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**Records of the  
Zoological Survey of India**

**Zooplankton Diversity in  
Floodplain lakes of Assam**

**SUMITA SHARMA  
B. K. SHARMA**

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**Zoological Survey of India  
Kolkata**

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## INTRODUCTION

**The floodplain lakes form an integral component of the major river systems of the world. They combine salient features of lentic and lotic ecosystems as well as of aquatic and semi-aquatic environments and, hence, present a rich mosaic of ecological characteristics. These interesting ecotones are colonized by a wide variety of micro- and macro-organisms and are known to harbor the richest aquatic biodiversity (Segers *et al.* 1993). Besides, these wetlands are considered to be the most productive freshwater biotopes (Odum, 1978; Mitsch and Gosselink, 1986).**

**The floodplain lakes, commonly termed as beels, chauris, tals, pats, moans and jheels in different parts or states of India, are mainly distributed in Eastern Bihar, Uttar Pradesh, West Bengal and Northeastern India. They comprise an important component of inland aquatic resources of India (area : 0.20 million ha). They cover a water spread area of 0.12 million ha in N. E. region and occur primarily in the Brahmaputra and Barak river basins of Assam and in the Ira<sup>1</sup>, Imphal and Thoubal river basins of the state of Manipur. The floodplain lakes or beels comprise about 93% of the total fish producing area of the state of Assam (0.10 million ha). These water bodies play vital role in socio-economic development of N. E. region in general and that of Assam in particular because of their significant fisheries potential which can be potentially increased through proper scientific management (Sugunan, 1997).**

**Although limnological investigations in India began nearly one century ago, the review of the Indian literature indicates limited information on the structure and functioning of the floodplain lakes in spite of several routine hydro-biological surveys. Further, little is known till date about composition, distribution, abundance and ecology of the littoral and limnetic invertebrate communities and zooplankton biodiversity in these ecotones of India in particular. Zooplankton inventories with incomplete species lists and incorrect species identifications or un-determined species, reflect lack of taxonomic expertise of various earlier workers, often result in under-estimation of the actual extent of the bio-diversity. Furthermore, lack of co-ordination even between specialists leads to studies on the selected groups and, hence, fails to provide holistic picture of the micro-faunal or zooplankton diversity of individual floodplain lakes or those of any particular river system of India. The stated lacunae are well highlighted in the published Indian literature.**

**The investigations on the micro-faunal diversity of zooplankton in the Indian floodplain lakes in general are primarily limited to the publications of Khan (1987), Khan (2002, 2003), Patil (2002) and Siddiqui and Ramakrishna (2002). On the other hand, the related study on zooplankton from Northeastern India is so far limited to a preliminary list, including several doubtful reports, from Loktak lake (Shyamananda Singh, 1991; Tombi Singh and Shyamananda Singh, 1994). Further, some ecological investigations are made by Sharma (2000a) and**

Sharma and Hussain (2001). Referring to individual groups of zooplankton, the studies in the floodplain lakes of North-eastern India are so far limited to the contributions to the faunal diversity of Rotifera of the beels of the Brahmaputra river basin (Sharma, 2000b, 2005; Sharma and Sharma, 2001) while Das *et al.* (2004) dealt with Rhizopoda of certain floodplain lakes of Manipur. On the other hand, investigations on faunal diversity of micro-crustaceans (Cladocera and Copepoda) of these ecosystems are primarily lacking. The stated remarks are based on the review of published taxonomic literature and limnological works indicating reliable species inventories.

The present comprehensive study on zooplankton diversity of the floodplain lakes of Assam assumes special taxonomic and ecological importance in view of the stated lacunae. Plankton samples collected from 87 beels of Assam are examined for analysis of the faunal diversity of zooplankton while investigations on their ecosystem diversity are based on regular seasonal collections from 30 beels. Various documented taxa are briefly diagnosed and illustrated. Remarks are made on general nature and composition of Zooplankton fauna and their constituent groups, biogeographically interesting elements, indicator species, community similarities between different beels and, species diversity, dominance and evenness of dominant qualitative groups namely Rotifera and Cladocera. In addition, comments are made on influence of basic abiotic factors on richness and abundance of zooplankton and their dominant groups. The scope of the present observations is limited not only to typical 'euplanktonic' taxa, which otherwise may be limited in the floodplain lakes, but also includes 'facultative zooplankton' and 'free-living micro-invertebrates' associated with various aquatic macrophytes frequently occurring in these wetlands.

## MATERIAL AND METHODS

### A. Sampled floodplain lakes

The present observations are based on the plankton samples collected from 87 floodplain lakes (Fig. 1, A-B) of Assam (Longitude : 90°- 93° E and latitude : 26°- 27° N). A majority of the sampled beels are located in the Brahmaputra river basin while only three beels located in the Barrak river system are sampled. The most common aquatic plants, however, include *Hydrilla verticellata*, *Eichhornia crassipes*, *Euryale ferox*, *Vallisnaria spiralis*, *Utricularia flexuosa*, *Trapa natans*, *Lemna major*, *L. minor*, *Pistia striates*, *Salvinia* sp., *Nymphaea* spp., *Nymphoides* spp., *Naias graminca*, *Nelumbo mucifera*, *Potamogeton* spp., *Azolla pinnata*, *Sagittaria* spp, and *Cyperus* spp. Some typical and interesting sampled lakes are shown in Figs. 2-10. The details (district-wise) of the sample beels are as follows :

#### Brahmaputra River basin

##### Dhubri district

1. Bhoispuri
2. Barundanga

3. Hakama
4. Horinchora
5. Dhir

6. Jogra

##### Barpeta district

7. Fingua

- |                          |                          |                           |
|--------------------------|--------------------------|---------------------------|
| 8. Sagmara               | 35. Patoni               | <b>Sibsagar district</b>  |
| <b>Nalbari district</b>  | 36. Lotha                | 63. Demon                 |
| 9. Kamakhya              | 37. Amuri                | 64. Mona                  |
| 10. Rowmari              | 38. Bamoni               | 65. Teliadanga            |
| <b>Kamrup district</b>   | 39. Basana               | <b>Dibrugarh district</b> |
| 11. Deepor               | 40. Dubratoli            | 66. Muijan                |
| 12. Dighali              | 41. Mohna                | 67. Kololua               |
| 13. Borbila              | 42. Sarang               | 68. Hakoi                 |
| 14. Siligurijan          | 43. Mori                 | 69. Sarain Hubbi          |
| 15. Ghorajan             | 44. Thekera              | 70. Sesa                  |
| 16. Kamranga             | 45. Bandha               | 71. Itakhuli              |
| 17. Urmal                | 46. Morakalong           | 72. Diang                 |
| 18. Hiragota             | <b>Nagaon district</b>   | 73. Bor beel              |
| 19. Chatla               | 47. Mihir                | <b>Tinsukia district</b>  |
| 20. Akhepeti             | 48. Daphlang             | 74. Raidong               |
| 21. Kakerikhola          | 49. Bhoismari            | 75. Memdubi               |
| 22. Padma                | 50. Sohala               | 76. Maghuri               |
| <b>Morigaon district</b> | 51. Moona                | <b>Dhemaji district</b>   |
| 23. Solmari              | 52. Karasing             | 77. Batua                 |
| 24. Haduk                | 53. Kowaimari            | 78. Balak                 |
| 25. Sitalmari            | 54. Deopani              | 79. Butikor               |
| 26. Goranga              | 55. Baghmari             | 80. Dhekia                |
| 27. Kandhi               | 56. Diphlu               | 81. Naruathan             |
| 28. Duptoli              | 57. Donga                | 82. Puwa Saikia           |
| 29. Dholi                | 58. Kutri                | 83. Samuajan              |
| 30. Ghorkhonjan          | 59. Mora Daphlang        | 84. Senijan               |
| 31. Jugdal               | <b>Golaghat district</b> | <b>Barrak River basin</b> |
| 32. Kanduli              | 60. Shitalpathar         | <b>Cachar district</b>    |
| 33. Padmakhua            | 61. Japara               | 85. Sone                  |
| 34. Kujibalipatty        | 62. Borbil-Tinsuki       | 86. Salchapra             |
|                          |                          | 87. Baskandi              |

Fifteen floodplain lakes namely Hakama, Horinchora, Ghorajan, Kamranga, Kakerikhola, Chatla, Hiragota, Urmal, Padma, Bamoni, Basana, Goranga, Sitalmari, Solmari and Daphlang were sampled seasonally during 2004-05.

In addition, fifteen floodplain lakes namely Bhoispuri, Barundanga, Dhir, Fingua, Sagmara, Kamakhya, Rowmari, Deepor, Dighali, Borbila, Siligurijan, Mori, Thekera, Kujibalipatty and Bandha were sampled during 2002-03 (refer Sharma, 2005)

## **B. Methods of Study**

1. Water samples were collected seasonally, during 2004-05, from 15 floodplain lakes of the Brahmaputra river basin of Assam. In addition, water samples were collected seasonally, during 2002-03, from 15 beels of lower Assam (refer Sharma, 2005).
2. Water samples were analyzed for basic abiotic parameters namely water temperature, specific conductivity, pH, dissolved oxygen, alkalinity and hardness. Water temperature, pH and specific conductivity were recorded with field probes, dissolved oxygen was estimated by modified Winkler's method and other parameters were analyzed following APHA (1992).
3. Plankton samples were collected and examined from 87 floodplain lakes. Among these, qualitative and quantitative samples were collected seasonally, during 2004-05, from 15 floodplain lakes of the Brahmaputra river basin, Assam while samples collected seasonally, during 2002-03, from 15 floodplain lakes of lower Assam (Sharma, 2005) were also examined. In addition, only qualitative plankton samples were collected occasionally from the different floodplain lakes during 2002-2006.
4. Qualitative plankton samples were collected by towing a nylobolt plankton net (No. 25) in different floodplain lakes and were preserved in 5% formalin.
5. Plankton samples (qualitative and quantitative) deposited in the holdings of Freshwater Biology Laboratory, Department of Zoology, North-Eastern Hill University, Shillong and those in the holdings of Eastern Regional Station, Zoological Survey of India, Shillong were examined.
6. Individual plankton samples were screened with a Wild stereoscopic binocular microscope for isolation of zooplankton taxa.
7. Permanent mounts of various species and their specific parts or appendages were prepared in Polyvinyl alcohol-lectophenol mixture. Illustrations of various zooplankton taxa were drawn with a Leitz-Dialux phase contrast stereoscopic microscope using a drawing-tube attachment.
7. All the measurements were given in micrometers ( $\mu\text{m}$ ) or millimeters (mm). The microphotographs of selected species were taken using an image analysis system.
8. Rotifera species were identified following the works of Kutikova (1970), Koste (1978), Koste and Shiel (1987, 1989, 1990), Shiel and Koste (1992, 1993), Segers (1995), De Smet (1997), Sharma (1983, 1987a, 1998b, 2001b), Sharma and Sharma (1997, 1999a, 2000) and Nogrady and Segers (2002). The system of Rotifera classification followed in this account is after Segers (2002).

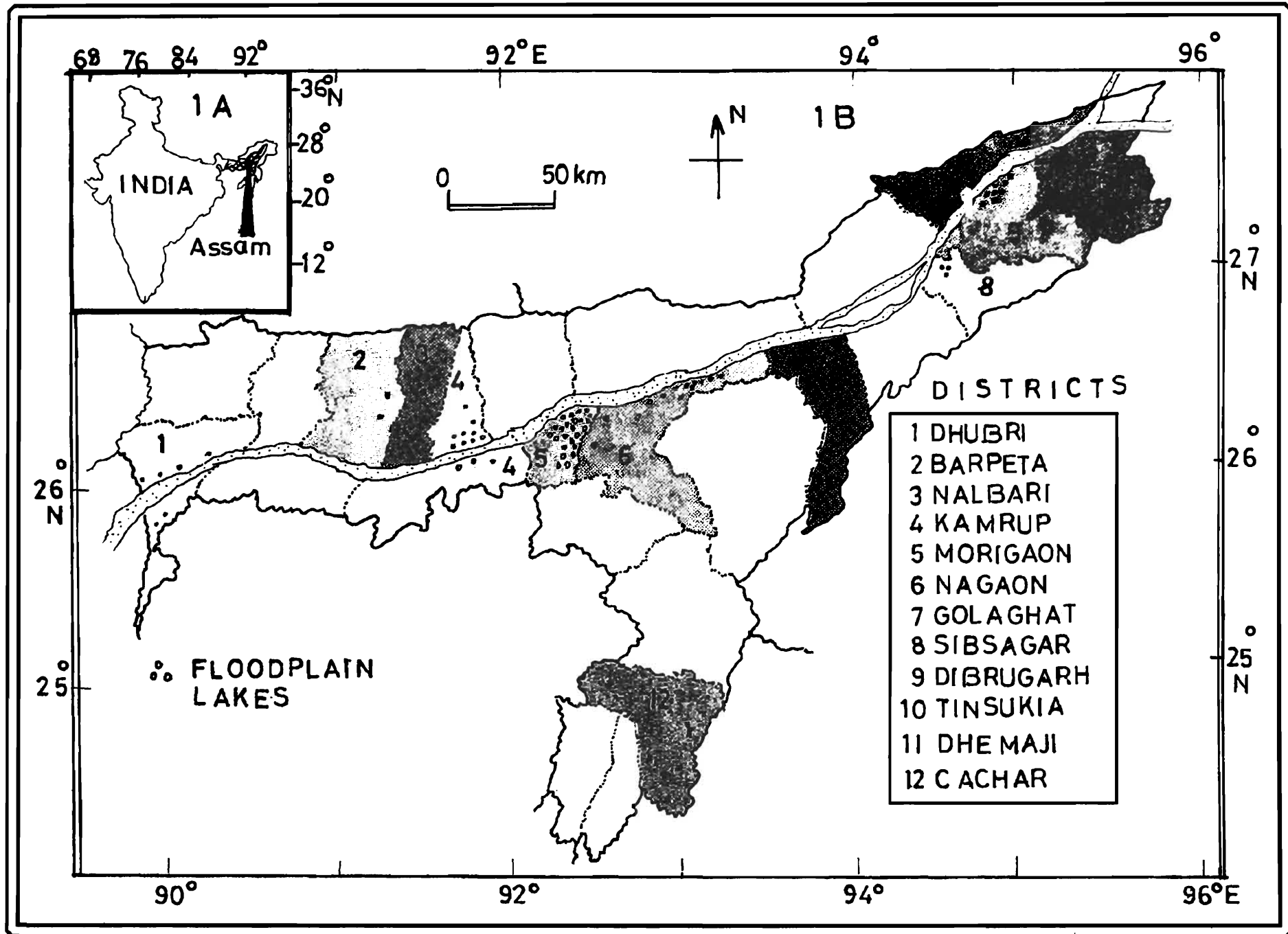


Fig. 1. (A-B) : (A) Map of India showing Assam State; (B) map of Assam showing sampled floodplain lakes (beels).



**Fig. 2 :** Deepor beel–A Ramsar site,  
Kamrup district



**Fig. 3 :** Memdubi, Dibru-Saikhowa  
Biosphere Reserve



**Fig. 4 :** Maghuri beel, Dibru-Saikhowa  
Biosphere Reserve

**Fig. 5 :** No. 11 beel, Dibru-Saikhowa Biosphere Reserve



**Fig. 6 :** Moona beel, Kaziranga National Park

**Fig. 7 :** Mihir beel, Kaziranga National Park





**Fig. 8 :** Karasing beel, Kaziranga National Park



**Fig. 9 :** Muijan beel (ox-bow lake),  
Bhathuni Chariali, Dibrugarh



**Fig. 10 :** Sarang beel (ox-bow lake),  
Borghat, Morigaon

9. Cladocera species were identified following the monographs of Smirnov (1971, 1976, 1992), Idris (1983), Smirnov and Timms (1983), Michael and Sharma (1988), Korovchinsky (1992) and Orlova-Bienkowskaja (2001), and the work of Sharma and Sharma (1999b). The system of Cladocera classification followed presently is after Negrea *et al.* (1999) and Dumont and Negrea (2002).
10. The Copepoda were identified following Ranga Reddy (1994, 2001), Fernando (2002) and Ueda and Reid (2004).
11. Rhizopoda species were identified following Deflandre (1959) and Chattopadhyay and Das (2003). Gastrotricha were identified following Brunson (1959) and Sharma (1980).
12. Quantitative plankton samples were obtained by filtering 25 litres of water each through nylobolt plankton net (No. 25). Each sample was concentrated to 25 ml. and preserved in 5% formalin.
14. Quantitative plankton samples were analyzed for abundance of Zooplankton and their constituent groups and different species. The densities were expressed as n/l and their mean values  $\pm$  S.D were calculated.
15. Species diversity, dominance and evenness of Rotifera and Cladocera were calculated *vide* Shannon's index, Berger-Parker's index and Pileou's index respectively following Ludwig & Reynolds (1988) and Magurran (1988). The community similarities were computed *vide* Sorenson's index.
16. The significance of temporal variations of various studied aspects of net plankton, zooplankton and constituent groups was ascertained by ANOVA.
17. Simple correlation coefficients (r) were computed for ascertaining ecological correlations between abiotic and biotic factors. Multiple regression and step-wise regression were computed to ascertain cumulative effect of six abiotic factors (water temperature, pH, conductivity, dissolved oxygen, alkalinity and hardness) on different biotic communities.

## RESULTS

### A. Abiotic parameters of the sampled beels

The abiotic factors of the floodplain lakes sampled recently as well as those sampled earlier (Sharma, 2005) are indicated in Tables 1 and 2 respectively. Water temperature varied between 16.4-33.6°C, specific conductivity ranged between 24.0-199.0  $\mu$ S/cm and pH varied between 5.5-9.5. Dissolved oxygen concentration in various beels varied between 3.8-12.4 mg/l. On the other hand, alkalinity of the sampled beels ranged between 22.0-132.0 mg/l while hardness varied between 10.0-82.0 mg/l. In addition, mean seasonal values of six abiotic factors in 30 floodplain lakes varied between 25.2-29.4°C, 28.2-164.8  $\mu$ S/cm, 6.2-7.9, 5.5-8.5 mg/l, 14.2-106.2 mg/l and 12.0-74.0 mg/l respectively.

**Table 1.** Abiotic factors of floodplain lakes

| Abiotic factors         | Water temp.<br>(°C)           | Specific<br>conductivity<br>( $\mu$ S/cm) | pH                         | Dissolved<br>oxygen<br>(mg/l) | Alkalinity<br>(mg/l)            | Hardness<br>(mg/l)             |
|-------------------------|-------------------------------|---|----------------------------|-------------------------------|---------------------------------|--------------------------------|
| <b>Floodplain lakes</b> |                               |   |                            |                               |                                 |                                |
| Hakama                  | 21.2 – 30.4<br>25.3 $\pm$ 4.0 | 41.0 – 76.0<br>50.2 $\pm$ 10.2            | 6.2 – 7.2<br>6.4 $\pm$ 0.6 | 5.4 – 10.8<br>7.2 $\pm$ 2.4   | 22.0 – 32.0<br>24.2 $\pm$ 2.8   | 15.8 – 30.0<br>22.0 $\pm$ 4.6  |
| Horinchora              | 22.0 – 32.0<br>26.2 $\pm$ 4.6 | 28.0 – 42.0<br>33.2 $\pm$ 3.0             | 6.0 – 6.9<br>6.3 $\pm$ 0.4 | 4.8 – 9.2<br>6.2 $\pm$ 2.6    | 22.0 – 34.0<br>26.2 $\pm$ 4.3   | 20.0 – 30.8<br>22.0 $\pm$ 5.2  |
| Ghorajan                | 21.0 – 33.2<br>28.6 $\pm$ 3.7 | 50.0 – 193.0<br>116.7 $\pm$ 46.7          | 6.8 – 8.4<br>7.5 $\pm$ 0.5 | 2.4 – 8.0<br>5.5 $\pm$ 1.6    | 30.0 – 86.0<br>57.0 $\pm$ 18.1  | 20.0 – 80.0<br>48.0 $\pm$ 17.5 |
| Kamranga                | 17.6 – 31.6<br>26.5 $\pm$ 5.3 | 62.0 – 163.0<br>109.5 $\pm$ 38.2          | 6.8 – 7.4<br>7.2 $\pm$ 0.2 | 5.8 – 10.6<br>7.8 $\pm$ 2.1   | 54.0 – 132.0<br>96.0 $\pm$ 29.7 | 54.0 – 76.0<br>67.5 $\pm$ 8.3  |
| Urmal                   | 16.6 – 31.3<br>27.0 $\pm$ 6.1 | 109.0 – 184.0<br>145.7 $\pm$ 32.7         | 6.7 – 8.3<br>7.4 $\pm$ 0.6 | 5.8 – 10.4<br>8.4 $\pm$ 1.8   | 48.0 – 84.0<br>65.2 $\pm$ 13.3  | 40.0 – 79.0<br>64.5 $\pm$ 14.7 |
| Hiragota                | 20.6 – 31.2<br>26.9 $\pm$ 3.8 | 57.0 – 186.0<br>113.5 $\pm$ 51.6          | 6.3 – 7.3<br>6.8 $\pm$ 0.4 | 6.8 – 10.2<br>8.5 $\pm$ 1.2   | 47.0 – 71.0<br>52.7 $\pm$ 9.4   | 31.0 – 74.0<br>50.7 $\pm$ 17.5 |
| Chatla                  | 17.3 – 32.6<br>27.3 $\pm$ 5.9 | 122.0 – 192.0<br>154.2 $\pm$ 31.2         | 6.8 – 7.7<br>7.2 $\pm$ 0.4 | 6.2 – 11.4<br>8.4 $\pm$ 2.1   | 49.0 – 78.0<br>64.7 11.8        | 43.0 – 72.0<br>58.7 12.1       |
| Padma                   | 18.4 – 32.0<br>25.2 $\pm$ 4.7 | 44.0 – 82.0<br>58.0 $\pm$ 20.2            | 6.4 – 7.2<br>6.8 $\pm$ 0.4 | 4.0 – 9.8<br>6.5 $\pm$ 2.0    | 38.0 – 52.0<br>45.3 $\pm$ 5.2   | 33.0 – 49.0<br>41.2 $\pm$ 1.8  |
| Kakerikhola             | 16.4 – 32.6<br>27.4 $\pm$ 6.4 | 17.0 – 77.0<br>46.0 $\pm$ 26.7            | 6.6 – 7.5<br>7.1 $\pm$ 0.4 | 5.6 – 8.4<br>7.1 $\pm$ 1.0    | 41.0 – 52.0<br>44.0 $\pm$ 4.2   | 33.0 – 43.0<br>36.5 $\pm$ 4.2  |
| Bamoni                  | 21.0 – 31.2<br>27.0 $\pm$ 3.6 | 40.0 – 78.0<br>50.8 $\pm$ 6.8             | 6.3 – 7.2<br>6.8 $\pm$ 0.4 | 5.6 – 8.8<br>7.4 $\pm$ 1.2    | 28.0 – 48.0<br>35.4 $\pm$ 5.2   | 26.0 – 44.6<br>31.6 $\pm$ 4.7  |
| Basana                  | 20.8 – 32.0<br>28.0 $\pm$ 4.0 | 50.0 – 88.0<br>58.0 $\pm$ 8.0             | 6.8 – 7.6<br>7.2 $\pm$ 0.5 | 5.0 – 9.6<br>7.2 $\pm$ 1.2    | 26.0 – 40.0<br>31.8 $\pm$ 4.0   | 24.8 – 37.0<br>28.0 $\pm$ 6.5  |
| Sitalmari               | 21.0 – 32.6<br>28.0 $\pm$ 4.0 | 66.0 – 98.0<br>76.0 $\pm$ 7.2             | 6.5 – 7.1<br>6.8 $\pm$ 0.3 | 5.8 – 9.0<br>7.6 $\pm$ 1.8    | 28.2 – 42.0<br>34.0 $\pm$ 4.2   | 25.0 – 40.8<br>31.0 $\pm$ 3.8  |
| Solmari                 | 22.0 – 30.0<br>26.6 $\pm$ 3.1 | 56.0 – 86.2<br>71.0 $\pm$ 6.2             | 6.4 – 7.2<br>6.8 $\pm$ 0.2 | 5.8 – 9.8<br>6.2 $\pm$ 1.8    | 34.0 – 56.4<br>40.5 $\pm$ 5.2   | 30.6 – 52.0<br>38.2 $\pm$ 4.8  |
| Goranga                 | 21.6 – 31.9<br>27.0 $\pm$ 4.0 | 66.0 – 90.0<br>76.0 $\pm$ 6.1             | 6.4 – 6.9<br>6.8 $\pm$ 0.1 | 6.8 – 9.0<br>7.6 $\pm$ 1.6    | 38.2 – 44.0<br>34.0 $\pm$ 4.2   | 28.0 – 40.8<br>32.2 $\pm$ 3.4  |
| Daphlang                | 22.0 – 31.8<br>26.4 $\pm$ 2.8 | 76.0 – 96.4<br>82.0 $\pm$ 5.4             | 6.5 – 7.2<br>6.8 $\pm$ 0.2 | 5.2 – 9.8<br>6.6 $\pm$ 2.2    | 44.0 – 52.4<br>44.6 $\pm$ 4.2   | 40.6 – 48.8<br>42.2 $\pm$ 2.8  |

**Table 2.** Abiotic factors of floodplain lakes (after Sharma, 2005)

| <b>Abiotic factors</b>  | <b>Water temp.<br/>(°C)</b>   | <b>Specific<br/>conductivity<br/>(<math>\mu</math>S/cm)</b> | <b>pH</b>                   | <b>Dissolved<br/>oxygen<br/>(mg/l)</b> | <b>Alkalinity<br/>(mg/l)</b>     | <b>Hardness<br/>(mg/l)</b>     |
|-------------------------|-------------------------------|---|-----------------------------|--|----------------------------------|--------------------------------|
| <b>Floodplain lakes</b> |                               |   |                             |  |                                  |                                |
| <b>Bhoispuri</b>        | 21.0 – 30.5<br>25.6 $\pm$ 3.1 | 39.0 – 86.5<br>60.2 $\pm$ 20.3                              | 6.3 – 7.2<br>6.4 $\pm$ 0.4  | 4.4 – 10.8<br>6.9 $\pm$ 2.7            | 18.0 – 32.0<br>22.4 $\pm$ 2.8    | 12.8 – 24.0<br>14.2 $\pm$ 4.5  |
| <b>Barundanga</b>       | 17.0 – 32.4<br>27.2 $\pm$ 5.6 | 24.0 – 37.0<br>28.2 $\pm$ 3.0                               | 5.5 – 6.6<br>6.2 $\pm$ 0.4  | 4.8 – 9.8<br>6.8 $\pm$ 2.1             | 12.0 – 26.0<br>14.2 $\pm$ 7.3    | 10.0 – 18.0<br>12.0 $\pm$ 4.5  |
| <b>Dhir</b>             | 17.5 – 30.0<br>25.6 $\pm$ 4.5 | 68.0 – 130.0<br>106.0 $\pm$ 17.6                            | 6.5 – 7.2<br>6.8 $\pm$ 0.3  | 5.0 – 10.6<br>7.8 $\pm$ 2.1            | 28.6 – 56.8<br>36.7 $\pm$ 5.1    | 20.4 – 48.0<br>34.1 $\pm$ 3.8  |
| <b>Fingua</b>           | 23.2 – 33.5<br>29.4 $\pm$ 5.5 | 89.0 – 173.0<br>137.3 $\pm$ 43.4                            | 6.9 – 9.4<br>7.9 $\pm$ 1.3  | 4.2 – 12.<br>7.9 $\pm$ 4.1             | 62.0 – 84.0<br>73.7 $\pm$ 11.1   | 57.0 – 76.0<br>67.0 $\pm$ 9.5  |
| <b>Sagmara</b>          | 21.0 – 32.6<br>28.0 $\pm$ 4.0 | 76.0 – 98.0<br>86.0 $\pm$ 6.1                               | 6.8 – 8.9<br>7.8 $\pm$ 0.4  | 5.8 – 9.0<br>7.6 $\pm$ 1.8             | 28.2 – 46.0<br>34.0 $\pm$ 5.2    | 25.0 – 42.8<br>32.1 $\pm$ 4.3  |
| <b>Kamakhya</b>         | 18.4 – 33.6<br>26.8 $\pm$ 7.7 | 114.0 – 182.0<br>158.0 $\pm$ 38.2                           | 6.8 – 7.2<br>7.05 $\pm$ 0.3 | 3.4 – 12.4<br>8.5 $\pm$ 4.6            | 58.0 – 78.0<br>69.3 $\pm$ 10.3   | 53.0 – 69.0<br>61.7 $\pm$ 8.1  |
| <b>Rowmari</b>          | 19.5 – 31.9<br>27.1 $\pm$ 4.4 | 72.0 – 148.0<br>111.0 $\pm$ 28.6                            | 6.8 – 7.9<br>7.3 $\pm$ 0.4  | 4.2 – 10.4<br>7.5 $\pm$ 2.6            | 83.0 – 124.0<br>106.2 $\pm$ 16.7 | 67.0 – 82.0<br>74.0 $\pm$ 5.6  |
| <b>Deepor</b>           | 20.9 – 32.8<br>28.7 $\pm$ 3.7 | 106.0 – 199.0<br>164.8 $\pm$ 32.9                           | 6.5 – 9.5<br>7.4 $\pm$ 0.7  | 3.2 – 12.8<br>6.4 $\pm$ 2.3            | 32.0 – 94.0<br>69.7 $\pm$ 17.9   | 46.0 – 82.0<br>63.3 $\pm$ 14.5 |
| <b>Dighali</b>          | 18.0 – 31.2<br>26.2 $\pm$ 4.6 | 46.0 – 89.0<br>60.8 $\pm$ 7.8                               | 6.4 – 7.2<br>6.7 $\pm$ 0.7  | 4.6 – 7.8<br>6.4 $\pm$ 2.2             | 28.0 – 48.0<br>38.4 $\pm$ 3.2    | 26.2 – 45.4<br>32.8 $\pm$ 5.7  |
| <b>Borbila</b>          | 17.8 – 32.0<br>27.0 $\pm$ 4.0 | 50.0 – 98.0<br>68.0 $\pm$ 8.0                               | 6.8 – 8.0<br>7.3 $\pm$ 0.5  | 5.2 – 10.6<br>7.8 $\pm$ 2.0            | 26.0 – 40.0<br>32.8 $\pm$ 4.0    | 20.8 – 38.0<br>26.0 $\pm$ 6.5  |
| <b>Siligurijan</b>      | 17.9 – 31.7<br>27.1 $\pm$ 5.5 | 130.0 – 189.0<br>157.0 $\pm$ 25.1                           | 6.8 – 7.4<br>7.2 $\pm$ 0.2  | 4.4 – 9.8<br>6.5 $\pm$ 2.0             | 45.0 – 84.0<br>61.4 $\pm$ 14.1   | 40.0 – 76.0<br>60.0 $\pm$ 14.1 |
| <b>Mori</b>             | 18.5 – 30.0<br>26.5 $\pm$ 4.2 | 80.6 – 132.0<br>98.0 $\pm$ 18.7                             | 6.8 – 8.2<br>7.6 $\pm$ 0.4  | 4.2 – 12.0<br>6.2 $\pm$ 3.8            | 55.0 – 85.0<br>65.4 $\pm$ 10.2   | 50.5 – 76.0<br>62.1 $\pm$ 7.1  |
| <b>Kujibalipatty</b>    | 18.0 – 30.0<br>26.2 $\pm$ 3.8 | 76.9 – 102.0<br>86.0 $\pm$ 12.5                             | 6.2 – 8.2<br>7.6 $\pm$ 0.6  | 5.7 – 12.5<br>6.8 $\pm$ 3.2            | 50.2 – 84.5<br>60.8 $\pm$ 10.7   | 36.8 – 82.0<br>59.6 $\pm$ 10.1 |
| <b>Thekera</b>          | 18.0 – 29.5<br>24.0 $\pm$ 4.2 | 130.0 – 178.0<br>152.4 $\pm$ 20.8                           | 7.2 – 8.1<br>7.6 $\pm$ 0.3  | 5.7 – 8.2<br>6.8 $\pm$ 1.3             | 32.0 – 57.0<br>38.4 $\pm$ 7.6    | 26.0 – 38.0<br>32.6 $\pm$ 2.5  |
| <b>Bandha</b>           | 16.8 – 30.0<br>25.6 $\pm$ 3.1 | 66.0 – 82.2<br>68.0 $\pm$ 7.5                               | 6.4 – 7.2<br>6.8 $\pm$ 0.2  | 4.8 – 7.8<br>6.2 $\pm$ 0.8             | 32.0 – 68.4<br>40.5 $\pm$ 10.2   | 30.6 – 62.0<br>38.9 $\pm$ 7.8  |

## B. Systematic Account of Zooplankton

Two hundred and seventy three species of zooplankton, including 176 species of Rotifera (Figs. 11-302), 56 species of Cladocera (Figs. 303-436), 11 species of Copepoda (Figs. 437-485), 27 species of Rhizopoda (Figs. 486-511) and 3 species of Gastrotricha (Figs. 512-514) are examined. The micro-photographs of selected species are given in Figs. 515-707. The systematic lists of the recorded species of the different groups and systematic accounts are provided hereunder:

### 1. Rotifera

#### SYSTEMATIC LIST OF REPORTED SPECIES

##### Phylum Rotifera

##### Class EUROTATORIA

##### Subclass MONOGONONTA

##### Order PLOIMA

##### Family BRACHIONIDAE

*Anuraeopsis coelata* De Beauchamp, 1932

*A. fissa* Gosse, 1851

*A. navicula* Rousselet, 1910

*Brachionus angularis* Gosse, 1851

*B. bidentatus* Anderson, 1889

*B. budapestinensis* Daday, 1885

*B. calyciflorus* Pallas, 1766

*B. caudatus personatus* (Ahlstrom, 1940)

*B. dichotomus reductus* Koste & Shiel, 1980

*B. diversicornis* (Daday, 1883)

*B. donneri* Brehm, 1951

*B. falcatus* Zacharias, 1898

*B. forficula* Wierzejski, 1891

*B. kostei* Shiel, 1983

*B. mirabilis* Daday, 1897

*B. quadridentatus* Hermann, 1783

*B. rubens* Ehrenberg, 1838

*Keratella cochlearis* (Gosse, 1851)

*K. edmondsoni* Ahlstrom, 1943

*K. javana* Hauer, 1937

*K. lenzi* Hauer, 1953

*K. procurva* (Thorpe, 1891)

*K. quadrata* (O.F. Müller, 1786)

*K. tropica* (Apstein, 1907)

*Platylas leloupi* (Gillard, 1967)

*P. quadricornis* (Ehrenberg, 1832)

*Platyonus patulus* (O.F. Müller, 1786)

*P. patulus macracanthus* (Daday, 1905)

##### Family EIPHANIDAE

*Epiphanes brachionus* (Ehrenberg, 1837)

##### Family EUCHLANIDAE

*Beauchampiella eudactylota* (Gosse, 1886)

*Euchlanis dilatata* Ehrenberg, 1832

*E. incisa* Carlin, 1939

*E. oropha* Gosse, 1887

*E. triquetra* Ehrenberg, 1838

*Dipleuchlanis ornata* Segers, 1993

*D. propatula* (Gosse, 1886)

Family MYTILINIDAE

*Lophocharis salpina* (Ehrenberg, 1834)

*Mytilina acanthophora* Hauer, 1938

*M. bisulcata* (Lucks, 1912)

*M. ventralis* (Ehrenberg, 1830)

*M. ventralis longidactyla* Wulfert, 1965

Family TRICHOTRIIDAE

*Macrochaetus collinsi* (Gosse, 1867)

*M. danneeli* Koste & Shiel, 1983

*M. longipes* Myers, 1934

*M. sericus* (Thorpe, 1893)

*Trichotria tetractis* (Ehrenberg, 1830)

Family LEPADELLIDAE

*Colurella adriatica* Ehrenberg, 1831

*C. obtusa* (Gosse, 1886)

*C. sanoamuangae* Chittapun *et al.* 1999

*C. sulcata* (Stenroos, 1898)

*C. uncinata* (O.F. Müller, 1773)

*Lepadella acuminata* (Ehrenberg, 1834)

*L. apsicora* Myers, 1934

*L. apsida* Haring, 1916

*L. biloba* Hauer, 1958

*L. cristata* (Rousselet, 1893)

*L. costatoides* Segers, 1992

*L. dactyliseta* (Stenroos, 1898)

*L. discoidea* Segers, 1993

*L. ehrenbergii* (Perty, 1850)

*L. eurysterna* Myers, 1942

*L. heterodactyla* Fadeew, 1925

*L. heterostyla* (Murray, 1913)

*L. lindau* Koste, 1981

*L. minuta* (Weber & Montet, 1918)

*L. minoruoides* Koste & Robertson, 1983

*L. ovalis* (O.F. Müller, 1786)

*L. patella* (O.F. Müller, 1773)

*L. rhomboides* (Gosse, 1886)

*L. triba* Myers, 1934

*L. triptera* Ehrenberg, 1830

*Squatinella mutica* (Ehrenberg, 1832)

Family LECANIDAE

*Lecane aculeata* (Jakubski, 1912)

*L. arcula* Haring, 1914

*L. braumi* Koste, 1988

*L. crepida* Haring, 1914

*L. curvicornis* (Murray, 1913)

*L. curvicornis nitida* (Hauer, 1938)

*L. doryssa* Haring, 1914

*L. flexilis* (Gosse, 1886)

*L. glypta* Haring & Myers, 1926

*L. hastata* (Murray, 1913)

*L. haliclysta* Haring & Myers, 1926

*L. hornemanni* (Ehrenberg, 1834)

*L. inermis* (Bryce, 1892)

*L. lateralis* Sharma, 1978

*L. leontina* (Turner, 1892)

*L. ludwigii* (Eckstein, 1883)

*L. luna* (O.F. Müller, 1776)

*L. nana* (Murray, 1913)

*L. ohioensis* (Herrick, 1885)

*L. papuana* (Murray, 1913)

*L. pertica* Haring & Myers, 1926

*L. ploenensis* (Voigt, 1902)

*L. pusilla* Haring, 1914

*L. ruttneri* Hauer, 1938

*L. signifera* (Jennings, 1896)

*L. sola* Hauer, 1936

*L. superaculeata* Sanoamuang & Segers, 1997

*L. ungulata* (Gosse, 1887)  
*L. (Hemimonostyla) blachei* Berzins, 1973  
*L. (Hm.) inopinata* Haring & Myers, 1926  
*L. (Hm.) sympoda* Hauer, 1929  
*L. (Monostyla) acanthinula* (Hauer, 1938)  
*L. (M.) batillifer* (Murray, 1913)  
*L. (M.) bifurca* (Bryce, 1892)  
*L. (M.) bulla* (Gosse, 1851)  
*L. (M.) closterocerca* (Schmarda, 1898)  
*L. (M.) decipiens* (Murray, 1913)  
*L. (M.) furcata* (Murray, 1913)  
*L. (M.) hamata* (Stokes, 1896)  
*L. (M.) lunaris* (Ehrenberg, 1832)  
*L. (M.) monostyla* (Daday, 1897)  
*L. (M.) obtusa* (Murray, 1913)  
*L. (M.) pyriformis* (Daday, 1905)  
*L. (M.) quadridentata* (Ehrenberg, 1830)  
*L. (M.) rugosa* (Haring, 1914)  
*L. (M.) scutata* (Haring & Myers, 1926)  
*L. (M.) stenroosi* (Meissner, 1908)  
*L. (M.) solfatara* (Hauer, 1938)  
*L. (M.) thienemanni* (Hauer, 1938)  
*L. (M.) unguitata* (Fadeev, 1925)  
 Family NOTOMMATIDAE  
*Cephalodella forficula* (Ehrenberg, 1830)  
*C. gibba* (Ehrenberg, 1830)  
*C. mucronata* Myers, 1924  
*C. ventripes* Dixon Nuttal, 1901  
*Monommata longiseta* (O.F. Müller, 1786)  
*M. maculata* Haring & Myers, 1930  
*Notommata pachyura* Gosse, 1886  
*N. spinata* Koste & Shiel, 1991  
*Taphrocampa annulosa* (Gosse, 1851)

## Family SCARIDIIDAE

*Scaridium longicaudum* (O.F. Müller, 1786)

## Family GASTROPODIDAE

*Ascomorpha saltans* Bartsch, 1870

*A. ovalis* (Bergendal, 1892)

## Family TRICHOCERCIDAE

*Trichocerca bicristata* (Gosse, 1887)

*T. capucina* (Wierzejski & Zacharias, 1893)

*T. cylindrica* (Imhof, 1891)

*T. elongata* (Gosse, 1886)

*T. flagellata* Hauer, 1937

*T. iernis* (Gosse, 1887)

*T. insignis* (Herrick, 1885)

*T. jenningsi* Voigt, 1957

*T. kostei* Ségers, 1993

*T. longiseta* (Schrank, 1802)

*T. porcellus* (Gosse, 1851)

*T. rattus* (O.F. Müller, 1776)

*T. similis* (Wierzejski, 1893)

*T. sulcata* (Jennings, 1894)

*T. weberi* (Jennings, 1903)

## Family ASPLANCHNIDAE

*Asplanchna brightwelli* Gosse, 1850

*A. priodonta* Gosse, 1850

## Family SYNCHAETIDAE

*Synchaeta oblonga* Ehrenberg, 1832

*Pleosoma lenticulare* Herrick, 1885

*Polyarthra vulgaris* Carlin, 1943

## Family DICRANOPHORIDAE

*Dicranophoroides caudatus* (Ehrenberg, 1834)

*Dicranophorus forcipatus* (O.F. Müller, 1786)

## Order FLOSCULARIACEAE

## Family FLOSCULARIIDAE

*Sinantherina spinosa* (Thorpe, 1893)

*S. socialis* (Linnaeus, 1758)

Family CONOCHILIDAE

*Conochilus unicornis* Rousselet, 1892

Family HEXARTHRIDAE

*Hexarthra intermedia* Wiszniewski, 1929

*H. mira* (Hudson, 1871)

Family FILINIIDAE

*Filinia brachiata* (Rousselet, 1901)

*F. camasecla* Myers, 1938

*F. longiseta* (Ehrenberg, 1834)

*F. opoliensis* (Zacharias, 1898)

*F. pejleri* Hutchinson, 1964

*F. saltator* (Gosse, 1886)

Family TESTUDINELLIDAE

*Testudinella brevicaudata* Yamamoto, 1951

*T. emarginula* (Stenroos, 1898)

*T. greeni* Koste, 1981

*T. parva parva* (Ternetz, 1892)

*T. parva bidentata* (Ternetz, 1892)

*T. patina* (Hermann, 1783)

*T. tridentata* Smirnov, 1931

*Pompholyx sulcata* Hudson, 1885

Family TROCHOSPHAERIDAE

*Horaella brehmi* Donner, 1949

*Trochosphaera aequatorialis* Semper, 1872

Subclass BDELLOIDEA

Family PHILODINIDAE

*Philodina citrina* Ehrenberg, 1832

*Rotaria neptunia* (Ehrenberg, 1830)

*R. rotatoria* (Pallas, 1766)

## SYSTEMATIC ACCOUNT

Phylum ROTIFERA

Class EUROTATORIA

*Characters* : Ovary with vitellarium. Reproduction parthenogenetic, bisexual or asexual.

