm) :**

|            |             |                        |
|------------|-------------|------------------------|
| Length     | Diameter    | Height of the aperture |
| 16.30-7.70 | 15.30-12.40 | 9.00-7.00              |

*Diagnosis* Shell depressedly conoid, imperforate; spire low, conical, apex rather acute; whorls eight, narrow; sculptured with prominent radiating ridges; keeled at the periphery, tumid below, aperture scarcely oblique, narrow; peristome obtuse, slightly thickened inside.

*Distribution* : India : Meghalaya : Khasi hills (West), Ri Bhoi; Arunachal Pradesh, Assam, Nagaland. Elsewhere : Myanmar.

***Khasiella falcata* Blanford**

(Text fig. 8D)

1870. *Khasiella falcata* Blanford, *J. Asiat. Soc. Beng.*, (239) : 15, pl. 3, fig. 11.

1908. *Khasiella falcata* : Blanford & Godwin-Austen, *Fauna of Brit. India*, Mollusca (Testacellidae and Zonitidae), p. 161.

*Material examined* : i) 10 exs., Siju, 27.4.91-Coll. D.K. Thakur and Party.

*Measurements* (in mm) :

| Length    | Diameter   | Height of the aperture |
|-----------|------------|------------------------|
| 7.20-3.85 | 10.00-6.50 | 5.95-3.90              |

*Diagnosis* : Shell depressed, conoid, perforate, thin, spire low, conoidal, suture impressed; whorls six, convex, rather closely wound, the last broader, subangulate at the periphery, convex below, concave around the umbilicus; aperture slightly oblique, lunate; peristome, thin, basal margin arcuate.

*Distribution* : India : Meghalaya : Garo hills (South). Elsewhere : Myanmar.

Genus ***Macrochlamys* Benson**

1832. *Macrochlamys* Benson, *J. Asiat. Soc. Beng.*, 1 : 76.

1908. *Macrochlamys* : Blanford and Godwin-Austen, *Fauna of Brit. India*, Mollusca (Testacellidae and Zonitidae), p. 77.

1991. *Macrochlamys* Subba Rao and Mitra, *Rec. zool. Surv. India, Occ. paper*, 126 : 53.

*Key to the species*

1. Shell below 6 mm in diameter ..... *M. molecula*  
Shell above 6 mm in diameter ..... 2
2. Labiate within the aperture ..... 3  
Non labiate within the aperture ..... 7
3. Shell striate ..... 4  
Shell smooth ..... 5
4. Shell broader above 10 mm in width aperture subvertical ..... *M. castaneo-labiata*  
Shell smaller, upto 10 mm in width aperture oblique ..... *M. lata*
5. Shell smaller (upto 12 mm, in diameter) body whorl subangulate  
at the periphery ..... *M. petasus*  
Shell larger (above 12 mm in diameter) body whorl rounded at the periphery ..... 6
6. Shell imperforate or subperforate, spire flattened ..... *M. consepta*  
Shell distinctly perforate, spire conoid ..... *M. atricolor*
7. Shell with sculpture ..... 8  
Shell without sculpture ..... 12
8. Shell with spiral markings ..... 9  
Shell without spiral markings ..... 11
9. Shell with only faint spiral markings ..... *M. petrosa*  
Shell with decussating markings ..... 10

10. Shell smaller, upto 20 mm in diameter, whorls 5 ..... *M. sequax*  
 Shell larger, above 20 mm in diameter, whorls 6-7 ..... *M. decussata*
11. Shell larger above 20 mm in diameter subangulate at the periphery ..... *M. plicifera*  
 Shell smaller upto 15 mm in diameter rounded at the periphery ..... *M. vesica*
12. Shell larger, above 20 mm in diameter ..... *M. lubrica*  
 Shell smaller below 15 mm in diameter ..... 13
13. Columellar margin vertical above, then curved ..... *M. terminus*  
 Columellar margin descending in a curve ..... *M. extraria*

***Macrochlamys atricolor* Godwin-Austen**

(Pl. 16, figs. 1 & 2)

1875. *Helix-Nanina atricolor* Godwin-Austen, *J. Asiat. Soc. Beng.*, (2)44, : 2, pl. 1, fig. 2.

1908. *Macrochlamys atricolor*: Blanford and Godwin-Austen, *Fauna Brit. India, Mollusca* (Testacellidae and Zonitidae), p. 99.

*Material examined*: i) 3 exs., Teria Ghat, Coll. H. H. Godwin-Austen.

*Measurements* (in mm) :

| Length      | Diameter    | Height of the aperture |
|-------------|-------------|------------------------|
| 10.85-10.55 | 22.55-21.60 | 10.85-10.75            |

*Diagnosis*: Shell thin, polished, smooth, depressed, perforate pale yellow in colour; spire low, conoidal, suture slightly impressed; whorls six, convex, aperture slightly oblique; thinly labiate inside the basal margin arcuata, columellar oblique, reflected.

*Distribution*: India: Meghalaya: Khasi hills (West); Assam, Manipur, Nagaland, Elsewhere: Myanmar.

***Macrochlamys castaneo-labiata* Godwin-Austen**

(Pl. 16, figs. 3 & 4)

1883. *Macrochlamys castaneo-labiata* Godwin-Austen, *Land and Freshwater Moll. India*, 1: 119, pl. 29, figs. 1-7.

1908. *Macrochlamys castaneo-labiata*: Blanford and Godwin-Austen, *Fauna Brit. India Mollusca* (Testacellidae and Zonitidae), p. 101.

*Material examined*: i) 4 exs., Meghalaya.

*Measurements* (in mm) :

| Length    | Diameter    | Height of the aperture |
|-----------|-------------|------------------------|
| 7.63-6.40 | 11.85-11.25 | 6.20-5.90              |

*Diagnosis*: Shell subconoidly depressed, perforate, light brown, comparatively thick; spire conoid, low, suture impressed; whorls six, convex, aperture subvertical, broadly lunate, peristome thin, strongly labiate inside; columellar margin oblique.

*Distribution*: India: Meghalaya, Assam, Manipur, Nagaland.

***Macrochlamys consepta* (Benson)**

(Pl. 16, figs. 5 & 6)

1860. *Helix consepta* Benson, *Ann. Mag. nat. Hist.*, (3) 6: 190.

1908. *Macrochlamys ? consepta*: Blanford and Godwin-Austen, *Fauna Brit. India, Mollusca* (Testacellidae and Zonitidae), p. 115.

*Material examined*: i) 2 exs., Khasi Hills, Coll. H.H. Godwin-Austen.

*Measurements* (in mm) :

| Length    | Diameter    | Height of the aperture |
|-----------|-------------|------------------------|
| 8.30-5.55 | 17.10-10.10 | 8.25-5.35              |

*Diagnosis* : Shell depressed, discoidal, comparatively thick, smooth, polished, whitish, spire flat, apex slightly raised, suture impressed; whorls seven, convex; aperture almost vertical, broadly lunate; peristome blunt, basal margin slightly arcuate, columellar margin oblique, expanded and reflected above.

*Distribution* : India : Meghalaya : Khasi hills (East and West). Elsewhere : Myanmar.

***Macrochlamys decussata* (Benson)**

(Pl. 17, figs. 1 & 2)

1836. *Nanina decussata* Benson, *J. Asiat. Soc. Beng.*, 5 : 330.

1908. *Macrochlamys decussata* : Blanford and Godwin-Austen, *Fauna Brit. India*, Mollusca (Testacellidae and Zonitidae), p. 102.

*Material examined* : i) 1 ex., Cherrapunji, ii) 3 exs., Teriaghat.

*Measurements* (in mm)

| Length      | Diameter    | Height of the aperture |
|-------------|-------------|------------------------|
| 16.55-13.90 | 29.50-23.70 | 15.85-11.90            |

*Diagnosis* : Shell depressed, perforate, smooth; spire little raised, suture slightly impressed; whorls six, slightly convex, regularly increasing towards periphery; aperture oblique, lunate; peristome thin, simple, upper margin straight, basal subarcuate, columella inclined.

*Distribution* : India : Meghalaya (East Khasi hills). Elsewhere : Bangladesh.

***Macrochlamys extraria* Godwin-Austen**

(Pl. 17, figs. 3 & 4)

1910. *Macrochlamys extraria* Godwin-Austen, *Land Freshwater Moll. India*, 2 : 252, pl. 120, figs. 13, 13a.

*Material examined* : i) 1 ex., Balat E., Khasi hills, 9.9.86-Coll. M.R. Rynth and Party.

*Measurements* (in mm) :

| Length | Diameter |
|--------|----------|
| 10.88  | 16.75    |

*Diagnosis* : Shell depressed, perforate, thin, polished; spire low, conical, apex obtusa.

*Distribution* : India : Meghalaya Khasi hills (East)

***Macrochlamys lata* Godwin-Austen**

(Pl. 17, figs. 5 & 6)

1888. *Macrochlamys lata* Godwin-Austen, *Land Freshwater Moll. India*, 1 : 209, pl. 53, fig. 8.

1908. *Macrochlamys lata* : Blanford and Godwin-Austen, *Fauna Brit. India*, Mollusca (Testacellidae and Zonitidae), p. 102.

*Material examined* : i) 2 exs., Teria Ghat, ii) 2 exs., Siju, 27.4.91-Coll. D.K. Thakur and party.

*Measurements* (in mm) :

| Length    | Diameter  | Height of the aperture |
|-----------|-----------|------------------------|
| 5.00-3.85 | 9.30-8.55 | 4.20-3.50              |

*Diagnosis* : Shell discoidal, depressed, perforate, faintly transversely striate, milky white; spire depressed, suture moderately impressed; whorls, five, aperture oblique, lunate; peristome thickened within on basal margin, which is arcuate, columellar margin sinuate, vertical for a short distance above, broadly reflected.

**Distribution** : India : Meghalaya : Garo hills (South), Khasi hills (West).

***Macrochlamys lubrica* Benson**

(Pl. 18, figs. 1 & 2)

1852. *Helix lubrica* Benson, *Ann. Mag. nat. Hist.*, (2) 10 : 349.

1908. *Macrochlamys lubrica* : Blanford and Godwin-Austen, *Fauna Brit. India* Mollusca (Testacellidae and Zonitidae), p. 89.

**Material examined** : i) 1 ex., Tura, Garo hills, 1200;1500 ft., June-July, 1917-Coll. S. W. Kemp.

**Measurements** (in mm) :

| Length | Diameter | Height of the aperture |
|--------|----------|------------------------|
| 9.85   | 18.20    | 7.50                   |

**Diagnosis** : Shell thin, depressed, perforate smooth, yellowish; spire low, flat, suture slightly impressed; whorls five, convex above; aperture broadly lunate, almost vertical; peristome, acute, columellar margin curved and reflected.

**Distribution** : India : Meghalaya Garo hills (West); Sikkim, West Bengal.

***Macrochlamys molecula* (Benson)**

(Pl. 18, figs. 3 & 6)

1859. *Helix molecula* Benson, *Ann. Mag. nat. Hist.*, (3) 3 : 389.

1909. *Macrochlamys molecula* : Blanford & Godwin-Austen, *Fauna Brit. India*, Mollusca (Testacellidae and Zonitidae), p. 122.

**Material examined** : i) 3 exs., Nongpoh, 7.5.91-Coll. D.K. Thakur and party.

**Measurements** (in mm) :

| Length    | Diameter  | Height of the aperture |
|-----------|-----------|------------------------|
| 3.70-2.20 | 4.20-3.60 | 2.15-1.50              |

**Diagnosis** : Shell narrow, depressedly conoidal, perforate, thin, spire low, conoid with convex sides, and obtuse apex, suture well impressed; whorls 5-5½; aperture scarcely oblique, broadly lunate; peristome thin, straight, columellar margin reflected.

**Distribution** : India : Meghalaya : Ri-Bhoi; Assam. Elsewhere : Myanmar, Thailand.

**Remarks** : It is one of the smallest species of *Macrochlamys*. Though mentioned by Blanford and Godwin-Austen (1908) as being a common and widely distributed species, only three examples could be examined by us.

***Macrochlamys petasus* Benson**

(Pl. 18, figs. 2 & 7)

1859. *Helix petasus* Benson, *Ann. Mag. nat. Hist.*, (3) 3 : 388.

1908. *Macrochlamys petasus* : Blanford and Godwin-Austen, *Fauna Brit. India*, Mollusca (Testacellidae and Zonitidae), p. 115.

**Material examined** : i) 1 ex., Mawsmei cave, Cherrapunji, 20.4.78-Coll. M.R. Rynth and Party; ii) 5 exs., Siju, 27.4.91-Coll. D.K. Thakur and party.

**Measurements** (in mm) :

| Length    | Diameter   | Height of the aperture |
|-----------|------------|------------------------|
| 6.20-3.20 | 10.75-7.40 | 5.65-3.00              |

**Diagnosis** : Shell perforate, depressed, smooth, thin, yellowish; whorls 6, body whorl bluntly subangulate, increasing slowly, flatly convex above; spire low, convexly conoid, suture scarcely impressed; aperture subvertical, broadly lunate; peristome blunt.

*Distribution* : India : Meghalaya : Garo hills (South), Khasi hills (East); Arunachal Pradesh, Assam. Elsewhere Myanmar.

***Macrochlamys petrosa* (Hutton)**

(Pl. 19, figs. 1 & 2)

1834. *Helix petrosa* Hutton, *J. Asiat. Soc. Beng.*, (3)3 : 83.

1908. *Macrochlamys petrosa* : Blanford and Godwin-Austen, *Fauna Brit. India, Mollusca (Testacellidae and Zonitidae)* p. 96.

*Material examined* : i) 1 ex., Siju, 27.4.91-Coll. D.K. Thakur and party

*Measurements* (in mm) :

| Length | Diameter | Height of the aperture |
|--------|----------|------------------------|
| 3.80   | 8.35     | 4.80                   |

*Diagnosis* : Shell broader in respect of height, spire low, excavated around the perforation; aperture broad in proportion to height; longitudinal sculpture faint, often obsolete.

*Distribution* : India : Meghalaya Garo hills (South); Bihar, Uttar Pradesh, West Bengal. Recorded for the first time from Meghalaya.

***Macrochlamys plicifera* (Blanford)**

(Pl. 19, figs. 3 & 4)

1870. *Nanina plicifera* Blanford, *J. Asiat. Soc. Beng.*, 2 : 13, pl. 3, fig. 7.

1908. *Macrochlamys ? plicifera* : Blanford and Godwin-Austen, *Fauna Brit. India Mollusca (Testacellidae and Zonitidae)*, p. 110.

*Material examined* : 3 exs. Shillong.

*Measurements* (in mm) :

| Length      | Diameter    | Height of the aperture |
|-------------|-------------|------------------------|
| 13.85-13.45 | 21.85-19.60 | 10.65-9.50             |

*Diagnosis* : Shell depressed, subobtusely perforate, thin, yellowish; sculptured with subpapillose radial striae; spire low, conoid, suture very slightly impressed; whorls six, almost flat; angulate and nodosely plicate at the periphery; aperture oblique, roundly lunate; peristome thin, basal margin arcuate, columellar margin curved, vertical and reflected above.

*Distribution* : India : Meghalaya : Jaintia hills.

***Macrochlamys sequax* (Benson)**

(Pl. 19, figs. 5 & 6)

1859. *Helix sequax* Benson, *Ann. Mag. nat. Hist.*, (3) 3 : 270.

1908. *Macrochlamys sequax* : Blanford and Godwin-Austen, *Fauna Brit. India Mollusca (Testacellidae and Zonitidae)* p. 86.

*Material examined* : i) 3 exs., Teria Ghat, Khasi hills, 25.2.23,-Coll. R.Hodgart; ii) 1 ex., Lauchumera hill, Shillong, 14.9.64-Coll. A.S. Rajagopal; iii) 1 ex., Naya Banglow, Khasi hill, 21.4.77-Coll. S.G. Patil and party; iv) 2 exs., Dobasipara, Tura, 20.4.91, v) 1 ex., Dopgiri, Tura, 21.4.91, vi) 1 ex., Siju, 24.4.91, vii) 10 exs., Nongpoh, 7.4.91-Coll. D.K. Thakur & party.

*Measurements* (in mm) :

| Length    | Diameter  | Height of the aperture |
|-----------|-----------|------------------------|
| 6.18-2.85 | 8.40-4.45 | 4.40-1.80              |

*Diagnosis* : Shell perforate, depressed, thin, polished; spire low, suture impressed; whorls five, convex, rapidly increasing, aperture slightly oblique, broadly lunate much broader than high, peristome thin, columellar margin curved.

**Distribution** : India : Meghalaya : Garo hills (South and West), Khasi Hills (East and West), Ri-Bhoi; West Bengal.

***Macrochlamys terminus* Godwin-Austen**  
(Pl. 20, figs. 1 & 2)

1899. *Macrochlamys terminus* Godwin-Austen, *Land Freshwater Moll. India*, 2 : 134, 136, pl. 94, figs. 3, 3a.

1908. *Macrochlamys terminus* : Blanford and Godwin-Austen, *Fauna Brit. India*, Mollusca (Testacellidae and Zonitidae), p. 106.

**Material examined** : i) 1 ex., Naya Bunglow, Khasi hills, 21.4.77-Coll. S.G. Patil.

**Measurements** (in mm) :

| Length | Diameter | Height of the aperture |
|--------|----------|------------------------|
| 7.50   | 11.85    | 5.40                   |

**Diagnosis** : Shell perforate, thin, depressed with radiating ridges; spire low, apex obtuse, suture shallow, scarcely impressed, whorls six, flatly convex above; aperture subvertical; peristome thin, basal margin slightly arcuate, columellar margin vertical for a short distance and reflected, then obliquely curved, slightly expanded.