This class includes freshwater and brackish water rotifers and is represented by two subclasses i. e., Monogononta and Bdelloidea in this account.

Subclass MONOGONONTA

*Characters* : Ovary unpaired. Reproduction mostly by parthenogenesis, at times bisexual. Forms usually free-swimming.

The monogononts belong to three orders (refer Segers, 2001) namely Ploima, Flosculariaceae and Collothecaceae; the last is not represented in the present study. It may be noted that the members of last two orders were grouped earlier under order Gnesiotrocha.

### Key to the reported Subclasses, Orders and Families of EUROTATORIA

1. Ovary single ..... Subclass MONOGONONTA.....2
- Ovaries paired ..... Subclass BDELLOIDEA.....21

2. Corona of diverse types. Trophi malleate, cardate, forcipate, virgate or incudate .....  
 ..... Order PLOIMA.....3  
 Corona of *Hexarthra*- or *Conochilus*- type.  
 Trophi malleoramate ..... Order FLOSCULARIACEAE.....16
3. Corona of *Brachionus*- or *Euchlanis*- type ..... 4  
 Corona of *Notommata*- or *Asplanchna*- type ..... 9
4. Trophi malleate, modified for suction ..... Family LECANIDAE  
 Trophi malleate, not modified for suction ..... 5
5. Head with hood. Corona with lateral lamellae ..... 6  
 Head without hood. Corona without lateral lamellae ..... Family LEPADELLIDAE
6. Dorsal surface of lorica without any longitudinal sulcus ..... 7  
 Dorsal surface of lorica with a longitudinal sulcus ..... Family MYTILINIDAE
7. Only trunk covered with lorica ..... 8  
 Head, trunk and foot loricate and clearly defined ..... Family TRICHOTRIIDAE
8. Dorsal and ventral plates of lorica fused laterally ..... Family BRACHIONIDAE  
 Dorsal and ventral plates joined laterally by thin membrane .....  
 ..... Family EUCHLANIDAE
9. Corona of *Notommata*-type. Trophi virgate ..... 10  
 Corona of *Asplanchna*-type.  
 Trophi modified virgate, incudate or forcipate ..... 11
10. Unci tips curved inwards ..... Family SCARIDIIDAE  
 Unci tips curved outwards ..... Family NOTOMMATIDAE
11. Trophi forcipate ..... Family DICRANOPHORIDAE  
 Trophi modified virgate or incudate ..... 12
12. Trophi modified virgate ..... 13  
 Trophi incudate ..... Family ASPLANCHNIDAE
13. Body loricate ..... 14  
 Body not loricate. Mouth in funnel-shaped buccal area. .... Family EIPHANIDAE
14. Corona symmetrical. Foot present or absent ..... 15

- Corona asymmetrical. Foot with equal or unequal bristle-like toes .....  
 ..... Family TRICHOCERCIDAE
15. Corona as a small ring. Stomach with blind extensions... Family GASTROPODIDAE  
 Corona reduced to small zone around mouth and on anterior lobes or auricles, if present.  
 Stomach without blind extensions ..... Family SYNCHAETIDAE
16. Body loricate; lorica with a distinct foot-opening ..... Family TESTUDINELLIDAE  
 Body illoricate ..... 17
17. Foot present ..... 18  
 Foot absent ..... 19
18. Forms free-swimming; colonial or solitary ..... Family CONOCHILIDAE  
 Forms sessile ; solitary or colonial ..... Family FLOSCULARIDAE
19. Body conical, bell- or vase-shaped, with appendages ..... 20  
 Body sacciform or spherical, without appendages ..... Family TROCHOSPHAERIDAE
20. Body with six arm-like appendages ..... Family HEXARTHRIIDAE  
 Body with 3-4 cuticular setae ..... Family FILINIIDAE
21. Stomach with a tubular lumen sometimes indistinct; food and excreta not formed into pellets. Corona large paired retractable trochus discs ..... Family PHILODINIDAE

### Order PLOIMA

*Characters* : Loricate or illoricate forms; body shape variable. Corona of diverse types; never of *Hexarthra*-, *Conochilus*- or *Collotheca*- type. Trophi malleate, cardate, forcipate, virgate or incudate. Foot, if present, with paired or unpaired toes. Forms creeping, free-swimming, free living, epibionts or ectoparasites; not in colonies.

Fourteen families of Ploima are represented in the samples collected from the floodplain lakes of Assam.

#### Family BRACHIONIDAE Wesenberg-Lund, 1899

*Characters* : Only trunk covered with lorica; dorsal and ventral plates of lorica closely fused laterally. Foot present or absent. Trophi malleate. Corona of *Brachionus* - or *Euchlanis* -type. Funnel shaped mouth in buccal area.

Five genera i.e., *Anuraeopsis*, *Brachionus*, *Keratella*, *Platytias* and *Platyonus* of the Brachionidae are observed in the examined material.

Genus *Anuraeopsis* Lauterborn, 1900

*Characters* : Lorica thin, ovate or navicular and rounded or obtusely truncate posteriorly. Dorsal and ventral plates of lorica joined laterally by a soft membrane. Foot absent.

Three species of *Anuraeopsis* are recorded in the material collected from the floodplain lakes of Assam.

1. *Anuraeopsis coelata* De Beauchamp, 1932

(Fig. 11)

*Material examined* : 3 examples, Horinchara, 03.03.2004, coll. B. K. Sharma; 2 examples, Jogra, 06.05.2002, coll. B. K. Sharma; 2 examples, Kakerikhola, 09.09.2004, coll. B. K. Sharma; 3 examples, Butikor, 02.03.2004, coll. B. K. Sharma; 2 examples, Urmal, 13.07.2004, coll. B. K. Sharma; 3 examples, Bamoni, 01. 06. 2006, coll. Sumita Sharma; 1 example, Sarang, 03. 09. 2006, coll. Sumita Sharma; 2 examples, Karasing, 02.12.2005, coll. Sumita Sharma; 3 examples, Maghuri, 30. 11. 2005, coll. Sumita Sharma; 1 example, Muijan, 29. 11. 2005, coll. Sumita Sharma; 4 examples, Salchapra, 08.08.2004, coll. B. K. Sharma.

*Characters* : Lorica slender, boat-shaped and granulated; dorsal plate with two longitudinal ridges running parallel to each other and then united at the hinder end to form a single ridge. Anterior occipital margin without any spines or serrations.

*Distribution* : INDIA - Assam, Meghalaya, Tripura, West Bengal, Orissa and Gujarat.

*Elsewhere* : Pantropical.

2. *Anuraeopsis fissa* Gosse, 1851

(Fig. 12)

*Material examined* : 5 examples, Bhoispuri, 03. 05. 2002, coll. B. K. Sharma; 5 examples, Bhoispuri, 12. 03. 2003, coll. B. K. Sharma; 3 examples, Hakama, 05. 05. 2004, coll. B. K. Sharma; 7 examples, Hakama, 08. 09. 2004, coll. B. K. Sharma; 5 examples, Dhir, 05. 05. 2002, coll. B. K. Sharma; 3 examples, Fingua, 06. 05. 2002, coll. B. K. Sharma; 2 examples, Sagmara, 10. 08. 2002, coll. B. K. Sharma; 3 examples, Kamakhya, 07. 05. 2002, coll. B. K. Sharma; 5 examples, Kamakhya, 13. 03. 2003, coll. B. K. Sharma; 3 examples, Rowmari, 11. 08. 2002, coll. B. K. Sharma; 5 examples, Deepor, 08. 05. 2002, coll. B. K. Sharma; 5 examples, Deepor, 04. 04. 2005, coll. Sumita Sharma; 3 examples, Ghorajan, 06. 04. 2005, coll. Sumita Sharma; 5 examples, Kamranga, 12. 07. 2004, coll. B. K. Sharma; 3 examples, Chatla, 10. 09. 2004, coll. B. K. Sharma; 3 examples, Hiragota, 10. 02. 2005, coll. B. K. Sharma; 3 examples, Haduk, 05. 04. 2005, coll. Sumita Sharma; 3 examples, Haduk, 01. 09. 2006, coll. Sumita Sharma; 2 examples, Goranga, 06. 04. 2005, coll. Sumita Sharma; 3 examples, Goranga, 01. 06. 2006, coll. Sumita Sharma; 3 examples, Solmari, 05. 04. 2005,

coll. Sumita Sharma; 3 examples, Sitalmari, 01. 09. 2006, coll. Sumita Sharma; 4 examples, Sarang, 03. 09. 2006, coll. Sumita Sharma; 3 examples, Basana, 03. 09. 2006, coll. Sumita Sharma; 5 examples, Siligurijan, 13. 08. 2002, coll. B. K. Sharma; 2 examples, Mori, 05. 04. 2005, coll. Sumita Sharma; 2 examples, Thekera, 03. 12. 2005, coll. Sumita Sharma; 2 examples, Bandha, 03. 09. 2006, coll. Sumita Sharma; 2 examples, Moona, 02. 12. 2005, coll. Sumita Sharma; 3 examples, Daphlang, 02. 12. 2005, coll. Sumita Sharma; 5 examples, Samuajan, 01. 03. 2004, coll. B. K. Sharma; 3 examples, Japara, 01. 12. 2005, coll. Sumita Sharma; 2, examples, Kololua, 29. 11. 2005, coll. Sumita Sharma; 2 examples, Bor beel, 01. 12. 2005, coll. Sumita Sharma; 4 examples, Baskandi, 19. 10. 2004, coll. B. K. Sharma; 5 examples, Sone, 08. 08. 2004, coll. B. K. Sharma.

*Characters* : Lorica ovate, finely stippled, obtusely pointed posteriorly and without any surface markings or crests. Anterior dorsal margin of lorica with a shallow sinus. Ventral plate projecting a little laterally beyond the dorsal plate in the anterior region.

*Distribution* : INDIA- Assam, Meghalaya, Tripura, West Bengal, Orissa, Bihar, Kerala, Rajasthan, Gujarat, Punjab, Chandigarh and Haryana.

*Elsewhere* : Cosmopolitan.

### 3. *Anuraeopsis navicula* Rousselet, 1910

(Fig. 13)

*Material examined* : 2 examples, Sagmara, 11. 03. 2003, coll. B. K. Sharma; 2 examples, Deepor, 06. 04. 2005, coll. Sumita Sharma; 2 examples 13. 03. 2003, Borbila, coll. B. K. Sharma; 2 examples, 13. 08. 2002, Siligurijan, coll. B. K. Sharma; 1 example, Kujibalipatty, 08. 05. 22002, coll. B. K. Sharma; 2 examples, Bandha, 03. 09. 2006, coll. Sumita Sharma.

*Characters* : Lorica elongated in outline, finely granulated and with slightly serrated anterior margin; ventral plate narrower. Cloacal opening small.

*Distribution* : INDIA - Assam and West Bengal.

*Elsewhere* : Pantropical

### Genus *Brachionus* Pallas, 1766

*Characters* : Body oval, more or less flattened dorso-ventrally and distinctly loricate. Head illoricate and retractile. Lorica usually separated into a dorsal and a ventral plate; basal plate of lorica developed in some species. Anterior occipital margin with two, four or six spines. Mental margin usually rigid and with a median sinus. Postero-lateral spines present in some species. Postero-median spines present in some species. Foot-opening at the posterior end of lorica between the basis of posterior spines, if present. Foot long, flexible, annulated and retractile; toes two.

Fourteen species of this genus are examined from the floodplain lakes of Assam.

#### 4. *Brachionus angularis* Gosse, 1851

(Figs. 14-16)

*Material examined* : 10 examples, Bhoispuri, 07. 01. 2003, coll. B. K. Sharma; 7 examples, Barundanga, 03. 05. 2002, coll. B. K. Sharma; 7 examples, Dhir, 09. 09. 2002, coll. B. K. Sharma; 5 examples, Hakama, 11. 07. 2004, coll. B. K. Sharma; 5 examples, Horinchora, 04. 07. 2004, coll. B. K. Sharma; 7 examples, Fingua, 06. 05. 2002, coll. B. K. Sharma; 5 examples, Sagmara, 11. 03. 2003, coll. B. K. Sharma; 5 examples, Kamakhya, 11. 08. 2002, coll. B. K. Sharma; 5 examples, Rowmari, 13. 03. 2003, coll. B. K. Sharma; 10 examples, Deepor, 12. 08. 2002, coll. B. K. Sharma; 5 examples, Deepor, 14. 03. 2003, coll. B. K. Sharma; 5 examples, Deepor, 09. 09. 2004, coll. B. K. Sharma; 5 examples, Deepor, 06. 04. 2005, coll. Sumita Sharma; 4 examples, Dighali, 06. 04. 2005, coll. Sumita Sharma; 3 examples, Borbila, 15. 03. 2003; coll. B. K. Sharma; 5 examples, Ghorajan, 12. 07. 2004, coll. B. K. Sharma; 5 examples, Ghorajan, 06. 04. 2005, coll. Sumita Sharma; 4 examples, Kamranga, 10. 02. 2005, coll. B. K. Sharma; 5 examples, Siligurijan, 09. 05. 2002, coll. B. K. Sharma; 5 examples, Chatla, 10. 09. 2005, coll. B. K. Sharma; 6 examples, Hiragota, 08. 05. 2004, coll. B. K. Sharma; 5 examples, Urmal, 10. 09. 2005, coll. B. K. Sharma; 8 examples, Kakerikhola, 14. 07. 2004, coll. B. K. Sharma; 5 examples, Padma, 06. 04. 2005, coll. Sumita Sharma; 4 examples, Bamoni, 01. 09. 2006, coll. Sumita Sharma; 3 examples, Basana, 03. 09. 2006, coll. Sumita Sharma; 5 examples Solmari, 05. 04. 2005, coll. Sumita Sharma; 3 examples, Sitalmari, 01. 09. 2006, coll. Sumita Sharma; 5 examples, Haduk, 01. 09. 2006, coll. Sumita Sharma; 3 examples, Duptoli, 05. 04. 2005, coll. Sumita Sharma; 4 examples, Ghorkhonjan, 15. 09. 2004, coll. B. K. Sharma; 2 examples, Jugdal, 01. 09. 2006, coll. Sumita Sharma; 5 examples, Mori, 03. 09. 2006, coll. Sumita Sharma; 7 examples, Kujibalipatty, 14. 03. 2003, coll. B. K. Sharma; 3 examples, Thekera, 03. 12. 2005, coll. Sumita Sharma; 3 examples, Bandha, 03. 09. 2006, coll. Sumita Sharma; 5 examples, Daphlang, 05. 09. 2006, coll. Sumita Sharma; 3 examples, Donga, 02. 12. 2005, coll. Sumita Sharma; 2 examples, Borbil, 01. 12. 2005, coll. Sumita Sharma; 5 examples, Muijan, 29. 11. 2005, coll. Sumita Sharma; 3 examples. Hakoi, 29. 11. 2005, coll. Sumita Sharma; 3 examples, Sesa, 01. 12. 2005, coll. Sumita Sharma; 2 examples, Diang, 01. 12. 2005, coll. Sumita Sharma; 5 examples, Deopani, 2. 12. 2005, coll. Sumita Sharma; 3 examples, Sohala, 05. 09. 2006, coll. Sumita Sharma; 6 examples, Mihir, 05. 09. 2006, coll. Sumita Sharma; 5 examples, Sone, 08. 08. 2004, coll. B. K. Sharma; 4 examples, Raidong, 30. 11. 2005, coll. Sumita Sharma; 3 examples, Dhekia, 03. 04. 2005, coll. B. K. Sharma; 5 examples, Naruathan, 19. 01. 2005, coll. B. K. Sharma; 3 examples, Samuajan, 09. 06. 2005, coll. B. K. Sharma; 5 examples, Sone, 119. 10. 2004, coll. B. K. Sharma; 5 examples, Salchakra, 09. 02. 2005, coll. B. K. Sharma.

*Characters* : Lorica rigid, usually stippled and compressed dorso-ventrally; with a pattern of cuticular plates in some specimens. Anterior occipital margin with two median spines flanked by a V-shaped sinus. Foot-opening large and flanked laterally by cuticular protuberances. Posterior spines lacking.

*Distribution* : INDIA - widely distributed, reported from Assam, Meghalaya, Tripura, West Bengal, Orissa, Bihar, Andhra Pradesh, Maharashtra, Madhya Pradesh, Delhi, Kashmir, Punjab, Haryana and Chandigarh.

*Elsewhere* : Cosmopolitan.

#### 5. *Brachionus bidentatus* Anderson, 1889

(Figs. 17-19)

*Material examined* : 3 examples, Bhoispuri, 07. 01. 2003, coll. B. K. Sharma; 3 examples, Barundanga, 12. 03. 2003, coll. B. K. Sharma; 5 examples, Dhir, 05. 05. 2002, coll. B. K. Sharma; 2 examples, Hakama, 07. 02. 2005, coll. B. K. Sharma; 3 examples, Horinchora, 07. 02. 2005, coll. B. K. Sharma; 5 examples, Fingua, 10. 08. 2002, coll. B. K. Sharma; 2 examples, Sagmara, 13. 02. 2002, coll. B. K. Sharma; 5 examples, Kamakhya, 13. 03. 2003, coll. B. K. Sharma; 2 examples, Rowmari, 07. 03. 2002, coll. B. K. Sharma; 3 examples, Deepor, 13. 02. 2002, coll. B. K. Sharma; 4 examples, Deepor, 04. 03. 2004, coll. B. K. Sharma; 3 examples, Deepor, 06. 04. 2005, coll. Sumita Sharma; 4 examples, Dighali, 15. 02. 2002, coll. B. K. Sharma; 3 examples, Borbila, 15. 03. 2003, coll. B. K. Sharma; 5 examples, Ghorajan, 04. 05. 2004, coll. B. K. Sharma; 3 examples, Ghorajan, 06. 04. 2005, coll. Sumita Sharma; 4 examples, Kamranga, 17. 07. 2004, coll. B. K. Sharma; 3 examples, Kakerikhola, 11. 02. 2005, coll. B. K. Sharma; 3 examples, Chatla, 08. 05. 2004, coll. B. K. Sharma; 2 examples, Hiragota, 05. 03. 2004, coll. B. K. Sharma; 3 examples, Padma, 06. 04. 2005, coll. Sumita Sharma; 4 examples, Goranga, 01. 09. 2006, coll. Sumita Sharma; 3 examples, Sitalmari, 05. 04. 2005, coll. Sumita Sharma; 3 examples, Solmari, 05. 04. 2005, coll. Sumita Sharma; 2 examples, Mori, 05. 04. 2005, coll. Sumita Sharma; 5 examples, Kujibalipatty, 14. 03. 2003, coll. B. K. Sharma; 3 examples, Thekera, 03. 12. 2005, coll. Sumita Sharma.

*Characters* : Lorica firm, stippled and moderately compressed dorso-ventrally. Dorsal and ventral plates joined together for about 3/4 of length of lorica and then diverge to unite with basal plate. Anterior margin with six occipital spines; laterals and medians longer than intermediate occipital spines. Postero-lateral spines almost parallel-sided and variable in length. Foot-opening with a symmetrically projecting sheath.

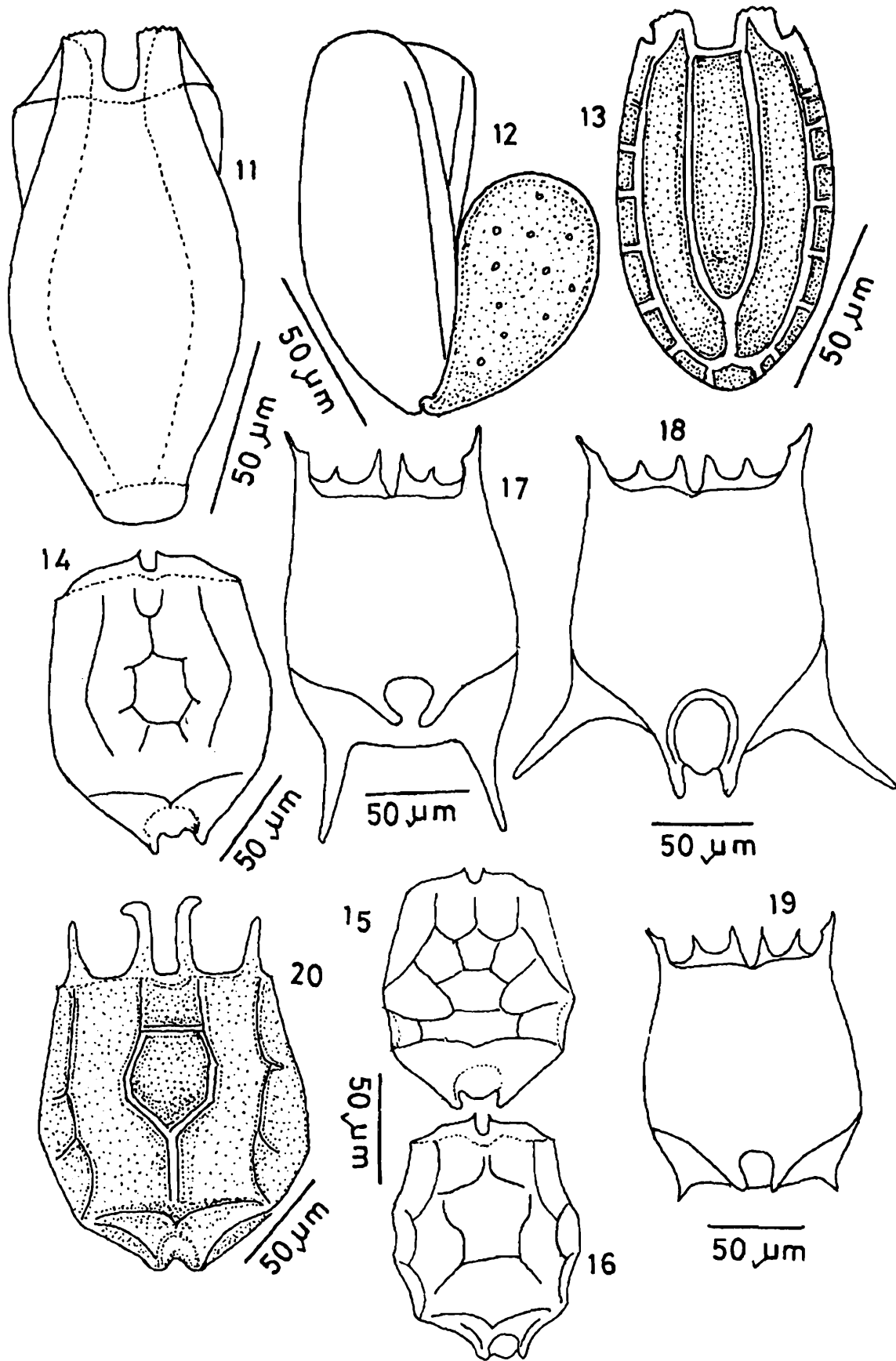
*Distribution* : INDIA - Assam, Meghalaya, Tripura, West Bengal, Andhra Pradesh, Orissa, Punjab and Haryana.

*Elsewhere* : Pantropical.

#### 6. *Brachionus budapestinensis* Daday, 1885

(Fig. 20)

*Material examined* : 5 examples, Bhoispuri, 07. 01. 2003, coll. B. K. Sharma; 2 examples, Barundanga, 12. 03. 2003, coll. B. K. Sharma; 3 examples, Bandha, 03. 09. 2006, coll. B.



*Anuraeopsis coelata* De Beauchamp : Fig. 11, dorsal view; *A. fissa* Gosse : Fig. 12, lateral view; *A. navicula* Rousselet : Fig. 13, dorsal view; *Brachionus angularis* Gosse : Figs. 14-16, dorsal views; *B. bidentatus* Anderson : 17-19, ventral views; *B. budapestinensis* Daday : Fig. 20, dorsal view.

K. Sharma; 5 examples, Padmakhua, 01. 09. 2006, coll. Sumita Sharma; 3 examples, Lotha, 01. 09. 2006, coll. Sumita Sharma; 2 examples, Itakhuli, 01. 12. 2005, coll. Sumita Sharma.

*Characters* : Lorica firm, oval and covered with minute tubercles. Dorsal plate with an ornamentation of cuticular ridges. Anterior occipital margin with four spines; median occipital spines longer than laterals. Caudal spines lacking. Foot-opening small v-shaped dorsally and a large oval opening ventrally.

*Distribution* : INDIA - Assam, Meghalaya, Tripura, West Bengal, Madhya Pradesh and Punjab.

*Elsewhere* : Cosmopolitan.

### 7. *Brachionus calyciflorus* Pallas, 1766

(Figs. 21-23)

*Material examined* : 6 examples, Bhoispuri, 07. 01. 2003, coll. B. K. Sharma; 5 examples, Barundanga, 12. 03. 2003, coll. B. K. Sharma; 5 examples, Dhir, 09. 08. 2002, coll. B. K. Sharma; 4 examples, Hakama, 03. 03. 2004, coll. B. K. Sharma; 5 examples, Horinchora, 11. 07. 2004, coll. B. K. Sharma; 3 examples, Ghorajan, 06. 04. 2005, coll. Sumita Sharma; 4 examples, Kamranga, 10. 02. 2005, coll. B. K. Sharma; 3 examples, Fingua, 12. 03. 2003, coll. B. K. Sharma; 3 examples, Kamakhya, 11. 08. 2002, coll. B. K. Sharma; 5 examples, Rowmari, 07. 05. 2002, coll. B. K. Sharma; 5 examples, Deepor, 12. 08. 2002, coll. B. K. Sharma; 6 examples, Deepor, 06. 04. 2005, coll. Sumita Sharma; 3 examples, Dighali, 06. 04. 2005, coll. Sumita Sharma; 3 examples, Siligurijan, 14. 12. 2002, coll. B. K. Sharma; 3 examples, Chatla, 10. 09. 2004, coll. B. K. Sharma; 3 examples, Hiragota, 10. 02. 2005, coll. B. K. Sharma; 2 examples, Urmal, 05. 03. 2004, coll. B. K. Sharma; 3 examples, Padma, 13. 07. 2004, coll. B. K. Sharma; 2 examples, Padma, 06. 04. 2005, coll. Sumita Sharma; Bamoni, 06. 04. 2005, coll. Sumita Sharma; 2 examples, Basana, 03. 09. 2006, coll. Sumita Sharma; 2 examples, Goranga, 01. 09. 2006, coll. Sumita Sharma; 4 examples, Sitalmari, 05. 04. 2005, coll. Sumita Sharma; 3 examples, Mori, 05. 04. 2005, coll. Sumita Sharma; 2 examples, Bandha, 03. 09. 2006, coll. Sumita Sharma; 3 examples, Daphlang, 05. 09. 2006, coll. Sumita Sharma.

*Characters* : Lorica flexible and oval; with four broad-based occipital spines of variable length. Posterior and postero-lateral spines present or absent, usually of variable length.

This polymorphic brachionid is represented by two forms namely *B. calyciflorus f. dorcas* (Gosse, 1851) and *B. calyciflorus f. amphiceros* (Brehm, 1909).

*Distribution* : INDIA - Assam, Meghalaya, Tripura, West Bengal, Orissa, Andhra Pradesh, Madhya Pradesh and Punjab.

*Elsewhere* : Cosmopolitan.

8. *Brachionus caudatus personatus* (Ahlstrom, 1940)  
(Fig. 24)

*Material examined* : 5 examples, Bhoispuri, 03. 05. 2002, coll. B. K. Sharma; 5 examples, Hakama, 11. 07. 2004, coll. B. K. Sharma; 3 examples, Fingua, 12. 03. 2003, coll. B. K. Sharma; 3 examples, Jogra, 06. 05. 2002, coll. B. K. Sharma; 4 examples, Sagmara, 11. 03. 2003, coll. B. K. Sharma; 5 examples, Deepor, 12. 08. 2002, coll. B. K. Sharma; 2 examples, Deepor, 14. 03. 2003, coll. B. K. Sharma; 3 examples, Deepor, 06. 04. 2005, coll. Sumita Sharma; 2 examples, Goranga, 05. 04. 2005, coll. Sumita Sharma; 3 examples, Siligurijan, 15. 03. 2003, coll. B. K. Sharma; 3 examples, Sitalmari, 05. 04. 2005, coll. Sumita Sharma; 3 examples, Kakerikhola, 11. 02. 2005, coll. B. K. Sharma; 4 examples, Urmal, 08. 05. 2004, coll. B. K. Sharma; 2 examples, Bamoni, 05. 04. 2005, coll. Sumita Sharma; 4 examples, Mori, 03. 09. 2006, coll. Sumita Sharma; 2 examples, Kujibalipatty, 14. 03. 2003, coll. B. K. Sharma; 3 examples, Sarain Hubbi, 29. 11. 2005, coll. Sumita Sharma

*Characters* : Lorica rigid, heavily stippled, moderately compressed and with a pattern of cuticular ridges. Lateral occipital spines longer than medians. Posterior spines in the plane axis of the body.

*Distribution* : INDIA - Assam, Meghalaya, Tripura, Punjab, Haryana, West Bengal, and Orissa.

*Elsewhere* : Pantropical.

9. *Brachionus dichotomus reductus* Koste & Shiel, 1980  
(Fig. 25)

*Material examined* : 3 examples, Bhoispuri, 12. 03. 2003, coll. B. K. Sharma; 2 examples, Borbila, 16. 02. 2002, coll. B. K. Sharma; 2 examples, Balak, 01. 04. 2005, coll. B. K. Sharma; 2 examples, Thekera, 03. 12. 2005, coll. Sumita Sharma

*Characters* : Lorica firm, stippled, dorso-ventrally compressed and with maximum width in its posterior region. Anterior occipital margin with distinct median spines of variable length. Posterior spines moderately long and divergent.

Differs from typical *B. dichotomus* in having shorter occipital and posterior spines.

*Distribution* : INDIA Assam, Meghalaya and Tripura.

*Elsewhere* : Australasia.

10. *Brachionus diversicornis* (Daday, 1883)  
(Fig. 26)

*Material examined* : 5 examples, Barundanga, 08. 08. 2002, coll. B. K. Sharma; 5 examples, Hakama, 06. 05. 2004, coll. B. K. Sharma; 3 examples, Horinchora, 02. 11. 2004, coll. B.

K. Sharma; 8 examples, Dhir, 11. 03. 2003, coll. B. K. Sharma; 3 examples. Fingua, 09. 01. 2003, coll. B. K. Sharma; 3 examples, Sagmara, 09. 01. 2003, coll. B. K. Sharma; 5 examples, Kamakhya, 11. 08. 2002, coll. B. K. Sharma; 4 examples, Rowmari, 11. 08. 2002, coll. B. K. Sharma; 8 examples. Deepor, 04. 03. 2004; coll. B. K. Sharma; 5 examples. Deepor, 06. 04. 2005; coll. Sumita Sharma; 5 examples, Dighali, 05. 05. 2002, coll. B. K. Sharma; 3 examples, Ghorajan, 06. 04. 3005, coll. Sumita Sharma Sharma; 3 examples, Kamranga, 04. 03. 3004, coll. B. K. Sharma; 3 examples, Kakerikhola, 14. 07. 2004, coll. B. K. Sharma; 5 examples, Chatla, 10. 02. 2005, coll. B. K. Sharma; 3 examples, Borbila, 15. 03. 2003, coll. B. K. Sharma; 5 examples, Siligurijan, 13. 08. 2002, coll. B. K. Sharma; 3 examples, 08. 05. 2004, Hiragota, coll. B. K. Sharma; 3 examples, Kujibalipatty, 08. 05. 2004, coll. B. K. Sharma; 4 examples, Padma, 06. 04. 2005, coll. Sumita. Sharma; 3 examples, Lotha, 01. 09. 2006, coll. Sumita Sharma; 5 examples, Bamoni, 01. 09. 2006, coll. Sumita Sharma; 3 examples, Basana, 03. 09. 2006, coll. Sumita Sharma; 2 examples, Sitalmari, 01. 09. 2006, coll. Sumita Sharma; 3 examples, Solmari, 01. 09. 2006, coll. Sumita Sharma; 3 examples, Sarang, 03. 09. 2006, coll. Sumita Sharma; 2 examples, Dubratoli, 03. 09. 2006, coll. Sumita Sharma; 2 examples, Thekera, 03. 12. 2005, coll. Sumita Sharma; 2 examples, Bandha, 03. 09. 2006, coll. Sumita Sharma; 3 examples, Daphlang, 02. 12. 2005, coll. Sumita Sharma; 2 examples, Bhoismari, 02. 12. 2005, coll. Sumita Sharma; 3 examples, Morakalong, 03. 12. 2005, coll. Sumita Sharma; 3 examples, Teliadanga, 01. 12. 2005, coll. Sumita Sharma; 5 examples, Muijan, 01. 12. 2005, coll. Sumita Sharma; 7 examples, Senijan, 01. 04. 2004, coll. B. K. Sharma; 5 examples, Sone, 10. 10. 2004, coll. B. K. Sharma

*Characters* : Lorica elongated and compressed dorso-ventrally. Anterior occipital margin with four spines; median occipital spines short and laterals longer. Posterior spines two, unequal and divergent; the right posterior spine longer than the left. Foot-opening situated between the bases of posterior spines; a rounded tongue-like projection of dorsal plate overhanging the foot-opening.

*Distribution* : INDIA - Assam, Meghalaya, Tripura, West Bengal, Orissa, Bihar, Haryana and Punjab.

*Elsewhere* : Cosmopolitan.

### 11. *Brachionus donneri* Brehm, 1951

(Fig. 27)

*Material examined* : 5 examples, Barundanga, 03. 05. 2002, coll. B. K. Sharma; 3 examples, Horinchora, 04. 07. 2004, coll. B. K. Sharma; 5 examples, Deepor, 12. 08. 2002, coll. B. K. Sharma; 5 examples, Deepor, 14. 03. 2003, coll. B. K. Sharma; 2 examples, Deepor, 06. 04. 2005, coll. Sumita Sharma; 3 examples, Haduk, 01. 09. 2006, coll. Sumita Sharma; 3 examples, Solmari, 01. 09. 2006, coll. Sumita Sharma; 3 examples, Sitalmari, 01. 09. 2006, coll. Sumita Sharma.

*Characters* : Lorica rigid, oval and strongly compressed dorso-ventrally. Anterior occipital margin with six blunt spines and ventral margin with four short blunt spines. Lateral antennae located on conical lateral protuberances. Foot-opening deep and flanked with distinct club-shaped projections.

*Distribution* : INDIA - Assam, Meghalaya, Tripura, West Bengal and Tamil Nadu.

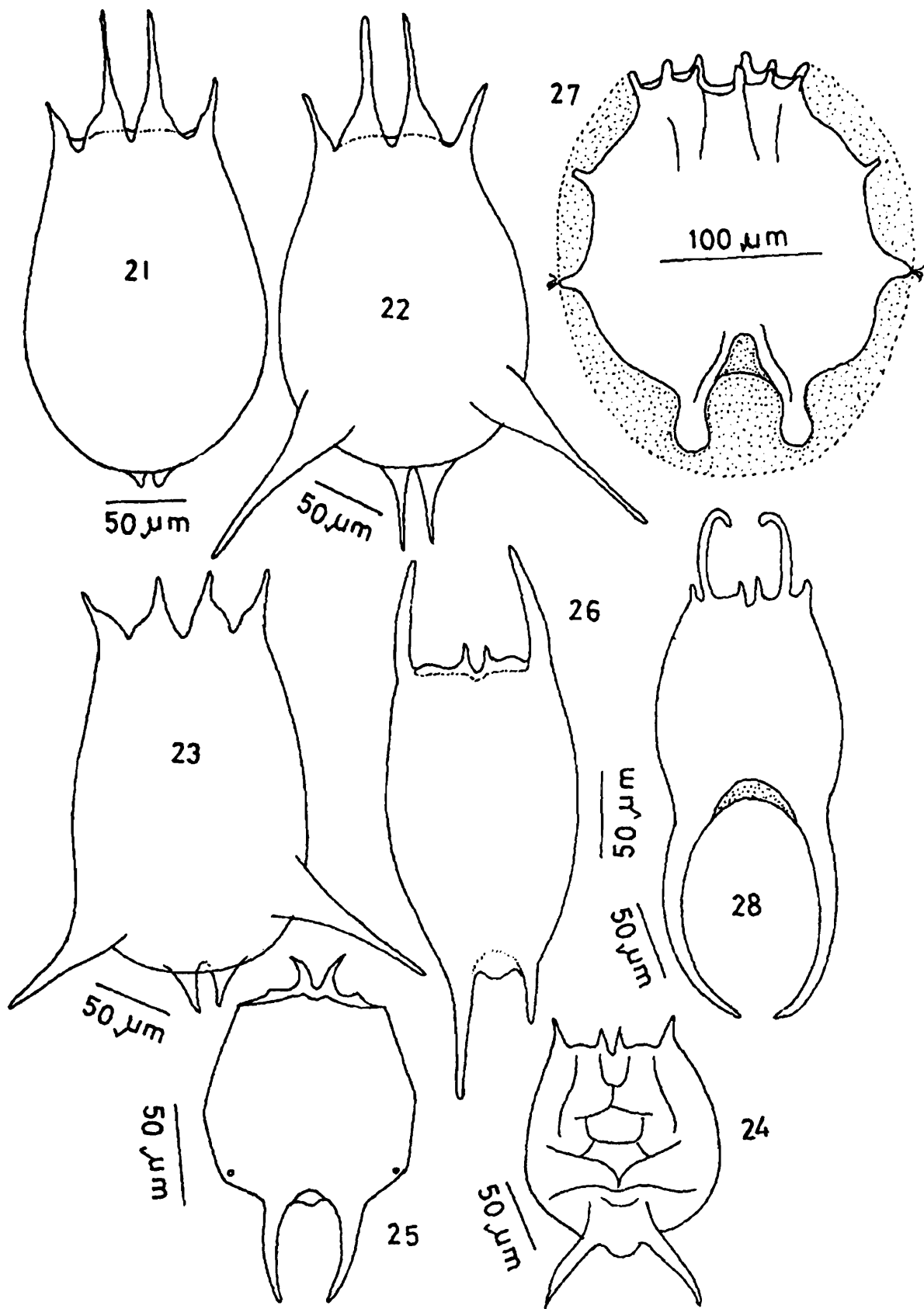
*Elsewhere* : Pantropical.

## 12 *Brachionus falcatus* Zacharias, 1898

(Fig. 28)

*Material examined* : 5 examples, Bhoispuri, 03. 05. 2002, coll. B. K. Sharma; 7 examples, Barundanga, 12. 03. 2003, coll. B. K. Sharma; 5 examples, Hakama, 06. 05. 2004, coll. B. K. Sharma; 5 examples, Horinchora, 11. 07. 2004, coll. B. K. Sharma; 6 examples, Dhir, 12. 03. 2003, coll. B. K. Sharma; 3 examples, Fingua, 09. 01. 2003, coll. B. K. Sharma; 5 examples, Jogra, 06. 05. 2002, coll. B. K. Sharma; 5 examples, Sagmara, 11. 03. 2003, coll. B. K. Sharma; 3 examples, Kamakhya, 14. 02. 2002, coll. B. K. Sharma; 5 examples, Rowmari, 07. 05. 2002, coll. B. K. Sharma; 4 examples, Ghorajan, 04. 03. 2004, coll. B. K. Sharma; 7 examples, 07. 05. 2004, Kamranga, coll. B. K. Sharma; 5 examples, Kakerikhola, 11. 02. 2005, coll. B. K. Sharma; 5 examples, Chatla, 05. 03. 2004, coll. B. K. Sharma; 3 examples, Hiragota, 10. 09. 2004, coll. B. K. Sharma; 3 examples, Urmal, 10. 09. 2004, coll. B. K. Sharma; 3 examples, Padma, 06. 04. 2005, coll. Sumita Sharma; 3 examples, Bamoni, 01. 09. 2006, coll. Sumita Sharma; 8 examples, Deepor, 06. 04. 2005, coll. Sumita Sharma; 6 examples, Dighali, 12. 08. 2002, coll. B. K. Sharma; 5 examples, Borbila, 09. 05. 2002, coll. Sumita Sharma; 3 examples, Siligurijan, 13. 08. 2002, coll. B. K. Sharma; 5 examples, Basana, 03. 09. 2006, coll. Sumita Sharma; 3 examples, Goranga, 05. 04. 2005, coll. Sumita Sharma; 3 examples, Haduk, 05. 04. 2005 coll. Sumita Sharma; 3 examples, Duptoli, 01. 09. 2006, coll. Sumita Sharma; 3 examples, Dholi, 01. 09. 2006, coll. Sumita Sharma; 2 examples, Kandhi, 01. 09. 2006, coll. Sumita Sharma; 4 examples, Ghorkhonjan, 01. 09. 2006, coll. Sumita Sharma; 3 examples, Sitalmari, 01. 09. 2006, coll. Sumita Sharma; 5 examples, Solmari, 01. 09. 2006, coll. Sumita Sharma; 3 examples, Mori, 03. 09. 2006, coll. Sumita Sharma; 2 examples, Kujibalipatty, 14. 03. 2003, coll. B. K. Sharma; 3 examples, Thekera, 03. 12. 2005, coll. Sumita Sharma; 5 examples, Bandha, 03. 09. 2006, coll. Sumita Sharma; 3 examples, Daphlang, 02. 12. 2005, coll. Sumita Sharma; 5 examples, Naruathan, 11. 06. 2004, coll. B. K. Sharma; 3 examples, Senijan, 07. 07. 2002, coll. B. K. Sharma; 7 examples, Samuajan, 18. 01. 2005, coll. B. K. Sharma; 5 examples, Sone, 19. 10. 2004, coll. B. K. Sharma; 3 examples, Salchapra, 09. 02. 2005, coll. B. K. Sharma.

*Characters* : Lorica rigid and compressed dorso-ventrally. Anterior occipital margin with six spines; intermediate occipitals longest and curved ventrally, laterals and medians short and of almost equal length. Posterior spines long, incurved and widely separated at their bases. Foot-opening situated between the bases of posterior spines.



*Brachionus calyciflorus* f. *dorcas* (Gosse) : Fig. 21, dorsal view; *B. calyciflorus* f. *amphiceros* (Brehm) Figs. 22-23, ventral views; *B. caudatus personatus* (Ahlstrom) : Fig. 24, dorsal view; *B. dichotomus reductus* Koste & Shiel : Fig. 25, ventral view; *B. diversicornis* (Daday) : Fig. 26, dorsal view; *B. donneri* Brehm : Fig. 27, dorsal view; *B. falcatus* Zacharias : Fig. 28, ventral view.

*Distribution* : INDIA Assam, Meghalaya, Tripura, West Bengal, Orissa, Bihar, Andhra Pradesh, Madhya Pradesh, Gujarat, Rajasthan, Kerala, Punjab and Haryana.

*Elsewhere* : Pantropical.

13. *Brachionus forficula* Wierzejski, 1891  
(Figs. 29-30)

*Material examined* : 5 examples, Bhoispuri, 08. 08. 2002, coll. B. K. Sharma; 5 examples, Barundanga, 03. 05. 2002, coll. B. K. Sharma; 6 examples, Hakama, 11. 07. 2004, coll. B. K. Sharma; 3 examples, Horinchora, 11. 07. 2004, coll. B. K. Sharma; 7 examples, 09. 08. 2002, Dhir, coll. B. K. Sharma; 4 examples, Fingua, 12. 03. 2003, coll. B. K. Sharma; 3 examples, Sagmara, 10. 08. 2002, coll. B. K. Sharma; 5 examples, Kamakhya, 13. 03. 2003, coll. B. K. Sharma; 5 examples, Ghorajan, 07. 05. 2004, coll. B. K. Sharma; 3 examples, Kamranga, 10. 02. 2005, coll. B. K. Sharma; 3 examples, Kakerikhola, 09. 05. 2004, coll. B. K. Sharma; 3 examples, Chatla, 10. 09. 2004, coll. B. K. Sharma; 3 examples, Hiragota, 13. 07. 2004, coll. B. K. Sharma; 3 examples, Urmal, 05. 03. 2004, coll. B. K. Sharma; 4 examples, Padma, 09. 05. 2004, coll. B. K. Sharma; 5 examples, Bamoni, 01. 09. 2006, coll. Sumita Sharma; 3 examples, Rowmari, 11. 08. 2002, coll. B. K. Sharma; 8 examples, Deepor, 06. 04. 2005, coll. Sumita Sharma; 5 examples, Dighali, 14. 03. 2003, coll. B. K. Sharma; 3 examples, Borbila, 09. 05. 2002, coll. B. K. Sharma; 5 examples, Siligurijan, 13. 08. 2002, coll. B. K. Sharma; 3 examples, Basana, 03. 09. 2006, coll. Sumita Sharma; 3 examples, Goranga, 01. 09. 2006, coll. Sumita Sharma; 3 examples, Haduk, 05. 04. 2005, coll. Sumita Sharma; 3 examples, Duptoli, 05. 04. 2005, coll. Sumita Sharma; 4 examples, Dholi, 05. 04. 2005, coll. Sumita Sharma; 2 examples, Kandhi, 01. 09. 2006, coll. Sumita Sharma; 3 examples, Ghorkhonjan, 01. 09. 2006, coll. Sumita Sharma; 3 examples, Sitalmari, 01. 09. 2006, coll. Sumita Sharma; 5 examples, Solmari, 01. 09. 2006, coll. Sumita Sharma; 3 examples, Mori, 03. 09. 2006, coll. Sumita Sharma; 3 examples, Kujibalipatty, 14. 03. 2003, coll. B. K. Sharma; 3 examples, Thekera, 03. 12. 2005, coll. Sumita Sharma; 3 examples, Bandha, 03. 09. 2006, coll. Sumita Sharma; 5 examples, Daphlang, 05. 09. 2006, coll. Sumita Sharma; 3 examples, Naruathan, 04. 04. 2005, coll. B. K. Sharma; 7 examples, Samuajan, 18. 01. 2005, coll. B. K. Sharma; 5 examples, Sone, 08. 08. 2004, coll. B. K. Sharma; 3 examples, Baskandi, 19. 10. 2004, coll. B. K. Sharma.

*Characters* : Lorica rigid, moderately compressed dorso-ventrally and finely stippled. Anterior margin with four occipital spines, laterals longer than medians. Posterior spines stout, inwardly directed and widely separated at their bases; each with a knee-like swelling on inner side near the base.

*Distribution* : INDIA - Assam, Meghalaya, Tripura, West Bengal, Orissa, Bihar, Andhra Pradesh, Gujarat and Punjab.

*Elsewhere* : Pantropical.

14. *Brachionus kostei* Shiel, 1983

(Figs. 31-32)

*Material examined* : 2 examples, Muijan, 29. 11. 2005, coll. Sumita Sharma.

*Characters* : Lorica vase-shaped, rigid and moderately compressed dorso-ventrally; with six pointed occipital spines and two characteristic dorsally convoluted foot-opening spines. Dorsal plate of lorica patterned with two pentagonal facets.

*Distribution* : INDIA - Assam.

*Elsewhere* : Australasian.

15. *Brachionus mirabilis* Daday, 1897

(Figs. 33-34)

*Material examined* : 2 examples, Deepor, 06. 04. 2005, coll. Sumita Sharma; 2 examples, Dhir, coll. B. K. Sharma; 2 examples, Dighali, 13. 02. 2002, coll. B. K. Sharma; 2 examples, Sitalmari, 05. 04. 2005, coll. Sumita Sharma; 1 example, Kandhi, 01. 09. 2006, coll. Sumita Sharma; 2 examples, Jugdal, 01. 09. 2006, coll. Sumita Sharma; 2 examples, Ghorajan, 01. 09. 2006, coll. B. K. Sharma; 2 examples, Sarang, 03. 09. 2006, coll. Sumita Sharma; 3 examples, Sesa, 01. 12. 2005, coll. Sumita Sharma; 3 examples, Maghuri, 29. 11. 2005, coll. Sumita Sharma; 2 examples, Samuajan, 11. 06. 2004, coll. B. K. Sharma.

*Characters* : Lorica rigid, stippled and moderately compressed. Anterior margin with six occipital spines; medians longest and curved outwards. Ventral plate of lorica produced into two posterior spines extending backwards at an angle of 45°. Foot-opening located between the bases of ventral spines and surrounded by a sheath.

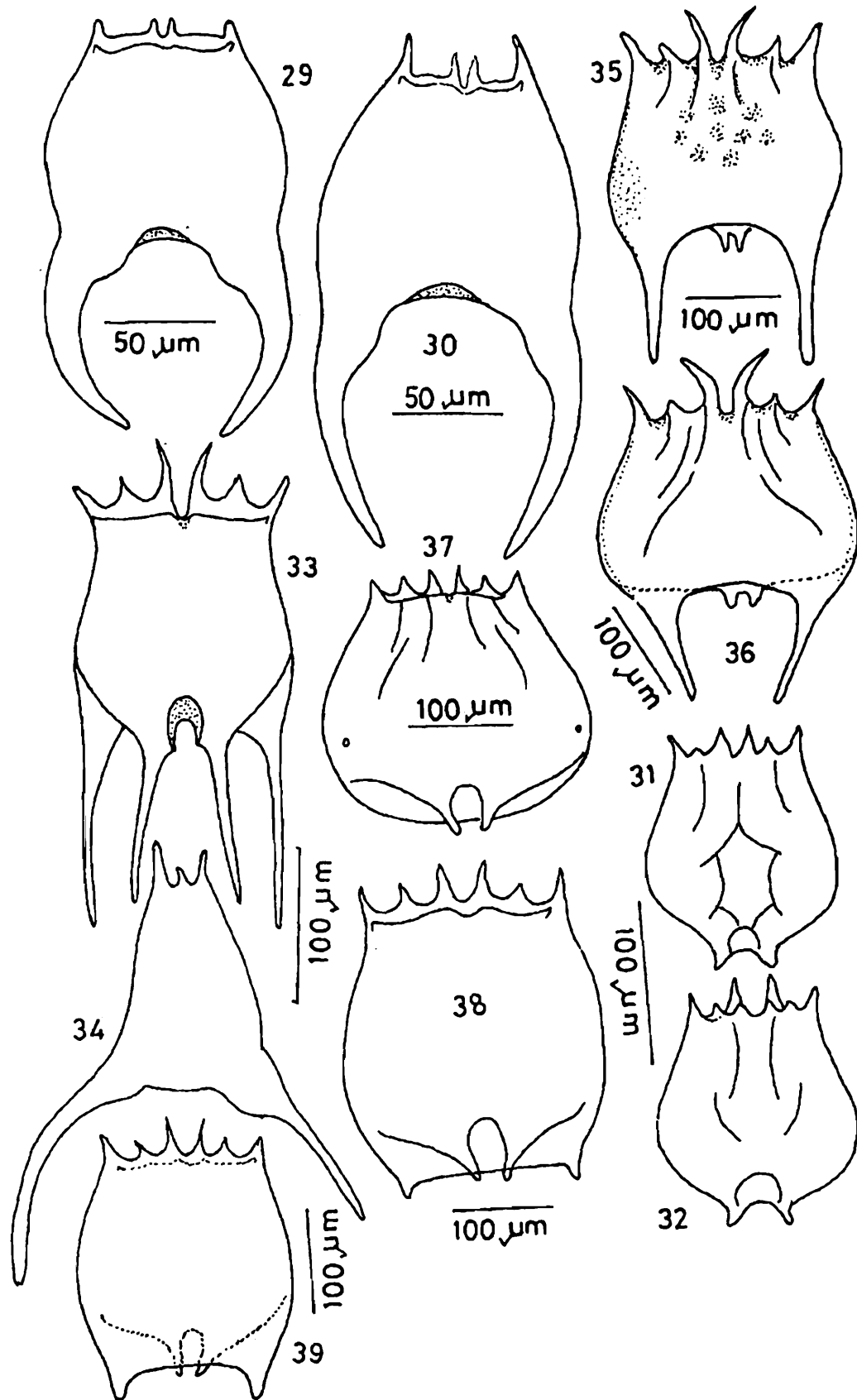
*Distribution* : INDIA - Assam, Meghalaya, Tripura, West Bengal and Orissa.

*Elsewhere* : Pantropical.

16. *Brachionus quadridentatus* Hermann, 1783

(Figs. 35-39)

*Material examined* : 3 examples, Bhoispuri, 12. 03. 2003, coll. B. K. Sharma; 3 examples, Barundanga, 03. 05. 2002, coll. B. K. Sharma; 2 examples, Hakama, 11. 07. 2004, coll. B. K. Sharma; 2 examples, Horinchora, 03. 03. 2004, coll. B. K. Sharma; 5 examples, Dhir, 11. 03. 2003, coll. B. K. Sharma; 5 examples, Fingua, 13. 02. 2002, coll. B. K. Sharma; 2 examples, Sagmara, 10. 08. 2002, coll. B. K. Sharma; 3 examples, Kamakhya, 13. 03. 2003, coll. B. K. Sharma; 3 examples, Rowmari, 07. 05. 2002, coll. B. K. Sharma; 6 examples, Deepor, 12. 09. 2002, coll. B. K. Sharma; 5 examples, Dighali, 08. 05. 2002, coll. B. K. Sharma; 2 examples, Borbila, 13. 08. 2002, coll. B. K. Sharma; 3 examples, Siligurijan, 09. 05. 2002, coll. B. K. Sharma; 3 examples, Ghorajan, 07. 05. 2002, coll. B. K. Sharma; 3 examples, Akhepeti, 11. 09. 2004, coll. B. K. Sharma; 3 examples, Padma, 09. 05. 2004, coll.



*Brachionus forficula* Wierzejski : Figs. 29-30, ventral views; *B. kostei* Shiel : Fig. 31, dorsal view, Fig. 32, ventral view; *B. mirabilis* Daday : Fig. 33, ventral view, Fig. 34, lateral view; *B. quadridentatus* Hermann : Figs. 35-36, dorsal views; *B. quadridentatus cluniorbicularis* (Skorikov) : Fig. 37, ventral view; *B. quadridentatus brevispinus* (Ehrenberg) : Fig. 38, ventral view; *B. quadridentatus rhenanus* (Lauterborn) : Fig. 39, ventral view.

B. K. Sharma; 2 examples, Solmari, 05. 04. 2005, coll. Sumita Sharma; 3 examples, Haduk, 05. 04. 2005, coll. Sumita Sharma; 3 examples, Sitalmari, 05. 04. 2005, coll. Sumita Sharma; 2 examples, Duptoli, 05. 04. 2005, coll. Sumita Sharma; 3 examples, Dholi, 05. 04. 2005, coll. Sumita Sharma; 3 examples, Kanduli, 05. 04. 2005, coll. Sumita Sharma; 2 examples, Ghorkhonjan, 05. 04. 2005, coll. Sumita Sharma; 3 examples, Padmakhua, 01. 09. 2006, coll. Sumita Sharma; 2 examples, Mohna, 03. 09. 2006, coll. Sumita Sharma; 3 examples, Mihir, 05. 09. 2006, coll. Sumita Sharma; 2 examples, Daphlang, 05. 09. 2006, coll. Sumita Sharma; 3 examples, Deopani, 06. 09. 2006, coll. Sumita Sharma; 3 examples, Moona, 06. 09. 2006, coll. Sumita Sharma; 2 examples, Shitalpathar, 01. 12. 2005, coll. Sumita Sharma; 3 examples, Demon, 01. 12. 2005, coll. Sumita Sharma; 3 examples, Kololua, 29. 11. 2005, coll. Sumita Sharma; 2 examples, Diang, 01. 12. 2005, coll. Sumita Sharma; 5 examples, Memdubi, 30. 11. 2005, coll. Sumita Sharma; 3 examples, Raidong, 30. 11. 2005, coll. Sumita Sharma; 3 examples, Senijan, 07. 07. 2002, coll. B. K. Sharma; 5 examples, Samuajan, 11. 06. 2004, coll. B. K. Sharma; 2 examples, Puwa Saikia, 10. 06. 2004, coll. B. K. Sharma; 3 examples, Sone, 08. 08. 2004, coll. B. K. Sharma; 3 examples, Salchakra, 08. 08. 2004, coll. B. K. Sharma; 2 examples, Baskandi, 08. 08. 2004, coll. B. K. Sharma.

*Characters* : Lorica rigid, stippled and moderately compressed dorso-ventrally. Anterior margin with six occipital spines; median occipital spines longest and ventrally curved, laterals longer than intermediates. Postero-lateral spines well developed. Ventro-posterior spines prolonged to form a foot sheath around the retractile foot.

Besides typical specimens, this species is represented by specimens belonging to *B. quadridentatus cluniorbicularis* (Skorikov, 1894), *B. quadridentatus brevispinus* (Ehrenberg, 1832) and *B. quadridentatus rhenanus* (Lauterborn, 1893).

*Distribution* : INDIA-Assam, Meghalaya, Tripura, West Bengal, Orissa, Bihar, Andhra Pradesh, Madhya Pradesh, Kerala, Rajasthan, Punjab and Kashmir.

*Elsewhere* : Cosmopolitan.

### 17. *Brachionus rubens* Ehrenberg, 1838 (Figs. 40-41)

*Material examined* : 6 examples, Fingua, 10. 08. 2002, coll. B. K. Sharma; 3 examples, Jogra, 06. 05. 2002, coll. B. K. Sharma; 3 examples, Sagmara, 13. 02. 2002, coll. B. K. Sharma; 3 examples, Kamakhya, 13. 03. 2003, coll. B. K. Sharma; 2 examples, Kamranga, 04. 03. 2004, coll. B. K. Sharma; 7 examples, Deepor, 04. 03. 2004, coll. B. K. Sharma; 5 examples, Dighali, 14. 03. 2003, coll. B. K. Sharma; 3 examples, Ghorajan, 04. 03. 2004, coll. B. K. Sharma; 3 examples, Siligurijan, 09. 05. 2002, coll. B. K. Sharma; 2 examples, Chatla, 13. 07. 2004, coll. B. K. Sharma; 3 examples, Hiragota, 13. 07. 2004, coll. B. K. Sharma; 2 examples, Urmal, 13. 07. 2004, coll. B. K. Sharma; 3 examples, Padma, 06. 03. 2004, coll. B. K. Sharma; 2 examples, Basana, 03. 09. 2006, coll. Sumita Sharma; 4 examples, Goranga, 01. 09. 2006, coll. Sumita Sharma; 3 examples, Mori, 03. 09. 2006, coll. Sumita

Sharma; 4 examples, Thekera, 03. 12. 2005, 2 examples, Demon, 03. 12. 2005, coll. Sumita Sharma; 2 examples, Bor beel, 01. 12. 2005, coll. Sumita Sharma; 3 examples, Balak, 01. 03. 2004, coll. B. K. Sharma; 6 examples, Samuajan, 09. 06. 2004, coll. B. K. Sharma; 5 examples, Sone, 19. 10. 2004, coll. B. K. Sharma.

*Characters* : Lorica oval and compressed dorso-ventrally; occipital margin with six spines; median and intermediate occipital spines with peculiar asymmetrical shape each spine showing a narrow anterior part, then rounding outwards and forming a broad base; median occipitals somewhat longer than others. Four inner occipital spines with short strengthening ridges.

*Distribution* : INDIA - Assam, Meghalaya, Tripura, West Bengal, Orissa, Punjab, Haryana and Rajasthan.

*Elsewhere* : Cosmopolitan.

### Genus *Keratella* Bory de St.Vincent, 1822

*Characters* : Lorica consists of a dorsal and a ventral plate; dorsal plate with characteristic facets and more or less distinctly granulated. Occipital margin with four or six spines. Posterior spines often present, one or two; single posterior spines usually median.

Seven species of *Keratella* are documented from the floodplain lakes of Assam.

#### 18. *Keratella cochlearis* (Gosse, 1851)

(Fig. 42)

*Material examined* : 8 examples, Bhoispuri, 12. 03. 2003, coll. B. K. Sharma; 5 examples, Barundanga, 12. 03. 2003, coll. B. K. Sharma; 5 examples, Hakama, 07. 02. 2005, coll. B. K. Sharma; 3 examples, Horinchora, 08. 09. 2004, coll. B. K. Sharma; 6 examples, Dhir, 11. 03. 2003, coll. B. K. Sharma; 5 examples, Fingua, 12. 03. 2003, coll. B. K. Sharma; 3 examples, Jogra, 12. 03. 2003, coll. B. K. Sharma; 3 examples, Sagmara, 11. 03. 2003, coll. B. K. Sharma; 5 examples, Kamakhya, 13. 03. 2003, coll. B. K. Sharma; 5 examples, Rowmari, 13. 03. 2003, coll. B. K. Sharma; 9 examples, Deepor, 12. 08. 2002, coll. B. K. Sharma; 6 examples, Dighali, 12. 08. 2002, coll. B. K. Sharma; 3 examples, Borbila, 13. 08. 2002, coll. B. K. Sharma; 5 examples, Siligurijan, 13. 08. 2002, coll. B. K. Sharma; 3 examples, Ghorajan, 07. 05. 2004, coll. B. K. Sharma; 3 examples, Kamranga, 04. 03. 2004, coll. B. K. Sharma; 5 examples, Akhepeti, 11. 09. 2004, coll. B. K. Sharma; 4 examples, Kakerikhola, 14. 07. 2004, coll. B. K. Sharma; 3 examples, Padma, 14. 07. 2004, coll. B. K. Sharma; 6 examples, Solmari, 01. 09. 2006, coll. Sumita Sharma; 5 examples, Haduk, 01. 09. 2006, coll. Sumita Sharma; 3 examples, Sitalmari, 01. 09. 2006, coll. Sumita Sharma; 5 examples, Goranga, 01. 09. 2006, coll. Sumita Sharma; 3 examples, Duptoli, 01. 09. 2006, coll. Sumita Sharma; 3 examples, Dholi, 01. 09. 2006, coll. Sumita Sharma; 2 examples, Kanduli, 01. 09. 2006, coll. Sumita Sharma; 3 examples, Ghorkhonjan, 08. 07. 2002, coll. Sumita Sharma; 5 examples, Padmakhua, 01. 09. 2006, coll. Sumita Sharma; 4 examples,

Mohna, 03. 09. 2006, coll. Sumita Sharma; 3 examples, Dubratoli, 01. 09. 2006, coll. Sumita Sharma; 5 examples, Sarang, 01. 09. 2006, coll. Sumita Sharma; 3 examples, Bandha, 03. 09. 2006, coll. Sumita Sharma; 3 examples, Mihir, 05. 09. 2006, coll. Sumita Sharma; 3 examples, Bhoismari, 05. 09. 2006, coll. Sumita Sharma; 5 examples, Daphlang, 05. 09. 2006, coll. Sumita Sharma; 4 examples, Deopani, 06. 09. 2006, coll. Sumita Sharma; 3 examples, Moona, 06. 09. 2006, coll. Sumita Sharma; 5 examples, Shitalpathar, 01. 12. 2005, coll. Sumita Sharma; 3 examples, Demon, 01. 12. 2005, coll. Sumita Sharma; 3 examples, Mona, 01. 12. 2005, coll. Sumita Sharma; 6 examples, Kololua, 29. 11. 2005, coll. Sumita Sharma; 5 examples, Diang, 01. 12. 2005, coll. Sumita Sharma; 7 examples, Memdubi, 30. 11. 2005, coll. Sumita Sharma; 5 examples, Raidong, 30. 11. 2005, coll. Sumita Sharma; 3 examples, Dhekia, 09. 06. 2002, coll. B. K. Sharma; 5 examples, Butikor, 02. 03. 2004, coll. B. K. Sharma; 3 examples, Senijan, 09. 06. 2004, coll. B. K. Sharma; 8 examples, Samuajan, 11. 06. 2004, coll. B. K. Sharma; 5 examples, Puwa Saikia, 11. 06. 2004, coll. B. K. Sharma; 5 examples, Sone, 08. 08. 2004, coll. B. K. Sharma; 3 examples, Salchapra, 08. 08. 2004, coll. B. K. Sharma; 5 examples, Baskandi, 19. 10. 2004, coll. B. K. Sharma.

**Characters** : Lorica elongated-oval, finely stippled and with a median posterior spine of variable length. Anterior margin with six occipital spines; medians longest and ventrally curved, intermediates usually divergent and shorter than laterals. Dorsal plate with a median longitudinal line extending from behind median frontal area; two enclosed plaques on either side of the median line, with two enclosed lateral polygons.

**Distribution** : INDIA - Assam, Meghalaya, Tripura, West Bengal, Orissa, Kerala, Kashmir, Ladak, Punjab and Rajasthan.

**Elsewhere** : Cosmopolitan.

#### 19. *Keratella edmondsoni* Ahlstrom, 1943

(Fig. 43)

**Material examined** : 4 examples, Dhir, 05. 05. 2002, coll. B. K. Sharma; 3 examples, Amuri, 01. 09. 2006, coll. Sumita Sharma.

**Characters** : Lorica elongated, granulated; with six anterior occipital spines, median occipitals longest and curved. Dorsal plate of lorica with characteristic pattern of carinal plaques on dorsum. Posterior spines equal and divergent spines.

**Distribution** : INDIA - Assam, Rajasthan and Orissa.

**Elsewhere** : Oriental region.

#### 20. *Keratella javana* Hauer, 1937

(Fig. 44)

**Material examined** : 5 examples, Bhoispuri, 03. 05. 2002, coll. B. K. Sharma.

*Characters* : Lorica elongate-oval, finely stippled and with six long and thin occipital spines; median occipitals longest and out-curved. Dorsal plate with asymmetrical arrangement of facets; anterior median plaque divided in two asymmetrical pentagonal facets. Posterior spine single and slightly dorsally directed.

*Distribution* : INDIA - Assam, Meghalaya and Tripura.

*Elsewhere* : Palaeotropical.

### 21. *Keratella lenzi* Hauer, 1953

(Fig. 45)

*Material examined* : 2 examples, Barundanga, 03.05.2002, coll. B. K. Sharma; 3 examples, Horinchora, 11. 07. 2004, coll. B. K. Sharma; 6 examples, Dhir, 05. 05. 2002, coll. B. K. Sharma; 3 examples, Sagmara, 06. 05. 2002, coll. B. K. Sharma; 4 examples, Kamakhya, 11. 08. 2002, coll. B. K. Sharma; 2 examples, Rowmari, 07. 05. 2002, coll. B. K. Sharma; 7 examples, Deepor, 12. 08, 2002, coll. B. K. Sharma; 5 examples, Deepor, 12. 07. 2004, coll. B. K. Sharma; 5 examples, Dighali, 08. 05. 2002, coll. B. K. Sharma; 5 examples, Ghorajan, 04. 03. 2004, coll. B. K. Sharma; Kakerikhola, 09. 05. 2004, coll. B. K. Sharma; 3 examples, Chatla, 14. 07. 2004, coll. B. K. Sharma; 2 examples, Hiragota, 08. 05. 2004, coll. B. K. Sharma; 2 examples, Borbila, 15. 03. 2003, coll. B. K. Sharma; 3 examples, Siligurijan, 09. 05. 2002, coll. B. K. Sharma; 4 examples, Jugdal, 01. 09. 2006, coll. Sumita Sharma; 3 examples, Bamoni, 01. 09. 2006, coll. Sumita Sharma; 2 examples, Basana, 03. 09. 2006, coll. Sumita Sharma; 5 examples, Mori, 05. 04. 2005, coll. Sumita Sharma; 3 examples, Bandha, 03. 09. 2006, coll. Sumita Sharma; 2 examples, Daphlang, 05. 09. 2006, coll. Sumita Sharma; 2 examples, Japara, 01. 12. 2005, coll. Sumita Sharma; 3 examples, Diphlu, 06. 09. 2006, coll. Sumita Sharma; 7 examples, Samuajan, 11. 06. 2004, coll. B. K. Sharma; 3 examples, Sone, 08. 08. 2004, coll. B. K. Sharma.

*Characters* : Lorica oval, rounded posteriorly and without any posterior spine. Anterior occipital margin with six spines; medians longest, sickle-shaped and ventrally curved. Dorsal plate with three median plaques, the ultimate plaque elongated and its arms running towards the posterior margin in form of a divergent crest.

*Distribution* : INDIA - Assam, Meghalaya, Tripura, West Bengal, Orissa and Punjab.

*Elsewhere* : Pantropical.

### 22. *Keratella procurva* (Thorpe, 1891)

(Fig. 46)

*Material examined* : 2 examples, Barundanga, 12. 03. 2003, coll. B. K. Sharma; 3 examples, Horinchora, 07. 02. 2003, coll. B. K. Sharma; 3 examples, Dhir, 10. 12. 2002, coll. B. K. Sharma; 2 examples, Sagmara, 11. 03. 2003, coll. B. K. Sharma; 2 examples, Rowmari, 12. 12. 2002, coll. B. K. Sharma; 5 examples, Deepor, 09. 09. 2004, coll. B. K. Sharma; 2

examples, Borbila, 15. 03. 2003, coll. B. K. Sharma; 2 examples, Hiragota, 10. 09. 2004, coll. B. K. Sharma; 4 examples, Bamoni, 01. 09. 2006, coll. Sumita Sharma; 3 examples, Solmari, 01. 09. 2006, coll. Sumita Sharma; 3 examples, Thekera, 08. 11. 2004, coll. B. K. Sharma.

**Characters** : Lorica firm, finely stippled and compressed dorso-ventrally. Dorsal plate of lorica with three median plaques; posterior most plaque pentagonal and terminating in a short median line extending up to posterior margin of lorica. Posterior spines small, sub-equal and parallel or slightly divergent; widely separated at their bases.

**Distribution** : INDIA - Assam, West Bengal, Orissa, Kerala, Kashmir and Ladak.

**Elsewhere** : Pantropical.

### 23. *Keratella quadrata* (O. F. Müller, 1786)

(Fig. 47)

**Material examined** : 3 examples, Bhoispuri, 08. 08. 2002, coll. B. K. Sharma; 4 examples, Dhir, 11. 03. 2003, coll. B. K. Sharma; 5 examples, Deepor, 12. 07. 2004, coll. B. K. Sharma; 2 examples, Siligurijan, 13. 08. 2002, coll. B. K. Sharma.

**Characters** : Lorica almost rectangular in outline; with six occipital spines, medians longest and curved. Dorsal plate of lorica with three median hexagonal plaques behind anterior median area; lateral plaques arranged symmetrically on either side of median plaques. Posterior spines long, sub equal, widely separated at their base and parallel or divergent.

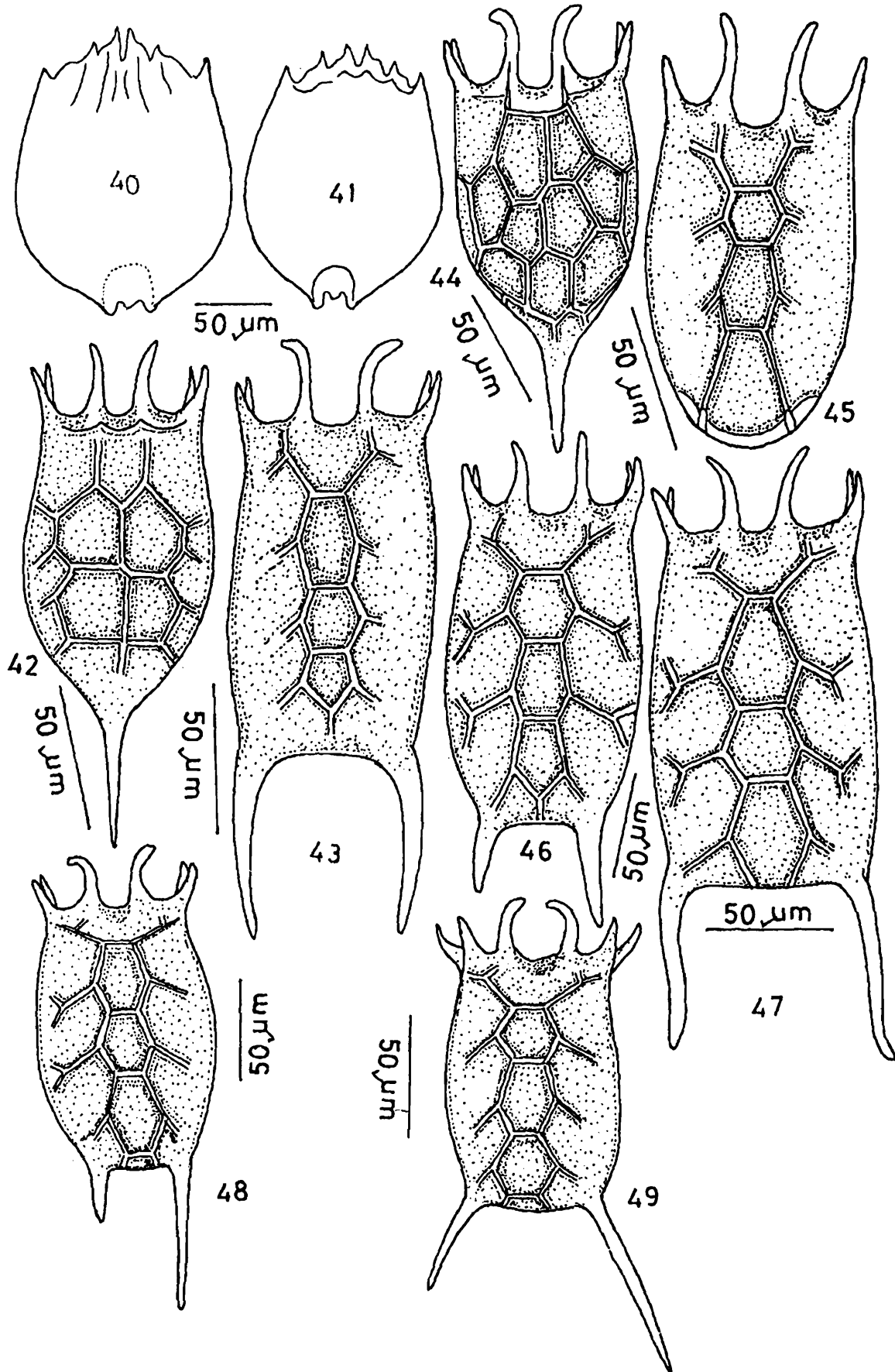
**Distribution** : INDIA - Assam, West Bengal, Tamil Nadu, Kerala, Kashmir and Ladak.

**Elsewhere** : Cosmopolitan.

### 24. *Keratella tropica* (Apstein, 1907)

(Figs. 48-49)

**Material examined** : 10 examples, Bhoispuri, 12. 03. 2003, coll. B. K. Sharma; 5 examples, Barundanga, 4. 12. 2002, coll. B. K. Sharma; 5 examples, Hakama, 07. 02. 2005, coll. B. K. Sharma; 4 examples, Horinchora, 08. 08. 2004, coll. B. K. Sharma; 9 examples, Dhir, 10. 12. 2002, coll. B. K. Sharma; 3 examples, Fingua, 10. 08. 2002, coll. B. K. Sharma; 3 examples, Sagmara, 11. 03. 2003, coll. B. K. Sharma; 5 examples, Kamakhya, 13. 03. 2005, coll. B. K. Sharma; 5 examples, Rowmari, 12. 12. 2002, coll. B. K. Sharma; 10 examples, Deepor, 12. 08. 2002, coll. B. K. Sharma; 10 examples, Deepor, 12. 07. 2004, coll. B. K. Sharma; 9 examples, Deepor, 06. 04. 2005, coll. Sumita Sharma; 5 examples, Dighali, 06. 04. 2005, coll. Sumita Sharma; 5 examples, Siligurijan, 09. 05. 2002, coll. B. K. Sharma; 10 examples, Ghorajan, 12. 07. 2004, coll. B. K. Sharma; 5 examples, Kamranga, 15. 02. 2002, coll. B. K. Sharma; 2 examples, Akhepeti, 11. 09. 2004, coll. B. K. Sharma; 5 examples, Kakerikhola, 05. 11. 2004, coll. B. K. Sharma; 5 examples, Solmari, 05. 04. 2005, coll. Sumita Sharma; 5 examples, Haduk, 01. 09. 2006, coll. Sumita Sharma; 5 examples, Sitalmari, 01. 09. 2006,



*Brachionus rubens* Ehrenberg : Fig. 40, dorsal view, Fig. 41, ventral view; *Keratella cochlearis* Gosse : Fig. 42, dorsal view; *K. edmondsoni* Ahlstrom : Fig. 43, dorsal view; *K. javana* Hauer : Fig. 44, dorsal view; *K. lenzi* Hauer : Fig. 45, dorsal view; *K. procurva* (Thorpe) : Fig. 46, dorsal view; *K. quadrata* (O. F. Müller) : Fig. 47, dorsal view; *K. tropica* (Apstein) : Figs. 48-49, dorsal views.

coll. Sumita Sharma; 4 examples, Goranga, 01. 09. 2006, coll. Sumita Sharma; 3 examples, Duptoli, 01. 09. 2006, coll. Sumita Sharma; 5 examples, Kanduli, 01. 09. 2006, coll. Sumita Sharma; 3 examples, Padmakhua, 01. 09. 2006, coll. Sumita Sharma; 2 examples, Mohna, 03. 09. 2006, coll. Sumita Sharma; 6 examples, Mihir, 05. 09. 2006, coll. Sumita Sharma; 5 examples, Bhoismari, 01. 12. 2005, coll. Sumita Sharma; 3 examples, Daphlang, 02. 12. 2005, coll. Sumita Sharma; 4 examples, Deopani, 02. 12. 2005, coll. Sumita Sharma; 4 examples, Shitalpathar, 02. 12. 2005, coll. Sumita Sharma; 3 examples, Demon, 01. 12. 2005, coll. Sumita Sharma; 3 examples, Kololua, 29. 11. 2005, coll. Sumita Sharma; 4 examples, Diang, 01. 12. 2005, coll. Sumita Sharma; 7 examples, Memdubi, 30. 11. 2005, coll. Sumita Sharma; 4 examples, Raidong, 30. 11. 2005, coll. Sumita Sharma; 9 examples, Samuajan, 10. 02. 2005, coll. B. K. Sharma; 5 examples, Puwa Saikia, 10. 06. 2004, coll. B. K. Sharma; 5 examples, Sone, 19. 10. 2004, coll. B. K. Sharma; 3 examples, Baskandi, 09. 02. 2005, coll. B. K. Sharma.

*Characters* : Lorica elongate-oval, stippled and with six occipital spines; medians occipitals longest, pointed and outcurved. Dorsal plate with three median hexagonal plaques and a small (squarish) area between the last median plaque and the posterior margin of lorica. Posterior spines unequal and variable in length; the right spine generally longer than the left.

*Distribution* : INDIA - Assam, Meghalaya, Tripura, West Bengal, Bihar, Orissa, Andhra Pradesh, Madhya Pradesh, Kerala, Gujarat, Rajasthan, Punjab, Haryana, Kashmir and Ladak.

*Elsewhere* : Cosmopolitan.

#### Genus *Platyias* Haring, 1913

*Characters* : Lorica somewhat compressed dorso-ventrally, separated into a dorsal and a ventral plate. Anterior and posterior margins of lorica with two spines each. Mental margin variable. Foot jointed and retractile, foot-opening located in ventral plate; toes two.

Represented by two species in the material examined from Assam.

#### 25. *Platyias leloupi* (Gillard, 1967)

(Fig. 50)

*Material examined* : 2 examples, Barundanga, 07. 01. 2003, coll. B. K. Sharma; 3 examples, 06. 05. 2004, Bandha, coll. B. K. Sharma.

*Characters* : Lorica broadly circular in outline, rigid, granulated and moderately compressed dorso-centrally. Anterior dorsal margin with two blunt spines, posterior end with two long and parallel spines. Dorsum with distinct keel under the triangular frontal dorsal plaque.

*Distribution* : INDIA Assam and Tamil Nadu.

*Elsewhere* : Tropicopolitan.

26. *Platyias quadricornis* (Ehrenberg, 1832)

(Fig. 51)

*Material examined* : 3 examples, Bhoispuri, 12. 03. 2003, coll. B. K. Sharma; 2 examples, Hakama, 12. 03. 2003, coll. B. K. Sharma; 5 examples, Dhir, 05. 05. 2002, coll. B. K. Sharma; 2 examples, Fingua, 10. 08. 2002, coll. B. K. Sharma; 3 examples, Kamakhya, 10. 12. 2002, coll. B. K. Sharma; 3 examples, 07. 05. 2002, Rowmari, coll. B. K. Sharma; 6 examples, Deepor, 11. 07, 2004, coll. B. K. Sharma; 5 examples, Dighali, 12. 08, 2002, coll. B. K. Sharma; 2 examples, Dighali, 06. 04. 2005, coll. Sumita. Sharma; 3 examples, Siligurijan, 13. 08. 2002, coll. B. K. Sharma; 4 examples, Ghorajan, 12. 07. 2004, coll. B. K. Sharma; 2 examples, Ghorajan, 06. 04. 2005, coll. Sumita Sharma; 3 examples, Kamranga, 09. 09. 2004, coll. B. K. Sharma; 3 examples, Solmari, 01. 09. 2006, coll. Sumita Sharma; 3 examples, Haduk, 01. 09. 2006, coll. Sumita Sharma; 4 examples, Sitalmari, 01. 09. 2006, coll. Sumita Sharma; 2 examples, Goranga, 01. 09. 2006, coll. Sumita Sharma; 3 examples, Dholi, 05, 04, 2005, coll. Sumita Sharma; 2 examples, Kanduli, 01. 09. 2006, coll. Sumita Sharma; 3 examples, Padmakhua, 01. 09. 2006, coll. Sumita Sharma; 2 examples, Mihir, 05. 09. 2006, coll. Sumita Sharma; 3 examples, Bhoismari, 05. 09. 2006, coll. Sumita Sharma; 2 examples, Deopani, 06. 09. 2006, coll. Sumita Sharma; 2 examples, Moona, 06. 09. 2006, coll. Sumita Sharma; 3 examples, Shitalpathar, 01. 12. 2005, coll. Sumita Sharma; 3 examples, Demon, 01. 12. 2005, coll. Sumita Sharma; 2 examples, 29. 11. 2005, Kololua, coll. Sumita Sharma; 2 examples, Diang, 01. 12. 2005, coll. Sumita Sharma; 5 examples, Memdubi, 30. 11. 2005, coll. Sumita Sharma; 3 examples, Raidong, 30. 11. 2005, coll. Sumita Sharma; 3 examples, Senijan, 05. 04. 2005, coll. B. K. Sharma; 4 examples, Samuajan, 09. 06. 2004, coll. B. K. Sharma; 3 examples, Sone, 09. 02. 2005, coll. B. K. Sharma; 2 examples, Salchapra, 09. 02. 2005, coll. B. K. Sharma; 2 examples, Baskandi, 09. 02. 2005, coll. B. K. Sharma.

*Characters* : Lorica rigid, nearly circular, tuberculated and with a dorsal pattern of pentagonal facets. Occipital margin with two stout median spines, with bluntly rounded to nearly truncate tips. Posterior spines short and parallel.

*Distribution* : INDIA- Assam, Meghalaya, Tripura, West Bengal, Orissa, Bihar, Andhra Pradesh, Kerala, Rajasthan, Punjab, Haryana, Kashmir and Ladak.

*Elsewhere* : Cosmopolitan.

Genus *Plationus* Segers *et al.*, 1993

*Characters* : Lorica rigid, relatively high, with anterior and posterior spines, with or without a dorsal pattern of facets or plaques. Foot terminal, pseudo-segmented, bearing two equally long toes. Trophi malleate, with almost totally fused sub equal unci; proximal cavities of manubria close, anterior processes on rami present. Shaft of manubrium nearly straight. Eye present.

This genus is represented by only one species in the collections examined from the floodplain lakes of Assam.

27a. *Platyonus patulus* (O.F.Müller, 1786)  
(Figs. 52-53)

*Material examined* : 3 examples, Bhoispuri, 12. 03. 2003, coll. B. K. Sharma; 5 examples, Barundanga, 07. 02. 2003, coll. B. K. Sharma; 2 examples, Hakama, 07. 02. 2005, coll. B. K. Sharma; 3 examples, Horinchora, 02. 11. 2004, coll. B. K. Sharma; 3 examples, Jogra, 10. 12. 2002, coll. B. K. Sharma; 5 examples, Dhir, 11. 03. 2003, coll. B. K. Sharma; 3 examples, Kamakhya, 13. 03. 2003, coll. B. K. Sharma; 3 examples, Rowmari, 12. 12. 2002, coll. B. K. Sharma; 9 examples, Deepor, 08. 02. 2005, coll. B. K. Sharma; 3 examples, Dighali, 14. 03. 2003, coll. B. K. Sharma; 4 examples, Ghorajan, 08. 12. 2004, coll. B. K. Sharma; 2 examples, Urmal, 10. 02. 2005, coll. B. K. Sharma; 2 examples, Akhepeti, 10. 12. 2004, coll. B. K. Sharma; 3 examples, Kakerikhola, 05. 11. 2004, coll. B. K. Sharma; 5 examples, Padma, 11. 09. 2004, coll. B. K. Sharma; 3 examples, Solmari, 05. 04. 2005, coll. Sumita Sharma; 4 examples, Haduk, 01. 09. 2006, coll. Sumita Sharma; 5 examples, Sitalmari, 05. 04. 2005, coll. Sumita Sharma; 3 examples, Goranga, 05. 04. 2005, coll. Sumita Sharma; 2 examples, Duptoli, 05. 04. 2005, coll. Sumita Sharma; 3 examples, Dholi, 05. 04. 2005, coll. Sumita Sharma; 2 examples, Kanduli, 05. 04. 2005, coll. Sumita Sharma; 5 examples, Jugdal, 05. 04. 2005, coll. Sumita Sharma; 3 examples, Padmakhua, 01. 09. 2006, coll. Sumita Sharma; 2 examples, Mohna, 03. 09. 2006, coll. Sumita Sharma; 3 examples, Bandha, 03. 09. 2006, coll. Sumita Sharma; 4 examples, Mihir, 02. 12. 2005, coll. Sumita Sharma; 3 examples, Bhoismari, 2. 12. 2005, coll. Sumita Sharma; 3 examples, Daphlang, 05. 09. 2006, coll. Sumita Sharma; 2 examples, Deopani, 05. 09. 2006, coll. Sumita Sharma; 3 examples, Moona, 2. 12. 2005, coll. Sumita Sharma; 2 examples, Shitalpathar, 01. 12. 2005, coll. Sumita Sharma; 3 examples, Demon, 01. 12. 2005, coll. Sumita Sharma; 2 examples, Kololua, 29. 11. 2005, coll. Sumita Sharma; 5 examples, Diang, 01. 12. 2005, coll. Sumita Sharma; 3 examples, Memdubi, 30. 11. 2005, coll. Sumita Sharma; 4 examples, Raidong, 30. 11. 2005, coll. Sumita Sharma; 2 examples, Senijan, 17. 01. 2005, coll. B. K. Sharma; 5 examples, Samuajan, 18. 01. 2005, coll. B. K. Sharma; 2 examples, Puwa Saikia, 17. 02. 2005, coll. B. K. Sharma; 3 examples, Sone, 10. 10. 2004, coll. B. K. Sharma; 3 examples, Baskandi, 09. 02. 2005, coll. B. K. Sharma.