**Distribution** : India : Meghalaya : Khasi hills (East); Assam, Nagaland.

***Macrochlamys vesica* Godwin-Austen**  
(Pl. 20, figs. 3 & 4)

1900. *Macrochlamys vesica* Godwin-Austen, *Land Freshwater Moll. India*, 2 : 248, pl. 118, figs. 2, 2c.

1985. *Macrochlamys vesica* : Dey, Barua & Mitra, *Rec. zool. Surv. India*, 82 (1-4) : 269.

**Material examined** : i) 3 exs., Teriaghat, -Coll. F. Stoliczka; ii) 3 exs., Tura Peak, Garo hills, 28.2.65-Coll. A. S. Rajagopal.

**Measurements** (in mm) :

| Length    | Diameter   | Height of the aperture |
|-----------|------------|------------------------|
| 9.25-6.67 | 16.25-8.35 | 7.60-4.82              |

**Diagnosis** : Shell depressedly conoid, perforate, thin, polished, pale yellow; spire depressed; suture shallow; whorls 5; aperture ovate, subvertical, columellar margin weak. This species shows much variations in shell characters.

**Distribution** : India : Meghalaya : Garo hills (West), Khasi hills, Arunachal Pradesh, Assam, Mizoram. Elsewhere : Bangladesh.

**Genus *Oxytes* Pfeiffer**

1856. *Oxytes* Pfeiffer, *Zeitscher. Moll.*, p. 138.

1908. *Oxytes* : Blanford and Godwin-Austen, *Fauna Brit. India*, Mollusca (Testacellidae and Zenitidae), p. 166.

*Key to the species*

1. Shell widely umbilicate ..... 2  
Shell very narrowly perforate ..... 3
2. Sharply keeled all round the periphery ..... *O. oxytes*  
Angulate at the periphery, angulation becoming blunt near aperture ..... *O. cycloplax*
3. Shell brownish with more distinct spiral sculpture ..... *O. castor*  
Shell pale yellowish with less distinct spiral sculpture ..... *O. pollux*

***Oxytes castor* (Theobald)**

(Pl. 20, figs. 5 &amp; 6)

1858. *Helix castor* Theobald, *J. Asiat. Soc. Beng.*, 27 : 319.1908. *Oxytes castor* : Blanford and Godwin-Austen, *Fauna Brit. India, Mollusca (Testacellidae and Zonitidae)*, p. 168.*Material examined* : i) 5 exs., Cherrapunji.*Measurements* (in mm) :

| Length      | Diameter    | Height of the aperture |
|-------------|-------------|------------------------|
| 17.55-15.30 | 32.50-29.00 | 16.90-14.60            |

*Diagnosis* : Shell lenticular, thin, sharply keeled, light brown, finely decussated above and below; spire low, conical, apex acute; whorls  $5\frac{1}{2}$ , regularly increasing, flattened above, body whorls compressed at the keel; aperture oblique, angularly lunate; peristome thin, basal margin slightly arcuate.

*Distribution* : India : Meghalaya : Khasi hills (East).***Oxytes cycloplax* (Benson)**

(Pl. 21, figs. 1 &amp; 2)

1852. *Helix cycloplax* Benson, *Ann. Mag. nat. Hist.*, (2) 10 : 348.1908. *Oxytes cycloplax* : Blanford and Godwin-Austen *Fauna Brit. India, Mollusca (Testacellidae and Zonitidae)*, p. 168.*Material examined* : i) 4 exs., Khasi hills-Coll. H.H. Godwin-Austen; ii) 1 ex., Selbalgiri, 25.8.84-Coll. J.P. Sati.*Measurements* (in mm) :

| Length     | Diameter    | Height of the aperture |
|------------|-------------|------------------------|
| 17.50-6.80 | 37.30-14.40 | 15.70-7.50             |

*Diagnosis* : Shell umbilicate, depressed, brownish yellow, angulate at the periphery which becomes blunt and obsolete near the mouth; spire low, apex less pointed, umbilicus wider; whorls five; aperture oblique, peristome thin.

*Distribution* : India : Meghalaya : Garo hills (West), Khasi hills (East and West); Sikkim, West Bengal.***Oxytes oxytes* (Benson)**

(Pl. 21, figs. 3 &amp; 4)

1836. *Helix oxytes* Benson, *J. Asiat. Soc. Beng.*, 5 : 351.1908. *Oxytes oxytes* : Blanford and Godwin-Austen, *Fauna Brit. India, Mollusca (Testacellidae and Zonitidae)*, p. 167.*Material examined* : i) 1 ex., Above Tura, W. Garo Hills, 3500-3900 ft., July-August, 1917-Coll. S. Kemp; ii) 42 exs., Tura Peak, W. Garo Hills, 26.2.65-Coll. A. S. Rajagopal; iii) 1 ex., Dainadubi forest, 15.4.71-Coll. R. S. Pillai and party; iv) 1 ex., Balphakram National Park, Garo hills, 20.2.1991-Coll. J.R.B. Alfred; v) 1 ex., Siju, 27.4.91-Coll. D.K. Thakur and party.*Measurements* (in mm) :

| Length     | Diameter    | Height of the aperture |
|------------|-------------|------------------------|
| 17.45-6.65 | 35.20-16.12 | 15.90-7.72             |

*Diagnosis* : Shell depressed, obliquely striated, umbilicate; spire very low, apex pointed; whorls five, flattened above with a sharply keeled body whorl; aperture oblique, angularly lunate; peristome thin, umbilicus deep, exposing all the whorls.

Tentacles 2 pairs, upper pair dark brownish with darker dots. Lower pair light brown without

dots. Foot uniformly light brown with a caudal gland.

**Distribution** : India : Meghalaya : Garo hills (East, South and West); Arunachal Pradesh, Assam.

**Remarks** : A single shell collected from Balphakram National Park, W. Garo hills, differs from typical *O. oxytes* having a slightly more flattened spire and being a little more sharply keeled. This shell may actually belong to the Burmese species (? subspecies) *O. shanensis* as mentioned by Blanford & Godwin-Austen (1908).

***Oxytes pollux* (Theobald)**

(Pl.21, figs.586)

1858. *Helix pollux* Theobald, *J. Asiat. Soc. Beng.*, 27 : 319.

1908. *Oxytes pollux* : Blanford and Godwin-Austen, *Fauna Brit. India*, Mollusca (Testacellidae and Zonitidae), p.169.

**Material examined** : i) 7 exs., (damaged), Khasi hills—Coll. W.T Blanford.

**Measurements** (in mm) :

| Length     | Diameter    | Height of the aperture |
|------------|-------------|------------------------|
| 18.45-9.10 | 36.90-20.80 | 18.25-11.90            |

**Diagnosis** : Shell lenticular, sharply keeled, thin, finely striated, pale horny; spire low, conical, apex acute; whorls six, regularly increasing, flattened above, the last compressed at the keel, slightly convex beneath; aperture oblique, angularly lunate; peristome thin, basal margin slightly arcuate.

**Distribution** : India : Meghalaya : Khasi hills (East and West).

Genus ***Rahula*** Godwin-Austen, 1907

1907. *Rahula* Godwin-Austen, *Land Freshwater Moll. India*, 2 : 117.

1908. *Rahula* : Blanford and Godwin-Austen, *Fauna Brit. India*, Mollusca (Testacellidae and Zonitidae), p.249.

**Key to the species**

Strongly costulate at base, sharply angulate around umbilicus ..... *R. manipurensis*

Weakly striate at base, bluntly angulate around umbilicus ..... *R. bascauda*

***Rahula bascauda* (Benson)**

(Pl.22, figs.182)

1859. *Helix bascauda* Benson, *Ann. Mag. nat. Hist.*, (3) 3 : 186.

1908. *Rahula bascauda* : Blanford & Godwin-Austen, *Fauna Brit. India*, Mollusca (Testacellidae and Zonitidae), p.251.

**Material examined** : i) 8 exs., Jaintia hills ii) 3 exs., Bara pani iii) 2 exs., Tanir, iv) 1 ex., Toruputu, -Coll. H.H. Godwin-Austen.

**Measurements** (in mm) :

| Length    | Diameter  | Height of the aperture |
|-----------|-----------|------------------------|
| 3.10-2.90 | 3.35-3.05 | 2.30-1.20              |

**Diagnosis** : Shell subtrochiform, conoid, deeply umbilicate, ornamented with oblique, raised distant ribs above and less raised, closer striae below; spire conical, apex obtuse, suture impressed, whorls 6½, subangulate around the umbilicus; aperture slightly oblique, roundly lunate; peristome thin, columellar margin expanded.

**Distribution** : India : Meghalaya : Jaintia hills, Ri-Bhoj; Nagaland.

**Rahula munipurensis** Godwin-Austen

(Pl.22, figs.4 &amp; 5)

1907. *Rahula munipurensis* Godwin-Austen, *Land Freshwater Moll. India*, 2 : 220, pl.117, fig.4.1908. *Rahula munipurensis* : Blanford and Godwin-Austen, *Fauna Brit. India*, Mollusca (Testacellidae and Zonitidae), p.253.*Material examined* : i) 2 exs., Jaintia hills.*Measurements* (in mm) :

| Length    | Diameter  | Height of the aperture |
|-----------|-----------|------------------------|
| 3.85-3.15 | 4.20-3.30 | 2.20-2.10              |

*Diagnosis* : Shell globose, conical, deeply umbilicate; sculpture distant, strong and very regular costulation, both above and below; pale grey; spire conoid, flat on the side, apex rounded; suture impressed; whorls six, aperture semicircular; peristome thickened, columellar margin subvertical.

*Distribution* : India : Meghalaya (Jaintia hills), Manipur.

*Remarks* : Ray and Rajagopaleingear (1953) described a new variety *teriai* from Jaintia hills. Unfortunately we can't trace the material in our collection.

Genus **Sesara** Albers1860. *Sesara* Albers, *Heliceen*, ed 2, p. 91.1966. *Sesara* : Solem, *Spolia zool. Mus. haun.*, 24 : 29.**Sesara diplodon** (Benson)

(Pl.22, figs.386)

1859. *Helix diplodon* Benson, *Ann. Mag. nat. Hist.*, (3) 3 : 187.1908. *Sesara ? diplodon* : Blanford & Godwin-Austen, *Fauna Brit. India*, Mollusca (Testacellidae and Zonitidae), p.247.1990. *Sesara diplodon* : Mitra & Dey, *Rec. zool. Surv. India*, 86 (1) : 59.

*Material examined* : i) 20 exs., khasi hills—Coll. H.H. Godwin-Austen, ii) 4 exs., Garo hills, 27-28.2.65—Coll. A. S. Rajagopal; iii) 1 ex., Dobasipara, Tura, 20.4.92. iv) 1 ex., siju, 27.4.91—Coll. D.K. Thakur and party.

*Measurements* (in mm) :

| Length    | Diameter  | Height of the aperture |
|-----------|-----------|------------------------|
| 5.40-4.50 | 7.85-6.10 | 4.10-2.05              |

*Diagnosis* : Shell trochiform, thin perforate, smooth; spire conical, suture slightly impressed; whorls seven, convex, impressed in the umbilical region; aperture oblique, trapezoidal, palatal teeth two, a small and conical subcolumellar and an outer lamellar having two portions, inner portion being slightly higher.

*Distribution* : India : Meghalaya Garo hills (West), Khasi hills (East and West); Assam, Arunachal Pradesh, Mizoram.

Elsewhere : Bangladesh, Myanmar, Pakistan.

Genus **Sitala** H. Adams1865. *Sitala* H. Adams, *Proc. zool. Soc. Lond.*, p.408.1991. *Sitala* : Subba Rao and Mitra, *Rec. zool. Surv. India. Occ. paper*, 126 : 59.**Sitala rimicola** (Benaan)1859. *Helix rimicola* Benson, *Ann. Mag. nat. Hist.*, (3) 3 : 266.1908. *Sitala rimicola* : Godwin-Austen, *Fauna Brit. India*, Mollusca (Testacellidae and Zonitidae) p. 236.

**Material examined** : i) 1 ex., khasi hills.

**Measurements** (in mm) :

| Length | Diameter | Height of the aperture |
|--------|----------|------------------------|
| 4.10   | 4.80     | 2.45                   |

**Diagnosis** : Shell thin, subperforate, turbinata, globosely conical, finely obliquely striate decussate by spiral lirae pale brownish; spire conical, apex obtuse, suture impressed, whorls six convex; aperture oblique, semicircularly lunate; periostome thin, straight, columellar margin vertical, reflected.

**Distribution** : India : Meghalaya : Khasi hills (East and West); Assam, Nagaland, Sikkim, Uttar Pradesh, West Bengal.

Genus *Taphrospira* Blanford

1905. *Taphrospira* Blanford, Proc. zool. Soc. Lond., p.441.

1991. *Taphrospira* : Subba Rao and Mitra, Rec. zool. Surv. India Occ. paper 126 : 67.

***Taphrospira compluvialis* (Blanford)**

(Pl.22, figs.7 & 8)

1865. *Nanina compluvialis* Blanford, J. Asiat. Soc. Beng., (2) 34 : 66.

1908. *Taphrospira compluvialis* : Godwin-Austen, Fauna Brit. India. Mollusca (*Testacellidae* and *Zonitidae*) p.280.

**Material examined** : i) 1 ex., khasi hills—Coll. W.T Blanford.

**Measurements** (in mm) :

| Length | Diameter | Height of the aperture |
|--------|----------|------------------------|
| 13.00  | 9.45     | 5.50                   |

**Diagnosis** : Shell depressed, thin, perforate, subglobose with fine longitudinal striation; spire low, suture deep, broadly canaliculate, whorls 4 $\frac{1}{2}$  angulate; aperture oblique, roundly lunate; peristome thin, sinuate, columellar margin curved, expanded and broadly reflected.

**Distribution** : India : Meghalaya khasi hills (East and West); Elsewhere : Myanmar.

First record from Meghalaya.

Family CAMAENIDAE

*Key to the genera*

1. Shell elongate, sinistral.....*Amphidromus*  
Shell depressed, dextral.....2
2. Shell large, above 50 mm in diameter, spire distinctly raised ..... *Camaena*  
Shell smaller, upto 20 mm in diameter, spire usually flattened ..... *Chloritis*

Genus *Camaena* (Albers) Pilsbry

1891. *Camaena* Pilsbry Man. Conch. (2) 6 : 197.

1914. *Camaena* : Gude, Fauna Brit, India, Mollusca, 2 : 149.

***Camaena ochthoplax* (Benson)**

(Pl. 23, figs.1 & 2)

1860. *Helix ochthoplax* Benson, Ann. Mag. nat. Hist., (3) 6 : 180.

1914. *Camaena ochthoplax* : Gude, Fauna Brit. India, Mollusca, 2, : 150.

**Material examined** : i) 4 exs., khasi hills—Coll. H.H. Godwin-Austen.

*Measurements (in mm) :*

| Length      | Diameter    | Height of the aperture |
|-------------|-------------|------------------------|
| 34.90-24.90 | 61.40-41.24 | 34.15-20.90            |

*Diagnosis* : Shell depressedly conical, narrowly but deeply umbilicate, straw coloured, apex blunt; suture moderately impressed, obsolete granulatedly sculptured; whorls five, convex, body whorl subangulate; aperture oblique, lunate; peristome expanded and reflected, columella callosely thickened and reflected.

*Distribution* : India : Meghalaya : Khasi hills (East and West). Assam.

Elsewhere : Myanmar, Pegu.

Genus ***Amphidromus*** Albers

1850. *Amphidromus* Albers, *Die Heliceen*, p. 138.

1991. *Amphidromus* : Subba Rao and Mitra, *Rec. zool. Surv. India Occ. paper*, 126 : 68.

*Key to the species*

Shell with two bands at the base.....*A. sinensis*  
 Shell without bands.....*A. sylheticus*

***Amphidromus sinensis*** (Benson)

(Pl.23, figs.3 & 5)

1851. *Bulimus sinensis* Benson, *Ann. Mag. nat. Hist.*, (2) 7 : 264.

1914. *Amphidromus sinensis* : Gude, *Fauna Brit. India*, Mollusca, 2, : 182

*Material examined* : i) 2 exs., khasi hills—Coll. H. H. Godwin-Austen.

*Measurements (in mm) :*

| Length      | Diameter    | Height of the aperture |
|-------------|-------------|------------------------|
| 28.60-27.40 | 14.55-16.00 | 18.40-13.90            |

*Diagnosis* : Shell ovately conical, sinistral, deeply perforate; whitish with greenish tinch; spire conical, apex obtuse; whorls 5<sub>2</sub><sup>1</sup>, bodywhorl inflated and with two bands at the base, aperture oblique, ovate, peristome reflected and a little thickened, columella reflected and with a groove behind.

*Distribution* : India : Meghalaya : Khasi hills (East and West).

Elsewhere : China, Myanmar.

***Amphidromus sylheticus*** Reeve

(Pl.23, fig.6; Pl.24, fig.1)

1849. *Bulimus sylheticus* Reeve, *Conch. Icon 5 Bulimus.*, pl.77, fig. 564.

1914. *Amphidromus sylheticus* : Gude, *Fauna Brit. India*, Mollusca, 2 : 150.

*Material examined* : i) 3 exs., Siju, 27.4.91—Coll. D.K. Thakur and party.

*Measurements (in mm) :*

| Length      | Diameter    | Height of the aperture |
|-------------|-------------|------------------------|
| 27.04-22.45 | 14.80-12.70 | 10.30-9.80             |

*Diagnosis* : Shell sinistral, umbilicate, ovate-conic, greenish yellow, first whorl weakly punctulate; whorls 5<sub>2</sub><sup>1</sup>, slightly convex; aperture ovate, oblique, slightly brown; peristome white and reflected, columella with slightly convex edge.