*Characters* : Lorica rigid, sub-rectangular and moderately compressed dorso-ventrally ; dorsum with reticulate areolations and with a pattern of cuticular ridges. Both occipital and mental margins with short, blunt spines. Posterior spines short and stout. Foot - opening flanked by asymmetrical spines.

*Distribution* : INDIA - Assam, Meghalaya, Tripura, West Bengal, Orissa, Andhra Pradesh, Gujarat, Tamil Nadu, Kerala, Rajasthan, Punjab and Kashmir.

*Elsewhere* : Cosmopolitan.

27b. *Plationus patulus macracanthus* (Daday, 1905)  
(Figs. 54-55)

*Material examined* : 3 examples, Dhir, 12. 02. 2002, coll. B. K. Sharma; 2 examples, Sagmara, 11. 03. 2003, coll. B. K. Sharma; 2 examples, Kamakhya, 12. 12. 2002, coll. B. K. Sharma; 2 examples, Rowmari, 13. 03. 2003, coll. B. K. Sharma; 6 examples, Deepor, 08. 02. 2005, coll. B. K. Sharma; 4 examples, Dighali, 11. 02. 2003, coll. B. K. Sharma; 2 examples, Borbila, 15. 03. 2003, coll. B. K. Sharma; 3 examples, Kamranga, 04. 03. 2004, coll. B. K. Sharma; 2 examples, Akhepeti, 11. 02. 2005, coll. B. K. Sharma; 3 examples, Kakerikhola, 05. 11. 2004, coll. B. K. Sharma; 2 examples, Solmari, 01. 09. 2006, coll. Sumita Sharma; 3 examples, Haduk, 01. 09. 2006, coll. Sumita Sharma; 2 examples, Sitalmari, 01. 09. 2006, coll. Sumita Sharma; 3 examples, Kanduli, 05. 04. 2005, coll. Sumita Sharma; 3 examples, Padmakhua, 01. 09. 2006, coll. Sumita Sharma; 2 examples, Bandha, 03. 09. 2006, coll. Sumita Sharma; 5 examples, Mihir, 02. 12. 2005, coll. Sumita Sharma; 3 examples, Bhoismari, 05. 09. 2006, coll. Sumita Sharma; 2 examples, Deopani, 06. 09. 2006, coll. Sumita Sharma; 3 examples, Demon, 01. 12. 2005, coll. Sumita Sharma; 2 examples, Mona, 01. 12. 2005, coll. Sumita Sharma; 3 examples, Kololua, 29. 11. 2005, coll. Sumita Sharma; 2 examples, Diang, 01. 12. 2005, coll. Sumita Sharma; 4 examples, Memdubi, 30. 11. 2005, coll. Sumita Sharma; 3 examples, Raidong, 30. 12. 2005, coll. Sumita Sharma; 3 examples, Dhekia, 18. 01. 2005, coll. B. K. Sharma; 5 examples, Samuajan, 18. 01. 2005, coll. B. K. Sharma; 2 examples, Naruathan, 04. 04. 2005, coll. B. K. Sharma; 4 examples, Sone, 11. 12. 2004, coll. B. K. Sharma; 3 examples, Salchapra, 09. 02. 2005, coll. B. K. Sharma.

*Characters* : Lorica rigid, sub-rectangular and moderately compressed dorso-ventrally. Posterior spines distinctly elongated. Foot-opening flanked by long, asymmetrical spines.

*Distribution* : INDIA- Assam, Meghalaya, Tripura, West Bengal and Orissa.

*Elsewhere* : Neotropics.

Family EIPHANIDAE Bartos, 1959

*Characters* : Body loricate; mouth in funnel-shaped buccal area. Foot not off-set from trunk except in *Epiphanes*.

This family is represented by only genus *Epiphanes* in the present study.

Genus *Epiphanes* Ehrenberg, 1832

*Characters* : Body conical, cylindrical or sacciform; toes short and with large foot-glands. Corona consists of short buccal area, circum-apical band and stiff cilia on apical-field; mouth in a funnel. Certain species show stiffened integument and reduction of foot.

This genus is represented by one species in the samples examined from the floodplain lakes of Assam.

28. *Epiphanes brachionus* (Ehrenberg, 1837)  
(Fig. 56)

**Material examined** : 3 examples, Hakama, 11. 07. 2004, coll. B. K. Sharma; 3 examples, 09. 09. 2004, Ghorajan, coll. B. K. Sharma; 3 examples, Chatla, 10. 09. 2004, coll. B. K. Sharma; 3 examples, Padma, 14. 07. 2004, coll. B. K. Sharma; 3 examples, Sitalmari, 01. 09. 2006, coll. Sumita Sharma.

**Characters** : Body sacciform, semi-loricate; integument soft. Foot distinct, with three pseudo-segments, toes short. Pseudo-lorica with short lateral spines (var. *spinosa* Rousselet, 1901) in some specimens.

**Distribution** : INDIA - Assam, Kashmir and Delhi.

**Elsewhere** : Cosmopolitan.

Family EUCHLANIDAE Bartos, 1959

**Characters** : Lorica thin or strong, dorsal and ventral plates bounded together by a thin membrane; with or without lateral sulci. Dorsal plate with or without longitudinal groove. Toes very long and baton-shaped or small blade-shaped. Trophi malleate.

The family Euchlanidae is represented by three genera in the collections examined from the floodplain lakes of Assam.

Genus *Beauchampiella* Remane, 1929

**Characters** : Lorica thin, pear-shaped, dorsally bulged and without any lateral sulcus. Toes very long and baton-shaped.

This genus is represented by only one species from Assam.

29. *Beauchampiella eudactylota* (Gosse, 1886)  
(Fig. 57)

**Material examined** : 2 examples, Bhoispuri, 03. 05. 2002, coll. B. K. Sharma; 2 examples, Barundanga, 12. 03. 2003, coll. B. K. Sharma; 2 examples, Hakama, 11. 07. 2004, coll. B. K. Sharma; 3 examples, Dhir, 11. 03. 2003, coll. B. K. Sharma; 2 examples, Fingua, 10. 08. 2002, coll. B. K. Sharma; 2 examples, Kamakhya, 13. 03. 2003, coll. B. K. Sharma; 3 examples, Deepor, 04. 03. 2004, coll. B. K. Sharma; 2 examples, Kamranga, 10. 02. 2005, coll. B. K. Sharma; 2 examples, Urmal, 05. 03. 2004, coll. B. K. Sharma; 2 examples, Akhepeti, 11. 02. 2005, coll. B. K. Sharma; 2 examples, Sitalmari, 05. 04. 2005, coll. Sumita Sharma; 2 examples, Duptoli, 01. 09. 2006, coll. Sumita Sharma; 2 examples, Dholi, 01. 09. 2006, coll. Sumita Sharma; 3 examples, Mihir, 05. 09. 2006, coll. Sumita Sharma; 2 examples, Bhoismari, 05. 09. 2006, coll. Sumita Sharma; 3 examples, Shitalpathar, 01. 12. 2005, coll. Sumita Sharma; 2 examples, Demon, 01. 12. 2005, coll. Sumita Sharma; 2 examples, Diang,

01. 12. 2005, coll. Sumita Sharma; 3 examples, Memdubi, 30. 11. 2005, coll. Sumita Sharma; 3 examples, Baskandi, 19. 10. 2004, coll. B. K. Sharma.

*Characters* : Body thin, transparent, pear-shaped and with a distinct dorsal bulge. Muscle bands supporting body and foot distinct. Foot two segmented; first foot-segment thick and stout, second segment elongated. Toes long, baton-shaped and slightly swollen near the tips.

*Distribution* : INDIA - Assam, Meghalaya, West Bengal, Orissa, Tripura, Bihar, Andhra Pradesh and Madhya Pradesh.

*Elsewhere* : Cosmopolitan.

### Genus *Euchlanis* Ehrenberg, 1832

*Characters* : Lorica thin, dorsal and ventral plates bounded by a thin membrane. Dorsal plate usually arched, with or without dorsal keel; ventral plate generally flat. Foot short, two-segmented; toes short and with pointed tips. Trophi modified malleate.

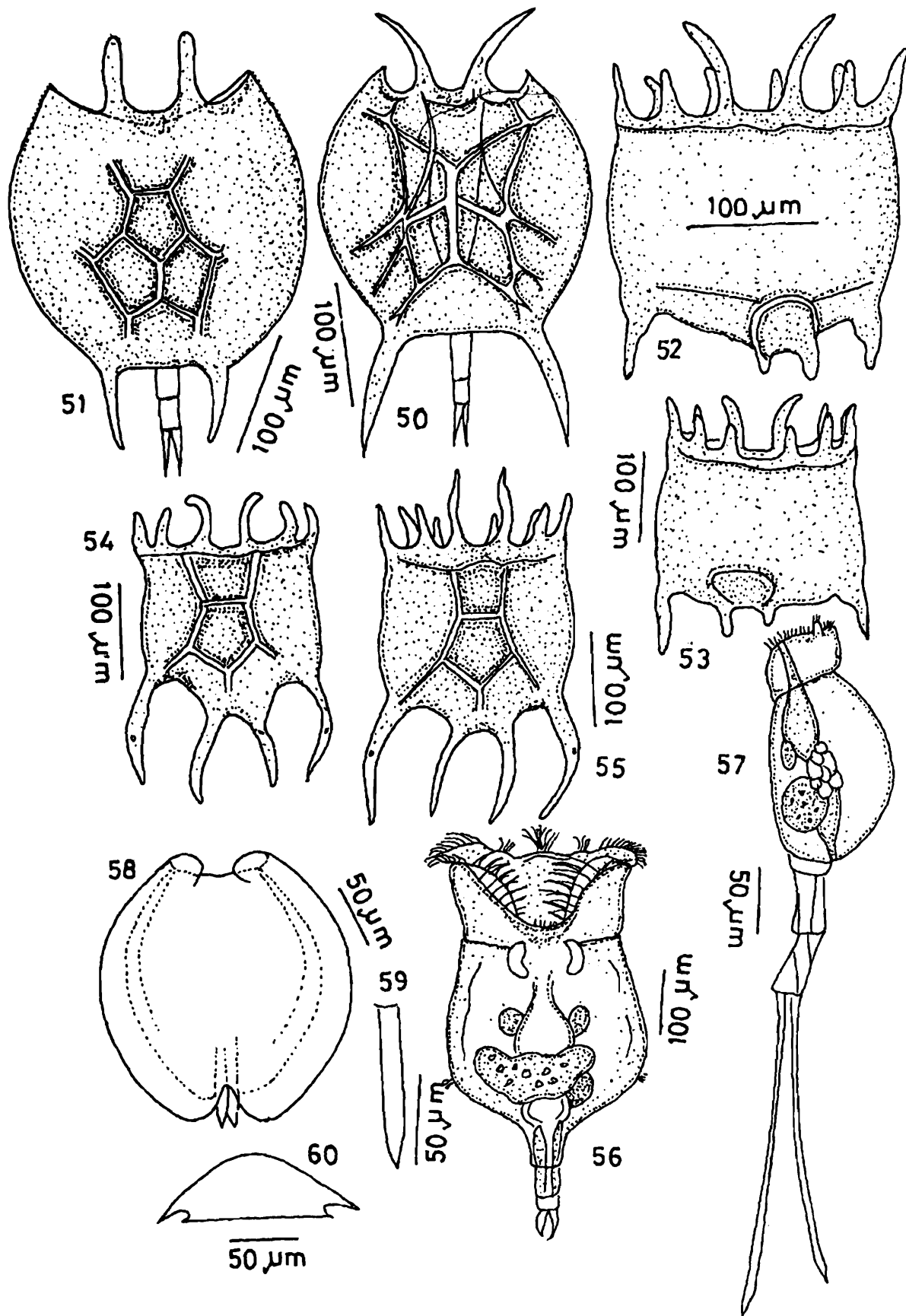
The genus *Euchlanis* is represented by four species in the present study.

### 30. *Euchlanis dilatata* Ehrenberg, 1832

(Figs. 58-60)

*Material examined* : 4 examples, Bhoispuri, 08. 08. 2002, coll. B. K. Sharma; 2 examples, Barundanga, 09. 12. 2002, coll. B. K. Sharma; 3 examples, Horinchora, 08. 09. 2004, coll. B. K. Sharma; 3 examples, Sagmara, 11. 12. 2002, coll. B. K. Sharma; 4 examples, Kamakhya, 11. 08. 2002, coll. B. K. Sharma; 3 examples, Deepor, 08. 02. 2005, coll. B. K. Sharma; 2 examples, Borbila, 16. 02. 2002, coll. B. K. Sharma; 3 examples, Siligurijan, 12. 02. 2003, coll. B. K. Sharma; 4 examples, Ghorajan, 08. 12. 2004, coll. B. K. Sharma; 2 examples, Kamranga, 10. 02. 2005, coll. B. K. Sharma; 2 examples, Urmal, 05. 03. 2004, coll. B. K. Sharma; 3 examples, Solmari, 05. 04. 2005, coll. Sumita Sharma; 2 examples, Haduk, 05. 04. 2005, coll. Sumita Sharma; 3 examples, Goranga, 05. 04. 2005, coll. Sumita Sharma; 2 examples, Duptoli, , 05. 04. 2005, coll. Sumita Sharma; 3 examples, Dholi, 01. 09. 2006, coll. Sumita Sharma; 2 examples, Kanduli, 05. 04. 2005, coll. Sumita Sharma; 2 examples, 05. 03. 2005, Ghorkhonjan, coll. Sumita Sharma; 2 examples, Deopani, 02. 12. 2005, coll. Sumita Sharma; 2 examples, Shitalpathar, 01. 12. 2005, coll. Sumita Sharma; 2 examples, Demon, 01. 12. 2005, coll. Sumita Sharma; 3 examples, Diang, 01. 12. 2005, coll. Sumita Sharma; 3 examples, Memdubi, 30. 11. 2005, coll. Sumita Sharma; 2 examples, Raidong, 30. 11. 2005, coll. Sumita Sharma; 2 examples, Dhekia, 18. 02. 2005, coll. B. K. Sharma; 3 examples, Sone, 19. 10. 2004, coll. B. K. Sharma; 3 examples, Baskandi, 19. 10. 2004, coll. B. K. Sharma.

*Characters* : Lorica oval, truncate anteriorly and rounded posteriorly. Dorsal plate arched and with a shallow notch at its posterior end. Ventral plate flat, smaller and narrower than dorsal plate. Toes parallel-sided and with pointed tips.



*Platyas leloupi* (Gillard) : Fig. 50, dorsal view; *P. quadricornis* (Ehrenberg) : Fig. 51, dorsal view; *Plationus patulus* (O.F. Müller) : Fig. 52, dorsal view, Fig. 53, ventral view; *P. patulus macracanthus* (Daday) : Figs. 54-55, dorsal views; *Epiphanes brachionus* (Ehrenberg): Fig. 56, ventral view; *Beauchampiella eudactylota* (Gosse) : Fig. 57, lateral view; *Euchlanis dilatata* Ehrenberg : Fig. 58, dorsal view, Fig. 59, toe; Fig. 60, cross-section.

*Distribution* : INDIA- Assam, Meghalaya, Tripura, West Bengal, Orissa, Bihar, Gujarat, Punjab, Ladak and Kashmir.

*Elsewhere* : Cosmopolitan.

31. *Euchlanis incisa* Carlin, 1939

(Figs. 61-63)

*Material examined* : 2 examples, Horinchora, 11. 07. 2004, coll. B. K. Sharma; 3 examples, Dhir, 11. 03. 2003, coll. B. K. Sharma; 2 examples, Kamakhya, 13. 03. 2003, coll. B. K. Sharma; 4 examples, Deepor, 03. 11. 2004, coll. B. K. Sharma; 2 examples, Chatla, 10. 09. 2004, coll. B. K. Sharma; 3 examples, Solmari, 09. 09. 2004, coll. B. K. Sharma; 3 examples, Thekera, 08. 11. 2004, coll. B. K. Sharma.

*Characters* : Lorica oval, triangular in cross-section, truncate anteriorly and rounded posteriorly. Dorsal plate extending laterally, with a V-shaped notch at posterior end and with a median keel extending from anterior to its posterior end. Ventral plate flat, smaller than dorsal plate. Toes slender, rod-like and with pointed tips.

*Distribution* : INDIA Assam and West Bengal.

*Elsewhere* : Cosmopolitan.

32. *Euchlanis oropha* Gosse, 1887

(Figs. 64-66)

*Material examined* : 2 examples, Barundanga, 11. 02. 2002, coll. B. K. Sharma; 2 examples, Hakama, 03. 03. 2004, coll. B. K. Sharma; 3 examples, Ghorajan, 10. 02. 2005, coll. B. K. Sharma; 2 examples, Siligurijan, 09. 05. 2002, coll. B. K. Sharma; 2 examples, Basana, 03. 09. 2006, coll. Sumita Sharma; 2 examples, Kujibalipatty, 14. 03. 2003, coll. B. K. Sharma.

*Characters* : Lorica ovoid; dorsal plate uniformly arched, longer than ventral plate and with a deep notch at its posterior end. Ventral plate flat and narrower than dorsal plate. Toes short, stout and spindle-shaped.

*Distribution* : INDIA Assam, West Bengal and Andhra Pradesh.

*Elsewhere* : Cosmopolitan.

33. *Euchlanis triquetra* Ehrenberg, 1838

(Figs. 67-69)

*Material examined* : 2 examples, Barundanga, 07. 01. 2003, coll. B. K. Sharma; 4 examples, Deepor, 03.11.2004, coll. B. K. Sharma; 3 examples, Dighali, 14. 03. 2003, coll. B. K. Sharma; 2 examples, Bandha, 03.09.2006, coll. Sumita Sharma; 2 examples, Goranga, 10.02.2005, coll. B. K. Sharma; 2 examples, Daphlang, 05.09.2006, coll. Sumita Sharma; 3 examples, Samuajan, 10.01.2005, coll. B. K. Sharma; 2 examples, Baskandi, 03.01.2004, coll. B. K. Sharma.

*Characters* : Lorica elliptical, truncate posteriorly and with lateral flanges; with a strong dorsal keel extending from anterior to posterior end of lorica. Dorsal plate longer than ventral plate. Toes slender, rod-shaped and with pointed tips.

*Distribution* : INDIA- Assam, Meghalaya, Tripura, West Bengal and Bihar.

*Elsewhere* : Cosmopolitan.

#### Genus *Dipleuchlanis* De Beauchamp, 1910

*Characters* : Ventral plate narrower than dorsal plate. Lateral sulci forming a deep groove. Foot three segmented, with setae; toes long and parallel-sided. Unci with 7–10 teeth each.

This genus is represented by two species in the material collected from the floodplain lakes of Assam.

#### 34. *Dipleuchlanis ornata* Segers, 1993 (Figs. 70-71)

*Material examined* : 3 examples, Bhoispuri, 04. 12. 2002, coll. B. K. Sharma; 2 examples, Thekera, 08. 11. 2004, coll. B. K. Sharma.

*Characters* : Lorica elongate, with dorsal and ventral plate and with deeply invaginated membranous lateral connections. Ventral plate broadest, convex and transversally undulate. Dorsal plate concave. Head aperture dorsally straight and ventrally concave. Lateral antennae located in distal part of body. Foot with two pseudo-segments. Toes long, parallel-sided and pointed distally.

*Distribution* : INDIA - Assam.

*Elsewhere* : Palaeotropical.

#### 35. *Dipleuchlanis propatula* (Gosse, 1886) (Figs. 72-73)

*Material examined* : 4 examples, Barundanga, 05. 05. 2002, coll. B. K. Sharma; 2 examples, Hakama, 06. 05. 2004, coll. B. K. Sharma; 4 examples, Kamakhya, 11. 08. 2002, coll. B. K. Sharma; 2 examples, Rowmari, 11. 08. 2002, coll. B. K. Sharma; 5 examples, Deepor, 09. 09. 2004, coll. B. K. Sharma; 2 examples, Dighali, 15. 02. 2002, coll. B. K. Sharma; 3 examples, Siligurijan, 09. 05. 2002, coll. B. K. Sharma; 2 examples, Ghorajan, 04. 03. 2004, coll. B. K. Sharma; 2 examples, Akhepeti, 11. 02. 2005, coll. B. K. Sharma; 2 examples, Kakerikhola, 05. 11. 2004, coll. B. K. Sharma; 2 examples, Sitalmari, 08. 02. 2005, coll. B. K. Sharma; 3 examples, Goranga, 01. 09. 2006, coll. Sumita Sharma; 2 examples, Padmakhua, 01. 09. 2006, coll. Sumita Sharma; 2 examples, Sarang, 03. 09. 2006, coll. Sumita Sharma; 3 examples, 02. 12. 2005, Mihir, coll. Sumita Sharma; 3 examples, Deopani, 02. 12. 2005, coll. Sumita Sharma; 3 examples, Memdubi, 30. 11. 2005, coll. Sumita Sharma; 2 examples,

Senijan, 17. 01. 2005, coll. B. K. Sharma; 3 examples, Samuajan, 01. 03. 2004, coll. B. K. Sharma; 2 examples, Puwa Saikia, 17. 02. 2005, coll. B. K. Sharma; 3 examples, Sone, 19. 10. 2004, coll. B. K. Sharma; 2 examples, Salchapra, 09. 02. 2005, coll. B. K. Sharma.

*Characters* : Lorica firm, oval or ovoid and compressed dorso-ventrally; with almost straight or slightly concave anterior end. Dorsal plate concave and smaller than ventral plate. Lateral sulci deep. Toes long, cylindrical, parallel-sided and with pointed tips, at times, slightly swollen near tips.

*Distribution* : INDIA - Assam, Meghalaya, Tripura, West Bengal, Orissa, Bihar, Punjab and Kerala.

*Elsewhere* : Cosmopolitan.

#### Family MYTILINIDAE Bartos, 1959

*Characters* : Trophi malleate. Lorica with or without anterior and posterior spines. Dorsal surface of lorica with a median longitudinal sulcus.

Two genera of this family are documented from in the present study

#### Genus *Lophocharis* Ehrenberg, 1838

*Characters* : Strongly loricate; lorica ornamented with distinct pattern and cavities, without any anterior or posterior spines. lorica without dorsal sulcus and with one strong keel. Toes short.

The material examined from the floodplain lakes of Assam includes only one species belonging to *Lophocharis*.

#### 36. *Lophocharis salpina* (Ehrenberg, 1834)

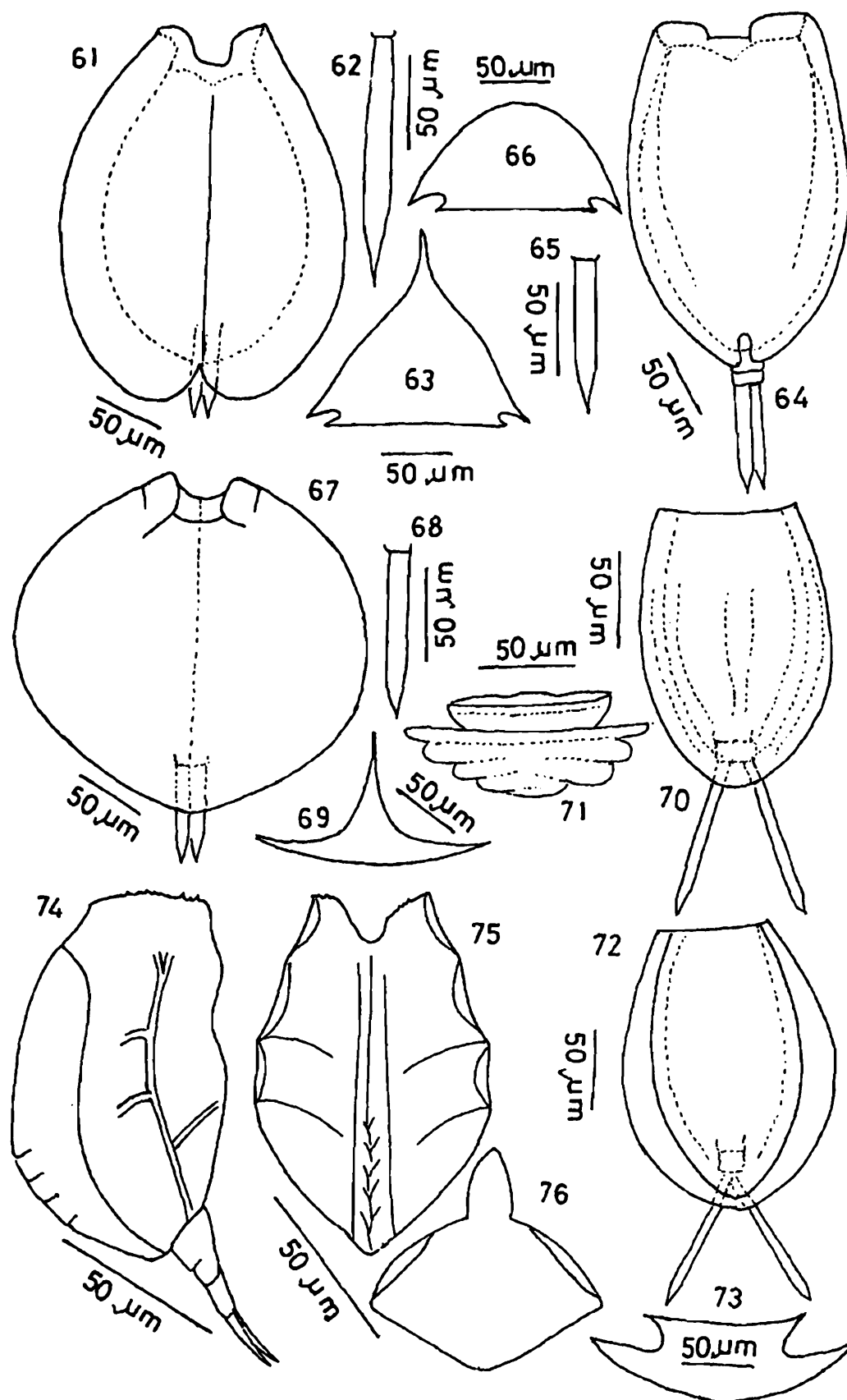
(Figs. 74-76)

*Material examined* : 2 examples, Barundanga, 11. 02. 2002, coll. B. K. Sharma; 3 examples, Dhir, 08. 01. 2003, coll. B. K. Sharma; 2 examples, Ghorajan, 04. 03. 2004, coll. B. K. Sharma; 2 examples, Kujibalipatty, 14. 03. 2003, coll. B. K. Sharma; 3 examples, Memdubi, 30. 11. 2005, coll. Sumita Sharma; 2 examples, Sarain Hubbi, 29. 11. 2005, coll. Sumita Sharma.

*Characters* : Lorica long, triangular in cross-section and anterior margin of lorica strongly serrated. Dorsal keel of lorica distinct and with transverse folds. Foot-groove ventral; toes thin pointed and ventrally directed.

*Distribution* : INDIA - Assam and Meghalaya.

*Elsewhere* : Cosmopolitan.



*Euchlanis incisa* Carlin : Fig. 61, dorsal view, Fig. 62, toe, Fig. 63, cross-section; *E. oropha* Gosse : Fig. 64, dorsal view, Fig. 65, toe, Fig. 66, cross-section; *E. triquetra* Ehrenberg: Fig. 67, dorsal view, Fig. 68, toe, Fig. 69, cross-section; *Dipleuchlanis ornata* Segers: Fig. 70, ventral view, Fig. 71, cross-section; *D. propatula* (Gosse): Fig. 72, dorsal view, Fig. 73, cross-section; *Lophocharis salpina* (Ehrenberg): Fig. 74, lateral view, Fig. 75, dorsal view, Fig. 76, cross-section.

Genus *Mytilina* Bory de St. Vincent, 1826

*Characters* : Body heavily loricate and laterally flattened. Lorica with double dorsal keel and with spines on all four corners ; spines, at times, completely or partly reduced. Foot with indistinct three segments; toes thin and slender. Corona similar to *Euchlanis* -type.

Three species of the genus *Mytilina* are documented in present account.

37. *Mytilina acanthophora* Hauer, 1938

(Figs. 77-78)

*Material examined* : 3 examples, Bhoispuri, 08. 08. 2002, coll. B. K. Sharma; 3 examples, Dighali, 12. 08. 2002, coll. B. K. Sharma; 2 examples, Kujibalipatty, 12. 08. 2002, coll. B. K. Sharma.

*Characters* : Lorica strong, granulated, dorsally arched and laterally compressed. Anterior ventral corners of lorica with distinct and characteristic triangular cusps. Posterior end with deep invagination. Toes long and slender; terminating into acute points.

*Distribution* : INDIA Assam, West Bengal and Punjab.

*Elsewhere* : Pantropical.

38. *Mytilina bisulcata* (Lucks, 1912)

(Figs. 79-80)

*Material examined* : 3 examples, Dhir, 11. 03. 2003, coll. B. K. Sharma; 2 examples, Sagmara, 09. 01. 2003, coll. B. K. Sharma; 3 examples, Deepor, 04. 03. 2004, coll. B. K. Sharma; 2 examples, Ghorajan, 07. 05. 2004, coll. B. K. Sharma; 2 examples, Borbila, 15. 03. 2003, coll. B. K. Sharma; 2 examples, Kujibalipatty, 11. 01. 2003, coll. B. K. Sharma; 3 examples, Haduk, 01. 09. 2006, coll. Sumita Sharma; 2 examples, Solmari, 13. 11. 2004, coll. B. K. Sharma.

*Characters* : Lorica thin, and its anterior end with two folds; almost rounded in cross section and dorsal keel with three stumps. Dorsal sulcus indistinct. Toes long, slender and terminating into distinct slender spines.

*Distribution* : INDIA Assam, Meghalaya, Tripura, West Bengal and Orissa.

*Elsewhere* : Tropics and subtropics.

39. *Mytilina ventralis* (Ehrenberg, 1830)

(Fig. 81)

*Material examined* : 4 examples, Bhoispuri, 03. 05. 2002, coll. B. K. Sharma; 3 examples, Barundanga, 11. 02. 2002, coll. B. K. Sharma; 3 examples, Hakama, 11. 07. 2004, coll. B. K. Sharma; 2 examples, Horinchora, 08. 09. 2004, coll. B. K. Sharma; 5 examples, Dhir, 05. 05. 2002, coll. B. K. Sharma; 2 examples, Sagmara, 11. 03. 2002, coll. B. K. Sharma;

5 examples, Deepor, 07. 05. 2004, coll. B. K. Sharma; 3 examples, Dighali, 12. 08. 2002, coll. B. K. Sharma; 2 examples, Borbila, 13. 08. 2002, coll. B. K. Sharma; 3 examples, Ghorajan, 12. 07. 2004, coll. B. K. Sharma; 2 examples, Urmal, 13. 07. 2004, coll. B. K. Sharma; 3 examples, Akhepeti, 11. 09. 2004, coll. B. K. Sharma; 3 examples, Solmari, 12. 07. 2004, coll. B. K. Sharma; 2 examples, Haduk, 05. 04. 2005, coll. Sumita Sharma; 2 examples, Duptoli, 05. 04. 2005, coll. Sumita Sharma; 3 examples, Dholi, 05. 04. 2005, coll. Sumita Sharma; 2 examples, Bandha, 03. 09. 2006, coll. Sumita Sharma; 3 examples, Mihir, 02. 12. 2005, coll. Sumita Sharma; 2 examples, Shitalpathar, 01. 12. 2005, coll. Sumita Sharma; 2 examples, Demon, 01. 12. 2005, coll. Sumita Sharma; 2 examples, Diang, 01. 12. 2005, coll. Sumita Sharma; 4 examples, Samuajan, 01. 03. 2004, coll. B. K. Sharma; 3 examples, Sone, 09. 02. 2005, coll. B. K. Sharma; 2 examples, Baskandi, 09. 02. 2005, coll. B. K. Sharma.

**Characters** : Lorica rigid, laterally compressed and anterior 1/3 part of lorica heavily granulated. Antero-ventral corners with a spine on each side. Postero-dorsal and postero-ventral spines short and variable. Toes two and moderately long.

**Distribution** : INDIA - Assam, Meghalaya, Tripura, West Bengal, Orissa, Bihar, Andhra Pradesh, Gujarat, Madhya Pradesh, Kerala, Punjab, Kashmir, Ladak and Rajasthan.

**Elsewhere** : Cosmopolitan.

### 39a *Mytilina ventralis longidactyla* Wulfert, 1965

(Figs. 82)

**Material examined** : 3 examples, Dhir, 09. 08. 2002, coll. B. K. Sharma; 2 examples, Fingua, 06. 05. 2002, coll. B. K. Sharma; 4 examples, Deepor, 12. 07. 2004, coll. B. K. Sharma; 2 examples, Borbila, 09. 05. 2002, coll. B. K. Sharma; 2 examples, Akhepeti, 11. 09. 2004, coll. B. K. Sharma; 3 examples, Maghuri, 30. 11. 2005, coll. Sumita Sharma.

**Characters** : Lorica strong and elongated and heavily stippled anteriorly. Posterior median and posterior ventral spines distinctly elongated. Toes longer parallel sided and with pointed tips.

**Distribution** : INDIA - Assam, West Bengal and Gujarat.

**Elsewhere** : Cosmopolitan.

### Family TRICHOTRIIDAE Bartos, 1959

**Characters** : Trophi malleate. Head, trunk and foot clearly defined and with lorica. Trunk laterally broad, slightly granulated, often with spines on dorsum.

This family is represented by two genera in the material collected from the floodplain lakes of Assam,.

Genus *Macrochaetus* Perty, 1850

*Characters* : Body scutellate, strongly loricate and granulate; its margins serrate or with spines. Dorsum with several pairs of mobile spines; spines also present on posterior margin of lorica and on anal segment. Foot two-segmented; toes two and thin.

Four species belonging to this genus are observed in the samples collected from the floodplain lakes of Assam

40. *Macrochaetus collinsi* (Gosse, 1867)

(Fig. 83)

*Material examined* : 4 examples, Dhir, 05. 05. 2002, coll. B. K. Sharma; 3 examples, Ghorajan, 04. 03. 2004, coll. B. K. Sharma; 2 examples, Hiragota, 08. 05. 2004, coll. B. K. Sharma; 2 examples, Basana, 03. 09. 2006, coll. Sumita Sharma; 2 examples, Goranga, 01. 09. 2006, coll. Sumita Sharma; 3 examples, Solmari, 04. 05. 2004, coll. B. K. Sharma; 2 examples, Daphlang, 02. 12. 2005, coll. Sumita Sharma; 2 examples, Bandha, 03. 09. 2006, coll. Sumita Sharma.

*Characters* : Lorica sub-rectangular or horse-shoe shaped, moderately compressed dorso-ventrally and with serrate external edges. Dorsum with four dorsal and four posterior spines. Anal segment with two anal spines. Toes slender and pointed.

*Distribution* : INDIA Assam, Meghalaya, West Bengal and Rajasthan.

*Elsewhere* : Pantropical.

41. *Macrochaetus danneeli* Koste & Shiel; 1983

(Fig. 84)

*Material examined* : 3 examples, Hakoi, 29. 11. 2005, coll. Sumita Sharma; 2 examples, Itakhuli, 01. 12. 2005, coll. Sumita Sharma.

*Characters* : Lorica shield-shaped or nearly circular outline, moderately compressed dorso-ventrally; covered with small spines and external margins serrate. Characteristic dorsal spines lacking. Toes slender and pointed.

*Distribution* : INDIA - Assam.

*Elsewhere* : Australasian.

42. *Macrochaetus longipes* Myers, 1934

(Fig. 85)

*Material examined* : 2 examples, Bhoispuri, 04. 12. 2002, coll. B. K. Sharma; 3 examples, Hakama, 07. 02. 2005, coll. B. K. Sharma; 2 examples, Ghorajan, 03. 11. 2004, coll. B. K. Sharma; 2 examples, Kutri, 03. 12. 2005, coll. Sumita Sharma; 3 examples, Diang, 01. 12. 2005, coll. Sumita Sharma.

**Characters** : Lorica shield-shaped, granulated and compressed dorso-ventrally; with serrate external margins and characterized by 12 long spines. Head protruded. Anal segment flanked by long spines. Toes long and pointed.

**Distribution** : INDIA - Assam and Meghalaya.

**Elsewhere** : Cosmopolitan.

#### 43. *Macrochaetus sericus* (Thorpe, 1893)

(Fig. 86)

**Material examined** : 2 examples, Barundanga, 11. 02. 2002, coll. B. K. Sharma; 4 examples, Horinchora, 07. 02. 2005, coll. B. K. Sharma; 3 examples, Dhir, 09. 08. 2002, coll. B. K. Sharma; 2 examples, Fingua, 12. 03. 2003, coll. B. K. Sharma; 3 examples, Sagmara, 09. 01. 2003, coll. B. K. Sharma; 2 examples, Kamakhya, 12. 12. 2002, coll. B. K. Sharma; 2 examples, Rowmari, 13. 03. 2003, coll. B. K. Sharma; 5 examples, Deepor, 08. 02. 2005, coll. B. K. Sharma; 3 examples, Dighali, 13. 03. 2003, coll. B. K. Sharma; 2 examples, Borbila, 14. 12. 2002, coll. B. K. Sharma; 2 examples, Siligurijan, 09. 05. 2002, coll. B. K. Sharma; 4 examples, Ghorajan, 08. 02. 2005, coll. B. K. Sharma; 2 examples, Kamranga, 12. 07. 2004, coll. B. K. Sharma; 2 examples, Kakerikhola, 05. 11. 2004, coll. B. K. Sharma; 3 examples, Haduk, 05. 04. 2005, coll. Sumita Sharma; 3 examples, Sitalmari, 05. 04. 2005, coll. Sumita Sharma; 3 examples, Goranga, 05. 04. 2005, coll. Sumita Sharma; 2 examples, Duptoli, 05. 04. 2005, coll. Sumita Sharma; 2 examples, Ghorkhonjan, 01. 09. 2006, coll. Sumita Sharma; 5 examples, Mihir, 02. 12. 2005, coll. Sumita Sharma; 2 examples, Bhoismari, 05. 09. 2006, coll. Sumita Sharma; 3 examples, Shitalpathar, 01. 12. 2005, coll. Sumita Sharma; 2 examples, Demon, 01. 12. 2005, coll. Sumita Sharma; 3 examples, Mona, 01. 12. 2005, coll. Sumita Sharma; 2 examples, Kololua, 29. 11. 2005, coll. Sumita Sharma; 4 examples, Memdubi, 30. 11. 2005, coll. Sumita Sharma; 2 examples, Raidong, 30. 11. 2005, coll. Sumita Sharma; 5 examples, Samuajan, 18. 01. 2005, coll. B. K. Sharma; 2 examples, Puwa Saikia, 02. 03. 2004, coll. B. K. Sharma; 2 examples, Salchapra, 09. 02. 2005, coll. B. K. Sharma.

**Characters** : Lorica horse-shoe shaped, granulated and with small spines at its external angles. Dorsum with eight spines arranged symmetrically along its mid-line; median caudal spines deeply inserted. Foot two-segmented; first foot-segment with flattened cuticle and two separated spines. Toes short and spindle-shaped.

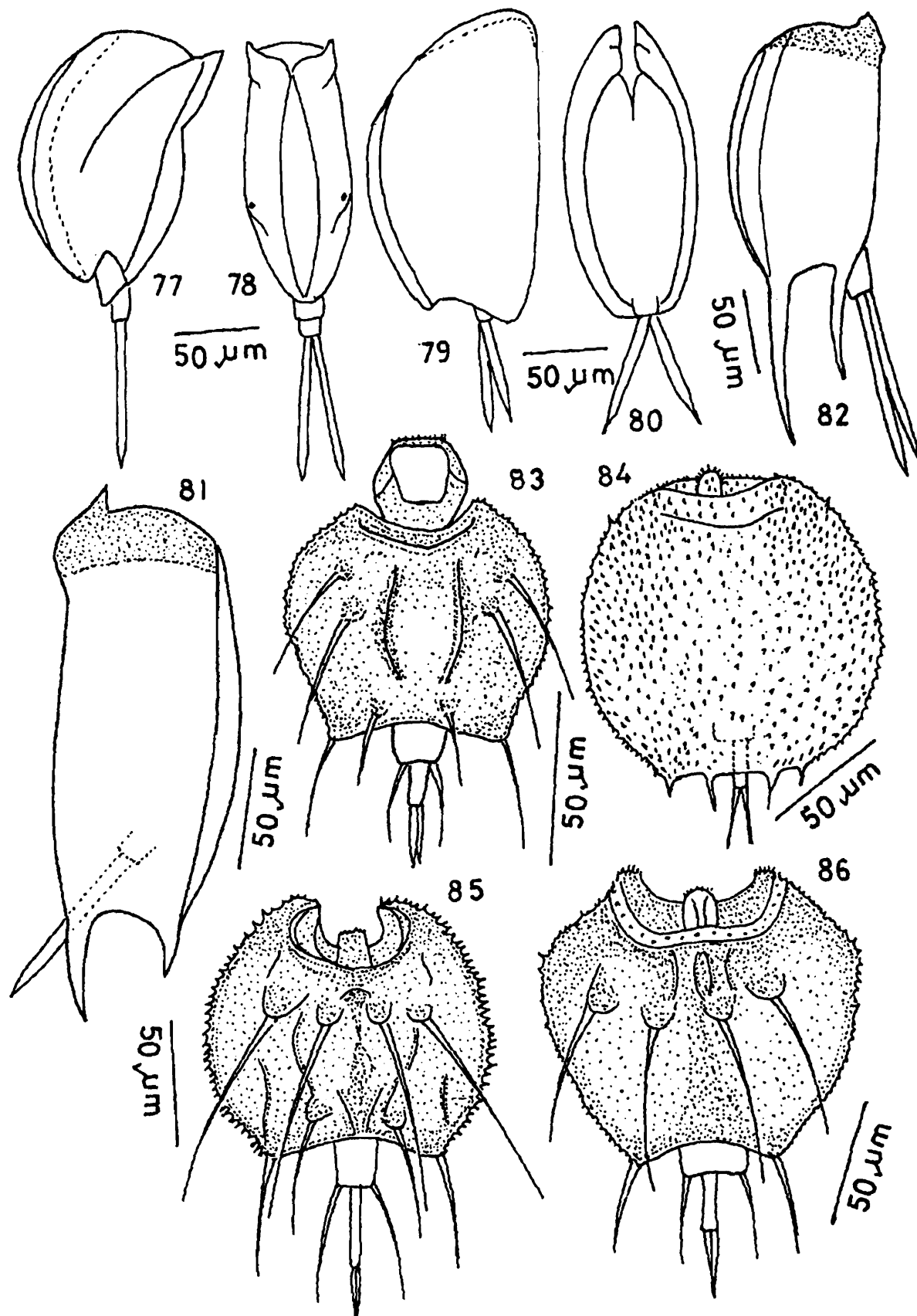
**Distribution** : INDIA - Assam, Meghalaya, West Bengal, Orissa, Andhra Pradesh and Madhya Pradesh.