*Distribution* : India : Maghalaya Garo hills (South); Assam.

*Remarks* : According to Godwin-Austen the name *sylheticus* is inappropriate because it is not likely to occur at Sylhet (Gude, 1914). But since Reeve (1849) includes Sylhet in its range

of distribution the comment seems unwarranted.

One of the shells studied possesses a dark brownish patch at the columellar region, said to be a character of *A. masoni*, to which it is very similar. But the shells are kept under *Syltheticus* on the basis of their smaller size, less number of whorls and lemon yellow colour.

Genus *Chloritis* Beek

1836. *Chloritis* Beek, *Index Moll.*, p.29.

1914. *Chloritis* : Gude, *Fauna British India, Mollusca*, 2 : 166.

*Chloritis delibrata* (Benson)

(Pl.23, fig.4)

1836. *Helix delibratus* Benson, *J. Asiat. Soc. Beng.*, 5 : 352.

1914. *Chloritis delibrata* : Gude, *Fauna of British India, Mollusca*, 2 : 172

**Material examined** : i) 3 exs., khasi hills; ii) 1 ex., Elephanta falls 12.7.67—Coll. S. Biswas, iii) 1 ex., Fruit garden, Shillong, 10.8.82—Coll. M.S. Jyrwa.

**Measurements** (in mm) :

| Length    | Diameter    | Height of the aperture |
|-----------|-------------|------------------------|
| 9.60-6.80 | 19.05-13.90 | 9.35-7.20              |

**Diagnosis** : Shell discoid, widely umbilicate; finely striate; spire plane, apex depressed, suture deep; whorls  $4\frac{1}{2}$ , convex, subangulate around the umbilicus; aperture oblique, ovate-auriculate; peristome white, thickened, reflected.

**Distribution** : India : Meghalaya : khasi hills (East and West); Arunachal Pradesh, Assam, West Bengal. Elsewhere : Bangladesh, Myanmar.

*Chloritis delibrata* (Benson) var. *fasciata* Godwin-Austen

1836. *Helix delibratus* Benson, *J. Asiat. Soc. Beng.*, 5 : 352.

1875. *Helix delibrata* var. *fasciata* Godwin-Austen, *J. Asiat. Soc. Beng.*, 45 : 1, pl. 1, fig.1.

1914. *Chloritis* var. *fasciata* : Gude, *Fauna Brit. India, Mollusca* : 2 : 173.

1990. *Chlorites delibrata* var. *fasciata* : Mitra & Dey, *Rec. zool. Surv. India*, 86 (1) : 63.

**Material examined** : i) 15 exs., above Tura, 3500-3900 ft., July-August, 1917—Coll. S. Kemp; ii) 1 ex., Collected from Mawphlang, Shillong, 22.8.63, iii) 1 ex., Elephant falls, Upper Shillong, 12.7.67—Coll. S. Biswas; iv) 1 ex., Fruit garden, Shillong, 10.8.82—Coll. M.S. Jyrwa.

**Measurements** (in mm) :

| Length    | Diameter   | Height of the aperture |
|-----------|------------|------------------------|
| 8.95-4.10 | 21.60-7.25 | 8.40-4.00              |

**Diagnosis** : Shell ornamented with a single brown supra peripheral band.

**Distribution** : India : Meghalaya : Garo hills (West), Khasi hills (East); Assam, Mizoram, West Bengal. Elsewhere : Bangladesh, Myanmar.

Family BRADYBAENIDAE

Genus *Plectotropis* van Matens

1880. *Plectotropis* van Martens, *Die Heliceen*, ed 2, p.121.

1914. *Plectotropis* : Gude, *Fauna Brit. India, Molluscs*, 2 : 210.

*Plectotropis tapeina* (Benson)

(Pl. 24, figs 2 & 3)

1836. *Helix tapeina* Benson, *J. Asiat. Soc. Beng.*, 5 : 352.

1914. *Plectotropis tapeina* : Gude, *Fauna Brit. India, Mollusca*, 2 : 214.

*Material examined* : i) 9 exs., khasi hills—Coll. H. H. Godwin-Austen; ii) 16 exs., Siju, West Garo hills, 27.4.91—Coll. D. K. Thakur and party.

*Measurements* (in mm) :

| Length     | Diameter   | Height of the aperture |
|------------|------------|------------------------|
| 11.20-3.85 | 17.80-7.75 | 7.40-3.25              |

*Diagnosis*: Shell depressed, perforate, openly umbilicate, obliquely striate; spire subconoid; carinate at the periphery, inflated at the base; edge of umbilicus angulate; suture impressed; whorls 6 $\frac{1}{2}$ , flatly convex, body whorl descending in front; aperture oblique, lunate; peristome discontinuous and reflected.

*Distribution* : India : Meghalaya : Garo hills (West), Khasi hills (East and West); Arunachal Pradesh, Assam, West Bengal.

Elsewhere : Bangladesh, Myanmar.

Order     SOLEOLIFERA  
Family    VERONICELLIDAE  
Genus     ***Laevicaulis*** Simroth,

1913 *Laevicaulis* Simroth in Vaoltzkow, *Reise Afr.*, 3 (3) : 147.

#### ***Laevicaulis alte*** (Ferussac)

(Pl.24, figs.4 & 5)

1821. *Vaginules alte* Ferussac, *Tabl. Syst. Limacea*, p.14.

1961. *Laevicaulis alte* : Ray, *Treubia*, 25 (3) : 275.

1991. *Laevicaulis alte* : Subba Rao and Mitra, *Rec.zool. Surv. India, Occ. paper*, 126 : 36.

*Material examined* : i) 3 exs., Nangpoh, 7.5.91—Coll. D. K. Thakur and party.

*Measurements* (in mm) :

| Length      | Width     |
|-------------|-----------|
| 32.75-28.55 | 8.55-8.50 |

*Diagnosis* : Animal elongate, flattend, dorsally oval, dark brown with dark blotches and usually with a yellowish line down the middle. Anterior and with two pairs of dark brown tentacles which are contractile; posterior end broad and rounded.

*Distribution* : India : Meghalaya : Ri-bhoi; Andaman and Nicobar Islands, Andhra Pradesh, Bihar, Gujarat, Maharastra, Pondichery, Punjab. Tamil Nadu, Uttar Pradesh and West Bengal. Elsewhere : Australia, China, East Africa, Hong Kong, Indonesia, Loyalti, Madagascar, Malaya Peninsula, Mauritius, New Caledonia, Reunion, Sri Lanka, Taiwan.

Recorded for the first time from Meghalaya.

### SUMMARY AND GENERAL REMARKS

A total of 223 species of land and freshwater molluscs spread over 67 genera and 28 families are known from Meghalaya. Of these, 135 species have been physically examined by us and the rest are included on the basis of literature records.

Freshwater molluscs are represented by 35 species, 15 genera and 10 families. The genus *Paludomus* is abundantly represented in the hillstreams and two of the species namely, *p. regulata* Benson and *P. stephanus* (Benson) are endemic to Meghalaya. *Cipangopaludina lecythis* (Benson) which was reported earlier from Manipur has been recorded for the first time from Meghalaya. *Pila theobaldi* (Hanley) which was hitherto known from Myanmar has been recorded with its range of distribution extending into India. It is also interesting that one example

of *Pila globosa* (Swainson), the well known Indian species, is for the first time recorded from Meghalaya. Among bivalves 3 species of *Parreysia* are recorded for the first time from Meghalaya. Intriguingly no freshwater molluscs except *Pisidium atkinsonianum*, the small bivalve, could be found in Thadlus Kein lake, near Jawai, a large waterbody with plenty of aquatic vegetations and muddy substratum.

One hundred and five species of land molluscs comprising 47 genera and 18 families have been studied. The number of species we could collect and study is poor when compared to the total number of land molluscs (188) recorded from Meghalaya. Although we do not have concrete data to substantiate, perhaps the habitat destruction in the state might have led to the extinction of at least a few species of land molluscs. For instance only four examples of *Macrochlamys molecula*, one of the smallest species of the genus, considered to be a common and widely distributed species by Blanford and Godwin-Austen (1908), could be collected and studied at present.

The forest clad hills of the north-eastern India account for the vast majority of the land operculates. Particularly the smaller genera like, *Alycaeus*, *Diplommatina*, *Raphaulus* etc. flourish and abound in the moist hill-forest. Five families of operculates are represented by 64 species and 17 genera in Meghalaya. Of these, five species each of *Alycaeus* and *Diplommatina*, two of *Cyclophorus*, one each of *Pupina* and *Gastroptychia* are restricted endemic to Meghalaya. *Pleuropoma arakanensis* (Helicinidae) is recorded for the first time from the state. Incidentally, it is the first ever record of an archaeogastropod land snail from Indian mainland.

Regarding pulmonates, three species *Macrochlamys*, two of *Oxytes*, one each of *Khasiella*, *Kaliella*, *Taphrospira*, *Amphidromus* and *Lamellaxis* are restricted endemic to Meghalaya. The two species of slug *Parmarion martensi* and *Laevicaulis alte* are new records. While the genus *Parmarion* is altogether a new record for India, *Laevicaulis alte* is the commonest land slug of Indian plains extending to Nongpoh in Meghalaya. The genus *Bensonia* is recorded for the first time from this state and it is an extension of range for this Himalayan genus. Several species like, *Glossula gemma*, *Macrochlamys petrosa*, *Lamellaxis gracile*, *Sivella castra* etc. enjoy very wide range of distribution starting from the Gangetic plains in Bihar and West Bengal and extending upto Tura and Siju in Meghalaya.

Of the molluscs recorded from Meghalaya, *Acmella tersa*, a land operculate is the smallest (1.65 mm.) and *Achatina fulica* the notorious agri-horticultural pest (94.0 mm.) is easily the largest.

Notwithstanding the presence of several overlapping species, there exists a broad line of demarcation in the distribution of molluscs in Meghalaya, guided obviously by the altitude.

Among the freshwater forms, *Pila globosa*, *Digoniostoma cerameopoma*, *Paludomus regulata*, *Indoplanorbis exustus*, *Parreysia caerulea* are the dominant species below 500 meter. *Pisidium atkinsonianum* was collected only above 1000 meter, whereas species like *Pila theobaldi*, *Paludomus conica*, *Bellamyia bengalensis*, *Lymnaea* spp. were noticed to occur both at lower and higher altitudes.

Among land molluscs, *Achatina fulica* and *Laevicaulis alte* were found only below 500 meter. Species of the genera like, *Alycaeus*, *Diplommatina*, *Pupina*, *Gastroptychia*, *Phaedusa*, *Bacillum*, *Curvella*, *Bensonia*, *Oxytes*, *Rahula*, *Taphrospira*, *Camaena* etc. were all collected above 1000 meter. Few genera like, *Cyclophorus*, *Plectopylis*, *Cryptaustenia* and *Macrochlamys*

are represented at both lower and higher altitudes.

#### *Edible shell resources and marketing*

Almost all the freshwater molluscs which occur abundantly in local aquatic bodies serve as food for the people of Meghalaya. Shell fishes seem to be more popular in the Garo hills than in the Khasi hills. Important species that are used for human consumption are *Bellamyia bengalensis* f. *typica* (Lamarck), *Bellamyia dissimilis* (Mueller), *Pila theobaldi* (Hanley), *Brotia (Antimelania) costula* (Rafinesque), *Paludomus* spp. and *Lamellidens marginalis* (Lamarck). The species are known under different common names in Garo but in the Khasi one common name mattah is used for all these molluscs.

Molluscs are regularly collected from the local stream river, ponds or lakes (Pl 25, fig. A) by the consumers themselves. They are also sold regularly in the market.

These molluscs are sold in packets made out of fresh banana leaves or in a lot in the markets of Tura (Pl. 25, fig B.), Barengapara and Baghmara. Some prevailing market rates of four important species recorded are mentioned below.

Specimens purchased from the market or collected from the aquatic bodies are boiled with water and then the flesh removed from the shell and consumed by adding salt or cooked with vegetables as per the consumer's choice.

**Table**

| Name  | Garo    | Khasi  | Baghmara      | Others       | Rate        |
|---|---------|--------|---------------|--------------|-------------|
| 1. <i>Bellamyia bengalensis</i><br>f. <i>typica</i> (Lamarck) | Echalok | Mattah | Sipuru        | Dhan Samuk   | *<br>1/-    |
| 2. <i>B. dissimilis</i> (Mueller)                             |         |        |               |              | **          |
| 3. <i>Pila theo baldi</i> (Hanely)                            | Yafu    | "      | Hamuk         | Tomka samuk  | 1/-         |
| 4. <i>Brotia (Antimelania)</i><br><i>costula</i> (Rafinesque) | Echalu  | "      | Sipuru rodong | Mochra samuk | ***<br>1/-  |
| 5. <i>Paludomus conica</i><br>(Gray)                          | Achhilu |        | Sipuru        | Samuk        | *<br>1/-    |
| 6. <i>P. regulata</i> Benson                                  | Echalok | "      | Sipuru        | Samuk        | *<br>1/-    |
| 7. <i>Lamellidens marginalis</i><br>(Lamarck)                 | Yafi    | "      | —             | Jhinai       | ****<br>1/- |

- \* include 50 to 60 average-sized specimens
- \*\* per lot includes 10 specimens of different sizes.
- \*\*\* include 100 to 120 average sized specimens
- \*\*\*\* a lot includes 8 to 10 specimens of diferent sizes.

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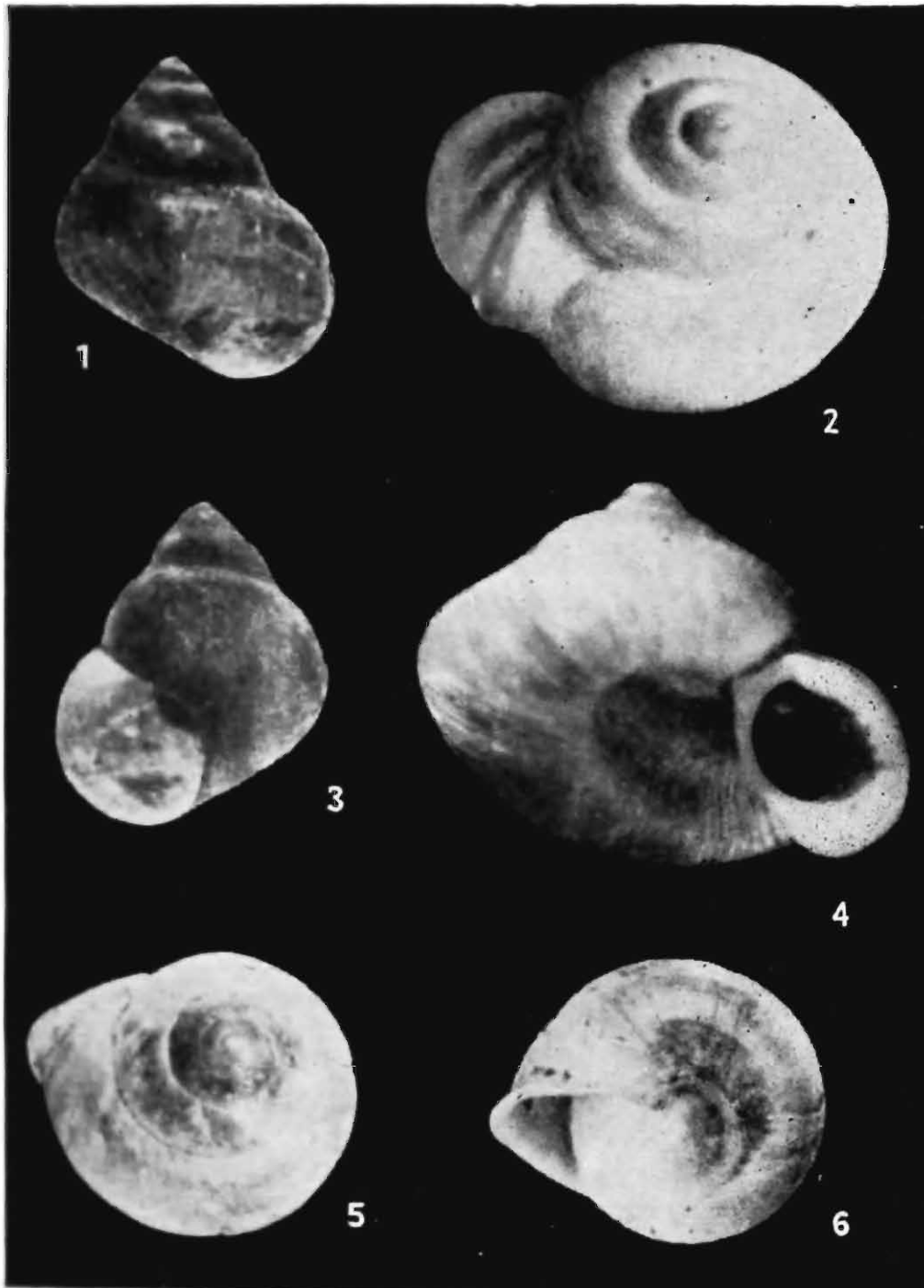
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SUBBA RAO et al