**Elsewhere** : Pantropical.

#### Genus *Trichotria* Bory de St. Vincent, 1827

**Characters** : Head, trunk and foot strongly loricate. Foot mobile, three-segmented; second foot-segment with spines of variable length. Toes long, slender and ending into pointed tips.

Only one species belonging to this genus is documented in the present study.



*Mytilina acanthophora* Hauer : Fig. 77, lateral view, Fig. 78, dorsal view; *M. bisulcata* (Lucks) : Fig. 79, lateral view; Fig. 80, ventral view; *M. ventralis* (Ehrenberg); Fig. 81, lateral view; *M. ventralis longidactyla* Wulfert : Fig. 82, lateral view; *Macrochaetus collinsi* (Gosse) : Fig. 83, dorsal view; *M. danneeli* Koste & Shiel : Fig. 84, dorsal view; *M. longipes* Myers : Fig. 85, dorsal view; *M. sericus* (Thorpe) : Fig. 86, dorsal view.

**44. *Trichotria tetractis* (Ehrenberg, 1830)**  
(Fig. 87)

**Material examined** : 3 examples, Bhoispuri, 03. 05. 2002, coll. B. K. Sharma; 5 examples, Barundanga, 08. 08. 2002, coll. B. K. Sharma; 3 examples, Hakama, 11. 07. 2004, coll. B. K. Sharma; 2 examples, Horinchora, 08. 09. 2004, coll. B. K. Sharma; 3 examples, Dhir, 05. 05. 2002, coll. B. K. Sharma; 2 examples, Fingua, 10. 08. 2002, coll. B. K. Sharma; 3 examples, Sagmara, 06. 05. 2002, coll. B. K. Sharma; 2 examples, Kamakhya, 11. 08. 2002, coll. B. K. Sharma; 3 examples, Rowmari, 07. 05. 2002, coll. B. K. Sharma; 7 examples, Deepor, 12. 07. 2005, coll. B. K. Sharma; 4 examples, Deepor, 06. 04. 2005, coll. Sumita Sharma; 3 examples, Dighali, 12. 08. 2002, coll. B. K. Sharma; 2 examples, Borbila, 09. 05. 2002, coll. B. K. Sharma; 3 examples, Siligurijan, 12. 03. 2003, coll. B. K. Sharma; 3 examples, Ghorajan, 12. 07. 2004, coll. B. K. Sharma; 2 examples, Kamranga, 09. 09. 2004, coll. B. K. Sharma; 2 examples, Urmal, 10. 09. 2004, coll. B. K. Sharma; 2 examples, Padma, 11. 09. 2004, coll. B. K. Sharma; 4 examples, Solmari, 09. 09. 2004, coll. B. K. Sharma; 2 examples, Duptoli, 05. 04. 2005, coll. Sumita Sharma; 3 examples, Ghorkhonjan, 08. 07. 2004, coll. B. K. Sharma; 2 examples, Padmakhua, 01. 09. 2006, coll. Sumita Sharma; 3 examples, Bandha, 03. 09. 2006, coll. Sumita Sharma; 5 examples, Daphlang, 02. 12. 2005, coll. Sumita Sharma; 2 examples, Deopani, 06. 09. 2006, coll. Sumita Sharma; 3 examples, Diang, 01. 12. 2005, coll. Sumita Sharma; 4 examples, Memdubi, 30. 11. 2005, coll. Sumita Sharma; 3 examples, Raidong, 30. 11. 2005, coll. Sumita Sharma; 2 examples, Senijan, 01. 04. 2004, coll. B. K. Sharma; 3 examples, Samuajan, 22. 06. 2004, coll. B. K. Sharma; 2 examples, Sone, 19. 10. 2004, coll. B. K. Sharma.

**Characters** : Lorica heavily stippled; antero-dorsal corners produced into small spines. Dorsum with distinct pattern of carinal plates and ridges. Second foot-segment longest. Toes long, cylindrical and terminating into acute points.

**Distribution** : INDIA - Assam, Meghalaya, Tripura, West Bengal, Orissa, Andhra Pradesh, Madhya Pradesh, Tamil Nadu, Kerala, Gujarat, Punjab and Kashmir.

**Elsewhere** : Cosmopolitan.

Family COLURELLIDAE Bartos, 1959

**Characters** : Corona with broad lateral lamellae and with hood. Eyes lateral. Lorica comprised of one or two plates, dorso-ventrally or laterally compressed; with or without ventral and dorsal furrows. Trophi modified malleate.

Three genera belonging to this family are included in this account.

Genus *Colurella* Bory de St. Vincent, 1824

**Characters** : Lorica oval or ovate, laterally compressed and consists of a single plate; with

a ventral median longitudinal cleft. Head plate small and retractile. Foot three-segmented; toes sharply pointed. Corona similar to *Euchlanis*-type. With or without eye.

Five species of the genus *Colurella* are noticed in the samples collected from the floodplain lakes of Assam.

45. *Colurella adriatica* Ehrenberg, 1831

(Figs. 88-89)

*Material examined* : 2 examples, Barundanga, 12. 03. 2003, coll. B. K. Sharma; 3 examples, Horinchora, 07. 02. 2005, coll. B. K. Sharma; 1 example, Kakerikhola, 05. 11. 2004, coll. B. K. Sharma; 2 examples, Bamoni, 01. 09. 2006, coll. Sumita Sharma; 2 examples, Thekera, 03. 12. 2005, coll. Sumita Sharma; 3 examples, Daphlang, 02. 12. 2005, coll. Sumita Sharma.

*Characters* : Lorica long and slender; length height ratio low. Posterior end of lorica extended to blunt apex. Toes long. Slender and pointed.

*Distribution* : INDIA - Assam and Meghalaya.

*Elsewhere* : Cosmopolitan.

46. *Colurella obtusa* (Gosse, 1886)

(Figs. 90-91)

*Material examined* : 3 examples, Bhoispuri, 12. 03. 2003, coll. B. K. Sharma; 4 examples, Barundanga, 09. 12. 2002, coll. B. K. Sharma; 2 examples, Hakama, 08. 09. 2004, coll. B. K. Sharma; 2 examples, Horinchora, 11. 07. 2004, coll. B. K. Sharma; 4 examples, Dhir, 11. 12. 2002, coll. B. K. Sharma; 2 examples, Fingua, 10. 08. 2002, coll. B. K. Sharma; 3 examples, Sagmara, 11. 03. 2003, coll. B. K. Sharma; 2 examples, Kamakhya, 11. 08. 2002, coll. B. K. Sharma; 2 examples, Rowmari, 13. 03. 2003, coll. B. K. Sharma; 5 examples, Deepor, 12. 07. 2004, coll. B. K. Sharma; 3 examples, Deepor, 06. 04. 2005, coll. Sumita Sharma; 4 examples, Dighali, 12. 08. 2002, coll. B. K. Sharma; 2 examples, Siligurijan, 12. 03. 2003, coll. B. K. Sharma; 3 examples, Ghorajan, 03. 11. 2004, coll. B. K. Sharma; 2 examples, Urmal, 13. 07. 2004, coll. B. K. Sharma; 2 examples, Akhepeti, 11. 09. 2004, coll. B. K. Sharma; 2 examples, Kakerikhola, 14. 07. 2004, coll. B. K. Sharma; 2 examples, Padma, 05. 11. 2004, coll. B. K. Sharma; 3 examples, Kanduli, 01. 09. 2006, coll. Sumita Sharma; 2 examples, Demon, 01. 12. 2005, coll. Sumita Sharma; 3 examples, Diang, 01. 12. 2005, coll. Sumita Sharma; 4 examples, Memdubi, 30. 11. 2005, coll. Sumita Sharma; 3 examples, Raidong, 30. 11. 2005, coll. Sumita Sharma; 3 examples, Sone, 09. 02. 2005, coll. B. K. Sharma; 2 examples, Baskandi, 19. 10. 2004, coll. B. K. Sharma.

*Characters* : Lorica small, oval and with obtuse posterior angles. Foot-opening relatively broad. Toes small, slender and pointed.

*Distribution* : INDIA-Assam, Meghalaya, Tripura, West Bengal and Punjab.

*Elsewhere* : Cosmopolitan.

47. *Colurella sanoamuangae* Chittapan *et al.* 1999  
(Fig. 92)

*Material examined* : 2 examples, Dhir, 11. 03. 2003, coll. B. K. Sharma.

*Characters* : Lorica oval in outline, about one and a half time as high as wide. Head aperture margins rounded; with a small U-shaped sinus dorsally and a deep V-shaped sinus ventrally. Posterior end with slightly projecting triangular tip. Ventral sulcus deep. Foot 3-segmented; distal segment twice the length of the basal or median segments. Toes relatively long and tapering to an acute point distally.

*Distribution* : INDIA - Assam.

*Elsewhere* : Oriental region.

48. *Colurella sulcata* (Stenroos, 1898)  
(Fig. 93)

*Material examined* : 3 examples, Bhoispuri, 04. 12. 2002, coll. B. K. Sharma; 3 examples, Hakama, 07. 02. 2005, coll. B. K. Sharma; 4 examples, Ghorajan, 08. 12. 2004, coll. B. K. Sharma; 2 examples, Kololua, 29. 11. 2005, coll. Sumita Sharma; 2 examples, Bor beel, 01. 12. 2005, coll. Sumita Sharma.

*Characters* : Lorica slender, elongated and with a longitudinal cleft; anterior margins of lorica rounded. Posterior angles distinct but not produced. Foot and toes forwardly directed; toes long, slender and pointed.

*Distribution* : INDIA - Assam, Meghalaya, West Bengal, Tripura, West Bengal, Orissa and Gujarat.

*Elsewhere* : Cosmopolitan.

49. *Colurella uncinata* (O.F. Müller, 1773)  
(Fig. 94)

*Material examined* : 3 examples, Bhoispuri, 03. 05. 2002, coll. B. K. Sharma; Fingua, 10. 08. 2002, coll. B. K. Sharma; 3 examples, Sagmara, 06. 05. 2002, coll. B. K. Sharma; 2 examples, Kamakhya, 11. 08. 2002, coll. B. K. Sharma; 3 examples, Rowmari, 11. 08. 2002, coll. B. K. Sharma; 4 examples, Deepor, 09. 09. 2004, coll. B. K. Sharma; 3 examples, Dighali, 12. 08. 2002, coll. B. K. Sharma; 4 examples, Ghorajan, 07. 05. 2004, coll. B. K. Sharma; 2 examples, Kamranga, 03. 11. 2004, coll. B. K. Sharma; 3 examples, Akhepeti, 11. 02. 2005, coll. B. K. Sharma; 2 examples, Kakerikhola, 05. 11. 2004, coll. B. K. Sharma; 3 examples, Sitalmari, 05. 04. 2005, coll. Sumita Sharma; 3 examples, Goranga, 03. 11. 2004, coll. B. K. Sharma; 2 examples, Patoni, 01. 09. 2006, coll. Sumita Sharma; 2 examples, Sarang, 03. 09. 2006, coll. Sumita Sharma; 2 examples, Demon, 01. 12. 2005, coll. Sumita Sharma; 3 examples, Mona, 01. 12. 2005, coll. Sumita Sharma; 2 examples, Diang, 01. 12.

2005, coll. Sumita Sharma; 2 examples, Sesa, 01. 12. 2005, coll. Sumita Sharma; 4 examples, Memdubi, 30. 11. 2005, coll. Sumita Sharma; 2 examples, Raidong, 30. 11. 2005, coll. Sumita Sharma; 5 examples, Samuajan, 18. 02. 2005, coll. B. K. Sharma; 3 examples, Salchapra, 09. 02. 2005, coll. B. K. Sharma.

*Characters* : Lorica broadly ovate; posterior angles of lorica produced and downwardly directed, edges drawn closer. Foot small and stout. Toes two, slender and pointed.

*Distribution* : INDIA-Assam, Meghalaya, Tripura and West Bengal.

*Elsewhere* : Cosmopolitan.

### Genus *Lepadella* Bory de St. Vincent, 1826

*Characters* : Lorica oval, ovate, pear shaped or circular and moderately to strongly compressed dorso-ventrally; with characteristic head and foot openings. Anterior end often with a stippled collar. Dorsal plate flat, arched or with a keel. Foot three segmented; toes long and pointed. Corona consists of a single line of cilia, with lateral tufts on buccal field. Trophi malleate.

This genus is represented by 20 species in the samples collected from the floodplain lakes of Assam. Further, this genus is divisible into three subgenera namely *Lepadella* (toes of equal length), *Heterolepadella* (toes of unequal length) and *Xenolepdella* (toes completely or partly fused). Of these, only first two are recorded in this study and these include 16 and four species respectively.

#### 50. *Lepadella acuminata* (Ehrenberg, 1834)

(Figs. 95-96)

*Material examined* : 2 examples, Bhoispuri, 10. 02. 2002, coll. B. K. Sharma; 3 examples, Dhir, 11. 03. 2003, coll. B. K. Sharma; 3 examples, Hakama, 02. 11. 2004, coll. B. K. Sharma; 2 examples, Jogra, 10. 12. 2002, coll. B. K. Sharma; 5 examples, Deepor, 12. 08. 2004, coll. B. K. Sharma; 2 examples, Deepor, 06. 04. 2005, coll. Sumita Sharma; 4 examples, Dighali, 41. 03. 2003, coll. B. K. Sharma; 3 examples, Kamranga, 03. 11. 2004, coll. B. K. Sharma; 3 examples, Ghorajan, 08. 02. 2005, coll. B. K. Sharma; 2 examples, Chatla, 09. 12. 2004, coll. B. K. Sharma; 2 examples, Padma, 11. 02. 2005, coll. B. K. Sharma; 2 examples, Bamoni, 01. 09. 2006, coll. Sumita Sharma; 3 examples, Dhuptoli, 05. 04. 2005, coll. Sumita Sharma; 3 examples, Sitalmari, 05. 04. 2005, coll. Sumita Sharma; 2 examples, Mori, 03. 09. 2006, coll. Sumita Sharma; 3 examples, Sohala, 05. 09. 2006, coll. Sumita Sharma; 2 examples, Sarain Hubbi, 29. 11. 2005, coll. Sumita Sharma; 3 examples, Muijan, 29. 11. 2005, coll. Sumita Sharma; 2 examples, Japara, 01. 12. 2005, coll. Sumita Sharma; 3 examples, Salchapra, 11. 12. 2004, coll. B. K. Sharma.

*Characters* : Lorica broadly oval in outline, moderately compressed dorso-ventrally and its posterior end produced into a pointed spine of variable length. Dorsal plate convex and

with two lateral keels. Dorsal sinus U-shaped, ventral sinus relatively deep and with pointed corners. Foot groove oval; toes pointed.

*Distribution* : INDIA-Assam, Meghalaya, Tripura, Arunachal Pradesh, West Bengal, Orissa, Bihar and Tamil Nadu.

*Elsewhere* : Cosmopolitan.

#### 51. *Lepadella apsicora* Myers, 1934

(Figs. 97-98)

*Material examined* : 3 examples, Hakama, 11. 07. 2004, coll. B. K. Sharma; 2 examples, Hiragota, 10. 09. 2004, coll. B. K. Sharma; 3 examples, Deepor, 08. 02. 2005, coll. B. K. Sharma; 2 examples, Solmari, 13. 11. 2004, coll. B. K. Sharma; 2 examples, Donga, 02. 12. 2005, coll. Sumita Sharma; 2 examples, Dhekia, 18. 01. 2005, coll. B. K. Sharma.

*Characters* : Lorica broadly oval; cross-section shallow, evenly arched dorsally. Anterior dorsal margin nearly straight or with a shallow sinus and ventral sinus V- shaped; stippled collar present. Foot groove wide. Last foot segment longest. Toes two, unequal; right toe longer than the left and toes often twisted.

*Distribution* : INDIA - Assam, Meghalaya, Tripura, and West Bengal.

*Elsewhere* : Mount Desert Island (USA), India and Indonesia.

#### 52 *Lepadella apsidea* Haring, 1916

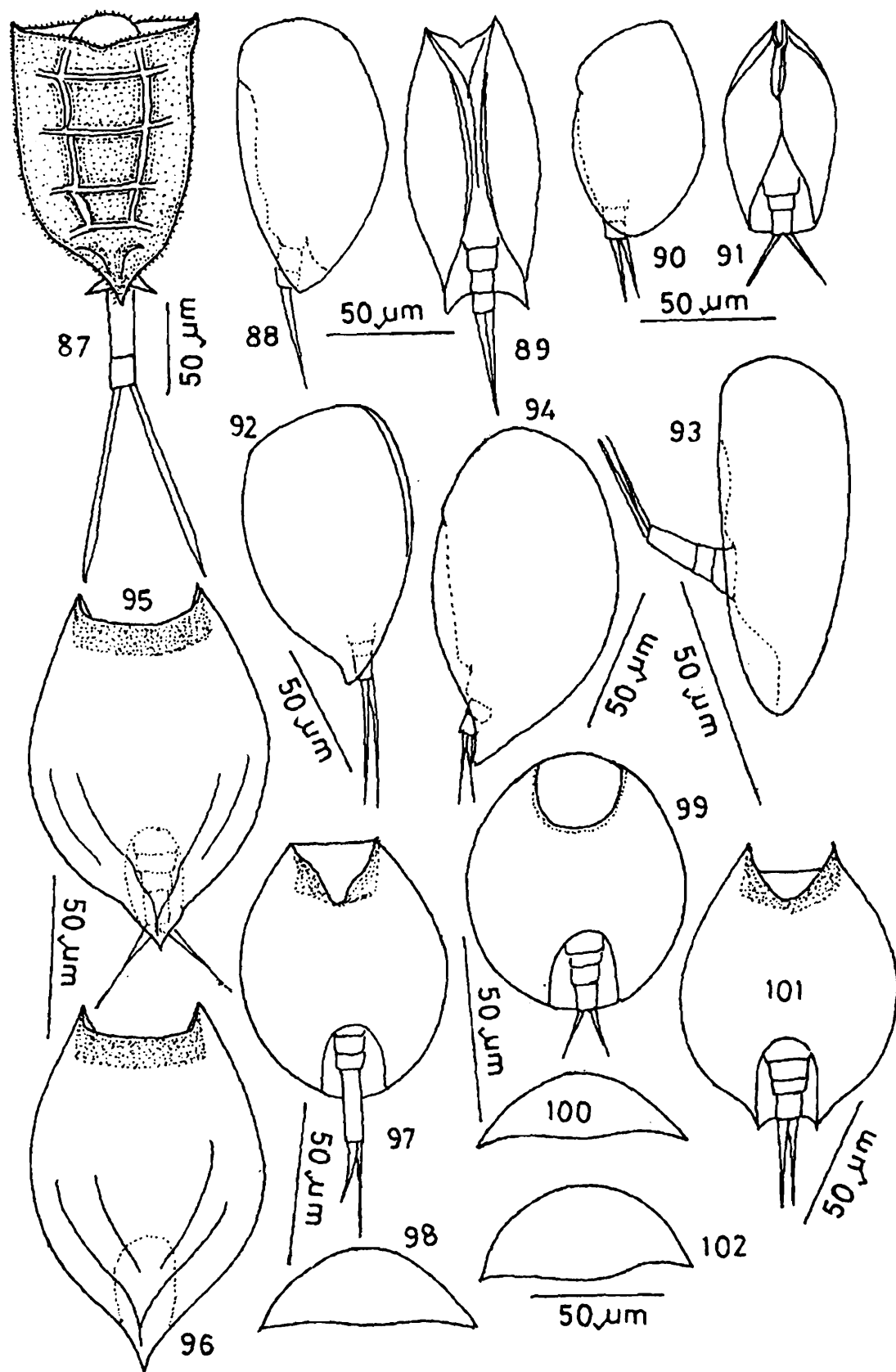
(Figs. 99-100)

*Material examined* : 2 examples, Bhoispuri, 12. 03. 2003, coll. B. K. Sharma; 3 examples, Barundanga, 09. 12. 2002, coll. B. K. Sharma; 2 examples, Hakama, 08. 09. 2004, coll. B. K. Sharma; 2 examples, Sagmara, 09. 01. 2003, coll. B. K. Sharma; 3 examples, Deepor, 04. 03. 2004, coll. B. K. Sharma; 2 examples, Deepor, 06. 04. 2005, coll. Sumita Sharma; 2 examples, Hiragota, 10. 09. 2004, coll. B. K. Sharma; 2 examples, Sitalmari, 13. 11. 2004, coll. B. K. Sharma; 3 examples, Muijan, 29. 11. 2005, coll. B. K. Sharma; 3 examples, Maghuri, 30. 11. 2005, coll. B. K. Sharma; 2 examples, Baskandi, 09. 02. 2005, coll. B. K. Sharma.

*Characters* : Lorica nearly circular in outline; dorsal sinus lacking, ventral sinus circular and without any stippled collar. Dorsal plate arched, ventral plate nearly flat. Foot-groove rounded U- shaped; toes short and pointed.

*Distribution* : INDIA - Assam, Meghalaya, Tripura, West Bengal and Panjab.

*Elsewhere* : China, America, Central and Eastern Asia, India.



*Trichotria tetractis* (Ehrenberg) : Fig. 87, dorsal view; *Colurella adriatica* Ehrenberg : Fig. 88, lateral view, Fig. 89, ventral view; *C. obtusa* (Gosse) : Fig. 90, lateral view, Fig. 91, ventral view; *C. sanoamuangae* Chittapun *et al.* : Fig. 92, lateral view; *C. sulcata* (Stenroos, 1898) : Fig. 93, lateral view; *C. uncinata* (O.F. Müller) : Fig. 94, lateral view; *Lepadella acuminata* (Ehrenberg) : 95-96, dorsal views; *L. apsicora* Myers : Fig. 97, ventral view, Fig. 98, cross-section; *L. apside* Haring : Fig. 99, ventral view, Fig. 100, cross-section; *L. biloba* Hauer : Fig. 101, ventral view, Fig. 102, cross-section.

53. *Lepadella biloba* Hauer, 1958  
(Figs. 101-102)

**Material examined** : 3 examples, Ghorajan, 07. 05. 2004, coll. B. K. Sharma; 2 examples, Hiragota, 13. 07. 2004, coll. B. K. Sharma; 1 example, Basana, 03. 09. 2006, coll. Sumita Sharma; 3 examples, Hakoi, 29. 11. 2005, coll. Sumita Sharma; 2 examples, 01. 12. 2005, Japara, coll. Sumita Sharma.

**Characters** : Lorica broadly ovoid in outline; dorsal plate strongly arched, ventral plate flat. Foot-groove nearly parallel-sided and acutely pointed posterior projections of lorica; foot-opening reflexed dorsally; toes moderately pointed and acutely pointed.

**Distribution** : INDIA - Meghalaya.

**Elsewhere** : Cosmopolitan.

54. *Lepadella cristata* (Rousselet, 1893)  
(Figs. 103-105)

**Material examined** : 2 examples, Barundanga, 08. 08. 2002, coll. B. K. Sharma; 3 examples, Horinchora, 08. 09. 2004, coll. B. K. Sharma; 3 examples, Hiragota, 13. 07. 2004, coll. B. K. Sharma; 2 examples, Rowmari, 11. 08. 2002, coll. B. K. Sharma; 2 examples, Bamoni, 01. 09. 2006, coll. Sumita Sharma.

**Characters** : Lorica oval, with a dorsal median keel and a distinct backwardly directed dorsal crest. Anterior dorsal margin nearly straight; anterior ventral margin with a V- shaped sinus. Foot-groove pear shaped; last foot-joint projecting beyond lorica. Toes long and pointed.

**Distribution** : INDIA - Assam, Meghalaya and Tripura and West Bengal.

**Elsewhere** : Cosmopolitan.

55. *Lepadella costatoides* Segers, 1992  
(Figs. 106-107)

**Material examined** : 2 examples, Dhir, 10. 12. 2002, coll. B. K. Sharma; 3 examples, Deepor, 03. 11. 2004, coll. B. K. Sharma.

**Characters** : Lorica oval in outline, dorsally arched and with three pairs of longitudinal ridges on dorsum. Anterior dorsal and ventral sinus relatively shallow; stippled collars present. Posterior end of lorica with nearly straight margin flanked by symmetrical and blunt postero-lateral projections. Foot-groove widened distally. Toes long and acutely pointed.

**Distribution** : INDIA - Assam and Meghalaya.

**Elsewhere** : Pantropical

56. *Lepadella ductyliseta* (Stenroos, 1898)  
(Figs. 108-109)

*Material examined* : 2 examples, Morakalong, 03. 12. 2005, coll. Sumita Sharma; 3 examples, Maghuri, 30. 11. 2005, coll. Sumita Sharma.

*Characters* : Lorica oval, dorsal plate strongly arched and ventral plate nearly flat. Anterior dorsal margin without sinus, nearly straight or slightly arched. Ventral margin ventrally directed in lateral view and with a V-shaped sinus, with a stippled collar. Foot-groove deep. Toes moderately long, pointed and ventrally directed.

*Distribution* : INDIA - Assam and Meghalaya.

*Elsewhere* : Palaeotropical.

57. *Lepadella discoidea* Segers, 1993  
(Figs. 110-111)

*Material examined* : 3 examples, Bhoispuri, 08. 08. 2002, coll. B. K. Sharma; 2 examples, Hakama, 08. 09. 2004, coll. B. K. Sharma; 2 examples, Padma, 11. 09. 2004, coll. B. K. Sharma.

*Characters* : Lorica circular in outline and compressed dorso-ventrally. Dorsal plate of lorica domed and ventral plate flat. Head aperture with a semicircular sinus dorsally and a deep V-shaped ventral sinus. Posterior edge of lorica slightly concave. Foot three segmented; distal foot-segment longest. Toes long and pointed.

*Distribution* : INDIA - Assam, Meghalaya and Delhi.

*Elsewhere* : Palaeotropical.

58. *Lepadella ehrenbergii* (Perty, 1850)  
(Figs. 112-113)

*Material examined* : 3 examples, Bhoispuri, 10. 02. 2002, coll. B. K. Sharma; 2 examples, Barundanga, 12. 03. 2003, coll. B. K. Sharma; 5 examples, Dhir, 11. 03. 2003, coll. B. K. Sharma; 2 examples, Hakama, 07. 02. 2005, coll. B. K. Sharma; 2 examples, Horinchora, coll. B. K. Sharma; 2 examples, Jogra, 10. 12. 2002, coll. B. K. Sharma; 3 examples, Sagmara, 11. 03. 2003, coll. B. K. Sharma; 2 examples, Rowmari, 10. 01. 2003, coll. B. K. Sharma; 5 examples, Deepor, 08. 02. 2005, coll. B. K. Sharma; 4 examples, Dighali, 14. 03. 2003, coll. B. K. Sharma; 4 examples, Ghorajan, 12. 07. 2004, coll. B. K. Sharma; 2 examples, Siligurijan, 14. 10. 2002, coll. B. K. Sharma; 2 examples, Chatla, 10. 09. 2004, coll. B. K. Sharma; 3 examples, Hiragota, 04. 11. 2004, coll. B. K. Sharma; 2 examples, Urinal, 10. 09. 2004, coll. B. K. Sharma; 2 examples, Patoni, 01. 09. 2006, coll. Sumita Sharma; 2 examples, Amuri, 01. 09. 2006, coll. Sumita Sharma; 3 examples, Goranga, 05. 04. 2005, coll. Sumita

Sharma; coll. B. K. Sharma; 3 examples, Solmari, 13. 11. 2004, coll. B. K. Sharma; 2 examples, Kujibalipatty, 14. 03. 2003, coll. B. K. Sharma; 3 examples, Morakalong, 03. 12. 2005, coll. Sumita Sharma; 2 examples, Shitalpathar, 01. 12. 2005, coll. Sumita Sharma; 2 examples, Borbil-Tinsuki, 01. 12. 2005, coll. Sumita Sharma; 4 examples, Memdubi, 30. 11. 2005, coll. Sumita Sharma; 2 examples, Raidong, 30. 11. 2005, coll. Sumita Sharma; 3 examples, Sone, 11. 12. 2004, coll. B. K. Sharma.

**Characters** : Lorica broadly rhomboid ovate in outline. Dorsal plate moderately convex in central region and relatively flat laterally. Lateral angles with median spurs curving outwards and forwards. Posterior angles pointed and posterior margin of lorica slightly concave. Foot-groove broader posteriorly; toes unequal and pointed.

**Distribution** : INDIA - Assam, Meghalaya, Tripura, Nagaland, West Bengal and Orissa.

**Elsewhere** : Cosmopolitan.

#### 59. *Lepadella eurysterna* Myers, 1942

(Fig. 114)

**Material examined** : 3 examples, Hakama, 11. 07. 2004, coll. B. K. Sharma; 2 examples, Horinchora, 02. 11. 2004, coll. B. K. Sharma; 2 examples, Daphlang, 05. 09. 2006, coll. Sumita Sharma.

**Characters** : Lorica almost oval in outline; dorsal plate moderately arched. Dorsal sinus U-shaped. Ventral sinus deep and V-shaped. Posterior margin of lorica convex in the region of its foot-opening. Toes elongated and pointed.

**Distribution** : INDIA - Meghalaya and Delhi.

**Elsewhere** : Cosmopolitan

#### 60. *Lepadella heterodactyla* Fadeew, 1925

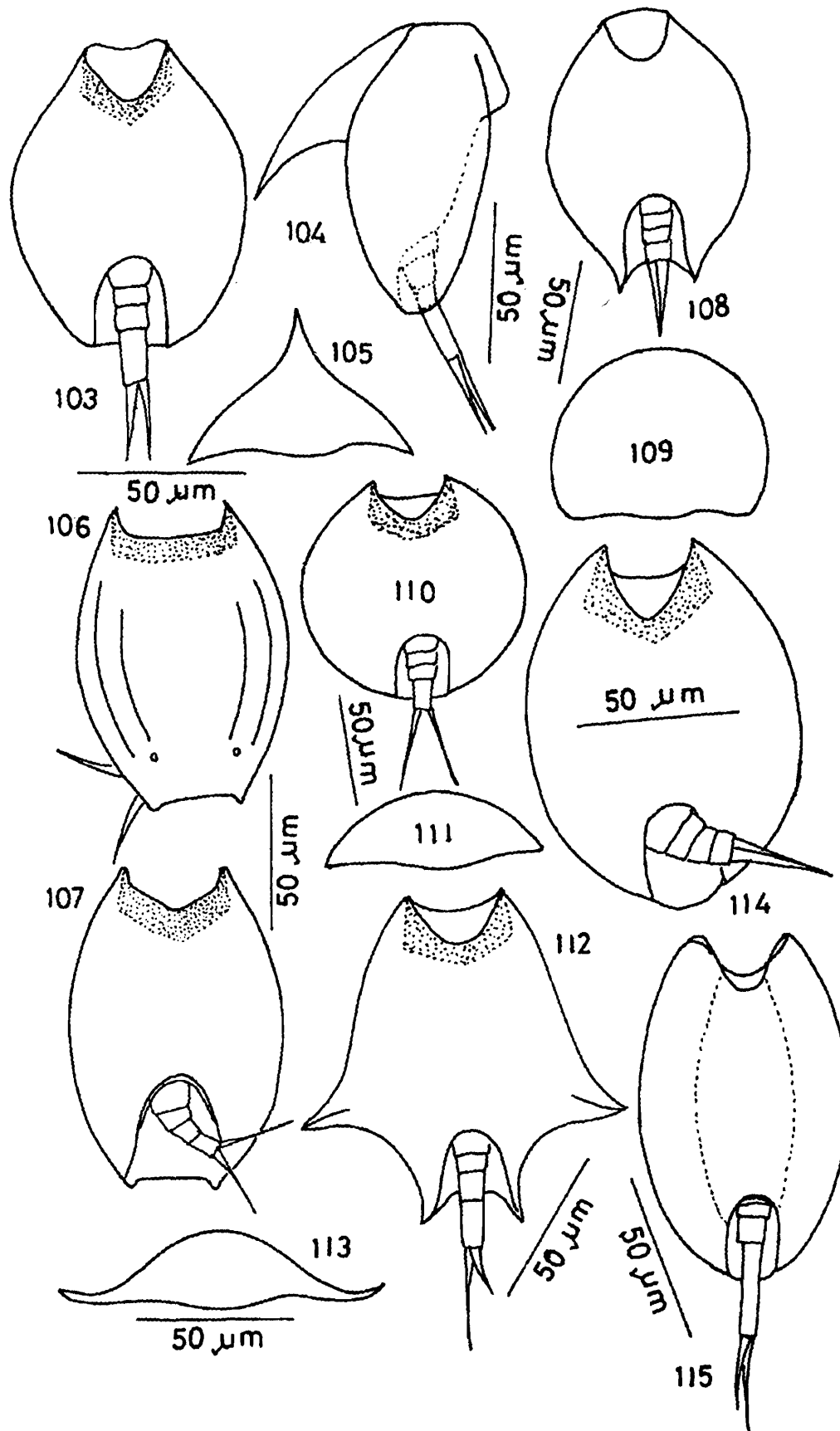
(Fig. 115)

**Material examined** : 2 examples, Barundanga, 09. 12. 2002, coll. B. K. Sharma; 2 examples, Mori, 03. 09. 2006, coll. B. K. Sharma.

**Characters** : Lorica broadly oval in outline; dorsal plate moderately arched, ventral plate nearly flat. Dorsal and ventral margins of head aperture with deep almost triangular sinuses. Foot groove nearly oval; last foot-segment distinctly project beyond lorica Toes unequal and pointed.

**Distribution** : INDIA - Assam.

**Elsewhere** : Cosmopolitan.



*Lepadella cristata* (Rousselet) : Fig. 103, ventral view, Fig. 104, lateral view, Fig. 105, cross-section; *L. costatoides* Segers : Fig. 106, dorsal view, Fig. 107, ventral view; *L. dactyliseta* (Stenroos) : Fig. 108, ventral view, Fig. 109, cross-section; *L. discoidea* Segers : Fig. 110, ventral view, Fig. 111, cross-section; *L. ehrenbergii* (Perty) : Fig. 112, ventral view, Fig. 113, cross-section; *L. eurysterna* Myers: 114, ventral view; *L. heterodactyla* Fadeew: Fig. 115, ventral view.

61. *Lepadella heterostyla* (Murray, 1913)  
(Figs. 116-117)

**Material examined** : 2 examples, Bhoispuri, 04. 12. 2002, coll. B. K. Sharma; 3 examples, Barundanga, 07. 01. 2003, coll. B. K. Sharma; 4 examples, Dhir, 11. 03. 2003, coll. B. K. Sharma; 2 examples, Horinchora, 08. 09. 2004, coll. B. K. Sharma; 3 examples, Fingua, 10. 08. 2002, coll. B. K. Sharma; 3 examples, Sagmara, 13. 02. 2002, coll. B. K. Sharma; 3 examples, Rowmari, 11. 08. 2002, coll. B. K. Sharma; 5 examples, Deepor, 13. 12. 2002, coll. B. K. Sharma; 3 examples, Deepor, 03. 11. 2004, coll. B. K. Sharma; 3 examples, Deepor, 06. 04. 2005, coll. Sumita Sharma; 4 examples, Dighali, 12. 08. 2002, coll. B. K. Sharma; 2 examples, Borbila, 15. 03. 2003, coll. B. K. Sharma; 2 examples, Kamranga, 09. 07. 2004, coll. B. K. Sharma; 3 examples, Ghorajan, 03. 11. 2004, coll. B. K. Sharma; 3 examples, Kakerikhola, 10. 12. 2004, coll. B. K. Sharma; 2 examples, Bamoni, 01. 09. 2006, coll. Sumita Sharma; 3 examples, Sitalmari, 08. 12. 2005, coll. B. K. Sharma; 2 examples, Bandha, 03. 09. 2006, coll. Sumita Sharma; 2 examples, Daphlang, 02. 12. 2005, coll. Sumita Sharma; 2 examples, Lotha, 01. 09. 2006, coll. Sumita Sharma; 4 examples, Mohna, 03.09. 2006, coll. Sumita Sharma; 4 examples, Mihir, 02. 12. 2006, coll. Sumita Sharma; 3 examples, Hakoi, 29. 11. 2005, coll. Sumita Sharma; 4 examples, Memdubi, 30. 11. 2005, coll. Sumita Sharma; 5 examples, Samuajan, 01. 03. 2004, coll. B. K. Sharma; 3 examples, Sone, 09. 02. 2005, coll. B. K. Sharma; 3 examples, Baskandi, 19. 12. 2004, coll. B. K. Sharma.

**Characters** : Lorica broadly rhomboidal and its edges curving upwards from the blunt lateral angles towards the anterior margin. Dorsal plate strongly convex in its median region. Posterior angles of lorica with semicircular emarginations. Toes unequal and pointed.

**Distribution** : INDIA - Assam, Meghalaya, Tripura, Mizoram, West Bengal, Orissa and Bihar.

**Elsewhere** : Cosmopolitan.

62. *Lepadella lindaui* Koste, 1981  
(Figs. 118-119 )

**Material examined** : 2 examples, Dhir, 05. 05. 2002, coll. B. K. Sharma; 2 examples, Horinchora, 08. 09. 2004, coll. B. K. Sharma; 2 examples, Sitalmari, 13. 11. 2004, coll. B. K. Sharma.

**Characters** : Lorica small, broadly egg-shaped in outline, compressed and bordered around lower part by cuticular ribs. Dorsal plate slightly arched with a raised hump, carrying flat keel and terminating in fine points reaching caudal margin. Head aperture ventral and nearly circular, caudal margin broadly rounded or slightly indented. Foot-opening elliptical. Toes small and pointed.

**Distribution** : INDIA - Assam.

**Elsewhere** : Cosmopolitan.

63. *Lepadella minuta* (Weber & Montet, 1918)  
(Fig. 120)

*Material examined* : 2 examples, Barundanga, 07. 01. 2003, coll. B. K. Sharma; 2 examples, Horinchora, 07. 02. 2005, coll. B. K. Sharma; 3 examples, Deepor, 12. 08. 2002, coll. B. K. Sharma; 2 examples, Urmal, 10. 09. 2004, coll. B. K. Sharma; 3 examples, Solmari, 13. 11. 2005, coll. B. K. Sharma; 2 examples, Daphlang, 02. 12. 2006, coll. Sumita Sharma.

*Characters* : Lorica small, elongate-oval, not compressed in cross-section. Anterior dorsal margin nearly straight, anterior ventral margin with a shallow sinus and with distinct external angles. Foot-groove semi-circular. Toes pointed.

*Distribution* : INDIA - Assam and Meghalaya.

*Elsewhere* : Cosmopolitan.

64. *Lepadella minoruoides* Koste & Robertson, 1983  
(Figs. 121-122)

*Material examined* : 2 examples, Morakalong, 03. 12.2005, coll. B. K. Sharma; 2 examples, Sarain Hubbi, 20. 11. 2005, coll. Sumita Sharma.

*Characters* : Lorica small, rhombic in outline, maximum width in its middle region with prominent dorsal keel and produced into lobate posterior projection. Dorsal plate covered with fine hairs and ventral plate granulated. Anterior dorsal margin nearly straight, ventral margin with a shallow sinus. Foot-groove nearly semi-circular. Foot not projecting beyond lorica. Toes moderately long and pointed.

*Distribution* : INDIA - Assam.

*Elsewhere* : Cosmopolitan.

65. *Lepadella ovalis* (O.F.Müller, 1786)  
(Figs. 123-125)

*Material examined* : 3 examples, Bhoispuri, 08. 08. 2002, coll. B. K. Sharma; 3 examples, Barundanga, 03. 05. 2002, coll. B. K. Sharma; 5 examples, Dhir, 09. 08. 2002, coll. B. K. Sharma; 2 examples, Hakama, coll. B. K. Sharma; 2 examples, Horinchora, coll. B. K. Sharma; 5 examples, Fingua, 10. 08. 2002, coll. B. K. Sharma; 2 examples, Sagmara, 11. 03. 2003, coll. B. K. Sharma; 5 examples, Kamakhya, 07. 05.2002, coll. B. K. Sharma; 2 examples, Rowmari, 13. 03. 2003, coll. B. K. Sharma; 5 examples, Deepor, 09. 07. 2004, coll. B. K. Sharma; 2 examples, Deepor, 06. 05. 2004, coll. Sumita Sharma; 3 examples, Dighali, 12. 08. 2002, coll. B. K. Sharma; 2 examples, Dighali, 06. 04. 2005, coll. Sumita Sharma; 2 examples, Borbila, 11. 12. 2002, coll. B. K. Sharma; 2 examples, Kamranga, 03. 11. 2004, coll. B. K. Sharma; 3 examples, Siligurijan, 13. 08. 2002, coll. B. K. Sharma; 2 examples, Hiragota, 10. 09. 2004, coll. B. K. Sharma; 2 examples, Urmal, 10. 02. 2005, coll.

B. K. Sharma; 2 examples, Kakerikhola, 11. 09. 2004, coll. B. K. Sharma; 2 examples, Padma, 05. 11. 2004, coll. B. K. Sharma; 2 examples, Bamoni, 01. 09. 2006, coll. B. K. Sharma; 2 examples, Basana, 01. 09. 2006, coll. Sumita Sharma; 2 examples, Goranga, 13. 11. 2004, coll. B. K. Sharma; 3 examples, Solmari, 08. 12. 2004, coll. B. K. Sharma; 3 examples, Sitalmari, 13. 11. 2004, coll. B. K. Sharma; 2 examples, Mori, 01. 12. 2005, coll. B. K. Sharma; 2 examples, Thekera, 08. 11. 2004, coll. B. K. Sharma; 2 examples, Kujibalipatty, 13. 12. 2002, coll. B. K. Sharma; 2 examples, Bandha, 03. 09. 2006, coll. Sumita Sharma; 3 examples, Haduk, 01. 09. 2006, coll. Sumita Sharma; 2 examples, Donga, 06. 09. 2006, coll. Sumita Sharma; 2 examples, Borbil-Tinsuki, 01. 12. 2005, 4 examples, Muijan, 29. 11. 2005, coll. Sumita Sharma; 2 examples, Sesa, 01. 12. 2005, coll. Sumita Sharma; 2 examples, Diang, coll. Sumita Sharma; 2 examples, Sohala, coll. Sumita Sharma; 3 examples, Mihir, 02. 12. 2006, coll. Sumita Sharma; 2 examples, Kutri, 03. 12. 2005, coll. Sumita Sharma; 3 examples, Raidong, 30. 11. 2005, coll. Sumita Sharma; 2 examples, Naruathan, 19. 01. 2005, coll. B. K. Sharma; 4 examples, Samuajan, 18. 01. 2005, coll. B. K. Sharma; 3 examples, Sone, 19. 10. 2004, coll. B. K. Sharma; 3 examples, Salchapra, 11. 12. 2004, coll. B. K. Sharma.

**Characters** : Lorica oval to circular and compressed dorso-ventrally; dorsal plate convex and ventral plate nearly flat. Dorsal and ventral sinus with stippled collars. Foot-groove nearly parallel-sided. Toes relatively short and pointed.

**Distribution** : INDIA - all states in North Eastern region, West Bengal, Orissa, Bihar, Kerala, Punjab, Haryana, Ladak and Kashmir.

**Elsewhere** : Cosmopolitan.

#### 66. *Lepadella patella* (O.F.Müller, 1773)

(Figs. 126-127)

**Material examined** : 3 examples, Bhoispuri, 08. 07. 2002, coll. B. K. Sharma; 5 examples, Barundanga, 03. 05. 2002, coll. B. K. Sharma; 5 examples, Dhir, 09. 08. 2002, coll. B. K. Sharma; 3 examples, Hakama, 11. 07. 2004, coll. B. K. Sharma; 3 examples, Horinchora, 02. 11. 2004, coll. B. K. Sharma; 2 examples, Fingua, 13. 03. 2003, coll. B. K. Sharma; 2 examples, Jogra, 10. 08. 2002, coll. B. K. Sharma; 3 examples, Sagmara, 09. 01. 2003, coll. B. K. Sharma; 2 examples, Kamakhya, 13. 03. 2003, coll. B. K. Sharma; 2 examples, Rowmari, 12. 12. 2002, coll. B. K. Sharma; 5 examples, Deepor, 9. 09. 2004, coll. B. K. Sharma; 4 examples, Dighali, 12. 08. 2002, coll. B. K. Sharma; 2 examples, Borbila, 15. 03. 2003, coll. B. K. Sharma; 2 examples, Kamranga, 03. 11. 2004, coll. B. K. Sharma; 3 examples, Ghorajan, 08. 12. 2004, coll. B. K. Sharma; 3 examples, Siligurijan, 12. 03. 2003, coll. B. K. Sharma; 2 examples, Chatla, 10. 09. 2004, coll. B. K. Sharma; 2 examples, Hiragota, 10. 02. 2005, coll. B. K. Sharma; 3 examples, Urmal, 09. 12. 2004, coll. B. K. Sharma; 2 examples, Kakerikhola, 11. 02. 2005, coll. B. K. Sharma; 2 examples, Padma, 09. 05. 2004, coll. B. K. Sharma; 2 examples, Bamoni, 01. 09. 2006, coll. Sumita Sharma; 3

examples, Basana, 01. 09. 2006, coll. Sumita Sharma; 2 examples, Solmari, 09. 09. 2004, coll. B. K. Sharma; 3 examples, Sitalmari, 08. 12. 2004, coll. B. K. Sharma; 2 examples, Mori, 01. 12. 2005, coll. B. K. Sharma; Thekera, 08. 11. 2004, coll. B. K. Sharma; 2 examples, 14. 03. 2003, Kujibalipatty, coll. B. K. Sharma; 3 examples, Daphlang, 02. 12. 2005, coll. Sumita Sharma; 2 examples, Haduk, 01. 09. 2006, coll. Sumita. Sharma; 2 examples, Duptoli, 01. 09. 2006, coll. Sumita Sharma; 2 examples, Jugdal, 01. 09. 2006, coll. Sumita Sharma; 2 examples, Borbil-Tinsuki, 01. 12. 2005, coll. Sumita Sharma; 4 examples, Muijan, 29. 11. 2005, coll. Sumita Sharma; 2 examples, Hakoi, 29. 11. 2005, coll. Sumita Sharma; 2 examples, Sesa, 01. 12. 2005, coll. Sumita Sharma; 2 examples, Morakalong, 05. 12. 2005, coll. Sumita. Sharma; 4 examples, Sohala, 05. 09. 2006, coll. Sumita Sharma; 2 examples, Mihir, 05. 09. 2006, coll. Sumita Sharma; 3 examples, Raidong, 30. 11. 2005, coll. Sumita Sharma; 2 examples, Balak, 17. 01. 2005, coll. Sumita Sharma; 5 examples, Samuajan, 10. 01. 2005, coll. B. K. Sharma; 2 examples, Sone, 19. 10.2004, coll. B. K. Sharma; 3 examples, Salchapra, 09. 02. 2005, coll. B. K. Sharma.

*Characters* : Lorica oval and dorsal plate strongly arched; anterior dorsal and ventral sinus with stippled collars. Foot groove parallel-sided to semicircular and its edges often projecting at the posterior end. Toes pointed.

*Distribution* : INDIA - all the states in North Eastern India, West Bengal, Orissa, Bihar, Rajasthan, Gujarat, Punjab, Ladak and Kashmir.

*Elsewhere* : Cosmopolitan.

### 67. *Lepadella rhomboides* (Gosse, 1886)

(Figs. 128-129)

*Material examined* : 3 examples, Bhoispuri, 12. 03. 2003, coll. B. K. Sharma; 4 examples, Dhir, 12. 02. 2002, coll. B. K. Sharma; 3 examples, Hakama, 02. 11. 2004, coll. B. K. Sharma; 2 examples, Jogra, 10. 12. 2002, coll. B. K. Sharma; 2 examples, Sagmara, 11. 03. 2003, coll. B. K. Sharma; 5 examples, Deepor, 08. 02. 2005, coll. B. K. Sharma; 2 examples, Deepor, 06. 04. 2005, coll. Sumita Sharma; 3 examples, Dighali, 14. 03. 2003, coll. B. K. Sharma; 2 examples, Kamranga, 03. 11. 2004, coll. B. K. Sharma; 3 examples, Ghorajan, 09. 09. 2004, coll. B. K. Sharma; 2 examples, Chatla, 10. 09. 2004, coll. B. K. Sharma; 3 examples, Urmal, 09. 12. 2004, coll. B. K. Sharma; 2 examples, Kakerikhola, 11. 09. 2004, coll. B. K. Sharma; 3 examples, Padma, 10. 02. 2005, coll. B. K. Sharma; 2 examples, Bamoni, 01. 09. 2006, coll. Sumita Sharma; 4 examples, Goranga, 05. 04. 2005, coll. B. K. Sharma; 3 examples, Jugdal, 01. 09. 2006, coll. Sumita Sharma; 3 examples, Solmari, 09. 09. 2004, coll. B. K. Sharma; 3 examples, Sitalmari, 08. 12. 2004, coll. B. K. Sharma; 2 examples, Kujibalipatty, 41. 03. 2003, coll. B. K. Sharma; 2 examples, Daphlang, 02. 12. 2005, coll. Sumita Sharma; 2 examples, Sohala, 05. 09. 2006, coll. Sumita Sharma; 3 examples, Sarain Hubbi, 29. 11. 2005, coll. Sumita Sharma; 4 examples, Samuajan, 01. 03. 2004, coll. B. K. Sharma; 3 examples, Salchapra, 09. 02. 2005, coll. B. K. Sharma.

**Characters** : Lorica rhomboid-oval; dorsal plate with a wide and moderately high median keel, sides of keel strongly convex and meet centrally at an obtuse angle forming a faint ridge. Foot groove variable. Foot long. Toes slender and pointed.

**Distribution** : INDIA - Assam, Meghalaya, Tripura, Nagaland, Manipur, Mizoram, West Bengal, Tamil Nadu, Gujarat and Punjab.

**Elsewhere** : Cosmopolitan.

68. *Lepadella triba* Myers, 1934

(Figs. 130-131)

**Material examined** : 3 examples, Barundanga, 09. 12. 2002, coll. B. K. Sharma; 3 examples, Horinchora, 02. 11. 2004, coll. B. K. Sharma; 2 examples, Hiragota, 10. 09. 2004, coll. B. K. Sharma; 2 examples, Raidong, 30. 11. 2005, coll. Sumita Sharma.

**Characters** : Lorica elongated, cross-section shallow, evenly arched dorsally. Dorsal margin of head aperture almost straight, ventrally with broadly V-shaped sinus. Ventral plate of lorica with slightly elevated mid-section. Foot-opening flaring. Distal foot-segment nearly half the length of toes. Toes long and tapering to slender drawn-out tips.

**Distribution** : INDIA - Assam, West Bengal, Orissa.

**Elsewhere** : Cosmopolitan.

69. *Lepadella triptera* (Ehrenberg, 1832)

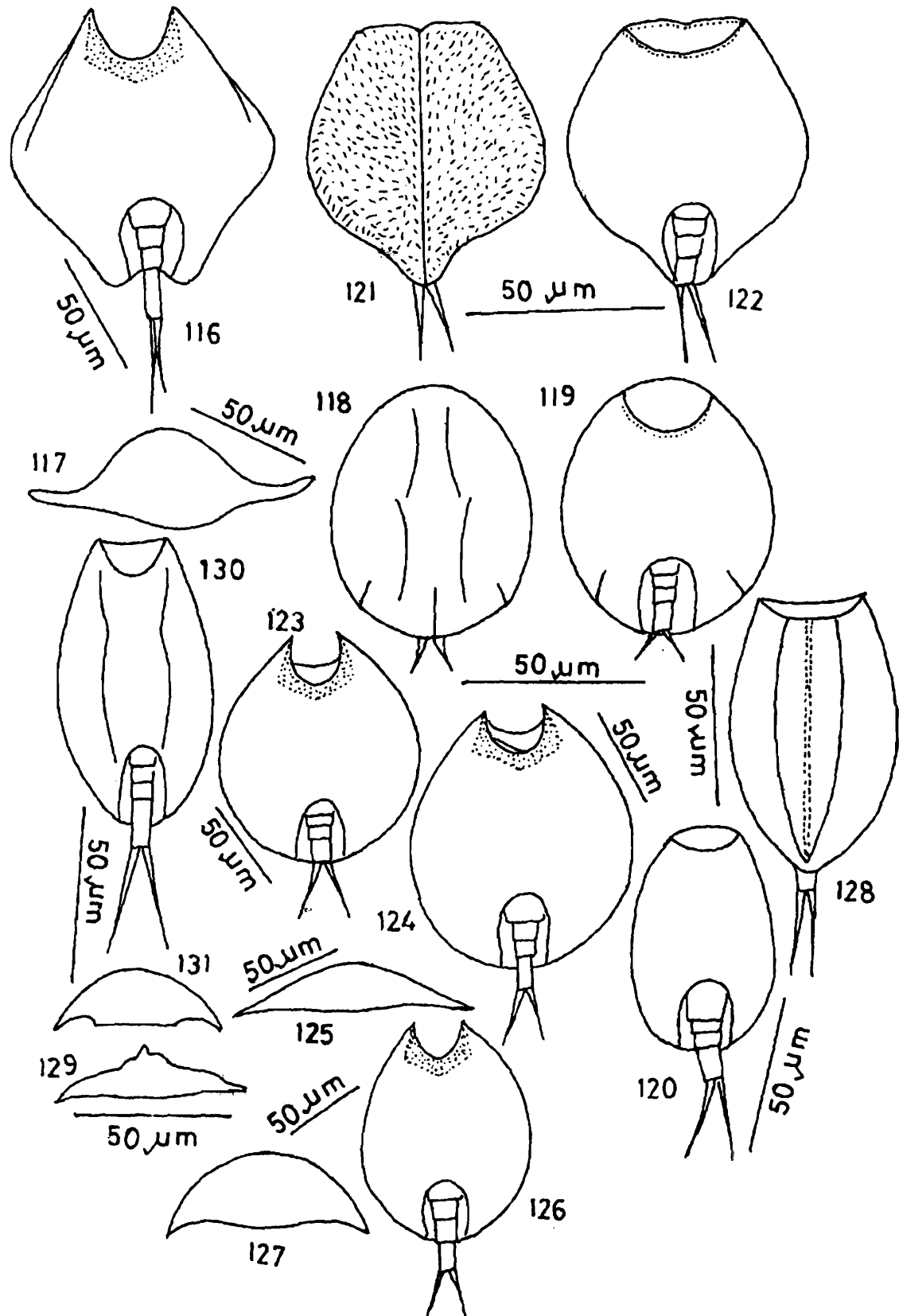
(Figs. 132-134)

**Material examined** : 3 examples, Barundanga, 08. 08. 2002, coll. B. K. Sharma; 3 examples, Deepor, 03. 11. 2002, coll. B. K. Sharma; 2 examples, Deepor, 06. 04. 2005, coll. Sumita Sharma; 2 examples, Dighali, 06. 04. 2005, coll. Sumita Sharma; 3 examples, Ghorajan, 08. 12. 2004, coll. B. K. Sharma; 2 examples, Siligurijan, 12. 01. 2003, coll. B. K. Sharma; 2 examples, Kujibalipatty, 41. 03. 2003, coll. B. K. Sharma; 2 examples, Urmal, 10. 09. 2004, coll. B. K. Sharma; 2 examples, Goranga, 01. 09. 2006, coll. B. K. Sharma; 3 examples, Solmari, 08. 12. 2004, coll. B. K. Sharma; 2 examples, Morakaleng, 05. 12. 2005, coll. Sumita Sharma; 2 examples, Sesa, 01. 12. 2005, coll. Sumita Sharma; 2 examples, Teliadanga, 01. 12. 2005, coll. Sumita Sharma; 4 examples, Maghuri, 30. 11. 2005, coll. Sumita Sharma; 3 examples, Samuajan, 01. 03. 2004, coll. B. K. Sharma; 3 examples, Sone, 19. 10. 2004, coll. B. K. Sharma.

**Characters** : Lorica small and broadly circular or rhombic in outline. Dorsal plate with a high and thin median keel. Anterior end of dorsal plate with a shallow notch, ventral sinus broad and U - shaped. Posterior end of lorica obtusely pointed. Foot-groove nearly oval. Toes short and pointed.

**Distribution** : INDIA - Assam, Meghalaya, Tripura, West Bengal, Orissa, Tamil Nadu, Punjab and Ladak.

**Elsewhere** : Cosmopolitan.



*Lepadella heterostyla* (Murray) : 116, ventral view, Fig. 117, cross-section; *L. lindau* Koste : Fig. 118, dorsal view, Fig. 119, ventral view; *L. minuta* (Weber & Montet) : Fig. 120, ventral view; *L. minoruoides* Koste & Robertson : Fig. 121, dorsal view, fig. 122, ventral view; *L. ovalis* (O. F. Müller) : Figs. 123-124, ventral views, Fig. 125, cross-section; *L. patella* (O.F. Müller) : Fig. 126, ventral view, Fig. 127, cross-section; *L. rhomboides* (Gosse) : Fig. 128, dorsal view, Fig. 129, cross-section; *L. triba* Myers : Fig. 130, ventral view, Fig. 131, cross-section.

70. *Squatinella mutica* (Ehrenberg, 1832)

(Fig. 135)

**Material examined** : 2 examples, Bhoispuri, 04. 12. 2002, coll. B. K. Sharma; 2 examples, Hakama, 07. 02. 2005, coll. B. K. Sharma; 3 examples, Horinchora, 02. 11. 2004, coll. B. K. Sharma; 2 examples, Sagmara, 09. 01. 2003, coll. B. K. Sharma; 3 examples, Deepor, 03. 11. 2002, coll. B. K. Sharma; 2 examples, Siligurijan, 14. 12. 2002, coll. B. K. Sharma.

**Characters** : Body transparent and with semicircular head shield; trunk with oblong-ovate lorica. First foot-segment covered by a shield-like projection of dorsal plate. Toes long, slender and acutely pointed.

**Distribution** : INDIA - Assam, Meghalaya, Tripura, West Bengal and Ladak.

**Elsewhere** : Cosmopolitan.

## Family LECANIDAE Bartos, 1959

**Characters** : Body loricate and consists of dorsal and ventral plates. Trophi malleate, modified for suction. Buccal area very simple. Foot one or two-jointed; toes one or two

Genus *Lecane* Nitzsch, 1827

**Characters** : Lorica oval, pear or shield-shaped, with dorsal and ventral plates and usually compressed dorso-ventrally. Antero-lateral edges of lorica prolonged into angles or short spines in some species; posterior and rounded or extended into a process. Foot short, two segmented; only second foot-joint mobile. Toes one or two, in the latter case completely or partially fused; often with short and pointed claws.

*Lecane* is divided into three subgenera namely *Lecane* (*s. str.*), *Hemimonostyla* and *Monostyla*; all these are represented in the collections examined from the floodplain lakes of Assam. Further, these include 27, 3 and 19 species respectively.

71. *Lecane aculeata* (Jakubski, 1912)

(Figs. 136-137)

**Material examined** : 4 examples, Bhoispuri, 07. 01. 2003, coll. B. K. Sharma; 3 examples, Dhir, 10. 12. 2002, coll. B. K. Sharma; 2 examples, Horinchora, 07. 02. 2005, coll. B. K. Sharma; 2 examples, Fingua, 12. 03. 2003, coll. B. K. Sharma; 2 examples, Rowmari, 10. 01. 2003, coll. B. K. Sharma; 4 examples, Deepor, 03. 11. 2004, coll. B. K. Sharma; 2 examples, Dighali, 11.2003, coll. B. K. Sharma; 2 examples, Kamranga, 10. 02. 2005, coll. B. K. Sharma; 3 examples, Ghorajan, 09. 09. 2004, coll. B. K. Sharma; 3 examples, Siligurijan, 13. 01. 2003, coll. B. K. Sharma; 2 examples, Urmal, 08. 05. 2004, coll. B. K. Sharma; 2 examples, Kakerikhola, 06. 03. 2004, coll. B. K. Sharma; 2 examples, Basana, 03. 09. 2006,

coll. Sumita Sharma; 4 examples, Mori, 01. 12. 2005, coll. B. K. Sharma; 2 examples, Lotha, 01. 09. 2006, coll. Sumita Sharma; 2 examples, Amuri, 01. 09. 2006, coll. Sumita Sharma; 3 examples, Karasing, 02. 12. 2005, coll. Sumita Sharma.

*Characters* : Lorica elongate-oval and compressed; with straight and coincident anterior margins; ventral plate narrower than dorsal plate and with distinct outcurving spines at its external edges. Posterior segment small and rounded. Toes parallel-sided and terminating into slender claws.

*Distribution* : INDIA - Assam, Meghalaya, Tripura, West Bengal and Orissa.

*Elsewhere* : Pantropical.

72. *Lecane arcula* Harring, 1914

(Figs. 138-139)

*Material examined* : 2 examples, Dhir, 12. 02. 2002, coll. B. K. Sharma; 2 examples, Mora Daphlang, 03. 12. 2005, coll. Sumita Sharma.

*Characters* : Lorica small, elongate-oval and compressed; with straight and coincident anterior margins. Ventral plate with relatively shorter and less elongated antero-lateral occipital spines. Toes parallel-sided; claw small and slender.

*Distribution* : INDIA - Assam and Meghalaya.

*Elsewhere* : Tropicopolitan

73. *Lecane braumi* Koste, 1988

(Fig. 140)

*Material examined* : 2 examples, Muijan, 29. 11. 2005, coll. Sumita. Sharma; 2 examples, Bor beel, 01. 12. 2005, coll. B. K. Sharma.

*Characters* : Lorica broadly elongate-oval, compressed dorso-ventrally, anterior margins slightly concave and without any external spines. Dorsal plate smaller than ventral plate and extending slightly beyond the latter at postero-lateral angles. Toes long and parallel-sided; claws small and each claw with a distinct basal spicule.

*Distribution* : INDIA - Assam and Tripura.

*Elsewhere* : Palaeotropical.

74. *Lecane crepida* Harring, 1914

(Figs. 141-142)

*Material examined* : 4 examples, Bhoispuri, 08. 08. 2002, coll. B. K. Sharma; 2 examples, Barundanga, 07. 01. 2003, coll. B. K. Sharma; 4 examples, Dhir, 08. 01. 2003, coll. B. K.

Sharma; 2 examples, Jogra, 10. 08. 2002, coll. B. K. Sharma; 3 examples, Kamakhya, 12. 12. 2002, coll. B. K. Sharma; 5 examples, Deepor, coll. B. K. Sharma; 4 examples, Dighali, coll. B. K. Sharma; 5 examples, Ghorajan, 08. 12. 2004, coll. B. K. Sharma; 2 examples, Ghorajan, 06. 04. 2005, coll. Sumita Sharma; 2 examples, Hiragota, 10. 02. 2005, coll. B. K. Sharma; 3 examples, Bamoni, 01. 09. 2006, coll. Sumita. Sharma; 2 examples, Basana, 01. 09. 2006, coll. Sumita Sharma; 3 examples, Solmari, 13. 11. 2004, coll. B. K. Sharma; 2 examples, Sitalmari, 09. 09. 2004, coll. B. K. Sharma; 3 examples, Thekera, 08. 11. 2004, coll. B. K. Sharma; 2 examples, Padmakhua, 01. 09. 2006, coll. Sumita Sharma; 2 examples, Morakalong, 03. 12. 2005, coll. Sumita Sharma; 3 examples, Memdubi, 30. 11. 2005, coll. Sumita Sharma; 5 examples, Samuajan, 18. 01. 2005, coll. B. K. Sharma; 3 examples, Sone, 11. 12. 2004, coll. B. K. Sharma.

*Characters* : Lorica elongated, parallel-sided, anterior margins almost straight and coincident; external angles of ventral plate with distinct anteriorly directed spines. Dorsal plate smaller than ventral plate. Second foot-joint squarish and projecting beyond lorica. Toes parallel-sided; each toe with a distinct and pointed claw.

*Distribution* : INDIA - Assam, Meghalaya, Tripura, West Bengal, Tamil Nadu, Gujarat and Punjab.

*Elsewhere* : Tropicopolitan.

#### 75. *Lecane curvicornis* (Murray, 1913)

(Figs. 142-144)

*Material examined* : 5 examples, Bhoispuri, 07. 01. 2003, coll. B. K. Sharma; 5 examples, Barundanga, 12. 03. 2003, coll. B. K. Sharma; 3 examples, Hakama, 08. 09. 2004, coll. B. K. Sharma; 4 examples, Horinchora, 08. 09. 2004, coll. B. K. Sharma; 2 examples, Fingua, 10. 08. 2002, coll. B. K. Sharma; 2 examples, Sagmara, 10. 08. 2002, coll. B. K. Sharma; 4 examples, Kamakhya, 14. 02. 2002, coll. B. K. Sharma; 7 examples, Deepor, 12. 07. 2004, coll. B. K. Sharma; 4 examples, Deepor, 06. 04. 2005, coll. Sumita Sharma; 4 examples, Dighali, 12. 08. 2002, coll. B. K. Sharma; 2 examples, Borbila, 09. 05. 2002, coll. B. K. Sharma; 3 examples, Kamranga, 04. 03. 2004, coll. B. K. Sharma; 5 examples, Ghorajan, 12. 07. 2004, coll. B. K. Sharma; 2 examples, Chatla, 10. 09. 2004, coll. B. K. Sharma; 3 examples, Hiragota, 05. 03. 2004, coll. B. K. Sharma; 3 examples, Padma, 09. 05. 2004, coll. B. K. Sharma; 3 examples, Basana, 03. 09. 2006, coll. Sumita Sharma; 4 examples, Solmari, 08. 12. 2004, coll. B. K. Sharma; 5 examples, Sitalmari, 09. 09. 2004, coll. B. K. Sharma; 3 examples, Thekera, 06. 05. 2004, coll. B. K. Sharma; 2 examples, Donga, 06. 09. 2006, coll. Sumita Sharma; 3 examples, Borbil-Tinsuki, 01. 12. 2005, coll. Sumita Sharma; 4 examples, Muijan, 29. 11. 2005, coll. Sumita Sharma; 2 examples, Hakoi, 29. 11. 2005, coll. Sumita Sharma; Sesa, 01. 12. 2005, coll. Sumita Sharma; 3 examples, Diang, 01. 12. 2005, coll. Sumita Sharma; 3 examples, Bor beel, 01. 12. 2005, coll. Sumita Sharma; 2 examples, Sohala, 05. 09. 2006, coll. Sumita Sharma; 2 examples, Shitalpathar, 01. 12. 2005, coll.

Sumita Sharma; 4 examples, Raidong, 30. 11. 2005, coll. Sumita Sharma; 5 examples, Naruathan, 19. 01. 2005, coll. B. K. Sharma; 4 examples, Samuajan, 18. 01. 2005, coll. B. K. Sharma; 2 examples, Salchapra, 09. 02. 2005, coll. B. K. Sharma.

*Characters* : Lorica large, pyriform and compressed; anterior margins coincident and with a V-shaped sinus; external angles with prominent spines. Dorsal plate narrower than ventral plate and without any surface markings. Posterior segment small; often rounded. Toes long, claws small and each claw with a basal spicule.

*Distribution* : INDIA - Assam, Meghalaya, Tripura, West Bengal, Bihar, Andhra Pradesh and Madhya Pradesh.

*Elsewhere* : Tropicopolitan.

75a. *Lecane curvicornis nitida* (Hauer, 1938)

(Fig. 145)

*Material examined* : 2 examples, Barundanga, 03. 05. 2002, coll. B. K. Sharma; 3 examples, Kamakhya, 11. 08. 2002, coll. B. K. Sharma; 4 examples, Deepor, 07. 05. 2004, coll. B. K. Sharma; 2 examples, Deepor, 06. 04. 2005, coll. Sumita Sharma; 3 examples, Ghorajan, 09. 09. 2004, coll. B. K. Sharma; 2 examples, Siligurijan, 13. 08. 2002, coll. B. K. Sharma; 3 examples, Hiragota, 10. 09. 2004, coll. B. K. Sharma; 3 examples, Ghorkhonjan, 08. 07. 2004, coll. B. K. Sharma; 2 examples, Borbil-Tinsuki, 01. 12. 2005, coll. Sumita Sharma; 3 examples, Muijan, 29. 11. 2005, coll. Sumita Sharma; 4 examples, Samuajan, 10. 06. 2004, coll. B. K. Sharma; 2 examples, Sone, 19. 10. 2004, coll. B. K. Sharma.

*Characters* : Dorsal and ventral plates with a strong pattern of surface markings. Anterior dorsal margin with a number of folds. Anterior ventral margin with a broad U-shaped sinus flanked by slightly inwardly directed distinct spines at external angles.

*Distribution* : INDIA - Meghalaya and West Bengal.

*Elsewhere* : South America, West Africa and Indonesia.

76. *Lecane doryssa* Haring, 1914

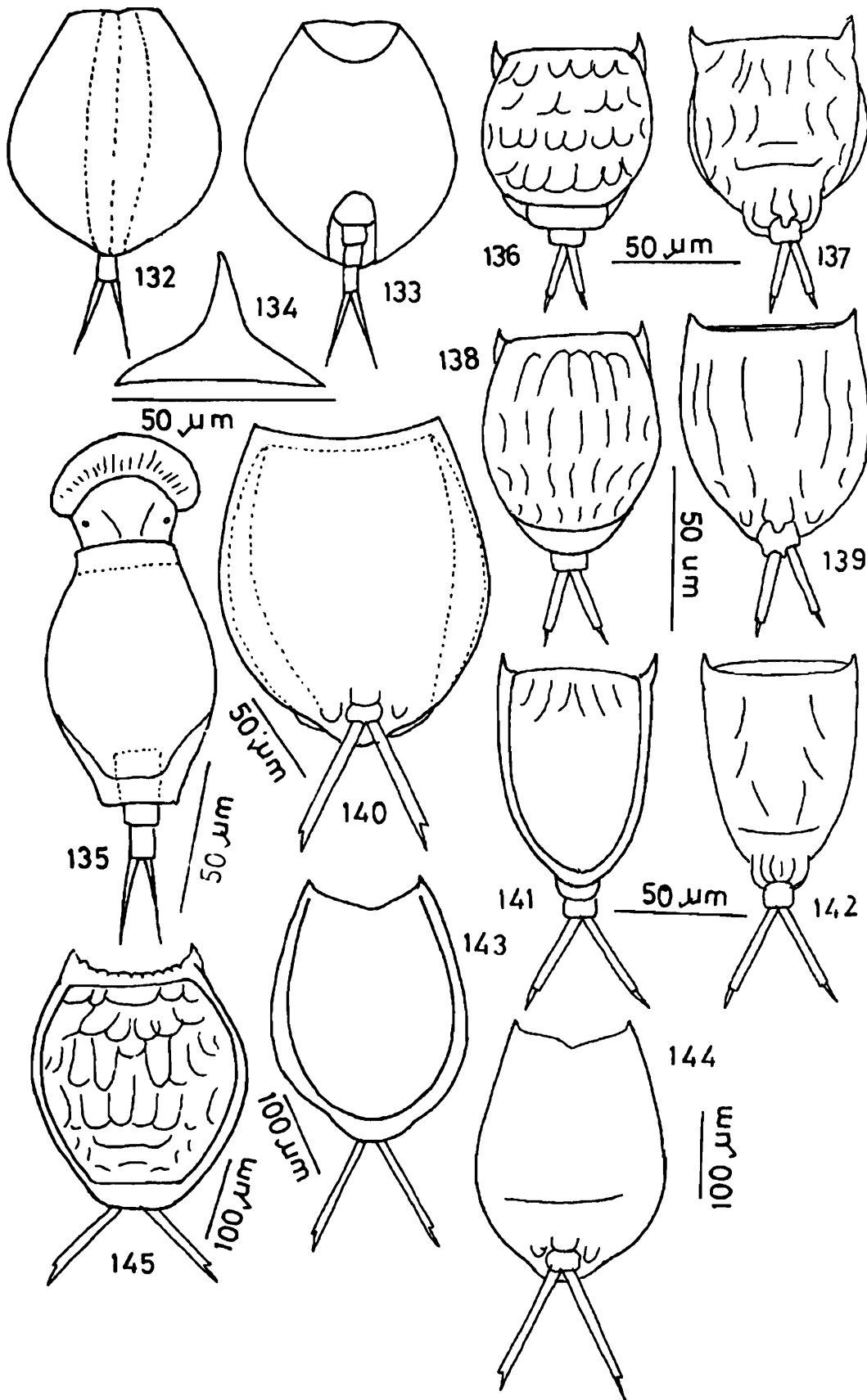
(Figs. 146-147)

*Material examined* : 4 examples, Horinchora, 06. 05. 2004, coll. B. K. Sharma; 3 examples, Basana, 03. 09. 2006, coll. Sumita Sharma.

*Characters* : Lorica flexible and with fewer surface markings. Anterior occipital margins nearly straight and coincident; dorsal plate broader than ventral plate. Posterior segment large. Toes slender and with thin, pointed and undifferentiated claws.

*Distribution* : INDIA - Assam and Meghalaya.

*Elsewhere* : Tropicopolitan.



*Lepadella triptera* (Ehrenberg) : Fig. 132, dorsal view, Fig. 133, ventral view, Fig. 134, cross-section; *Squatinella mutica* (Ehrenberg) : Fig. 135, dorsal view; *Lecane aculeata* (Jakubski) : Fig. 136, dorsal view, Fig. 137, ventral view; *L. arcuata* Harring : Fig. 138, dorsal view, Fig. 139, ventral view; *L. braumi* Koste : Fig. 140, ventral view; *L. crepida* Harring : Fig. 141, dorsal view, Fig. 142, ventral view; *L. curvicornis* (Murray) : Fig. 143, dorsal view, Fig. 144, ventral view; *L. curvicornis nitida* (Hauer) : Fig. 145, dorsal view.

77. *Lecane flexilis* (Gosse, 1886)  
(Figs. 148-149)

*Material examined* : 5 examples, Bhoispuri, 12. 03. 2003, coll. B. K. Sharma; 4 examples, Barundanga, 07. 01. 2003, coll. B. K. Sharma.

*Characters* : Lorica broadly semicircular, strongly gibbous and with straight anterior margins; with small triangular spines at external angles of ventral margin. Dorsal plate strongly arched in posterior region. Ventral plate flexible, narrower than dorsal plate and with a few folds and markings. Posterior segment rounded. Toes short, tapering to small and dorsally curved claws.

*Distribution* : INDIA Assam, Meghalaya, West Bengal, Tamil Nadu and Gujarat.

*Elsewhere* : Cosmopolitan.

78. *Lecane glypta* Harring and Myers, 1926  
(Figs. 150-151)

*Material examined* : 3 examples, Barundanga, 07. 01. 2003, coll. B. K. Sharma; 2 examples, Rowmari, 13. 03. 2003, coll. B. K. Sharma.

*Characters* : Lorica elongated and compressed dorso-ventrally. Dorsal and ventral plates with nearly equally broad and with intricate pattern of surface markings. Anterior dorsal margin slightly convex, ventral margin straight and with small spines at external angles. Lateral sulci indistinct. Posterior segment small and rounded. Toes small, slender, parallel-sided; claws small and acute.

*Distribution* : INDIA - Assam.

*Elsewhere* : Cosmopolitan.

79. *Lecane hastata* (Murray, 1913)  
(Fig. 152)

*Material examined* : 3 examples, Deepor, 04. 03. 2004, coll. B. K. Sharma; 2 examples, Bandha, 06. 05. 2004, coll. B. K. Sharma; 3 examples, Kamakhya, 11. 08. 2002, coll. B. K. Sharma; 2 examples, Solmari, 09. 09. 2004, coll. B. K. Sharma; 2 examples, Daphlang, 02. 12. 2005, coll. Sumita Sharma.

*Characters* : Lorica oval, anterior margins coincident and anterior external angles of ventral plate with two small anteriorly directed spines. Dorsal plate smaller than ventral plate. Toes parallel-sided, slightly swollen at their free ends; claws distinct and with swollen bases.

*Distribution* : INDIA - Assam, Meghalaya, Tripura and West Bengal.

*Elsewhere* : Tropicopolitan.

80. *Lecane haliclysta* Harring and Myers, 1926  
(Fig. 153)

*Material examined* : 3 examples, Mori, 01. 12. 2005, coll. B. K. Sharma; 4 examples, Kololua, 29. 11. 2005, coll. Sumita Sharma.

*Characters* : Lorica elongate-oval and with nearly straight anterior margins; anterior ventral margin with small spines at its external angles. Dorsal and ventral plates with surface markings. Ventral plate relatively narrow than dorsal plate. Toes moderately long, parallel-side for more than 3/4 of their length and then terminating into small undifferentiated and acutely pointed claws.

*Distribution* : INDIA - Assam and Meghalaya.

*Elsewhere* : Tropicopolitan.

81. *Lecane hornemanni* (Ehrenberg, 1834)  
(Fig. 154-155)

*Material examined* : 4 examples, Bhoispuri, 03. 05. 2002, coll. B. K. Sharma; 3 examples, Hakama, 11. 07. 2004, coll. B. K. Sharma; 3 examples, Fingua, 10. 08. 2002, coll. B. K. Sharma; 3 examples, Sagmara, 09. 01. 2003, coll. B. K. Sharma; 2 examples, Kamakhya, 11. 08. 2002, coll. B. K. Sharma; 2 examples, Rowmari, 07. 05. 2002, coll. B. K. Sharma; 6 examples, Deepor, 04. 03. 2004, coll. B. K. Sharma; 2 examples, Deepor, 06. 04. 2005, coll. Sumita Sharma; 5 examples, Dighali, 12. 08. 2002, coll. B. K. Sharma; 2 examples, Dighali, 06. 04. 2005, coll. Sumita Sharma; 3 examples, Ghorajan, 07. 05. 2004, coll. B. K. Sharma; 4 examples, Siligurijan, 13. 08. 2002, coll. B. K. Sharma; 2 examples, Kakerikhola, 09. 05. 2004, coll. B. K. Sharma; 3 examples, Padma, 11. 09. 2004, coll. B. K. Sharma; 5 examples, Goranga, 07. 05. 2003, coll. B. K. Sharma; 2 examples, Kutri, 03. 12. 2005, coll. Sumita Sharma; 2 examples, Borbil-Tinsuki, 01. 12. 2005, coll. Sumita Sharma; 3 examples, Muijan, 29. 11. 2005, coll. Sumita Sharma; 2 examples, Itakhuli, 01. 12. 2005, coll. Sumita Sharma; 3 examples, Bor beel, 01. 12. 2005, coll. Sumita Sharma; 3 examples, Raidong, 30. 11. 2005, coll. Sumita Sharma; 3 examples, Maghuri, 30. 11. 2005, coll. Sumita Sharma; 5 examples, Samuajan, 11. 06. 2004, coll. B. K. Sharma; 3 examples, Salchapra, 08. 08. 2004, coll. B. K. Sharma.

*Characters* : Lorica broadly ovate, anterior margins coincident and without any spines at external angles. Dorsal plate semicircular and broader than ventral plate. Posterior segment large and extending beyond the dorsal plate. Toes stout and tapering gradually to acute, slightly curved points.

*Distribution* : INDIA - Assam, Meghalaya and Tripura, West Bengal, Andhra Pradesh, Tamil Nadu, Gujarat and Kashmir.

*Elsewhere* : Tropicopolitan.

82. *Lecane inermis* (Bryce, 1892)

(Fig. 156)

*Material examined* : 2 examples, Bhoispuri, 04. 12. 2002, coll. B. K. Sharma; 2 examples, Dhir, 11. 03. 2003, coll. B. K. Sharma; 1 example, Hakama, 07. 02. 2005, coll. B. K. Sharma; 2 examples, Horinchora, 02. 11. 2004, coll. B. K. Sharma; 3 examples, Deepor, 14. 03. 2003, coll. B. K. Sharma; 2 examples, Deepor, 06. 04. 2005, coll. Sumita Sharma; 2 examples, Kamranga, 10. 02. 2005, coll. B. K. Sharma; 3 examples, Ghorajan, 08. 12. 2004, coll. B. K. Sharma; 2 examples, Hiragota, 10. 12. 2004, coll. B. K. Sharma; 2 examples, Kakerikhola, 05. 11. 2004, coll. B. K. Sharma; 2 examples, Padma, 11. 09. 2004, coll. B. K. Sharma; 2 examples, Basana, 03. 09. 2006, coll. Sumita Sharma; 3 examples, Solmari, 13. 11. 2004, coll. B. K. Sharma; 2 examples, Ghorkhonjan, 05. 02. 2005, coll. B. K. Sharma; 2 examples, Donga, 02. 12. 2005, coll. Sumita Sharma; 2 examples, Hakoi, 29. 11. 2005, coll. Sumita Sharma; 3 examples, Samuajan, 01. 03. 2004, coll. B. K. Sharma; 2 examples, Sone, 11. 12. 2004, coll. B. K. Sharma.

*Characters* : Lorica elongated and flexible; anterior margins nearly straight, coincident and without any spines at anterior external angles. Dorsal and ventral plates nearly equally broad. Lateral sulci indistinct. Toes small. claws long and pointed.

*Distribution* : INDIA Assam, Meghalaya, Tripura and West Bengal.

*Elsewhere* : Cosmopolitan.

83. *Lecane lateralis* Sharma, 1978

(Fig. 157)

*Material examined* : 4 examples, Fingua, 10. 08. 2002, coll. B. K. Sharma; 3 examples, Siligurijan, 09. 05. 2002, coll. B. K. Sharma; 2 examples, Kamranga, 09. 08. 2004, coll. B. K. Sharma; 2 examples, Basana, 03. 09. 2006, coll. Sumita Sharma; 3 examples, Sarain Hubbi, 29. 11. 2005, coll. Sumita Sharma.

*Characters* : Lorica ovate and compressed; anterior dorsal margin concave and anterior ventral margin with a shallow sinus flanked by undulating sides. Dorsal plate smaller than ventral plate. Ventral plate with characteristic postero-lateral extensions. Toes long, parallel-sided along  $\frac{3}{4}$  of their lengths, then tapering and terminating into stout claws; each claw with one basal spicule.

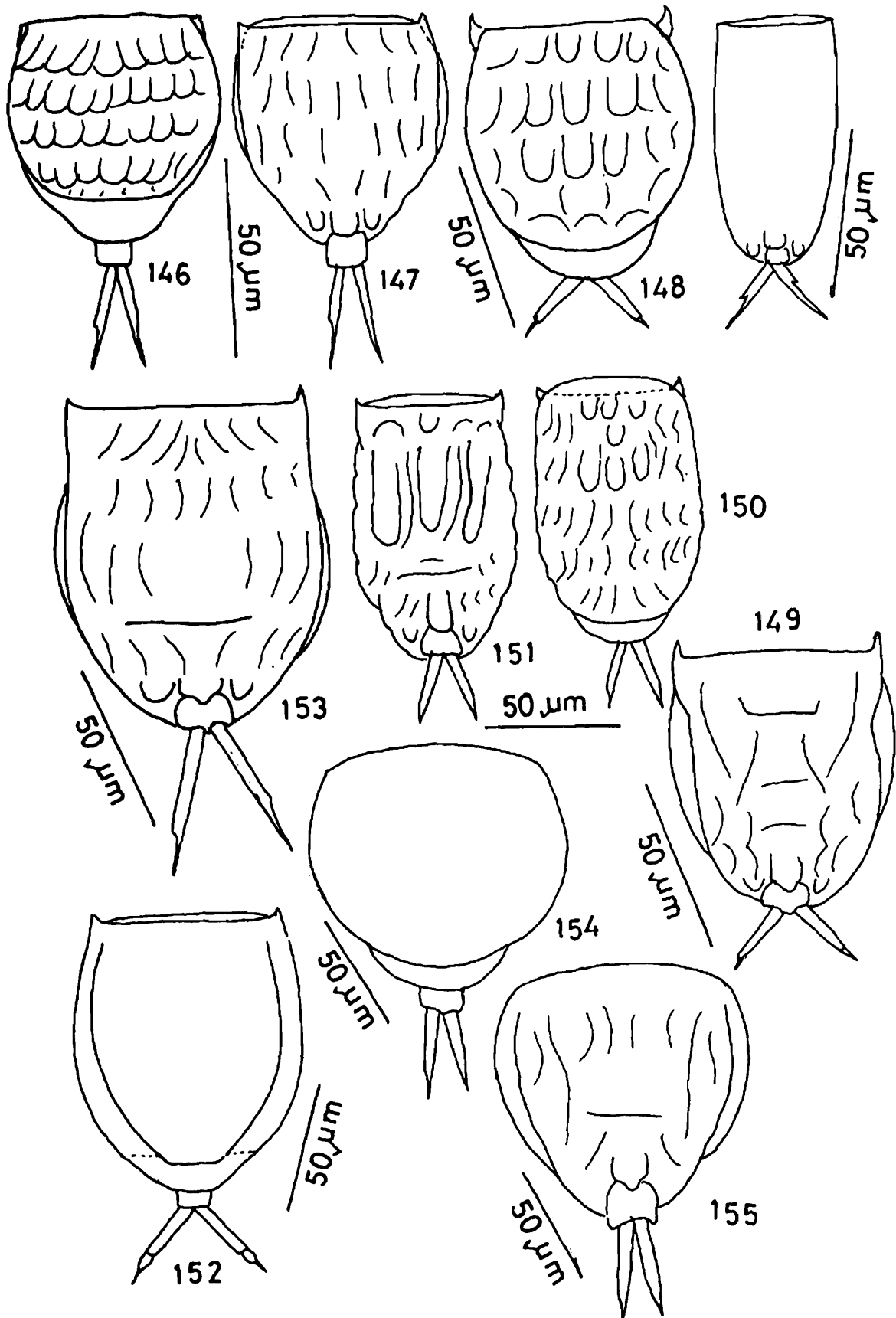
*Distribution* : INDIA - Assam, Meghalaya, Tripura, Orissa and West Bengal.