PLATE - 1

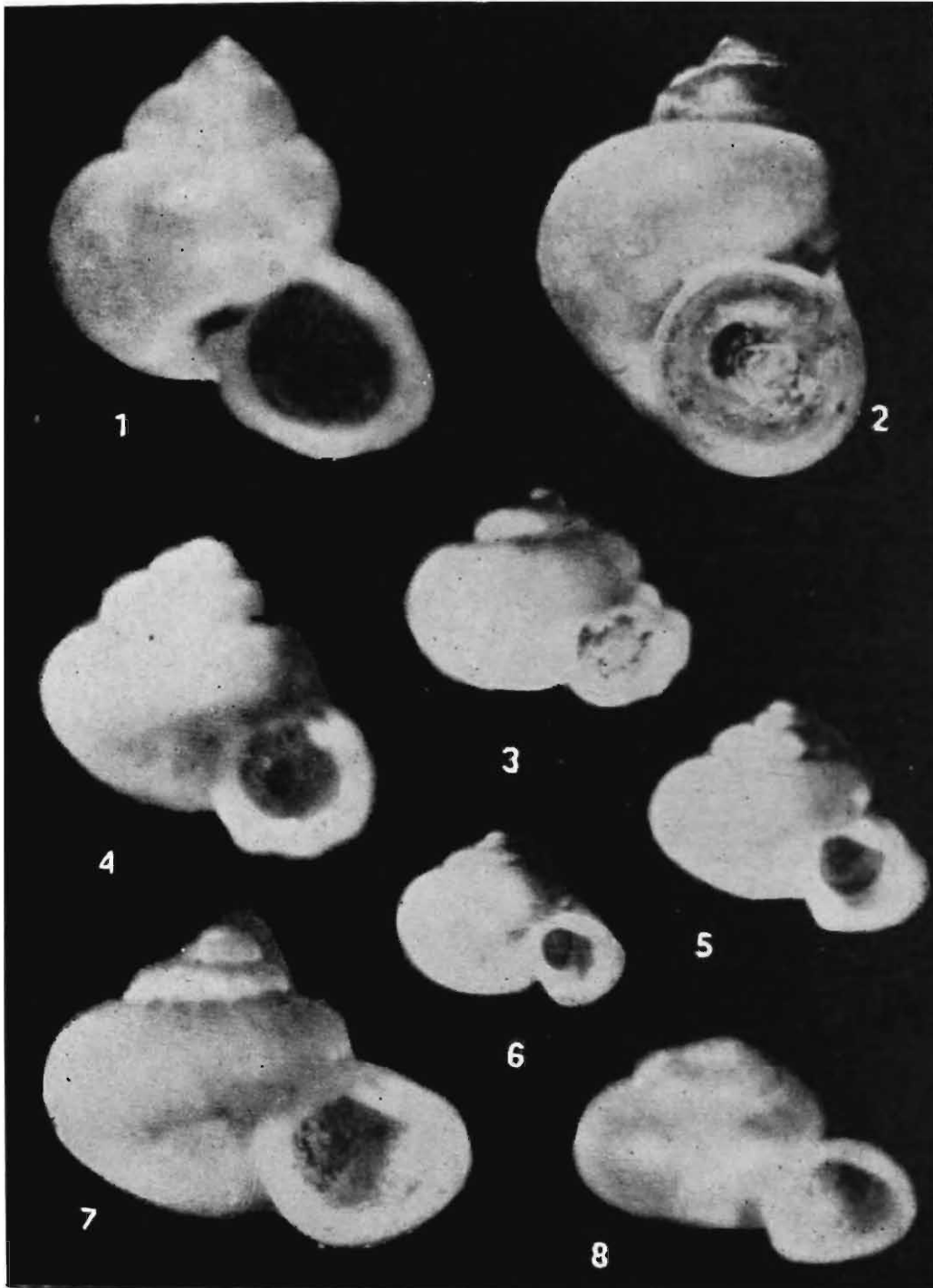


1&3. Sinistral shell of *Bellamyia bengalensis* f. *typica*  
(Lamarck)

2. *Alycaeus hebes* Benson

4. *A. crenatus* Godwin-Austen

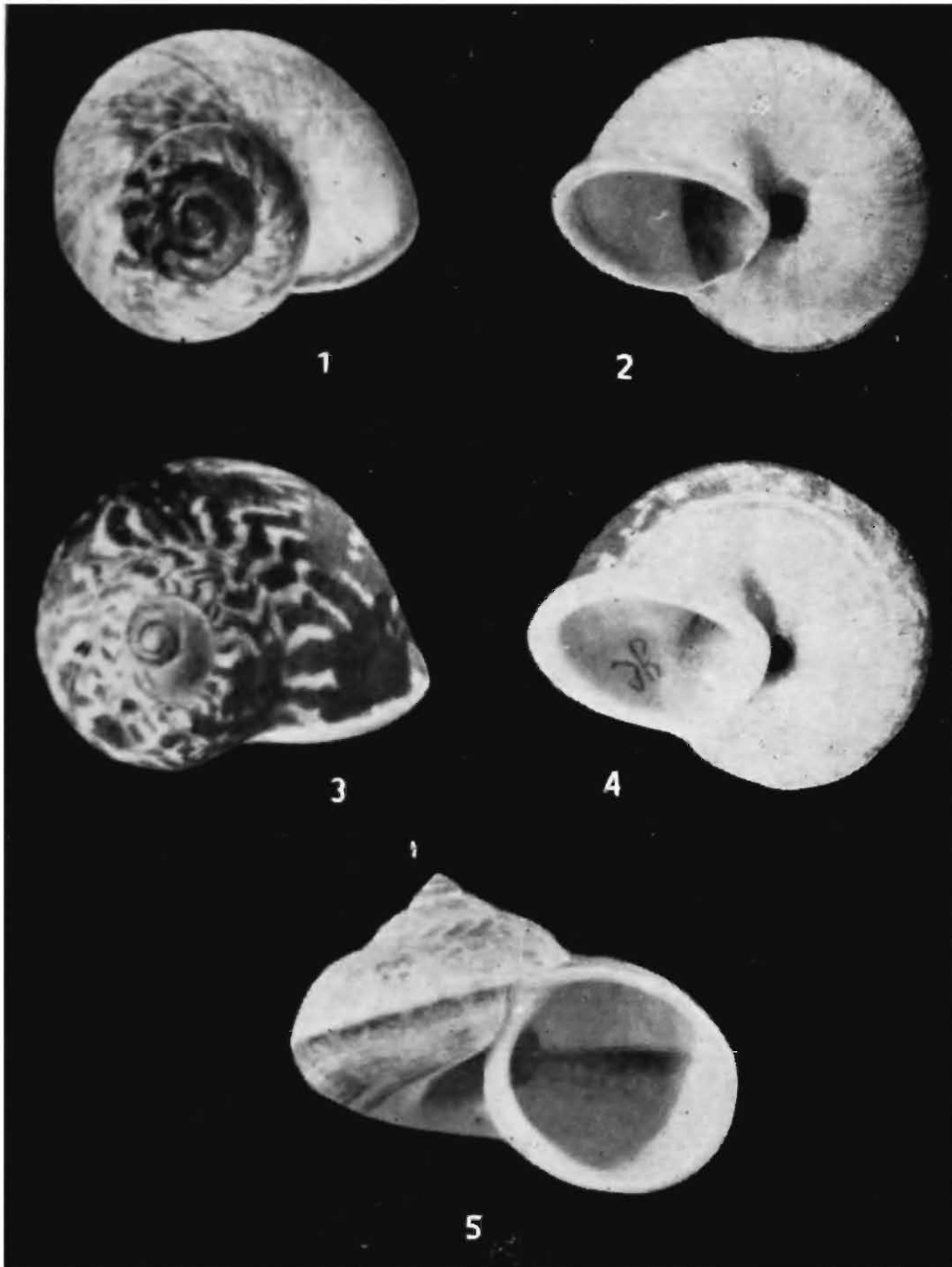
5&6. *Pleuropoma arakanensis* Blanford (4.00 x 5.55)



1. *Alycaeus otiphorus* Benson
2. *Dioryx urnula* Benson
3. *Alycaeus khasiacus* Godwin-Austen
4. *A. jaintiacus* Godwin-Austen
5. *A. graphicus* Blanford
6. *A. nongtunensis* Godwin-Austen
7. *A. theobaldi* Blanford
8. *A. prosectus* Benson

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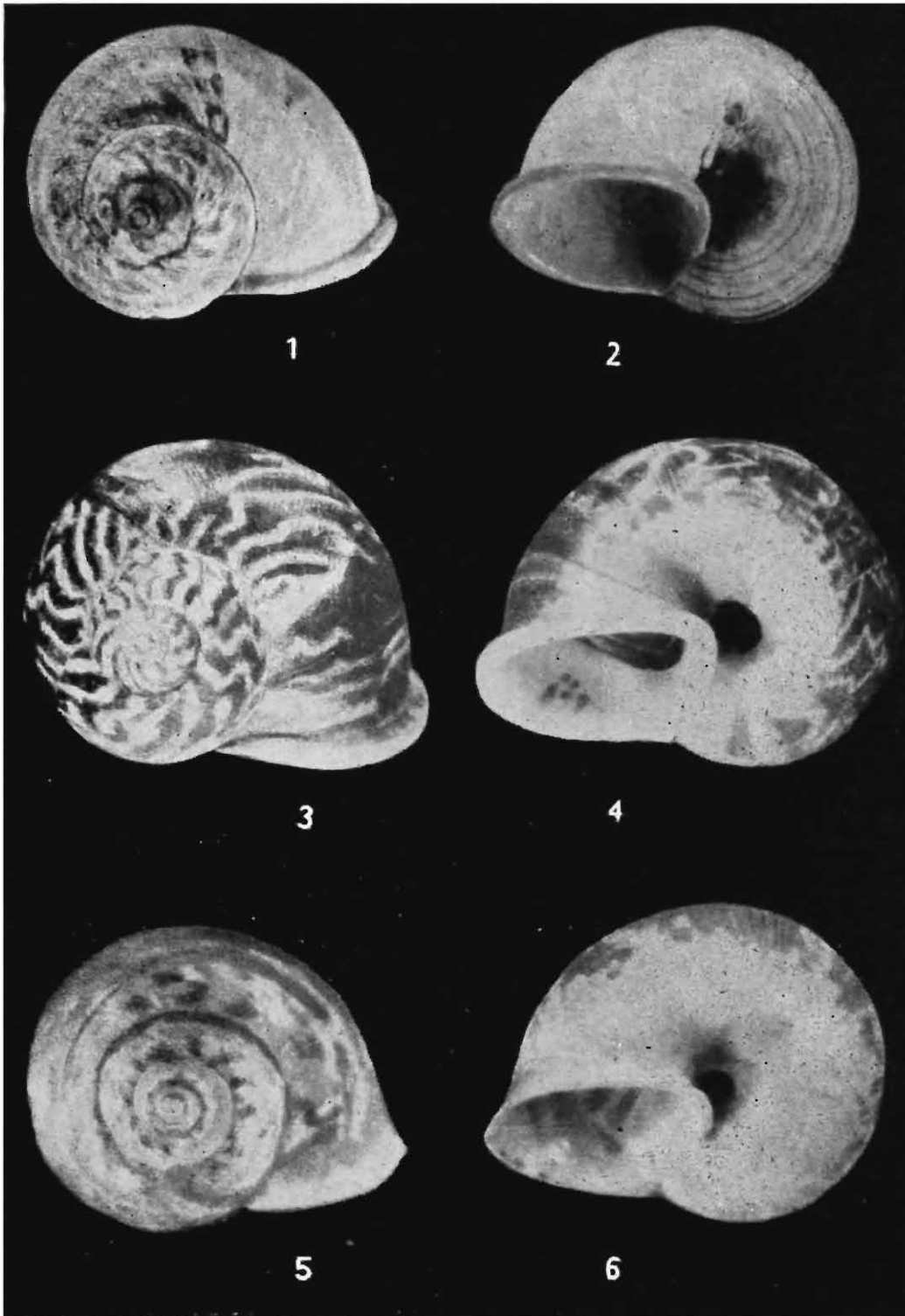
PLATE - 3



|      |                                     |                 |
|------|-------------------------------------|-----------------|
| 1&2. | <i>Cyclophorus affinis</i> Theobald | (22.75 x 27.20) |
| 3&4. | <i>C. hensoni</i> (Pfeiffer)        | (37.80 x 45.60) |
| 5&6. | <i>C. himalayanus</i> Pfeiffer      | (            )  |

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PLATE - 4



- 1&2. *Cyclophorus pearsoni* (Benson) (30.85 x 36.20)  
3&4. *C. khasiensis* Nevill (37.95 x 49.76)  
5&6. *C. zebrinus* Benson (15.50 x 18.40)

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PLATE - 5



1&2. *Pearsonia assamensis* (Fulton)

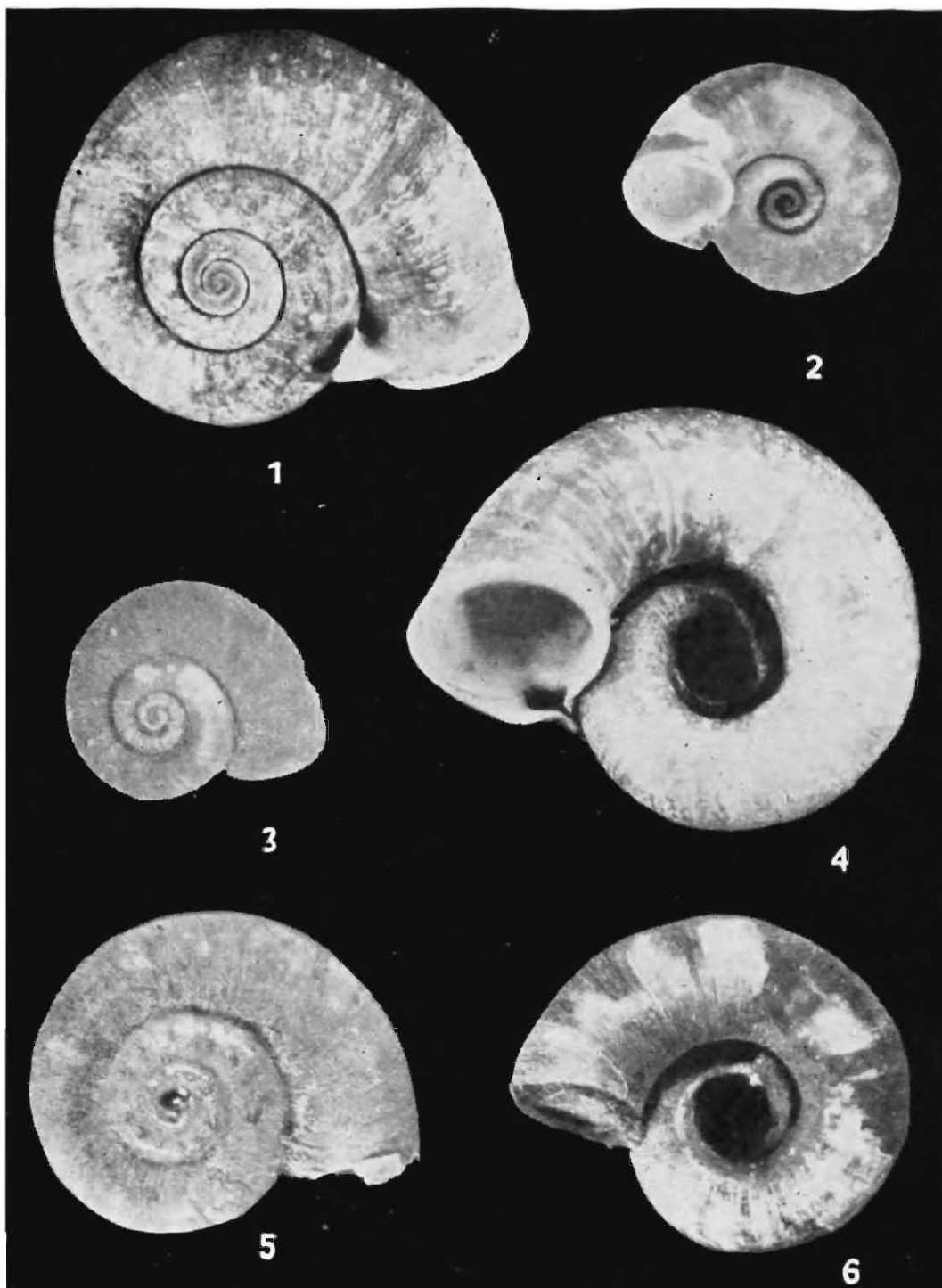
(4.00 x 11.30)

3&4. *P. hispidum* Pearson

(6.35 x 17.25)

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PLATE - 6



1&2. *Pterocyclus parvus* Pearson

(11.50 x 23.05)

3&4. *Scabrina pinnulifera* (Benson)

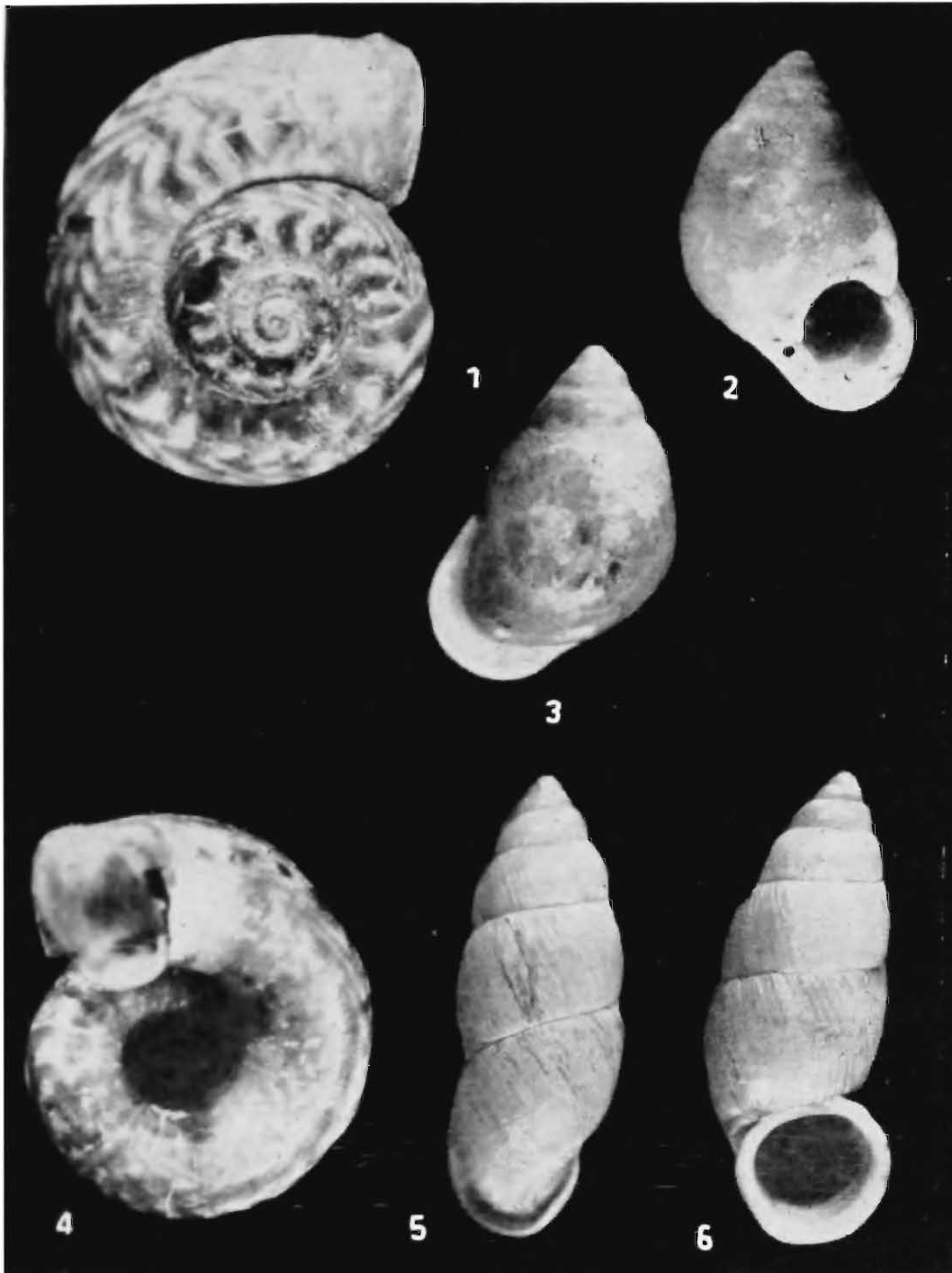
(6.10 x 11.60)

5&6. *Theobaldius orites* Nevill

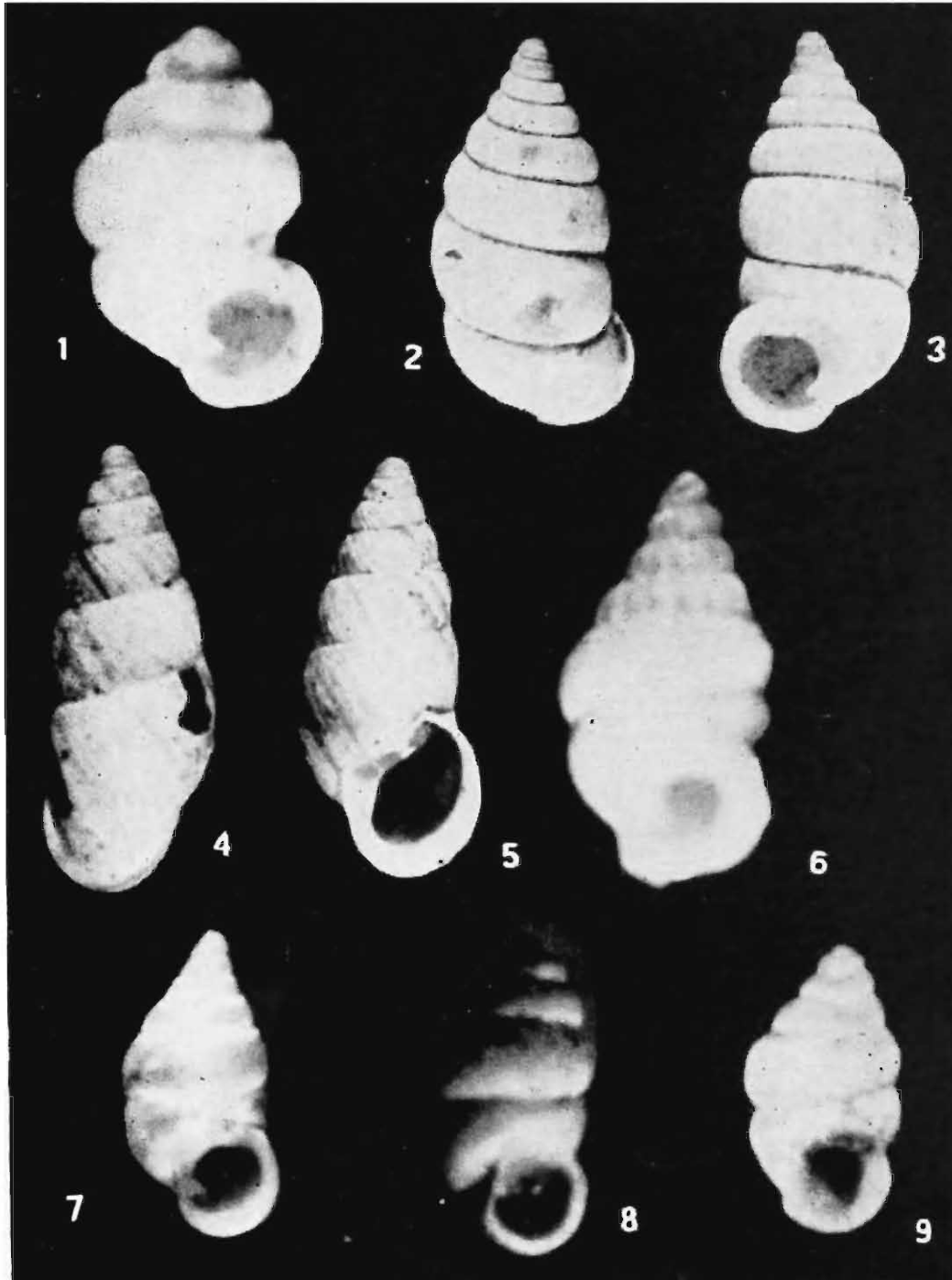
(4.95 x 13.10)

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PLATE - 7



- 1&4. *Theobaldius phaenotopicus* (Benson) (5.65 x 13.15)  
2&3. *Pupina imbricifera* Benson (9.45 x 5.30)  
5&6. *Schistoloma funiculatum* (Sowerby) (23.30 x 8.90)



1. *Diplommatina depressa* Godwin-Austen
- 2&3. *Gastroptychia insignis* Godwin-Austen (7.60 x 3.60)
- 4&5. *Enna nilagiricus* Pfeiffer (18.35x6.70)
6. *Diplommatina scalaria* Blanford
7. *D. tumida* Godwin-Austen
8. *D. austeni* Blanford
9. *D. polypleuris* Blanford

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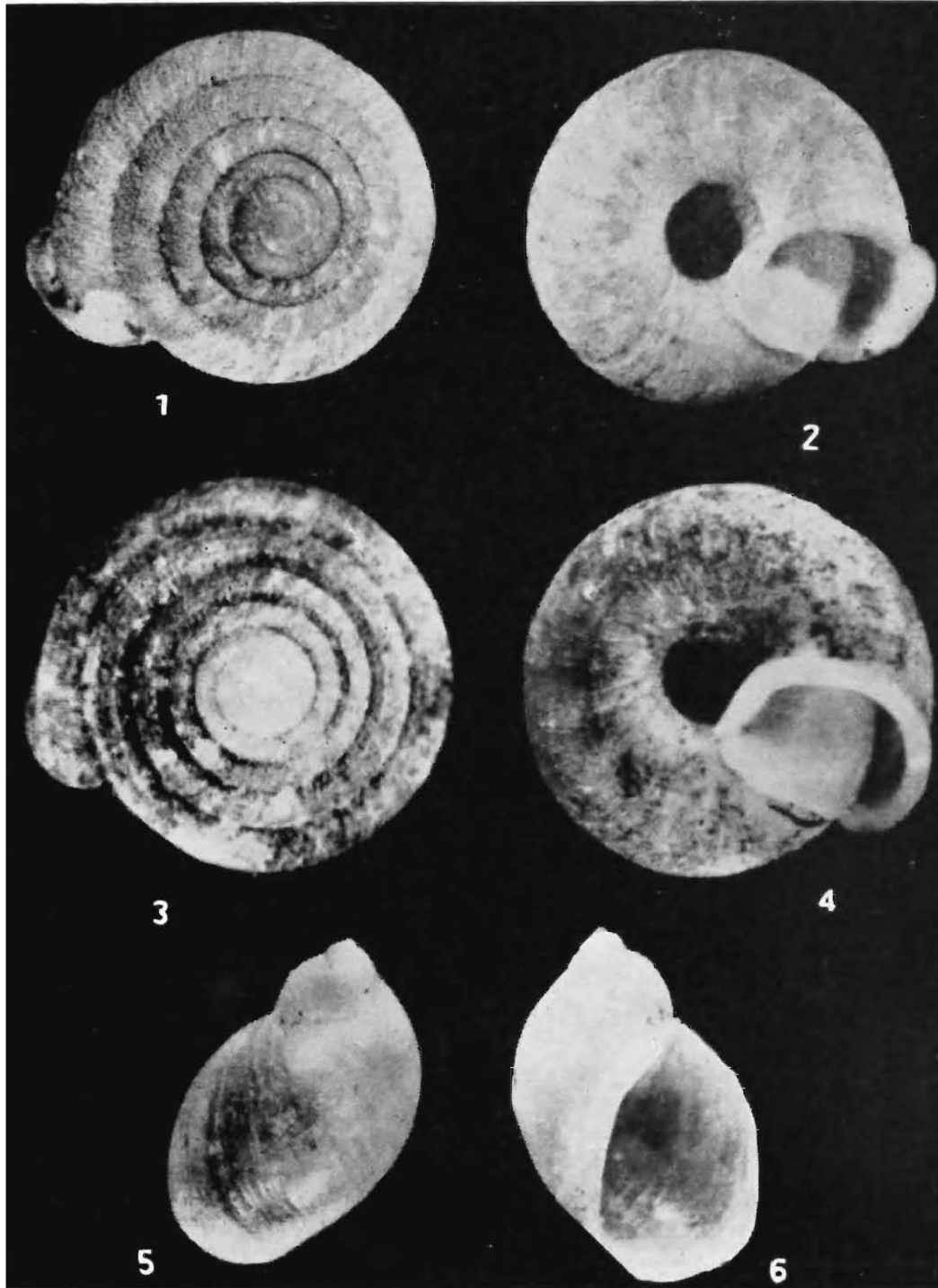
PLATE - 9



- 1&2. *Phaedusa bacillum* Hanley & Theobald (15.25 x 3.30)  
3&4. *P. loxostoma* (Benson) (26.15 x 5.60)  
5&6. *Plectopylis minor* Godwin-Austen (2.25 x 5.10)  
7&8. *P. brahma* Godwin-Austen (4.60 x 8.10)

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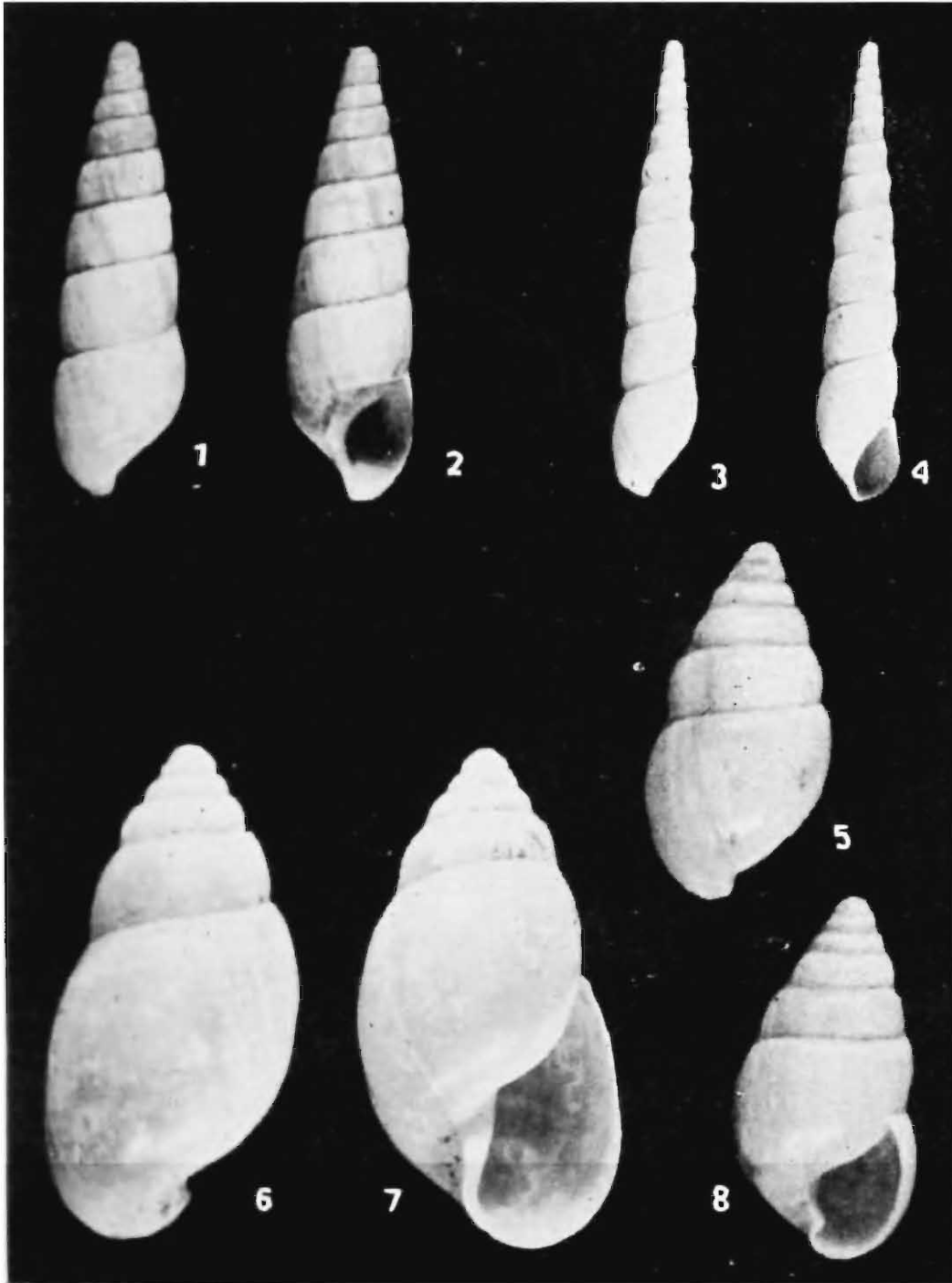
PLATE - 10



1&2. *Plectopylis plectostoma* (Benson) (5.15 x 7.90)  
3&4. *P. affinis* Gude (6.60 x 8.95)  
5&6. *Succinea rutilans* Blanford (9.45 x 5.70)

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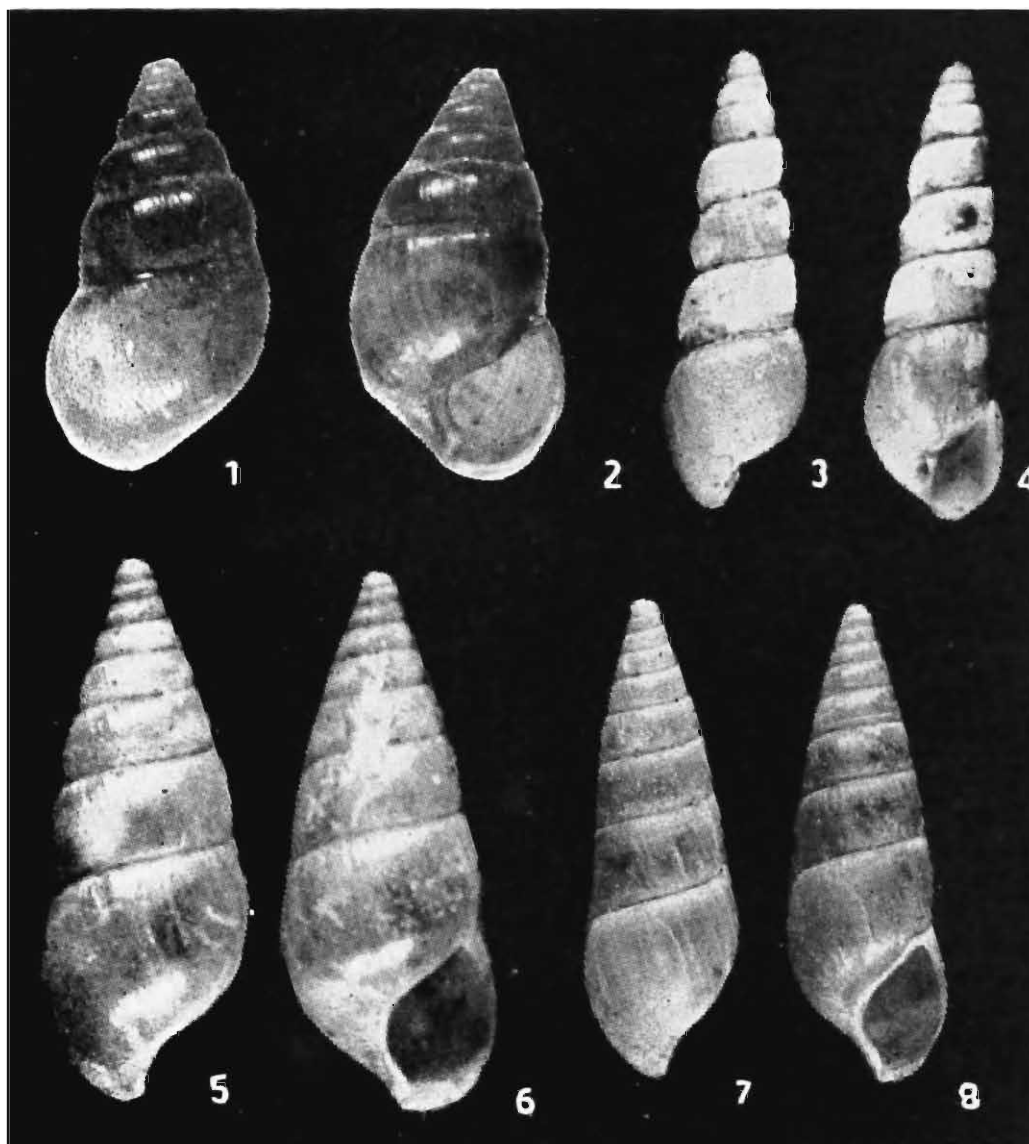
PLATE - 11