*Elsewhere* : Palaeotropical.

84. *Lecane leontina* (Turner, 1892)

(Fig. 158)

*Material examined* : 5 examples, Bhoispuri, 03. 05. 2002, coll. B. K. Sharma; 4 examples, Barundanga, 08. 08. 2002, coll. B. K. Sharma; 5 examples, Dhir, 05. 05. 2003, coll. B. K.



*Lecane doryssa* Harring: Fig. 146, dorsal view, Fig. 147, ventral view; *L. flexilis* (Gosse): Fig. 148, dorsal view, Fig. 149, ventral view; *L. glypta* Harring & Myers : Fig. 150 dorsal view, Fig. 151, ventral view; *L. hastata* (Murray): Fig. 152, dorsal view; *L. haliclysta* Harring & Myers: Fig. 153, ventral view; *L. hornemanni* (Ehrenberg): Fig. 154, dorsal view, Fig. 155, ventral view; *L. inermis* (Bryce): Fig. 156, ventral view.

Sharma; 3 examples, Hakama, 11. 07. 2004, coll. B. K. Sharma; 4 examples, Horinchora, 06. 05. 2004, coll. B. K. Sharma; 3 examples, Jogra, 10. 08. 2002, coll. B. K. Sharma; 4 examples, Sagmara, 31. 2. 2002, coll. B. K. Sharma; 4 examples, Kamakhya, 11. 08. 2002, coll. B. K. Sharma; 3 examples, Rowmari, 13. 03. 2003, coll. B. K. Sharma; 8 examples, Deepor, 12. 07. 2004, coll. B. K. Sharma; 3 examples, Deepor, 06. 04. 2005, coll. Sumita Sharma; 5 examples, Dighali, 12. 08. 2002, coll. B. K. Sharma; 2 examples, Borbila, 09. 05. 2002, coll. B. K. Sharma; 2 examples, Kamranga, 07. 05. 2004, coll. B. K. Sharma; 5 examples, Ghorajan, 04. 03. 2004, coll. B. K. Sharma; 4 examples, Siligurijan, 13. 08. 2002, coll. B. K. Sharma; 4 examples, Chatla, 10. 09. 2004, coll. B. K. Sharma; 3 examples, Hiragota, 08. 05. 2004, coll. B. K. Sharma; 4 examples, Urmal, 13. 07. 2004, coll. B. K. Sharma; 3 examples, Kakerikhola, 14. 07. 2004, coll. B. K. Sharma; 3 examples, Solmari, 04. 05. 2004, coll. B. K. Sharma; 3 examples, Sitalmari, 05. 04. 2005, coll. B. K. Sharma; 3 examples, Solmari, 05. 04. 2005, coll. Sumita Sharma; 2 examples, Morakalong, 03. 12. 2005, coll. Sumita Sharma; 2 examples, Mori, 06. 05. 2004, coll. B. K. Sharma; 2 examples, Kujibalipatty, 12. 08. 2002, coll. B. K. Sharma; 2 examples, Bandha, 03. 09. 2006, coll. Sumita Sharma; 3 examples, Daphlang, 02. 12. 2005, coll. Sumita Sharma; 2 examples, Haduk, 01. 09. 2006, coll. Sumita Sharma; 3 examples, Donga, 06. 09. 2006, coll. Sumita Sharma; 4 examples, Borbil-Tinsuki, 01. 10. 2005, coll. Sumita Sharma; 2 examples, Muijan, 29. 11. 2005, coll. Sumita Sharma; 3 examples, Diang, 01. 12. 2005, coll. Sumita Sharma; 2 examples, Kutri, 03. 12. 2005, coll. Sumita Sharma; 5 examples, Memdubi, 20. 11. 2005, coll. Sumita Sharma; 5 examples, Maghuri, 30. 11. 2005, coll. Sumita Sharma; 5 examples, Dhekia, 10. 05. 2004, coll. B. K. Sharma; 4 examples, Naruathan, 11. 06. 2004, B. K. Sharma; 4 examples, Sone, 19. 10. 2004, coll. B. K. Sharma; 3 examples, Baskandi, 09. 02. 2005, coll. B. K. Sharma.

*Characters* : Lorica oblong-ovate, anterior dorsal and ventral sinus broadly V-shaped; ventral plate broader than dorsal plate and with triangular spines at external angles. Posterior segment extending over foot as a tail-like projection. Toes long, parallel-sided and terminating into pointed claws; each claw with a basal spicule.

*Distribution* : INDIA - all the states in North-Eastern India, West Bengal, Orissa, Bihar, Andhra Pradesh, Madhya Pradesh and Punjab.

*Elsewhere* : Tropicopolitan.

### 85. *Lecane ludwigi* (Eckstein, 1883)

(Fig. 159)

*Material examined* : 3 examples, Bhoispuri, 08. 01. 2003, coll. B. K. Sharma; 3 examples, Dhir, 11. 03. 2003, coll. B. K. Sharma; 2 examples, Hakama, 07. 02. 2005, coll. B. K. Sharma; 2 examples, Fingua, 13. 02. 2002, coll. B. K. Sharma; 2 examples, Sagmara, 11. 03. 2003, coll. B. K. Sharma; 2 examples, Kamakhya, 14. 02. 2002, coll. B. K. Sharma; 3 examples, Rowmari, 13. 03. 2003, coll. B. K. Sharma; 4 examples, Deepor, 07. 04. 2004, coll. B. K. Sharma; 4 examples, Dighali, 14. 03. 2003, coll. B. K. Sharma; 2 examples,

Borbila, 13. 08. 2002, coll. B. K. Sharma; 2 examples, Kamranga, 12. 07. 2004, coll. B. K. Sharma; 4 examples, Ghorajan, 04. 03. 2004, coll. B. K. Sharma; 3 examples, Hiragota, 08. 05. 2004, coll. B. K. Sharma; 2 examples, Urmal, 13. 07. 2004, coll. B. K. Sharma; 2 examples, Padma, 11. 02. 2005, coll. B. K. Sharma; 3 examples, Solmari, 04. 05. 2004, coll. B. K. Sharma; 3 examples, Sitalmari, 09. 05. 2004, coll. B. K. Sharma; 2 examples, Haduk, 01. 09. 2006, coll. B. K. Sharma; 2 examples, Duptoli, 01. 09. 2006, coll. Sumita Sharma; 2 examples, Jugdal, 05. 04. 2005, coll. Sumita Sharma; 2 examples, Borbil-Tinsuki, 01. 12. 2005, coll. Sumita Sharma; 4 examples, Muijan, 29. 11. 2005, coll. Sumita Sharma; 3 examples, Hakoi, 29. 11. 2005, coll. Sumita Sharma; 2 examples, Sohala, 05. 09. 2006, coll. Sumita Sharma; 3 examples, Mihir, 05. 9. 2006, coll. Sumita Sharma; 4 examples, Maghuri, 30.11. 2005, coll. Sumita Sharma; 3 examples, Samuajan, 01. 03. 2004, coll. B. K. Sharma; 3 examples, Salchapra, 08. 08. 2004, coll. B. K. Sharma.

**Characters** : Lorica oval; anterior margins coincident, slightly concave and with prominent spines at external angles of ventral margin. Dorsal plate truncate posteriorly and broader than ventral plate. Posterior segment produced into a long, triangular spine. Toes long, slender, parallel-sided and terminating into distinct conical points.

**Distribution** : INDIA - Assam, Meghalaya, Tripura, West Bengal, Orissa, Bihar, Andhra Pradesh and Punjab.

**Elsewhere** : Cosmopolitan.

#### 86. *Lecane luna* (O. F. Müller, 1776)

(Fig. 160)

**Material examined** : 2 examples, Bhoispuri, 03. 05. 2002, coll. B. K. Sharma; 3 examples, Dhir, 05. 05. 2002, coll. B. K. Sharma; 2 examples, Hakama, 09. 09. 2004, coll. B. K. Sharma; 2 examples, 03. 03. 2004, Horinchora, coll. B. K. Sharma; 2 examples, Jogra, 10. 08. 2002, coll. B. K. Sharma; 3 examples, Fingua, 12. 03. 2003, coll. B. K. Sharma; 2 examples, Sagmara, 06. 05. 2002, coll. B. K. Sharma; 3 examples, Kamakhya, 07. 05. 2002, coll. B. K. Sharma; 2 examples, Rowmari, 13. 03. 2003, coll. B. K. Sharma; 4 examples, Deepor, 12. 07. 2004, coll. B. K. Sharma; 2 examples, Borbila, 13. 08. 2002, coll. B. K. Sharma; 2 examples, Kamranga, 09. 09. 2004, coll. B. K. Sharma; 3 examples, Ghorajan, 07. 05. 2004, coll. B. K. Sharma; 3 examples, Siligurijan, 13. 08. 2002, coll. B. K. Sharma; 2 examples, Chatla, 10. 09. 2004, coll. B. K. Sharma; 2 examples, Hiragota, 08. 05. 2004, coll. B. K. Sharma; 2 examples, Urmal, 05. 03. 2004, coll. B. K. Sharma; 2 examples, Kakerikhola, 14. 07. 2004, coll. B. K. Sharma; 3 examples, Padma, 11. 09. 2004, coll. B. K. Sharma; 2 examples, Amuri, 01. 09. 2006, coll. Sumita Sharma; 2 examples, Bamoni, 01. 09. 2006, coll. Sumita Sharma; 2 examples, Solmari, 12. 07. 2004, coll. B. K. Sharma; 2 examples, Sitalmari, 09. 05. 2004, coll. B. K. Sharma; 2 examples, Ghorkhonjan, 05. 03. 2005, coll. B. K. Sharma; 2 examples, Sarang, 06. 05. 2004, coll. B. K. Sharma; 2 examples, Borbil-Tinsuki, 01. 12. 2005, coll. Sumita Sharma; 3 examples, Muijan, 29. 11. 2005, coll. Sumita Sharma; 2 examples,

Hakoi, 29. 11. 2005, coll. Sumita Sharma; 2 examples, Moona, 06. 09. 2006, coll. Sumita Sharma; 2 examples, Kutri, 06. 09. 2006, coll. Sumita Sharma; 2 examples, Muijan, 29. 11. 2005, coll. Sumita Sharma; 3 examples, Memdubi, 30. 11. 2005, coll. Sumita Sharma; 2 examples, Naruathan, 11. 06. 2004, coll. B. K. Sharma; 4 examples, Senijan, 09. 06. 2004, coll. B. K. Sharma; 3 examples, Samuajan, 11. 06. 2004, coll. B. K. Sharma; 3 examples, Sone, 08. 08. 2004, coll. B. K. Sharma; 2 examples, Baskandi, 19. 02. 2005, coll. B. K. Sharma.

*Characters* : Lorica ovate to subcircular, dorsal plate broader than ventral plate; anterior ventral sinus V-shaped and with cuspidate external angles. Toes stout, parallel-sided, slightly swollen at their bases and with distinct claws; each claw with a distinct basal spicule.

*Distribution* : INDIA - widely distributed and reported so far from all states of North-Eastern region, West Bengal, Orissa, Bihar, Gujarat, Rajasthan, Punjab, Kashmir and Ladak.

*Elsewhere* : Cosmopolitan.

#### 87. *Lecane nana* (Murray, 1913)

(Fig. 161)

*Material examined* : 2 examples, Bhoispuri, 12. 03. 2003, coll. B. K. Sharma; 3 examples, Hakama, 07. 02. 2005, coll. B. K. Sharma; 2 examples, Kamakhya, 13. 03. 2003, coll. B. K. Sharma; 3 examples, Dighali, 14. 03. 2003, coll. B. K. Sharma; 3 examples, Basana, 03. 09. 2006, coll. Sumita Sharma; 2 examples, Goranga, 05. 04. 2005, coll. Sumita Sharma; 2 examples, Sitalmari, 13. 11. 2004, coll. B. K. Sharma; 2 examples, Teliadanga, 01. 12. 2005, coll. Sumita Sharma; 2 examples, Baghmari, 06. 09. 2006, coll. Sumita Sharma; 3 examples, Itakhuli, 01. 12. 2005, coll. Sumita Sharma; 2 examples, Batua, 17. 01. 2005, coll. B. K. Sharma; 3 examples, Salchapra, 09. 02. 2005, coll. B. K. Sharma.

*Characters* : Lorica small and broadly subcircular; anterior margins coincident, slightly convex and external angles produced into distinct edges. Ventral plate narrower than dorsal plate, almost parallel-sided anteriorly and then tapering. Toes slender and produced into curved, pointed tips.

*Distribution* : INDIA - Assam, Meghalaya, Tripura, West Bengal, Rajasthan and Gujarat.

*Elsewhere* : Cosmopolitan.

#### 88. *Lecane ohioensis* (Herrick, 1885)

(Figs. 162-163)

*Material examined* : 3 examples, Barundanga, 11. 02. 2002, coll. B. K. Sharma; 2 examples, Horinchora, 07. 02. 2005, coll. B. K. Sharma; 3 examples, Ghorajan, 03. 11. 2004, coll. B. K. Sharma; 2 examples, Kamakhya, 14. 02. 2002, coll. B. K. Sharma; 4 examples, Deepor, 03. 11. 2004, coll. B. K. Sharma; 2 examples, Urmal, 10. 09. 2004, coll. B. K. Sharma; 3

examples, Goranga, 01. 09. 2006, coll. Sumita Sharma; 2 examples, Sitalmari, 08. 02. 2005, coll. B. K. Sharma; 2 examples, Mori, 01. 12. 2005, coll. B. K. Sharma; 2 examples, Bandha, 03. 09. 2006, coll. Sumita Sharma; 2 examples, Daphlang, 02. 12. 2005, coll. Sumita Sharma; 2 examples, Karasing, 02. 12. 2005, coll. Sumita Sharma; 2 examples, Kowaimari, 06. 09. 2006, coll. Sumita Sharma; 3 examples, Maghuri, 30. 11. 2005, coll. Sumita Sharma; 2 examples, Salchapra, 08. 08. 2004, coll. B. K. Sharma.

**Characters** : Lorica oval and anterior external margins with stout spines; dorsal plate truncate posteriorly, ventral plate narrower than dorsal plate. Posterior segment broad and with a spade-shaped process. Toes long, parallel-sided and with short, pointed tips.

**Distribution** : INDIA - Assam, Meghalaya, Tripura and West Bengal.

**Elsewhere** : Tropicopolitan.

### 89. *Lecane papuana* (Murray, 1913)

(Fig. 164)

**Material examined** : 6 examples, Bhoispuri, 03. 05. 2002, coll. B. K. Sharma; 7 examples, Barundanga, 08. 08. 2002, coll. B. K. Sharma; 6 examples, Dhir, 09. 08. 2002, coll. B. K. Sharma; 3 examples, Hakama, 11. 07. 2004, coll. B. K. Sharma; 5 examples, Horinchora, 08. 09. 2004, coll. B. K. Sharma; 2 examples, Kamakhya, 11. 08. 2002, coll. B. K. Sharma; 9 examples, Deepor, 12. 07. 2004, coll. B. K. Sharma; 4 examples, Deepor, 06. 04. 2005, coll. Sumita Sharma; 5 examples, Dighali, 08. 05. 2002, coll. B. K. Sharma; 5 examples, Ghorajan, 12. 07. 2004, coll. B. K. Sharma; 4 examples, Siligurijan, 13. 08. 2002, coll. B. K. Sharma; 3 examples, Hiragota, 10. 09. 2004, coll. B. K. Sharma; 3 examples, Urmal, 08. 05. 2004, coll. B. K. Sharma; 2 examples, Padma, 11. 09. 2004, coll. B. K. Sharma; 2 examples, Bamoni, 01. 09. 2006, coll. Sumita Sharma; 2 examples, Basana, 03. 09. 2006, coll. Sumita Sharma; 5 examples, Solmari, 09. 09. 2004, coll. B. K. Sharma; 3 examples, Sitalmari, 13. 11. 2004, coll. B. K. Sharma; 3 examples, Ghorkhonjan, 05. 03. 2005, coll. B. K. Sharma; 2 examples, Jugdal, 05. 04. 2005, coll. Sumita Sharma; 2 examples, Padmakhua, 01. 09. 2006, coll. Sumita Sharma; 2 examples, Thekera, 03. 12. 2005, coll. Sumita Sharma; 2 examples, Japara, 01. 12. 2005, coll. Sumita Sharma; 4 examples, Muijan, 29. 11. 2005, coll. Sumita Sharma; 2 examples, Sarain Hubbi, 29. 11. 2005, coll. Sumita Sharma; 2 examples, Bor beel, 01. 12. 2005, coll. Sumita Sharma; 3 examples, Sohala, 05. 09. 2006, coll. Sumita Sharma; 5 examples, Mihir, 05. 09. 2006, coll. Sumita Sharma; 3 examples, Kutri, 06. 09. 2006, coll. Sumita Sharma; 5 examples, Memdubi, 30. 11. 2005, coll. Sumita Sharma; 4 examples, Naruathan, 04. 09. 2005, coll. B. K. Sharma; 5 examples, Samuajan, 01. 03. 2004, coll. B. K. Sharma; 3 examples, Sone, 03. 01. 2004, coll. B. K. Sharma; 3 examples, Baskandi, 09. 02. 2005, coll. B. K. Sharma.

**Characters** : Lorica oval to circular; anterior dorsal margin straight, anterior ventral margin with a shallow median sinus flanked by undulating sides. Ventral plate slightly narrower than dorsal plate. Posterior segment small and rounded. Toes moderately long, parallel-sided and terminating into small claws; each claw with a distinct basal spicule.

*Distribution* : INDIA- Assam, Meghalaya, Tripura, Nagaland, Manipur, West Bengal, Orissa, Bihar, Tamil Nadu, Kashmir and Ladak.

*Elsewhere* : Tropicopolitan.

90. *Lecane pertica* Harring & Myers, 1926

(Figs. 165-166)

*Material examined* : 3 examples, Hakama, 06. 05. 2004, coll. B. K. Sharma; 2 examples, Fingua, 10. 08. 2002, coll. B. K. Sharma; 3 examples, Kamakhya, 11. 08. 2002, coll. B. K. Sharma; 4 examples, Deepor, 09. 09. 2004, coll. B. K. Sharma; 2 examples, Kamranga, 07. 05. 2004, coll. B. K. Sharma; 4 examples, Ghorajan, 12. 07. 2004, coll. B. K. Sharma; 4 examples, Siligurijan, 13. 08. 2002, coll. B. K. Sharma; 3 examples, Hiragota, 10. 09. 2004, coll. B. K. Sharma; 2 examples, Goranga, 10. 02. 2005, coll. B. K. Sharma; 3 examples, Muijan, 29. 11. 2005, coll. Sumita Sharma; 2 examples, Hakoi, 29. 11. 2005, coll. Sumita Sharma; 3 examples, Memdubi, 30. 11. 2005, coll. Sumita Sharma; 2 examples, Maghuri, 30. 11. 2005, coll. Sumita Sharma.

*Characters* : Lorica elongate-oval, anterior margins coincident and with small spines at external angles. Dorsal plate oval, broader than ventral plate and with surface markings. Ventral plate elongated and with a few markings. Toes long, parallel-sided and with long, pointed tips.

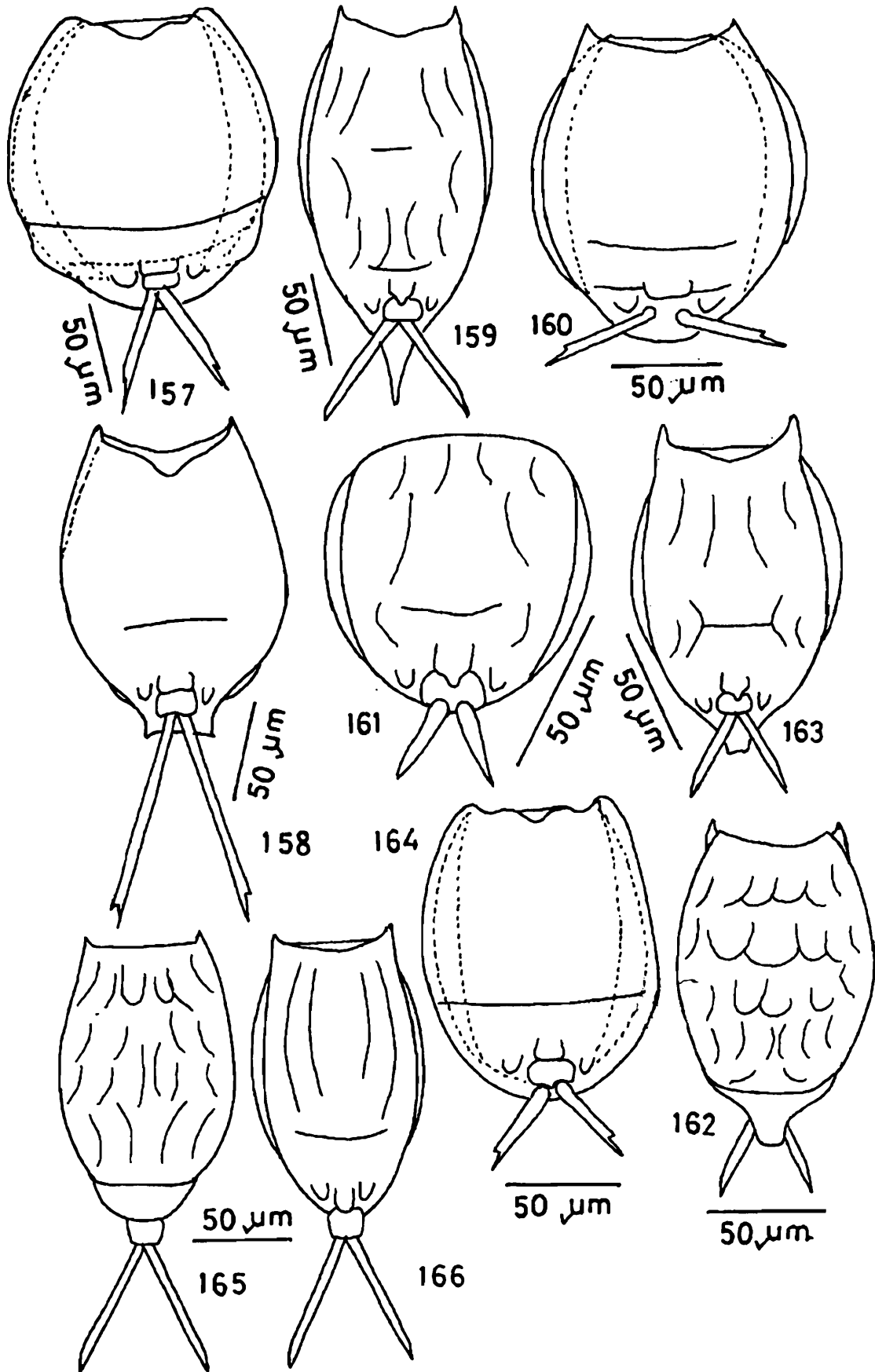
*Distribution* : INDIA - Assam, Meghalaya, Tripura and West Bengal.

*Elsewhere* : Tropicopolitan.

91. *Lecane ploenensis* (Voigt, 1902)

(Fig. 167-168)

*Material examined* : 3 examples, Bhoispuri, 08. 01. 2003, coll. B. K. Sharma; 2 examples, Barundanga, 12. 03. 2003, coll. B. K. Sharma; 2 examples, Hakama, 02. 11. 2004, coll. B. K. Sharma; 2 examples, Horinchora, 07. 02. 2005, coll. B. K. Sharma; 2 examples, Sagmara, 04. 12. 2002, coll. B. K. Sharma; 3 examples, Kamakhya, 12. 12. 2002, coll. B. K. Sharma; 4 examples, Deepor, 03.11. 2004; coll. B. K. Sharma; 4 examples, Dighali, 11. 01. 2003, coll. B. K. Sharma; 2 examples, Borbila, 14. 12. 2002, coll. B. K. Sharma; 3 examples, Kamranga, 10. 02. 2005, coll. B. K. Sharma; 2 examples, Siligurijan, 13. 08. 2002, coll. B. K. Sharma; 2 examples, Chatla, 09. 12. 2004, coll. B. K. Sharma; 2 examples, Urmal, 10. 02. 2005, coll. B. K. Sharma; 2 examples, Padma, 11. 09. 2004, coll. B. K. Sharma; 2 examples, Basana, 03. 09. 2006, coll. Sumita Sharma; 3 examples, Goranga, 10. 02. 2005, coll. B. K. Sharma; 3 examples, Solmari, 08. 12. 2004, coll. B. K. Sharma; 2 examples, Duptoli, 01. 09. 2006, coll. Sumita Sharma; 4 examples, Mori, 08. 11. 2004, coll. B. K. Sharma; 2 examples, Thekera, 01. 12. 2005, coll. B. K. Sharma; 2 examples, Borbil-Tinsuki, 01. 12. 2005, coll. Sumita Sharma; 2 examples, Muijan, 29. 11. 2005, coll. Sumita Sharma; 2 examples, Raidong,



*Lecane lateralis* Sharma : Fig. 157, ventral view; *L. leontina* (Turner) : Fig. 158, ventral view; *L. ludwigii* (Eckstein) : Fig. 159, ventral view; *L. luna* (O.F. Müller) : Fig. 160, ventral view; *L. nana* (Murray) : Fig. 161, ventral view; *L. ohioensis* (Herrick) : Fig. 162, dorsal view, Fig. 163, ventral view; *L. papuana* (Murray) : Fig. 164, ventral view; *L. pertica* Haring & Myers: Fig. 165, dorsal view, Fig. 166, ventral view.

30. 11. 2005, coll. Sumita Sharma; 4 examples, Naruathan, 04. 04. 2005, coll. B. K. Sharma; 3 examples, Samuajan, coll. B. K. Sharma; 3 examples, Sone, 11. 12. 2004, coll. B. K. Sharma; 2 examples, Salchakra, 09. 02. 2005, coll. B. K. Sharma.

*Characters* : Lorica elongate-oval and with relatively longer spines at anterior external angles. Dorsal plate truncate posteriorly and with strong surface markings. Toes relatively elongated and terminating into acute points.

*Distribution* : INDIA - Assam, Meghalaya, Mizoram, Tripura, West Bengal Gujarat and Punjab.

*Elsewhere* : Cosmopolitan.

92. *Lecane pusilla* Harring, 1914  
(Figs. 169-170)

*Material examined* : 3 examples, Barundanga, 07. 01. 2003, coll. B. K. Sharma; 2 examples, Kololua, 29. 11. 2005, coll. Sumita Sharma.

*Characters* : Lorica small, broadly vase-shaped, anterior margins straight and nearly coincident and without spines at external angles. Dorsal plate distinctly faceted, ventral plate with less conspicuous pattern; lateral sulci deep. Ventral plate narrow than dorsal plate. Posterior segment rounded. Toes long, slender, parallel-sided and terminating into recurved, acute claws.

*Distribution* : INDIA - Assam.

*Elsewhere* : Tropicopolitan.

93. *Lecane ruttneri* Hauer, 1938  
(Figs. 171-172)

*Material examined* : 4 examples, Siligurijan, 11. 03. 2003, coll. B. K. Sharma.

*Characters* : Lorica broadly rectangular; anterior dorsal and ventral margins slightly convex and coincident and with spines at external angles, dorsal margin wider than ventral. Dorsal plate narrow than ventral plate and with truncate posterior end. Dorsal and ventral plates weakly ornamented. Posterior segment rounded posteriorly. Second foot segment squarish and projecting beyond lorica. Toes straight on inner margin and tapering on outer margin; claws short and acute.

*Distribution* : INDIA - Assam.

*Elsewhere* : Pantropical.

94. *Lecane signifera* (Jennings, 1896)  
(Figs. 173-174)

*Material examined* : 3 examples, Bhoispuri, 08. 01. 2003, coll. B. K. Sharma; 3 examples, Barundanga, 07. 01. 2003, coll. B. K. Sharma; 2 examples, Hakama, 02. 11. 2004, coll. B.

K. Sharma; 4 examples, Fingua, 11. 12. 2002, coll. B. K. Sharma; 5 examples, Deepor, 08. 02. 2005, coll. B. K. Sharma; 3 examples, Kamranga, 10. 01. 2003, coll. B. K. Sharma; 4 examples, Ghorajan, 08. 12. 2004, coll. B. K. Sharma; 2 examples, Padma, 05. 11. 2004, coll. B. K. Sharma; 2 examples, Basana, 03. 09. 2006, 3 examples, Sitalmari, 13. 11. 2004, coll. B. K. Sharma; 2 examples, Haduk, 05. 04. 2005, coll. Sumita Sharma; 2 examples, Duptoli, 01. 09. 2006, coll. Sumita Sharma; 3 examples, Mori, 01. 12. 2005, coll. B. K. Sharma; 3 examples, Thekera, 01. 12. 2005, coll. B. K. Sharma; 2 examples, Kujibalipatty, 13. 12. 2002, coll. B. K. Sharma; 2 examples, Daphlang, 02. 12. 2005, coll. Sumita Sharma; 3 examples, Donga, 06. 09. 2006, coll. Sumita Sharma; 3 examples, Borbil-Tinsuki, 01. 12. 2005, coll. Sumita Sharma; 4 examples, Mihir, 05. 09. 2006, coll. Sumita Sharma; 4 examples, Naruathan, 11. 06. 2004, coll. B. K. Sharma; 4 examples. Samuajan, 18. 01. 2005, coll. B. K. Sharma; 3 examples, Sone, 11. 12. 2004, coll. B. K. Sharma; 4 examples, Salchapra, 09. 02. 2005, coll. B. K. Sharma.

*Characters* : Lorica oblong and compressed; anterior margins straight, coincident and with small spines at external angles. Dorsal plate rounded posteriorly and with rounded surface markings. Ventral plate narrower than dorsal plate. Toes long, parallel-sided and with pointed tips.

*Distribution* : INDIA - Assam, Meghalaya, Tripura, West Bengal and Bihar.

*Elsewhere* : Tropicopolitan.

#### 95. *Lecane sola* Hauer, 1936

(Fig. 175)

*Material examined* : 4 examples, Dhir, 09. 08. 2002, coll. B. K. Sharma; 4 examples, Deepor, 14. 03. 2003, coll. B. K. Sharma; 3 examples, Rowmari, 11. 08. 2002, coll. B. K. Sharma.

*Characters* : Lorica small, oval, with straight and coincident anterior margins. Dorsal plate with distinct pattern. Ventral plate smaller than dorsal plate and with small spines at its external angles. Second foot-segment elongated, projecting beyond posterior end of lorica. Toes parallel-sided for about half of their length and then tapering to pointed tips.

*Distribution* : INDIA - Assam, Tripura and Tamil Nadu.

*Elsewhere* : Tropics and subtropics.

#### 96. *Lecane superaculeata* Sanoamuang & Segers, 1997

(Fig. 176)

*Material examined* : 3 examples, Dhir, 10. 12. 2002, coll. B. K. Sharma.

*Characters* : Lorica elongate-oval and compressed; anterior margins straight and coincident and ventral plate with prominent antero-lateral spines. Dorsal plate narrow anteriorly and

wider than ventral plate and rounded posteriorly; with characteristic pattern of surface ornamentation. Ventral plate longer than width and with surface margins. Posterior segment small, broad and rounded posteriorly. Foot not projecting. Toes moderately long, parallel-sided and with small pointed claws.

*Distribution* : INDIA - Assam.

*Elsewhere* : Oriental region.

97. *Lecane ungulata* (Gosse, 1887)

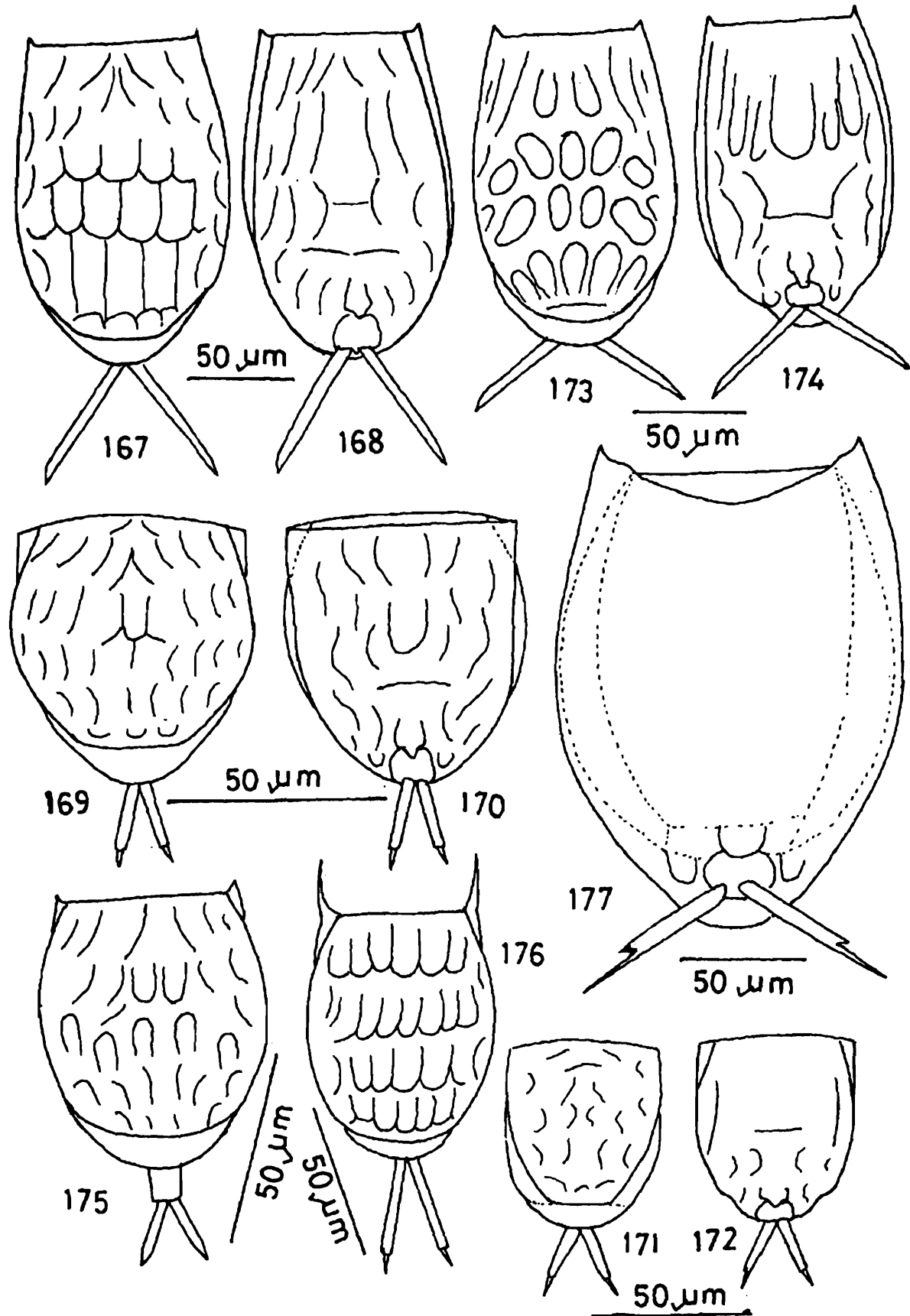
(Fig. 177)

*Material examined* : 5 examples, Bhoispuri, 09. 01. 2003, coll. B. K. Sharma; 5 examples, Barundanga, 12. 03. 2003, coll. B. K. Sharma; 4 examples, Dhir, 08. 01. 2003, coll. B. K. Sharma; 2 examples, Horinchora, 02. 11. 2004, coll. B. K. Sharma; 3 examples, Sagmara, 11. 03. 2003, coll. B. K. Sharma; 3 examples, Kamakhya, 10. 01. 2003, coll. B. K. Sharma; 5 examples, Deepor, 03. 11. 2004, coll. B. K. Sharma; 4 examples, Dighali, 11. 12. 2002, coll. B. K. Sharma; 2 examples, Kamranga, 10. 02. 2005, coll. B. K. Sharma; 2 examples, Ghorajan, 03. 11. 2004, coll. B. K. Sharma; 3 examples, Siligurijan, coll. B. K. Sharma; 2 examples, Chatla, coll. B. K. Sharma; 2 examples, Hiragota, 09. 12. 2004, coll. B. K. Sharma; 3 examples, Urmal, 10. 09. 2004, coll. B. K. Sharma; 3 examples, Kakerikhola, 05. 11. 2004, coll. B. K. Sharma; 2 examples, Basana, 03. 09. 2006, coll. Sumita Sharma; 4 examples, Solmari, 09. 09. 2004, coll. B. K. Sharma; 3 examples, Sitalmari, 13. 11. 2004, coll. B. K. Sharma; 2 examples, Haduk, 01. 09. 2006, coll. Sumita Sharma; 3 examples, Kanduli, 01. 09. 2006, coll. Sumita Sharma; 4 examples, Thekera, 08. 11. 2004, coll. Sumita Sharma; 3 examples, Bandha, 01. 12. 2005, coll. B. K. Sharma; 2 examples, Mora Daphlang, 03. 12. 2005, coll. Sumita Sharma; 2 examples, Borbil-Tinsuki, 01. 12. 2005, coll. Sumita Sharma; 2 examples, Sarain Hubbi, 29. 11. 2005, coll. Sumita Sharma; 2 examples, Bor beel, 01. 12. 2005, coll. Sumita Sharma; 2 examples, Baghmari, 06. 09. 2006, coll. Sumita Sharma; 4 examples, Karasing, 02. 12. 2005, coll. Sumita Sharma; 2 examples, Sohala, 05. 09. 2006, coll. Sumita Sharma; 3 examples, Mihir, 05. 09. 2006, coll. Sumita Sharma; 4 examples, Maghuri, 30. 11. 2005, coll. Sumita Sharma; 3 examples, Samuajan, 11. 10. 2004, coll. B. K. Sharma; 3 examples, Sone, 11. 12. 2004, coll. B. K. Sharma; 3 examples, Baskandi, 19. 10. 2004, coll. B. K. Sharma.

*Characters* : Lorica large, ovate; anterior margins nearly straight and with characteristic triangular cuspidate spines at external angles. Dorsal plate narrower than ventral plate. Posterior segment large. Toes parallel-sided, with long stout claws; each claw with a prominent basal spicule.

*Distribution* : INDIA - Assam, Meghalaya, Tripura, Mizoram, Nagaland, West Bengal, Orissa, Bihar, Andhra Pradesh, Gujarat and Punjab.

*Elsewhere* : Cosmopolitan.



*Lecane ploenensis* (Voigt) : Fig. 167, dorsal view, Fig. 168, ventral view ; *L. pusilla* Harring : Fig. 169, dorsal view, Fig. 170, ventral view; *L. ruttneri* Hauer : Fig. 171, dorsal view, Fig. 172, ventral view; *L. signifera* (Jennings) : Fig. 173, dorsal view, Fig. 174, ventral view; *L. sola* Hauer : Fig. 175, dorsal view; *L. superaculeata* Sanoamuang & Segers : Fig. 176, dorsal view; *L. ungulata* (Gosse) : Fig. 177, ventral view.

98. *Lecane (Hemimonostyla) blachei* Berzins, 1973  
(Fig. 178)

*Material examined* : 4 examples, Bhoispuri, 04. 12. 2002, coll. B. K. Sharma; 3 examples, Borbila, 15. 03. 2003, coll. B. K. Sharma; 3 examples, Hakama, 07. 02. 2005, coll. B. K. Sharma; 5 examples, Deepor, 03. 11. 2004, coll. B. K. Sharma; 2 examples, Dubratoli, 03. 09. 2006, coll. Sumita Sharma; 4 examples, Sarang, 03. 09. 2006, coll. Sumita Sharma; 4 examples, Maghuri, 30. 11. 2005, coll. Sumita Sharma.

*Characters* : Lorica oval, compressed dorso-ventrally; dorsal plate smaller than ventral plate and with distinct surface markings. Anterior dorsal margin nearly straight or slightly concave; anterior ventral margin with a shallow median sinus flanked by undulating sides and blunt external angles. Toes fused partly at base, claws with distinct basal spines.

*Distribution* : INDIA - Assam and Delhi.

*Elsewhere* : Oriental region.

99. *Lecane (Hemimonostyla) inopinata* (Harring & Myers, 1926)  
(Figs. 179-180)

*Material examined* : 3 examples, Bhoispuri, 07. 01. 2003, coll. B. K. Sharma; 2 examples, Fingua, 12. 03. 2003, coll. B. K. Sharma; 3 examples, Kamakhya, 12. 12. 2002, coll. B. K. Sharma; 3 examples, Deepor, 03. 11. 2004, coll. B. K. Sharma; 2 examples, Borbila, 12. 01. 2003, coll. B. K. Sharma; 3 examples, Siligurijan, 14. 12. 2002, coll. B. K. Sharma; 2 examples, Kujibalipatty, 14. 03. 2003, coll. B. K. Sharma; 3 examples, Teliadanga, 01. 12. 2005, coll. Sumita Sharma.

*Characters* : Lorica oval, anterior margins straight and coincident. Dorsal plate oval, truncate posteriorly and without any surface markings. Ventral plate narrower than dorsal plate and with a few longitudinal ridges. Toes fused for about 1/3 of their length and tapering into distinct, curved claws.

*Distribution* : INDIA - Assam, Meghalaya, Tripura, West Bengal, Orissa and Andhra Pradesh.

*Elsewhere* : Tropicopolitan.