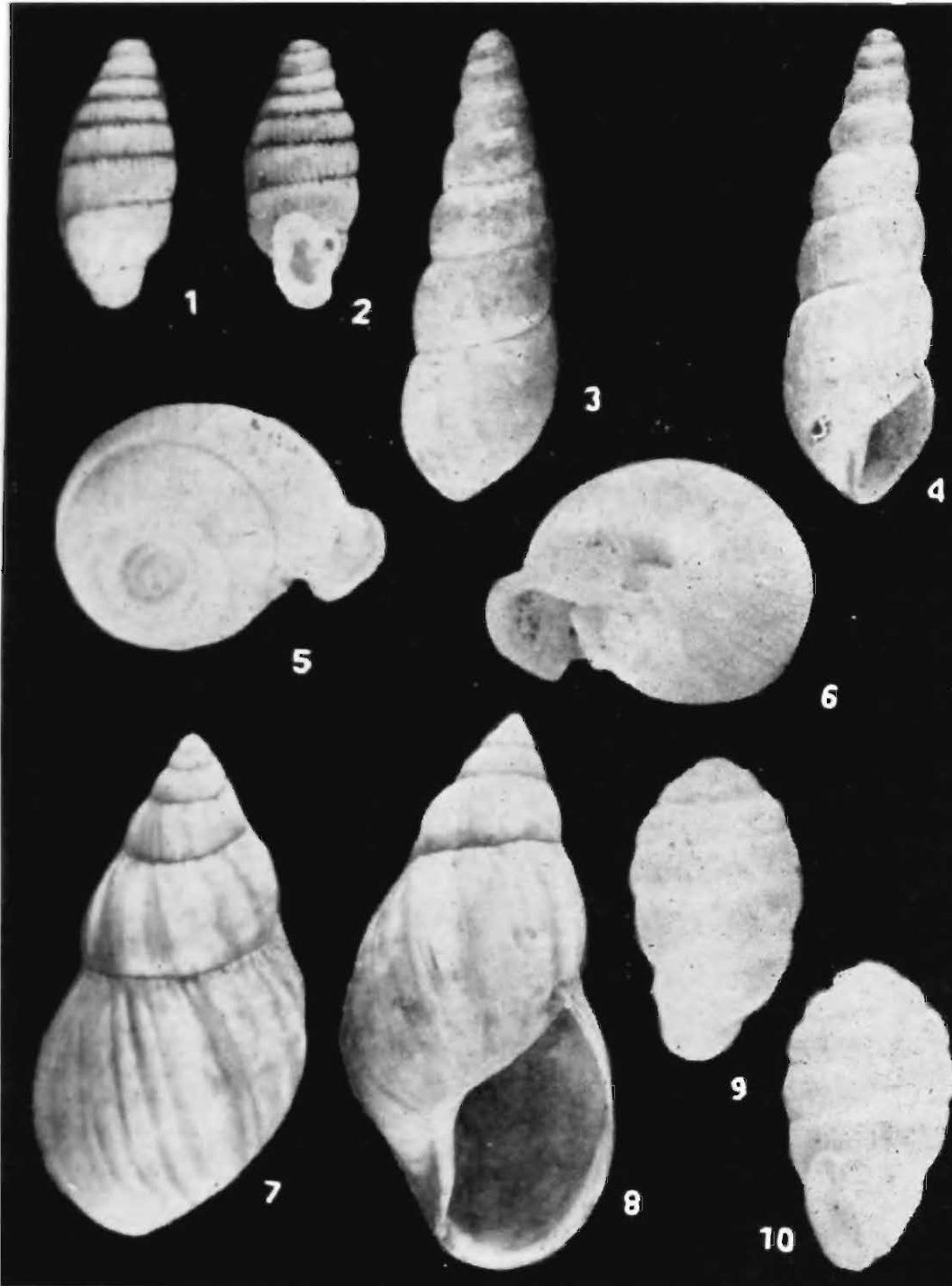
- 1&2. *Bacillum daflaensis* Godwin-Austen (21.70 x 6.20)  
3&4. *B. orthoceras* Godwin-Austen (60.35 x 11.20)  
5&8. *Glessula crassula* (Reeve) (11.20 x 5.46)  
6&7. *Curvella khasiana* Godwin-Austen (12.90 x 6.25)

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PLATE - 12



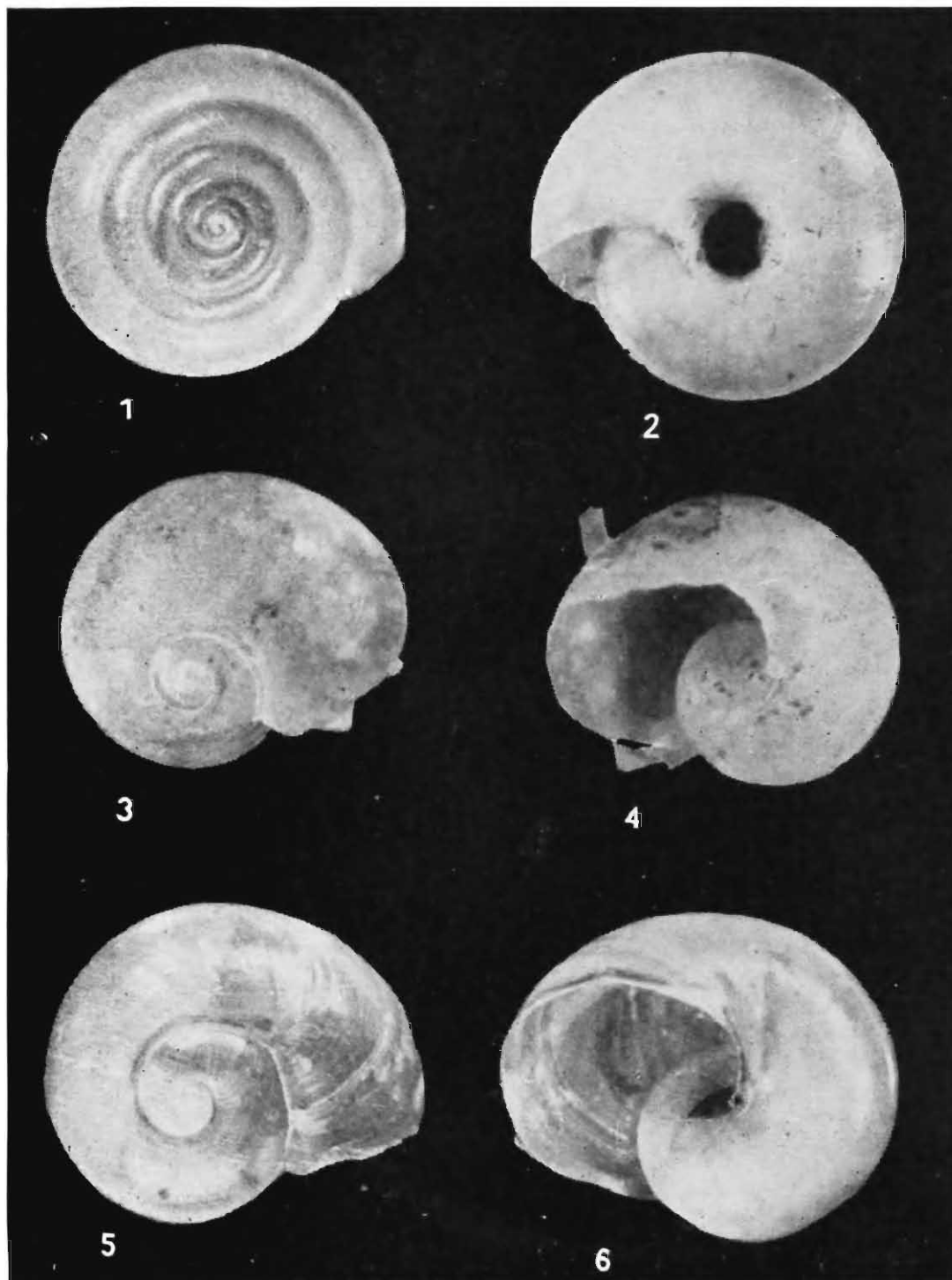
- |      |  |                |
|------|--|----------------|
| 1&2. | <i>Glessula gemma</i> (Reeve)                        | (13.05 x 4.15) |
| 3&4. | <i>Lamellaxis cavernicola</i> Annandale &<br>Prashad | (11.70 x 3.10) |
| 5&6. | <i>G. naja</i> Pilsbry                               | (18.30 x 7.10) |
| 7&8. | <i>G. tenuispira</i> (Benson)                        | (20.90 x 6.65) |



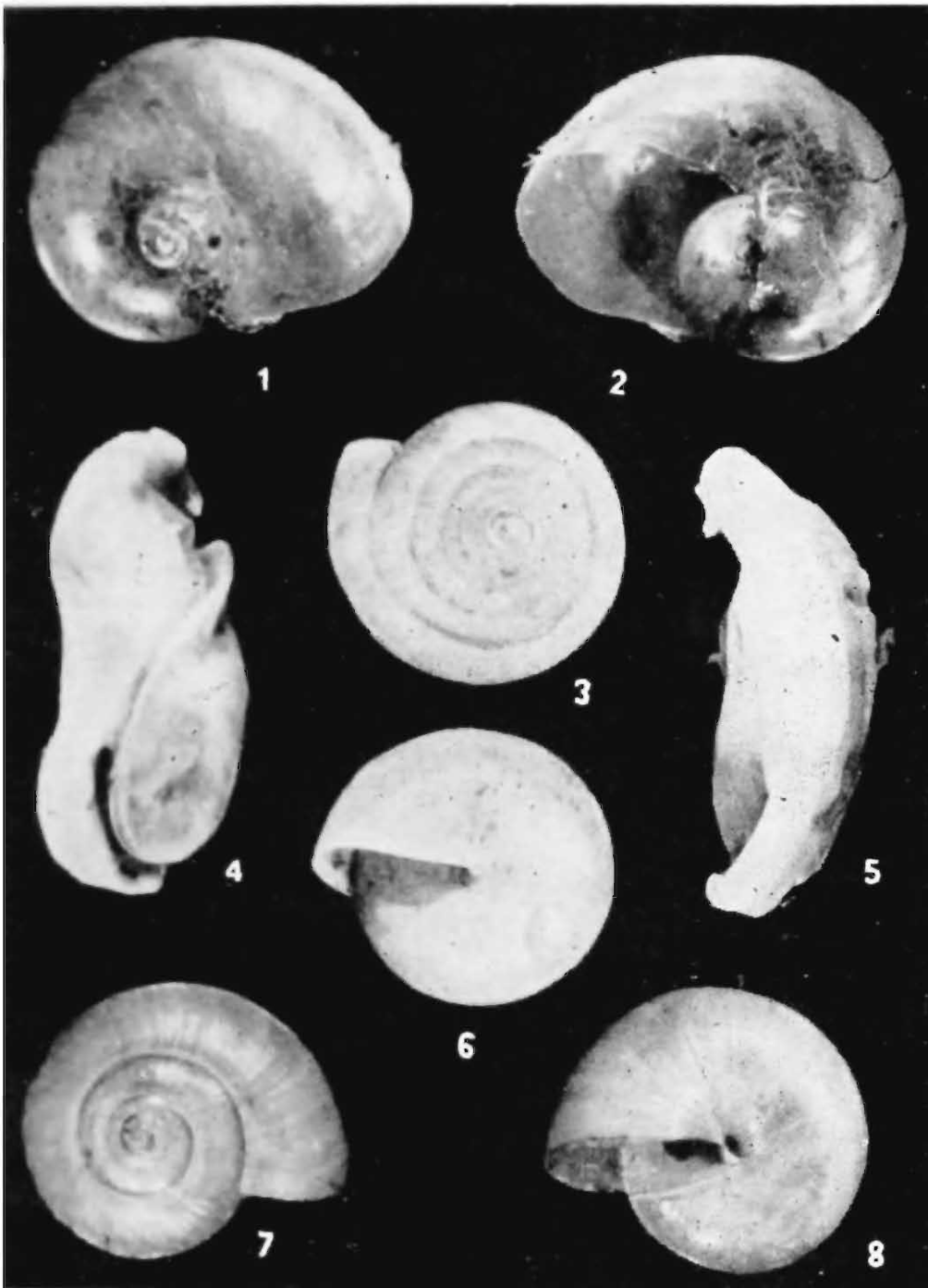
- |       |   |                 |
|-------|---|-----------------|
| 1&2.  | <i>Ennea vara</i> Benson                | (5.20 x 2.20)   |
| 3&4.  | <i>Lamellaxis gracilis</i> (Hutton)     | (9.15 x 2.70)   |
| 5&6.  | <i>Streptaxis theobaldi</i> Benson      | (4.10 x 4.50)   |
| 7&8.  | <i>Achatina fulica fulica</i> (Bowdich) | (83.40 x 39.10) |
| 9&10. | <i>Ennea stenopylis</i> Benson          | (3.55 x 1.85)   |

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PLATE - 14



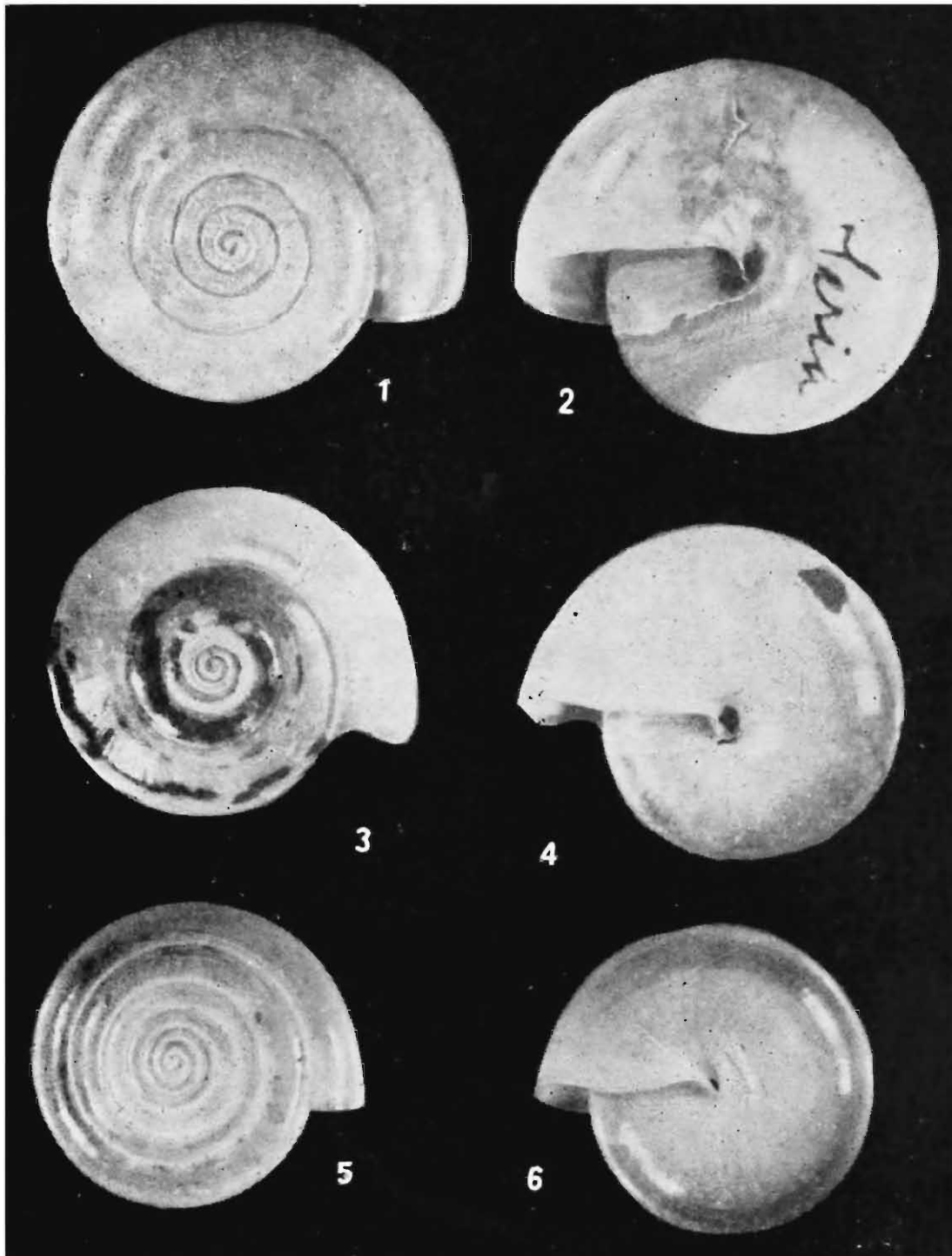
1&2. *Sivella castra* (Benson) (5.55 x 10.85)  
3&4. *Cryptaustenia ovata* (H. Blanford) (6.85 x 10.90)  
5&6. *C. silcharensis* Godwin-Austen (5.75 x 11.65)



- 1&2. *Cryptaustenia succinea* Reeve (7.50 x 4.10)  
3&6. *Khasiella climacterica* (Benson) (8.65 x 13.00)  
4&5. *Parmarion martensi* Simroth (19.65 x 7.10)  
7&8. *Bensonia mainwaringi* Godwin-Austin (12.50 x 18.20)

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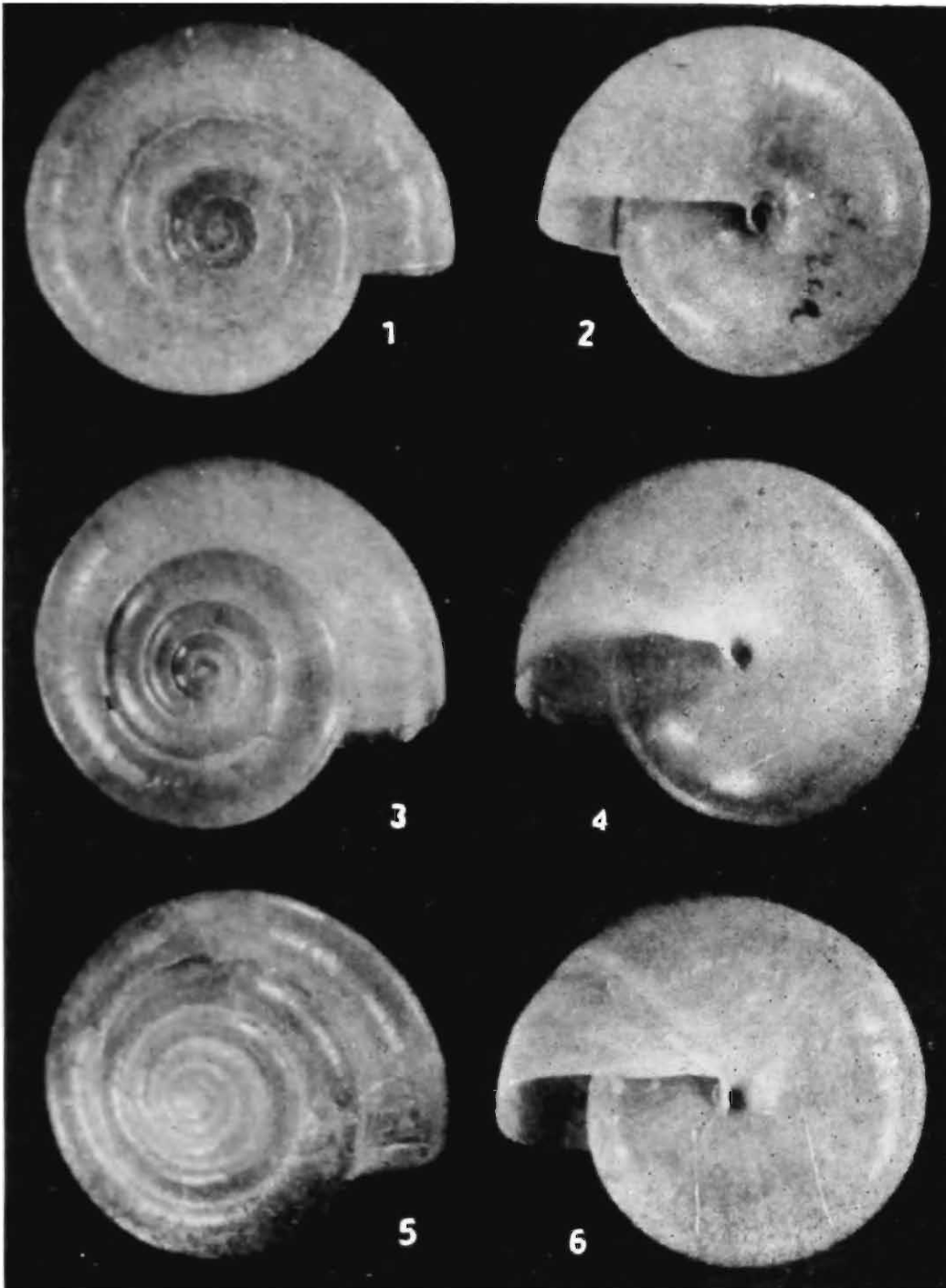
PLATE - 16



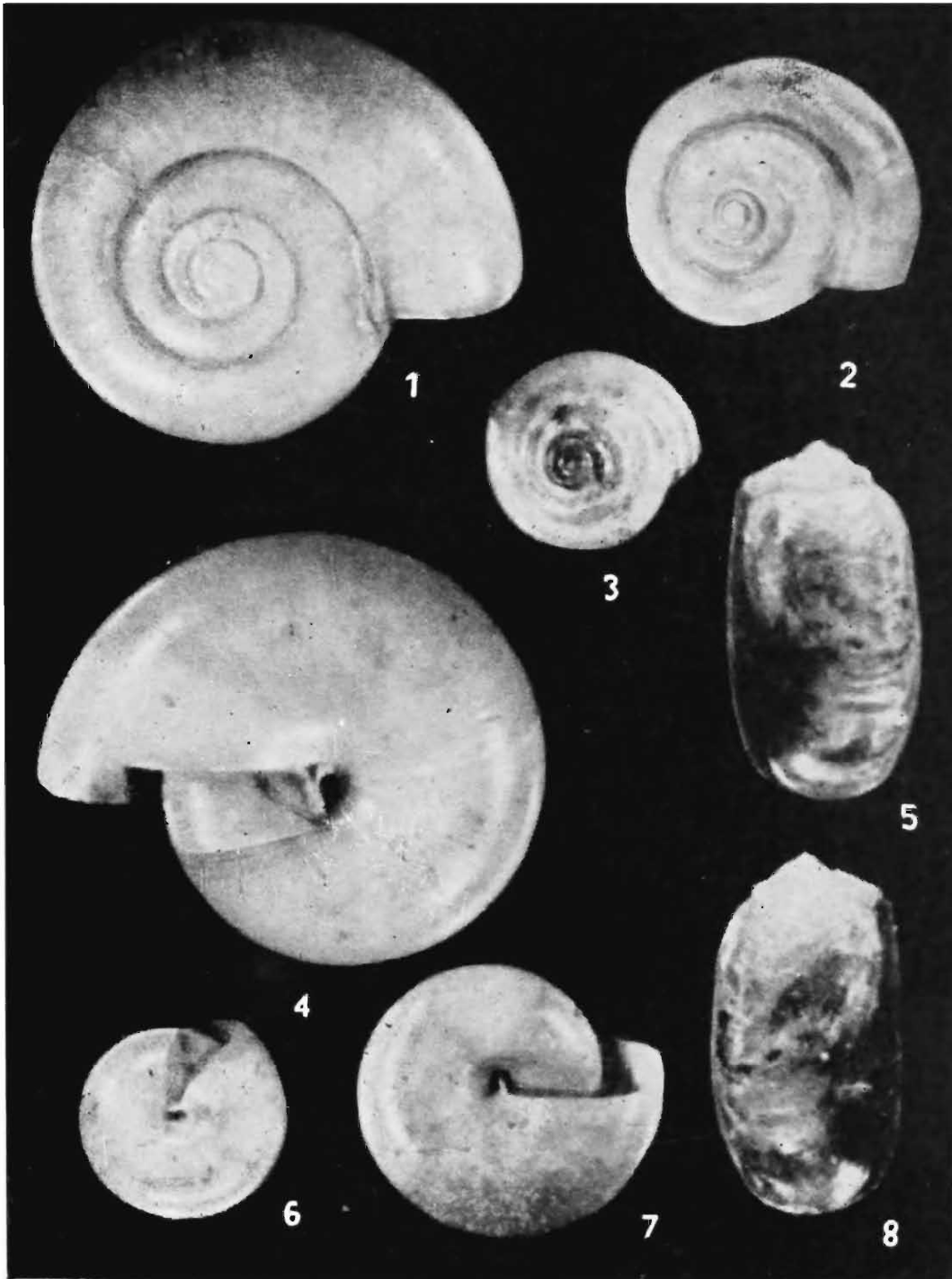
- 1&2. *Macrochlamys atricolor* Godwin-Austen (11.60x20.70)  
3&4. *M. castaneolabiata* Godwin-Austen (8.55x12.85)  
5&6. *M. consepta* Benson (7.00x10.80)

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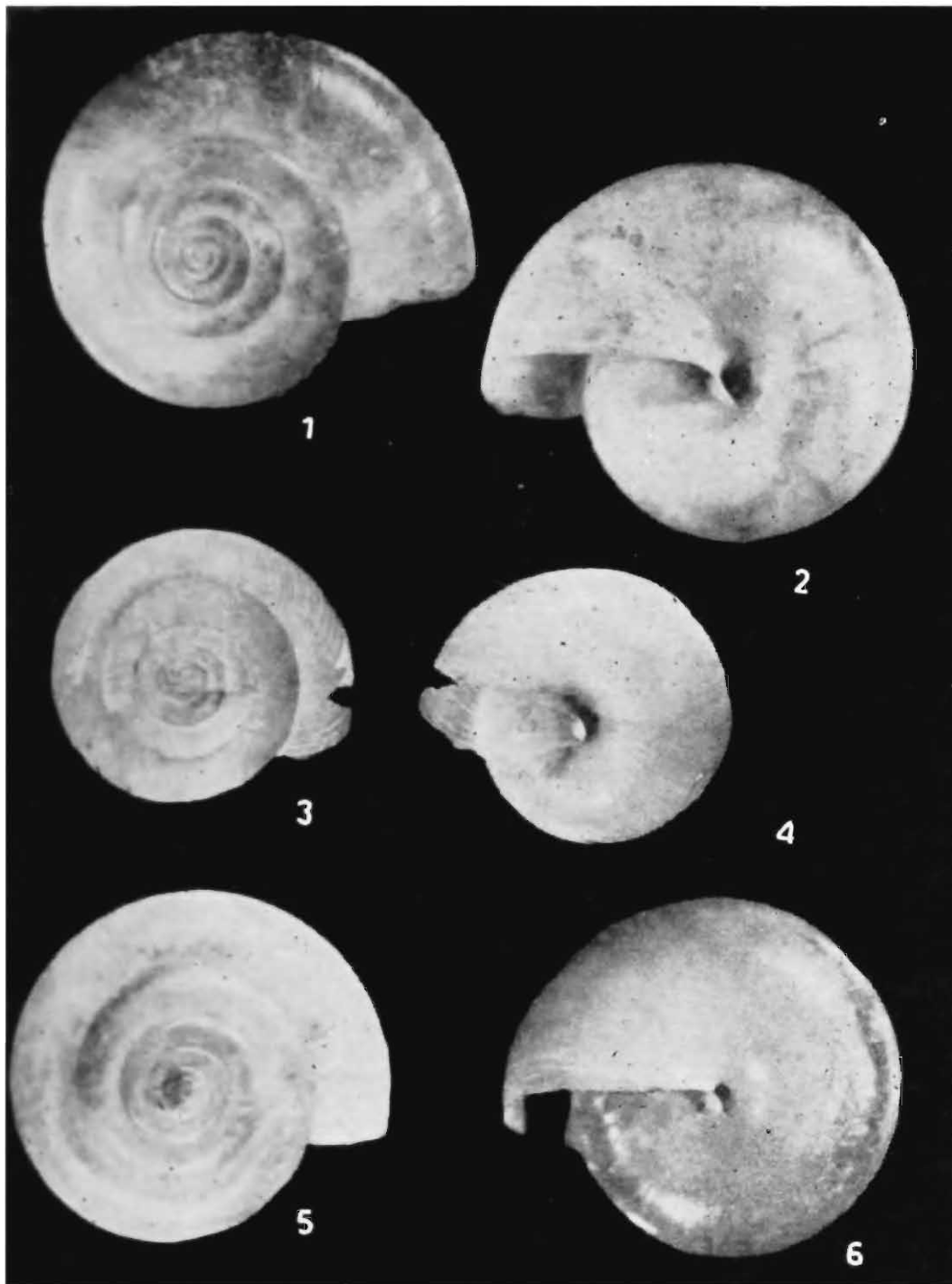
PLATE - 17



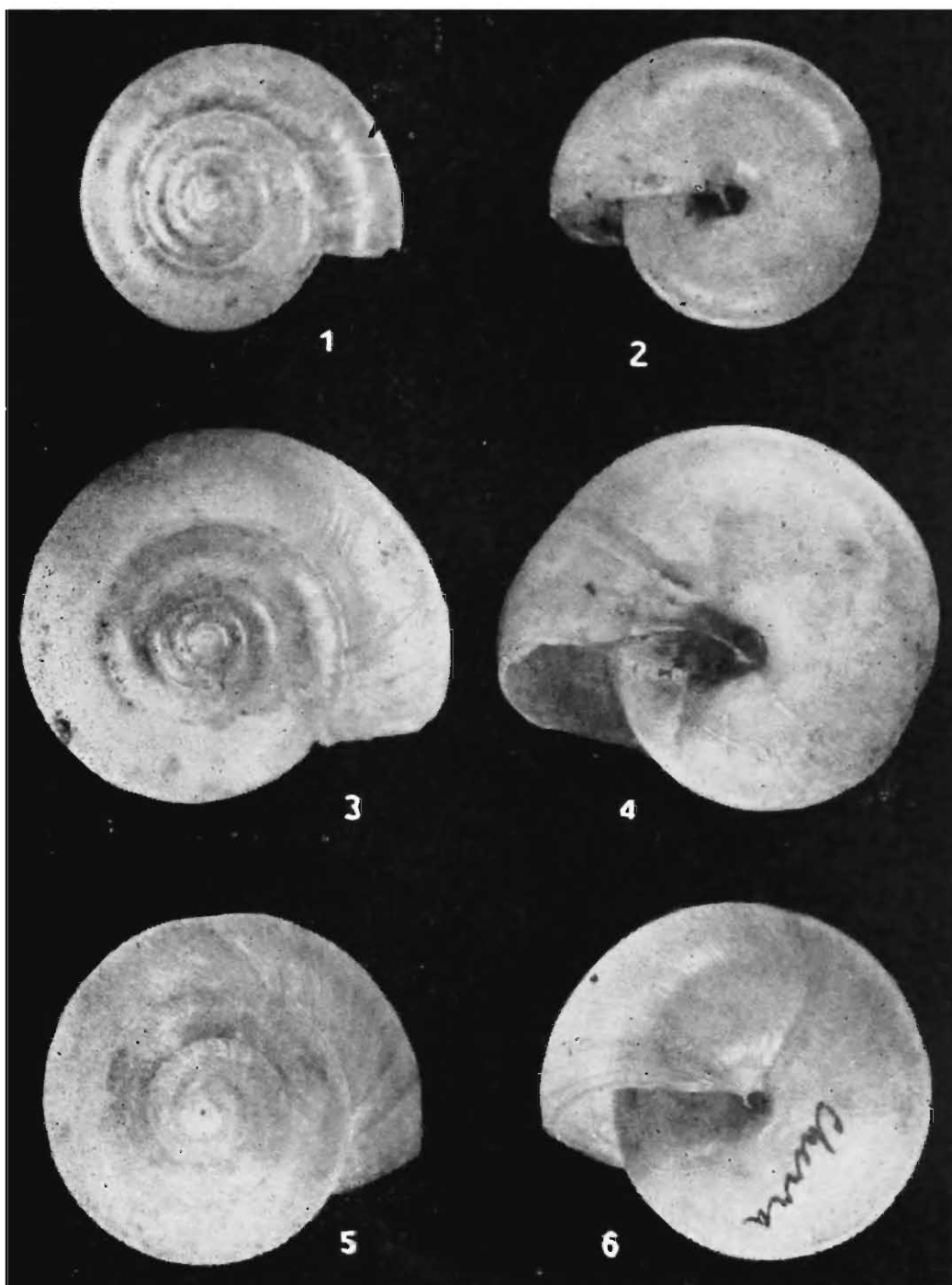
- |      |                                      |                 |
|------|--------------------------------------|-----------------|
| 1&2. | <i>Macrochlamys decussata</i> Benson | (15.10 x 26.05) |
| 3&4. | <i>M. extraria</i> Godwin-Austen     | (4.45 x 10.45)  |
| 5&6. | <i>M. lata</i> Godwin-Austen         | (5.20 x 12.80)  |



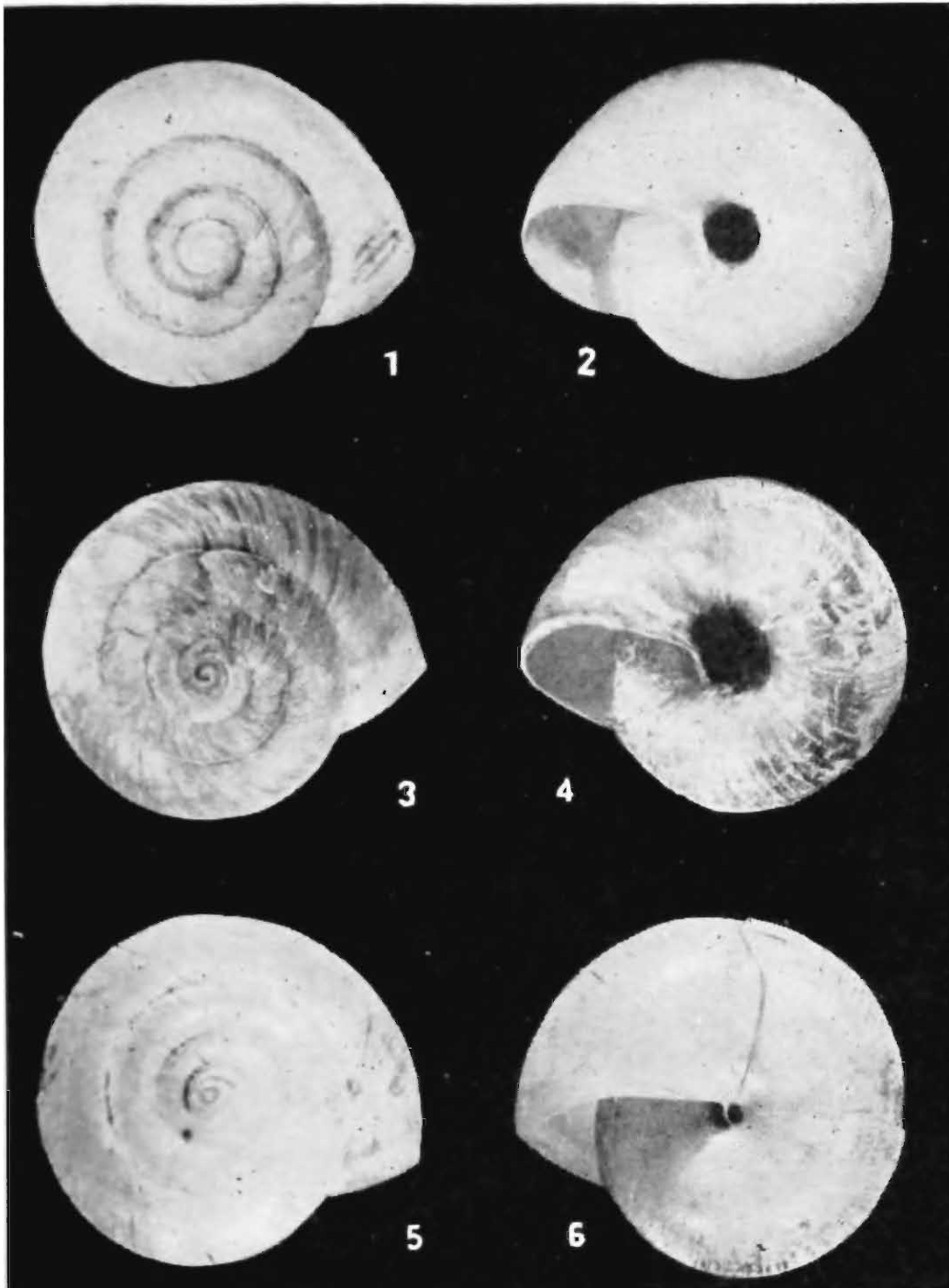
- 1&4. *Macrochlamys lubrica* Benson (12.60 x 23.25)  
2&7. *M. petasus* Benson (6.45 x 10.40)  
3&6. *M. molecula* Benson (2.25 x 3.45)  
5&8. *Girasia crocea* (Godwin-Austen)



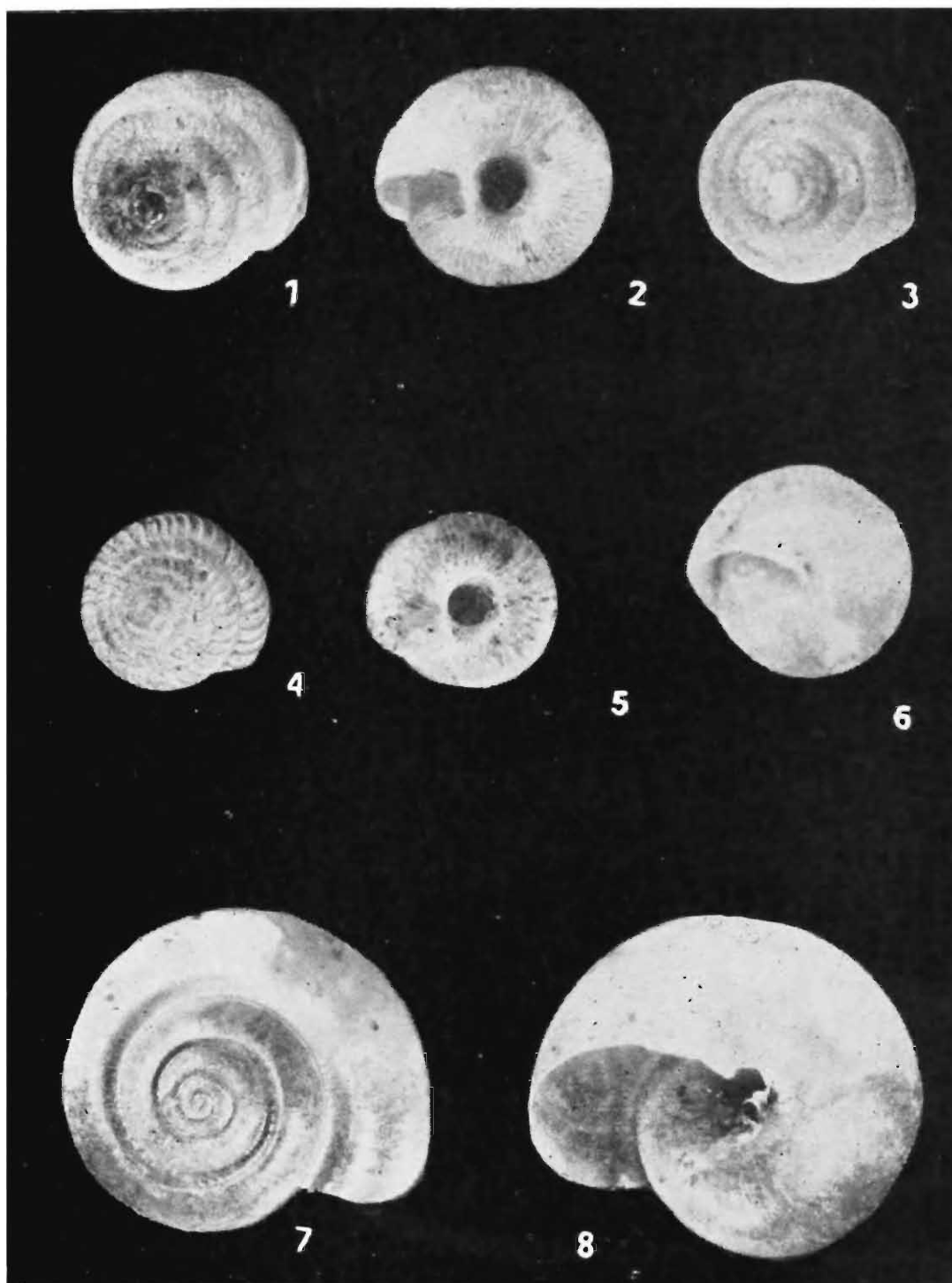
|      |                                      |                 |
|------|--------------------------------------|-----------------|
| 1&2. | <i>Macrochlamys petrosa</i> (Hutton) | (13.20 x 22.00) |
| 3&4. | <i>M. plicifera</i> Blanford         | (13.20 x 22.30) |
| 5&6. | <i>M. sequax</i> Benson              | (8.85 x 14.85)  |



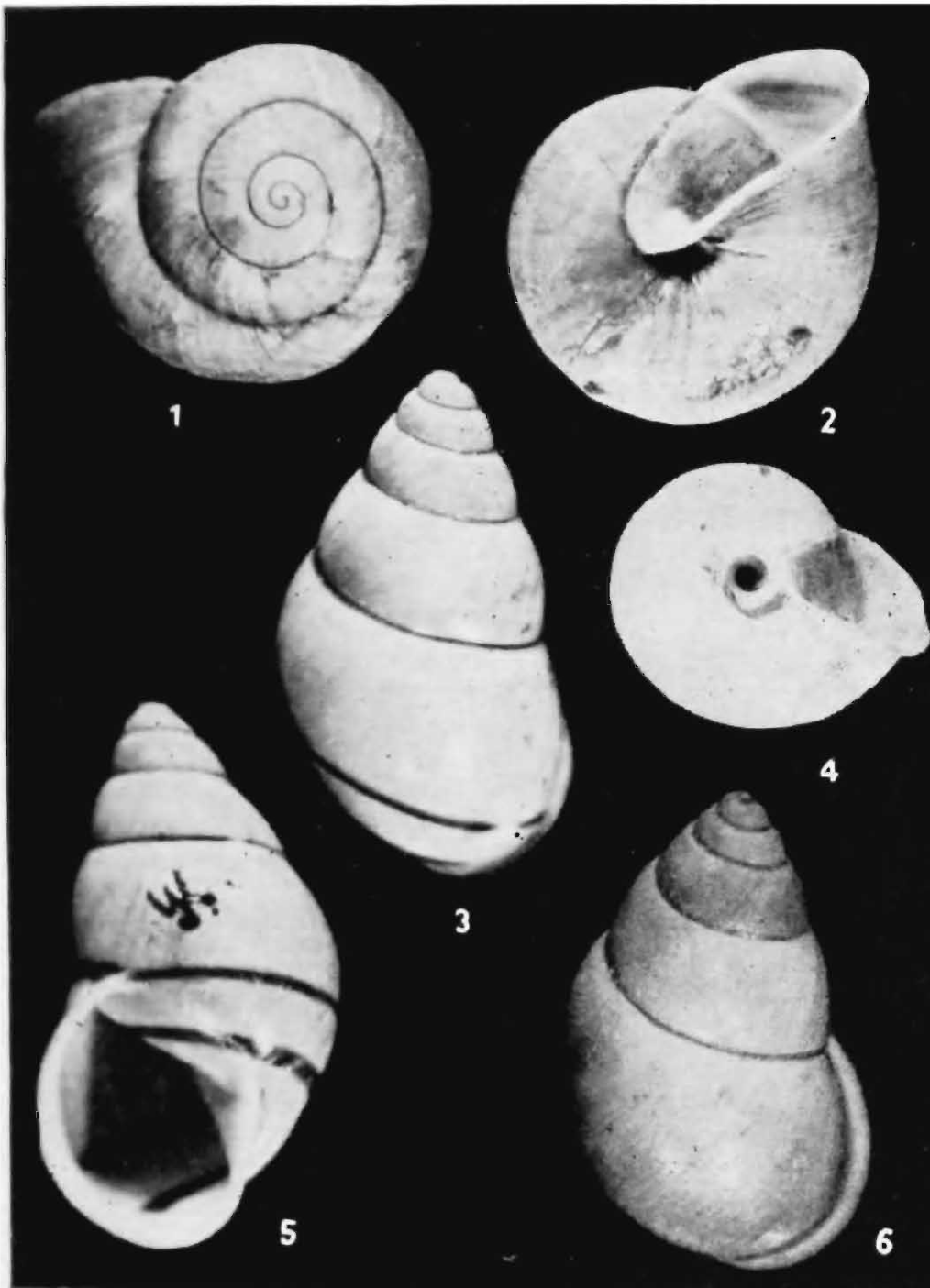
- 1&2. *Macrochlamys terminus* Godwin-Austen (7.10x12.00)  
3&4. *M. vesica* Godwin-Austen (5.55x4.60)  
5&6. *Oxytes castor* (Theobald) (15.55x32.50)



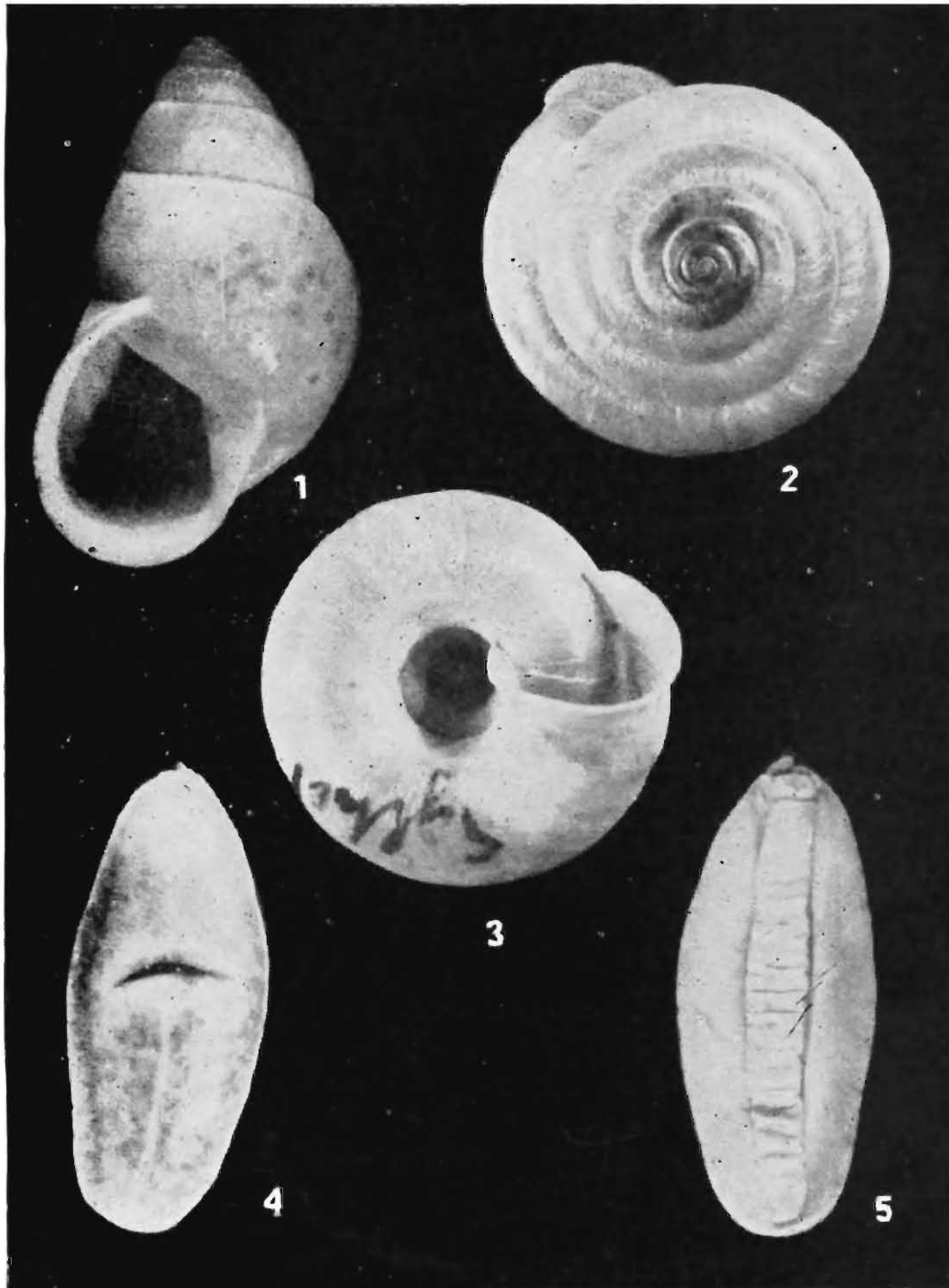
|      |                                  |                 |
|------|----------------------------------|-----------------|
| 1&2. | <i>Oxytes cycloplax</i> (Benson) | (22.10 x 39.00) |
| 3&4. | <i>O. oxytes</i> (Benson)        | (12.50 x 32.50) |
| 5&6. | <i>O. pollux</i> Theobald        | (13.05 x 32.00) |



1&2. *Rahula bascauda* (Benson) (3.65 x 4.95)  
3&6. *Sesara diplodon* (Benson) (4.70 x 6.40)  
4&5. *Rahula manipurensis* Godwin-Austen (2.95 x 3.55)  
7&8. *Taphrospira compluvialis* (Blandford) (7.55 x 12.80)



- |      |                                     |                 |
|------|-------------------------------------|-----------------|
| 1&2. | <i>Camaena ochthoplax</i> Benson    | (32.80 x 58.05) |
| 3&5. | <i>Amphidramus sinensis</i> Benson  | (29.10 x 14.70) |
| 4.   | <i>Chloritis delibrata</i> Benson   | (82.65 x 18.20) |
| 6.   | <i>Amphidromus sylheticus</i> Reeve | (25.00 x 13.45) |



1. *Amphidromus sylheticus* Reeve (25.00 x 13.45)  
2&3. *Plectotropis tapaeina* Benson (10.00 x 15.50)  
4&5. *Laevicaulis alte* Ferussac (32.75 x 8.55)



**A**



**B**

**Fig. A :** People collecting shell fishes from a lake Damalgiri, West Garo hills.

**Fig. B :** A woman preparing banana packet of shell fishes at Tur Market, Meghalaya.

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PLATE - 26



*Girasia crocea* (Godwin-Austen) crawling on mango leaf,  
collected from Siju, South Garo hills.