100. *Lecane (Hemimonostyla) sympoda* Hauer, 1929  
(Figs. 181-182)

*Material examined* : 4 examples, Deepor, 11. 01. 2003, coll. B. K. Sharma; 3 examples, Dighali, 12. 12. 2002, coll. B. K. Sharma; 3 examples, Ghorajan, 03. 11. 2004, coll. B. K. Sharma; 2 examples, Jogra, 10. 12. 2002, coll. B. K. Sharma; 2 examples, Thekera, 05. 11.

2004, coll. B. K. Sharma; 2 examples, Daphlang, 02. 12. 2005, coll. Sumita Sharma; 2 examples, Demon, 01. 12. 2005, coll. Sumita Sharma; 2 examples, Sesa, 01. 12. 2005, coll. Sumita Sharma; 4 examples, Butikor, 02. 04. 2005, coll. B. K. Sharma; 3 examples, Baskandi, 03. 01. 2004, coll. B. K. Sharma.

**Characters** : Lorica broadly oval; anterior margins straight and coincident and with small spines at ventral external angles. Dorsal plate narrow anteriorly, wider than the ventral plate in the middle region and with surface ornamentation. Ventral plate longer than wide and with incomplete longitudinal and transverse folds. Posterior segment large and rounded. Foot not projecting beyond lorica. Toes fused proximally over third or half and bearing completely separated claws.

**Distribution** : INDIA - Assam, West Bengal and Gujarat.

**Elsewhere** : Cosmopolitan.

101. *Lecane (Monostyla) acanthinula* (Hauer, 1938)  
(Fig. 183)

**Material examined** : 3 examples, Rowmari, 10. 01. 2003; coll. B. K. Sharma; 3 examples, Deepor, 08. 02. 2005, coll. B. K. Sharma.

**Characters** : Lorica oval and with straight and coincident anterior margins. Dorsal plate ovate, ventral plate narrower than dorsal plate and with small spines at external angles. Toe parallel-sided for half of its length, then slightly narrowing and with two claws; each claw with a small basal spine.

**Distribution** : INDIA - Assam, Tripura, Kerala and Orissa.

**Elsewhere** : Oriental region.

102. *Lecane (Monostyla) batillifer* (Murray, 1913)  
(Fig. 184)

**Material examined** : 4 examples, Barundanga, 07. 01. 2003, coll. B. K. Sharma; 3 examples, Dighali, 13. 12. 2002, coll. B. K. Sharma; 4 examples, Deepor, 08. 02. 2005, coll. B. K. Sharma.

**Characters** : Lorica ovate, anterior dorsal margin narrow and concave. Anterior ventral margin with a deep sinus and with triangular cusps at external angles. Posterior segment small, plate-like and with angular free ends. Toe slender, parallel-sided for half of its length and tapering to an acute point.

**Distribution** : INDIA - Assam, Meghalaya and Tripura.

**Elsewhere** : Australasian.

103. *Lecane (Monostyla) bifurca* (Bryce, 1892)  
(Fig. 185)

*Material examined* : 3 examples, Bhoispuri, 07. 01. 2003, coll. B. K. Sharma; 2 examples, Fingua, 09. 01. 2003, coll. B. K. Sharma; 3 examples, Deepor, 03. 11. 2004, coll. B. K. Sharma.

*Characters* : Lorica small, oval, compressed and without any markings. Anterior dorsal and ventral margins nearly straight and coincident. Ventral plate slightly narrower than dorsal plate and with small posterior projections. Posterior segment small and rounded posteriorly. Toe small, parallel-sided and claws divergent.

*Distribution* : INDIA - Delhi, Orissa.

*Elsewhere* : Cosmopolitan.

104. *Lecane (Monostyla) bulla* (Gosse, 1851)  
(Figs. 186-187)

*Material examined* : 5 examples, Bhoispuri, 07. 01. 2003, coll. B. K. Sharma; 4 examples, Barundanga, 08. 02. 2002, coll. B. K. Sharma; 6 examples, Dhir, 11. 03. 2003, coll. B. K. Sharma; 3 examples, Hakama, 07. 02. 2005, coll. B. K. Sharma; 3 examples, Horinchora, 02. 11. 2004, coll. B. K. Sharma; 4 examples, Jogra, 10. 12. 2002, coll. B. K. Sharma; 4 examples, Fingua, 12. 02. 2003, coll. B. K. Sharma; 3 examples, Sagmara, 11. 03. 2003, coll. B. K. Sharma; 5 examples, Kamakhya, 10. 02. 2003, coll. B. K. Sharma; 5 examples, Rowmari, 13. 03. 2003, coll. B. K. Sharma; 9 examples, Deepor, 08. 02. 2005, coll. B. K. Sharma; 3 examples, Deepor, 06. 04. 2005, coll. Sumita Sharma; 3 examples, Borbila, 51. 03. 2003, coll. B. K. Sharma; 2 examples, Kamranga, 03. 11. 2004, coll. B. K. Sharma; 5 examples, Ghorajan, 08. 12. 2004, coll. B. K. Sharma; 3 examples, Siligurijan, 13. 01. 2003, coll. B. K. Sharma; 3 examples, Chatla, 10. 02. 2005, coll. B. K. Sharma; 4 examples, Hiragota, 10. 02. 2005, coll. B. K. Sharma; 4 examples, Urmal, 09. 12. 2004, coll. B. K. Sharma; 2 examples, Kakerikhola, 05. 11. 2004, coll. B. K. Sharma; 3 examples, Padmakhua, 01. 09. 2006, coll. Sumita Sharma; 5 examples, Basana, 03. 09. 2006, coll. Sumita Sharma; 6 examples, Goranga, 10. 02. 2005, coll. B. K. Sharma; 4 examples, Solmari, 13. 11. 2004, coll. B. K. Sharma; 5 examples, Sitalmari, 08. 12. 2004, coll. B. K. Sharma; 3 examples, Duptoli, 01. 09. 2006, coll. Sumita Sharma; 5 examples, Ghorkhonjan, 05. 03. 2005, coll. B. K. Sharma; 2 examples, Jugdal, 05. 04. 2005, coll. Sumita Sharma; 2 examples, Padmakhua, 01. 09. 2006, coll. Sumita Sharma; 5 examples, Mori, 01. 12. 2005, coll. B. K. Sharma; 4 examples, Kujibalipatty, 14. 03. 2003, coll. B. K. Sharma; 4 examples, Daphlang, 05. 09. 2006, coll. Sumita Sharma; 2 examples, Donga, 06. 09. 2006, coll. Sumita Sharma; 2 examples, Diphlu, 02. 12. 2005, coll. Sumita Sharma; 3 examples, Japara, 01. 12. 2005, coll. Sumita Sharma; 2 examples, Hakoi, 29. 11. 2005, coll. Sumita Sharma; 2 examples, Sarain Hubbi, 29. 11. 2005, coll. Sumita Sharma; 2 examples, Bor beel, 01. 12. 2005, coll. Sumita Sharma;

4 examples, Diang, 01. 12. 2005, coll. Sumita Sharma; 3 examples, Sohala, 05. 09. 2006, coll. Sumita Sharma; 5 examples, Mihir, 02. 12. 2005, coll. Sumita Sharma; 2 examples, Raidong, 30. 11. 2005, coll. Sumita Sharma; 5 examples, Memdubi, 30. 11. 2005, coll. Sumita Sharma; 4 examples, Maghuri, 30. 11. 2005, coll. Sumita Sharma; 5 examples, Butikor, 02. 04. 2005, coll. B. K. Sharma; 5 examples, Naruathan, 04. 04. 2005, coll. B. K. Sharma; 6 examples, Samuajan, 18. 01. 2005, coll. B. K. Sharma; 4 examples, Sone, 11. 12. 2004, coll. B. K. Sharma; 4 examples, Baskandi, 09. 02. 2005, coll. B. K. Sharma.

**Characters** : Lorica oblong-ovate; anterior dorsal margin with a shallow sinus, anterior ventral margin with a deep sinus flanked with small cusps at external angles. Toes long and terminating into a long and pointed claw with distinct basal spicules; claw with a distinct median line but not divided.

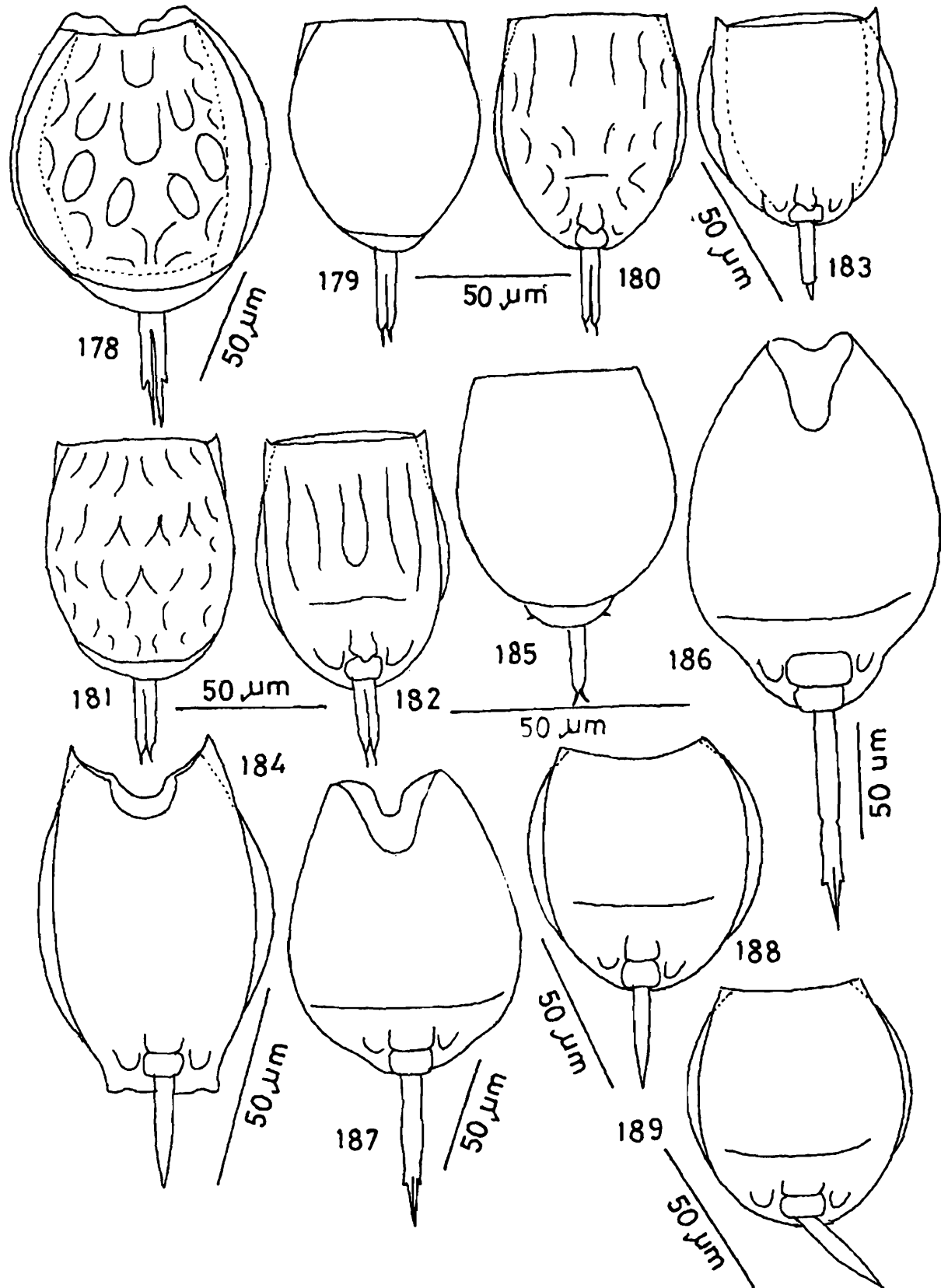
**Distribution** : INDIA - all states of North-Eastern region, West Bengal, Orissa, Bihar, Andhra Pradesh, Tamil Nadu, Rajasthan, Gujarat, Punjab and Kashmir.

**Elsewhere** : Cosmopolitan.

#### 105. *Lecane (Monostyla) closterocerca* (Schmarda, 1859)

(Figs. 188-189)

**Material examined** : 5 examples, Bhoispuri, 12. 03. 2003, coll. B. K. Sharma; 3 examples, Barundanga, 07. 01. 2003, coll. B. K. Sharma; 5 examples, Dhir, 10. 12. 2002, coll. B. K. Sharma; 5 examples, Hakama, 07. 02. 2005, coll. B. K. Sharma; 4 examples, Horinchora, 02. 11. 2004, coll. B. K. Sharma; 2 examples, Fingua, 09. 01. 2003, coll. B. K. Sharma; 2 examples, Kamakhya, 13. 03. 2003, coll. B. K. Sharma; 3 examples, Rowmari, 10. 01. 2003, coll. B. K. Sharma; 6 examples, Deepor, 09. 09. 2004, coll. B. K. Sharma; 3 examples, Deepor, 06.04. 2005, coll. Sumita Sharma; 5 examples, Dighali, 14. 03. 2003, coll. B. K. Sharma; 2 examples, Borbila, 15. 03. 2003, coll. B. K. Sharma; 5 examples, Ghorajan, 08. 12. 2004, coll. B. K. Sharma; 4 examples, Siligurijan, 13. 01. 2003, coll. B. K. Sharma; 2 examples, Hiragota, 10. 02. 2005, coll. B. K. Sharma; 2 examples, Urmal, 09. 12. 2004, coll. B. K. Sharma; 2 examples, Kakerikhola, 10. 12. 2004, coll. B. K. Sharma; 3 examples, Amuri, 01. 09. 2006, coll. Sumita Sharma; 4 examples, Goranga, 13. 11. 2004, coll. B. K. Sharma; 3 examples, Solmari, 09. 09. 2004, coll. B. K. Sharma; 4 examples, Sitalmari, 13. 11. 2004, coll. B. K. Sharma; 2 examples, Jugdal, 05. 04. 2005, coll. Sumita Sharma; 2 examples, Padmakhua, 01. 09. 2006, coll. Sumita Sharma; 2 examples, Kanduli, 01. 09. 2006, coll. Sumita Sharma; 2 examples, Thekera, 06. 05. 2004, coll. B. K. Sharma; 2 examples, Kujibalipatty, 11. 01. 2003, coll. B. K. Sharma; 2 examples, Donga, 06. 09. 2006, coll. Sumita Sharma; 2 examples, Dubratoli, 01. 9. 2006, coll. Sumita Sharma; 2 examples, Hakoi, 29. 11. 2005, coll. Sumita Sharma; 3 examples, Sarain Hubbi, 29. 11. 2005, coll. Sumita Sharma; 2 examples, Sesa, 01. 12. 2005, coll. Sumita Sharma; 3 examples, Kutri, 03. 12. 2005, coll. Sumita Sharma; 4 examples, Raidong, 30. 11. 2005, coll. Sumita Sharma; 4 examples, Memdubi, 30. 11. 2005, coll. Sumita Sharma; 3 examples, Maghuri, 30. 11. 2005, coll. Sumita Sharma; 3 examples, Puwa Saikia, 17. 01. 2005, coll. B. K. Sharma;



*Lecane (Hemimonostyla) blachei* Berzins : Fig. 178, dorsal view; *L. (Hm.) inopinata* Harring & Myers : Fig. 179, dorsal view. Fig. 180, ventral view; *L. (Hm.) sympoda* Hauer : Fig. 181, dorsal view, Fig. 182, ventral view; *L. (Monostyla) acanthinula* (Hauer): Fig. 183, ventral view; *L. (M.) batillifer* (Murray): Fig. 184, ventral view; *L. (M.) bifurca* (Bryce) : Fig. 185, ventral view; *L. (M.) bulla* (Gosse): Figs. 186-187, ventral views; *L. (M.) closterocerca* (Schmarda): Figs. 188-189, ventral views.

5 examples, Samuajan, 01. 03. 2004, coll. B. K. Sharma; 4 examples, Sone, 09. 02. 2005, coll. B. K. Sharma.

**Characters** : Lorica broadly oval and compressed; anterior margins slightly concave and coincident; external angles rounded or produced into small corners. Ventral plate narrower than dorsal plate. Toe parallel-sided for about 1/2 of its length and then tapering to a slender point.

**Distribution** : INDIA - all states in North-Eastern India, Orissa, Tamil Nadu, Gujarat, Rajasthan, Punjab, Kashmir and Ladak.

**Elsewhere** : Cosmopolitan.

106. *Lecane (Monostyla) decipiens* (Murray, 1913)  
(Figs. 190-191)

**Material examined** : 3 examples, Bhoispuri, 07. 01. 2003, coll. B. K. Sharma; 4 examples, Ghorajan, 03. 11. 2004, coll. B. K. Sharma; 3 examples, Hiragota, 10. 02. 2005, coll. B. K. Sharma; 4 examples, Deepor, 08. 02. 2005, coll. B. K. Sharma; 3 examples, Borbila, 12. 01. 2003, coll. B. K. Sharma; 2 examples, Bamoni, 01. 09. 2006, coll. Sumita Sharma; 3 examples, Sitalmari, 08. 12. 2004, coll. B. K. Sharma; 3 examples, Solmari, 06. 02. 2004, coll. B. K. Sharma; 2 examples, Itakhuli, 11. 12. 2005, coll. Sumita Sharma; 3 examples, Kowaimari, 02. 12. 2005, coll. Sumita Sharma; 4 examples, Muijan, 29. 11. 2005, coll. Sumita Sharma.

**Characters** : Lorica elongate-oval; anterior margins coincident and with a deep U-shaped sinus flanked by two acute triangular cusps at external angles. Dorsal plate oval and broader than ventral plate. Posterior segment small and rounded. Toe slender parallel-sided for about half of its length and then tapering to an acute point.

**Distribution** : INDIA - Assam, Meghalaya, West Bengal, Orissa and Punjab.

**Elsewhere** : Pantropical

107. *Lecane (Monostyla) furcata* (Murray, 1913)  
(Fig. 192)

**Material examined** : 4 examples, Deepor, 08. 02. 2005, coll. B. K. Sharma; 3 examples, Dubratoli, 03. 09. 2006, coll. Sumita Sharma; 3 examples, Teliadanga, 01. 12. 2005, coll. Sumita Sharma.

**Characters** : Lorica broadly oval in outline and without surface markings. Anterior dorsal and ventral margins nearly straight and coincident. Ventral plate almost parallel-sided and narrower than dorsal plate. Toe short, stout and terminating into two small, divergent and pointed claws.

**Distribution** : INDIA - Assam, Meghalaya, Mizoram and West Bengal.

**Elsewhere** : Cosmopolitan.

108. *Lecane (Monostyla) hamata* (Stokes, 1896)  
(Figs. 193-194)

*Material examined* : 4 examples, Barundanga, 12. 03. 2003, coll. B. K. Sharma; 3 examples, Horinchora, 02. 11. 2004, coll. B. K. Sharma; 2 examples, Sagmara, 09. 01. 2003, coll. B. K. Sharma; 3 examples, Kamakhya, 13. 03. 2003, coll. B. K. Sharma; 5 examples, Deepor, 08. 02. 2005, coll. B. K. Sharma; 2 examples, Borbila, 14. 12. 2002, coll. B. K. Sharma; 4 examples, Ghorajan, 09. 09. 2004, coll. B. K. Sharma; 3 examples, Siligurijan, 13. 01. 2003, coll. B. K. Sharma; 2 examples, Chatla, 10. 02. 2005, coll. B. K. Sharma; 2 examples, Kakerikhola, 05. 11. 2004, coll. B. K. Sharma; 2 examples, Padma, 11. 02. 2005, coll. B. K. Sharma; 3 examples, Goranga, 10. 02. 2005, coll. B. K. Sharma; 3 examples, Solmari, 06. 02. 2004, coll. B. K. Sharma; 4 examples, Sitalmari, 13. 11. 2004, coll. B. K. Sharma; 2 examples, Duptoli, 01. 09. 2006, coll. Sumita Sharma; 2 examples, Ghorkhonjan, 05. 03. 2005, coll. B. K. Sharma; 2 examples, Thekera, 01.12. 2005, coll. B. K. Sharma; 4 examples, Kujibalipatty, 11. 01. 2003, coll. B. K. Sharma; 2 examples, Bandha, 06. 05. 2004, coll. B. K. Sharma; 2 examples, Daphlang, 02. 12. 2005, coll. Sumita Sharma; 3 examples, Borbil-Tinsuki, 01. 12. 2005, coll. Sumita Sharma; 2 examples, Muijan, 29. 11. 2005, coll. Sumita Sharma; 4 examples, Diang, 06. 09. 2006, coll. Sumita Sharma; 2 examples, Raidong, 30. 11. 2005, coll. Sumita Sharma; 3 examples, Maghuri, 30. 11. 2005, coll. Sumita Sharma; 2 examples, Butikor, 18. 01. 2005, coll. B. K. Sharma; 4 examples, Samuajan, 18. 01. 2005, coll. B. K. Sharma; 3 examples, Sone, 11. 12. 2004, coll. B. K. Sharma; 3 examples, Salchapra, 09. 02. 2005, coll. B. K. Sharma.

*Characters* : Lorica elongate-oval in shape. Anterior dorsal margin with a shallow lunate sinus; anterior ventral margin with a deep V-shaped sinus and with acute angled distinct cusps at its external angles. Ventral plate narrower than dorsal plate. Toe parallel-sided about half of its length and then tapering to an acute point.

*Distribution* : INDIA - Assam, Meghalaya, Tripura, Mizoram, West Bengal, Orissa, Tamil Nadu, Gujarat, Rajasthan, Punjab and Kashmir.

*Elsewhere* : Cosmopolitan.

109. *Lecane (Monostyla) lunaris* (Ehrenberg, 1832)  
(Figs. 195-196)

*Material examined* : 6 examples, Bhoispuri, 07. 01. 2003, coll. B. K. Sharma; 5 examples, Barundanga, 12. 03. 2003, coll. B. K. Sharma; 6 examples, Dhir, 08. 01. 2003, coll. B. K. Sharma; 4 examples, Hakama, 02. 11. 2005, coll. B. K. Sharma; Hakama, 3 examples, Horinchora, 07. 02. 2005, coll. B. K. Sharma; 3 examples, Fingua, 0. 01. 2003, coll. B. K. Sharma; 4 examples, Sagmara, 11. 03. 2003, coll. B. K. Sharma; 3 examples, Rowmari, 10. 01. 2003, coll. B. K. Sharma; 8 examples, Deepor, 03. 11. 2004, coll. B. K. Sharma; 6 examples, Dighali, 11. 01. 2003, coll. B. K. Sharma; 2 examples, Borbila, 14. 12. 2002, coll. B. K. Sharma; 3 examples,

Kamranga, 08. 12. 2004, coll. B. K. Sharma; 5 examples, Ghorajan, 08. 12. 2004, coll. B. K. Sharma; 3 examples, Siligurijan, 12. 03. 2003, coll. B. K. Sharma; 4 examples, Chatla, 10. 02. 2005, coll. B. K. Sharma; 2 examples, Hiragota, 09. 12. 2004, coll. B. K. Sharma; 3 examples, Urmal, 04. 11. 2004, coll. B. K. Sharma; 4 examples, Kakerikhola, 05. 11. 2004, coll. B. K. Sharma; 5 examples, Padma, 10. 12. 2004, coll. B. K. Sharma; 3 examples, Basana, 03. 09. 2004, coll. Sumita Sharma; 4 examples, Goranga, 10. 02. 2005, coll. B. K. Sharma; 4 examples, Solmari, 12. 07. 2004, coll. Sumita Sharma; 5 examples, Sitalmari, 09. 09. 2004, coll. Sumita Sharma; 5 examples, Ghorkhonjan, 05. 03. 2005, coll. B. K. Sharma; 3 examples, Padmakhua, 01. 09. 2006 coll. Sumita Sharma; 3 examples, Kanduli, 01. 09. 2006, coll. Sumita Sharma; 2 examples, Kujibalipatty, 11. 01. 2003, coll. B. K. Sharma; 2 examples, Bandha, 01. 12. 2005, coll. B. K. Sharma; 4 examples, Mora Daphlang, 03. 12. 2005, coll. Sumita Sharma; 3 examples, Donga, 02. 12. 2005, coll. Sumita Sharma; 3 examples, Diphlu, 06. 09. 2006, coll. Sumita Sharma; 2 examples, Japara, 01. 12. 2005, coll. Sumita Sharma; 4 examples, Muijan, 29. 12. 2005, coll. Sumita Sharma; 2 examples, Sarain Hubbi, 29. 11. 2005, coll. Sumita Sharma; 3 examples, Bor beel, 01. 12. 2005, coll. Sumita Sharma; 3 examples, Diang, 01. 12. 2005, coll. Sumita Sharma; 4 examples, Sohala, 05. 09. 2006, coll. Sumita Sharma; 3 examples, Kutri, 03. 12. 2005, coll. Sumita Sharma; 2 examples, Memdubi, 30. 11. 2005, coll. Sumita Sharma; 2 examples, Maghuri, 30. 11. 2005, coll. Sumita Sharma; 4 examples, Senijan, 07. 07. 2004, coll. B. K. Sharma; 4 examples, Samuajan, 18. 01. 2005, coll. B. K. Sharma; 3 examples, Soie, 19. 10. 2004, coll. B. K. Sharma; 3 examples, Baskandi, 19. 10. 2004, coll. B. K. Sharma.

**Characters** : Lorica ovate and compressed; anterior margins with a shallow sinus; dorsal plate semicircular to pear-shaped, ventral plate broadly oval and narrower than dorsal plate. Posterior segment rounded posteriorly. Toe long, parallel-sided; claw pointed, with a median furrow and two basal spicules.

**Distribution** : INDIA - all states in North-Eastern region, West Bengal, Orissa, Bihar, Gujarat and Kashmir.

**Elsewhere** : Cosmopolitan.

110. *Lecane (Monostyla) monostyla* (Daday, 1897)  
(Fig. 197)

**Material examined** : 3 examples, Barundanga, 12. 03. 2003, coll. B. K. Sharma; 2 examples, Horinchora, 02. 11. 2004, coll. B. K. Sharma; 4 examples, Deepor, 08. 02. 2005, coll. B. K. Sharma; 3 examples, Ghorajan, 03. 11. 2004, coll. B. K. Sharma; 3 examples, Goranga, 05. 11. 2004, coll. B. K. Sharma; 3 examples, Solmari, 08. 12. 2004, coll. B. K. Sharma; 2 examples, Mori, 05. 11. 2004, coll. B. K. Sharma; 3 examples, Maghuri, 30. 11. 2005, coll. Sumita Sharma.

**Characters** : Lorica small, oval, with straight and coincident anterior margins; dorsal plate with characteristic lateral spine-like processes, ventral plate with very small spines at external angles. Toe parallel-sided for 3/4 of its length and then tapering to an acute point.

*Distribution* : INDIA - Assam, Meghalaya, Tripura and Kerala.

*Elsewhere* : Cosmopolitan.

111. *Lecane (Monostyla) obtusa* (Murray, 1913)  
(Fig. 198)

*Material examined* : 4 examples, Deepor, 09. 09. 2004, coll. B. K. Sharma; 3 examples, Jogra, 10. 08. 2002, coll. B. K. Sharma; 3 examples, Dholi, 05. 04. 2005, coll. Sumita Sharma; 3 examples, Teliadanga, 01. 12. 2005, coll. Sumita Sharma; 2 examples, Kololua, 29. 11. 2005, coll. Sumita Sharma.

*Characters* : Lorica oval, without surface markings; anterior margins straight, coincident and with minute spines at external angles. Ventral plate narrow than dorsal late. Toe cylindrical, slightly swollen in its middle region; claw pointed, with basal spicules.

*Distribution* : INDIA - Assam, Meghalaya, Tripura, West Bengal, Andhra Pradesh.

*Elsewhere* : Pantropical.

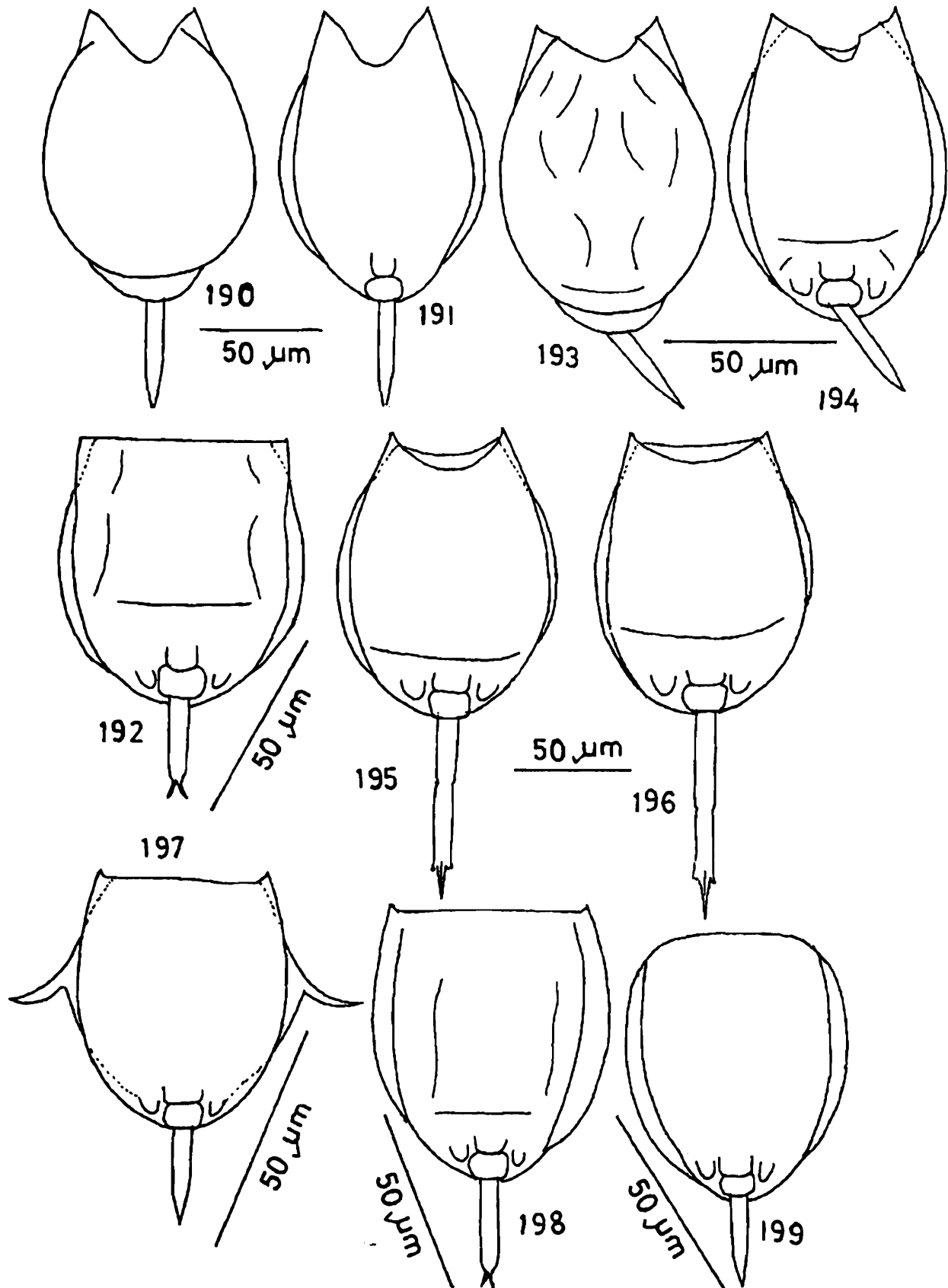
112. *Lecane (Monostyla) pyriformis* (Daday, 1905)  
(Fig. 199)

*Material examined* : 4 examples, Bhoispuri, 03. 05. 2002, coll. B. K. Sharma; 5 examples, Barundanga, 12. 03. 2003, coll. B. K. Sharma; 3 examples, Hakama, 06. 05. 2004, coll. B. K. Sharma; 3 examples, Horinchora, 04. 07. 2004, coll. B. K. Sharma; 3 examples, Fingua, 10. 08. 2002, coll. B. K. Sharma; 3 examples, Kamakhya, 07. 05. 2002, coll. B. K. Sharma; 2 examples, Rowmari, 14. 02. 2002, coll. B. K. Sharma; 5 examples, Deepor, 07. 05. 2004, coll. B. K. Sharma; 4 examples, Dighali, 12. 08. 2002, coll. B. K. Sharma; 4 examples, Kamranga, 09. 09. 2004, coll. B. K. Sharma; 3 examples, Siligurijan, 17. 08. 2002, coll. B. K. Sharma; 3 examples, Hiragota, 08. 05. 2004, coll. B. K. Sharma; 2 examples, Urmal, 10. 09. 2004, coll. B. K. Sharma; 2 examples, Padma, 14. 07. 2004, coll. B. K. Sharma; 2 examples, Bamoni, 01. 09. 2006, coll. Sumita Sharma; 3 examples, Sitalmari, 04. 05. 2004, coll. B. K. Sharma; 3 examples, Thekera, 06. 05. 2004, coll. B. K. Sharma; 4 examples, Kujibalipatty, 12. 08. 2002, coll. B. K. Sharma; 3 examples, Bandha, 01. 12. 2005, coll. B. K. Sharma; 2 examples, Daphlang, 05. 09. 2006, coll. Sumita Sharma; 2 examples, Muijan, 29. 11. 2005, coll. Sumita Sharma; 2 examples, Hakoi, 29. 11. 2005, coll. Sumita Sharma; 2 examples, Memdubi, 30. 11. 2005, coll. Sumita Sharma; 3 examples, Samuajan, 11. 06. 2004, coll. B. K. Sharma; 3 examples, Salchapra, 08. 08. 2004, coll. B. K. Sharma.

*Characters* : Lorica broadly oval, anterior margins straight or slightly convex, coincident and with rounded external angles; ventral plate narrower than dorsal plate. Toe parallel-sided for some distance and then tapering into a slender tip.

*Distribution* : INDIA - Assam, Meghalaya, Tripura, West Bengal, Orissa, Bihar and Punjab.

*Elsewhere* : Cosmopolitan.



*Lecane (Monostyla) decipiens* (Murray) : Fig. 190, dorsal view, Fig. 191, ventral view; *L. (M.) furcata* (Murray); Fig. 192, ventral view; *L. (M.) hamata* (Stokes) : Fig. 193, dorsal view, Fig. 194, ventral view; *L. (M.) lunaris* (Ehrenberg) : Figs. 195-196, ventral views; *L. (M.) monostyla* (Daday) : Fig. 197, ventral view; *L. (M.) obtusa* (Murray) : Fig. 198, ventral view; *L. (M.) pyriformis* (Daday) : Fig. 199, ventral view.

113. *Lecane (Monostyla) quadridentata* (Ehrenberg, 1830)  
(Figs. 200-201)

*Material examined* : 5 examples, Bhoispuri, 12. 03. 2003, coll. B. K. Sharma; 4 examples, Barundanga, 07. 01. 2003, coll. B. K. Sharma; 5 examples, Hakama, 07. 02. 2005, coll. B. K. Sharma; 4 examples, Sagmara, 09. 01. 2003, coll. B. K. Sharma; 3 examples, Kamakhya, 13. 03. 2003, coll. B. K. Sharma; 2 examples, Rowmari, 10. 01. 2003, coll. B. K. Sharma; 9 examples, Deepor, 03. 11. 2004, coll. B. K. Sharma; 4 examples, Deepor, 06. 04. 2005, coll. Sumita Sharma; 7 examples, Dighali, 12. 08. 2002, coll. B. K. Sharma; 2 examples, Borbila, 09. 05. 2002, coll. B. K. Sharma; 3 examples, Ghorajan, 04. 03. 2004, coll. B. K. Sharma; 5 examples, Siligurijan, 13. 08. 2002, coll. B. K. Sharma; 3 examples, Hiragota, 10. 09. 2004, coll. B. K. Sharma; 3 examples, Urmal, 08. 05. 2004, coll. B. K. Sharma; 3 examples, Kakerikhola, 14. 07. 2004, coll. B. K. Sharma; 5 examples, Solmari, 12. 07. 2004, coll. B. K. Sharma; 4 examples, Sitalmari, 09. 05. 2004, coll. B. K. Sharma; 3 examples, Sitalmari, 01. 09. 2006, coll. Sumita Sharma; 4 examples, Ghorkhonjan, 08. 07. 2004, coll. B. K. Sharma; 3 examples, Jugdal, 05. 04. 2005, coll. Sumita Sharma; 5 examples, Mori, 05. 11. 2004, coll. B. K. Sharma; 2 examples, Thekera, 06. 05. 2004, coll. B. K. Sharma; 3 examples, Kujibalipatty, 12. 08. 2002, coll. B. K. Sharma; 3 examples, Bandha, 03. 09. 2006, coll. Sumita Sharma; 4 examples, Diphlu, 02. 12. 2005, coll. Sumita Sharma; 6 examples, Muijan, 29. 11. 2005, coll. Sumita Sharma; 5 examples, Hakoi, 29. 11. 2005, coll. Sumita Sharma; 2 examples, Sohala, 05. 09. 2006, coll. Sumita Sharma; 2 examples, Kutri, 03. 12. 2005, coll. Sumita Sharma; 4 examples, Maghuri, 30. 11. 2005, coll. Sumita Sharma; 3 examples, Naruathan, 11. 06. 2004, coll. B. K. Sharma; 5 examples, Samuajan, 18. 01. 2005, coll. B. K. Sharma; 5 examples, Sone, 08. 08. 2004, coll. B. K. Sharma; 3 examples, Baskandi, 19. 10. 2004, coll. B. K. Sharma.

*Characters* : Lorica ovate to pyriform, anterior dorsal margin with two out-curved spines, ventral margin with a V-shaped sinus and its external angles produced into minute spines. Dorsal plate narrower than ventral plate. Toe long and parallel-sided; claw pointed and with two distinct basal spicules.

*Distribution* : INDIA - Assam, Meghalaya, Manipur, Mizoram, Nagaland, Tripura, Orissa, Bihar, Andhra Pradesh, Madhya Pradesh, Rajasthan, Punjab, Haryana and Kashmir.

*Elsewhere* : Cosmopolitan.

114. *Lecane (Monostyla) rugosa* (Harring, 1914)  
(Fig. 202)

*Material examined* : 2 examples, Deepor, 03. 11. 2004, coll. B. K. Sharma.

*Characters* : Lorica broadly oval, anterior dorsal and ventral margins straight and coincident. Dorsal plate broader than long, its anterior margin narrow than that of ventral plate. Dorsal and ventral plates with surface markings. Ventral plate narrow than dorsal plate. Lateral sulci

shallow and indistinct. Posterior segment small and rounded. Toe about  $\frac{1}{4}$  the length of lorica and terminating into two acute claws.

*Distribution* : INDIA - Assam.

*Elsewhere* : Cosmopolitan.

115. *Lecane (Monostyla) scutata* (Harring & Myers, 1926)  
(Fig. 203)

*Material examined* : 2 examples, Bhoispuri, 04. 12. 2002, coll. B. K. Sharma; 3 examples, Dhir, 10. 12. 2002, coll. B. K. Sharma; 3 examples, Rowmari, 13. 03. 2003, coll. B. K. Sharma; 4 examples, Deepor, 08. 02. 2005, coll. B. K. Sharma; 4 examples, Dighali, 41. 03. 2003, coll. B. K. Sharma; 3 examples, Mori, 08. 11. 2004, coll. B. K. Sharma.

*Characters* : Lorica broadly oval, anterior margins coincident and slightly concave; anterior ventral margin produced into sharp corners at its external angles. Ventral plate narrower than dorsal plate and almost parallel-sided. Toes parallel-sided; claw short and pointed.

*Distribution* : INDIA - Assam, Meghalaya, Tripura and West Bengal.

*Elsewhere* : Arctic-temperate region.

116. *Lecane (Monostyla) solfatara* (Hauer, 1938)  
(Fig. 204)

*Material examined* : 4 examples, Borbila, 12. 02. 2003, coll. B. K. Sharma.

*Characters* : Lorica broadly oval, slightly longer than its width and without any ornamentation; anterior dorsal margins slightly convex, coincident and with spines at external angles. Dorsal and ventral plates equally wide. Posterior segment broad and rounded. Foot segment relatively broad. Toe parallel-sided, relatively short and with terminal fissure; claws long, completely separated and divergent.

*Distribution* : INDIA - Assam.

*Elsewhere* : Oriental region.

117. *Lecane (Monostyla) stenroosi* (Meissner, 1908)  
(Fig. 205)

*Material examined* : 5 examples, Dhir, 09. 08. 2002, coll. B. K. Sharma; 2 examples, Kujibalipatty, 12. 08. 2002, coll. B. K. Sharma; 3 examples, Ghorajan, 03. 11. 2004, coll. B. K. Sharma; 3 examples, Hiragota, 09. 12. 2004, coll. B. K. Sharma; 2 examples, Solmari, 08. 02. 2005, coll. B. K. Sharma; 3 examples, Thekera, 05. 11. 2004, coll. B. K. Sharma; 2 examples, Bandha, 01. 12. 2005, coll. B. K. Sharma; 2 examples, Hakoi, 29. 11. 2005, coll. Sumita Sharma; 3 examples, Karasing, 02. 12. 2005, coll. Sumita Sharma; 5 examples, Senijan, 17. 01. 2005, coll. B. K. Sharma.

*Characters* : Lorica ovate to circular in outline. Anterior dorsal margin straight, ventral margin with a shallow median sinus flanked by sharp inwardly directed spines. Dorsal plate smaller than ventral plate and its lateral margins reaching anterior end of lorica. Ventral plate longer than wide, widest medially and with a complete transverse fold. Lateral sulci deep. Posterior segment small and rounded posteriorly. Foot segment not projecting. Toe stout, enlarged basally and then nearly parallel-sided and with two separate pseudo-claws.

*Distribution* : INDIA - Assam, West Bengal, Andhra Pradesh and Gujarat.

*Elsewhere* : Pantropical.

118. *Lecane (Monostyla) thienemanni* (Hauer, 1938)  
(Fig. 206)

*Material examined* : 3 examples, Fingua, 09. 01. 2003, coll. B. K. Sharma; 2 examples, Rowmari, 13. 03. 2003, coll. B. K. Sharma; 4 examples, Deepor, 03. 11. 2004, coll. B. K. Sharma; 4 examples, Dighali, 12. 08. 2002, coll. B. K. Sharma; 3 examples, Ghorajan, 03. 11. 2004, coll. B. K. Sharma; 2 examples, Borbila, 15. 03. 2003, coll. B. K. Sharma; 3 examples, Siligurijan, 13. 01. 2003, coll. B. K. Sharma; 2 examples, Urmal, 10. 02. 2005, coll. B. K. Sharma; 2 examples, Bamoni, 01. 09. 2006, coll. Sumita Sharma; 3 examples, Goranga, 08. 12. 2004, coll. B. K. Sharma; 3 examples, Mori, 01. 12. 2005, coll. B. K. Sharma.

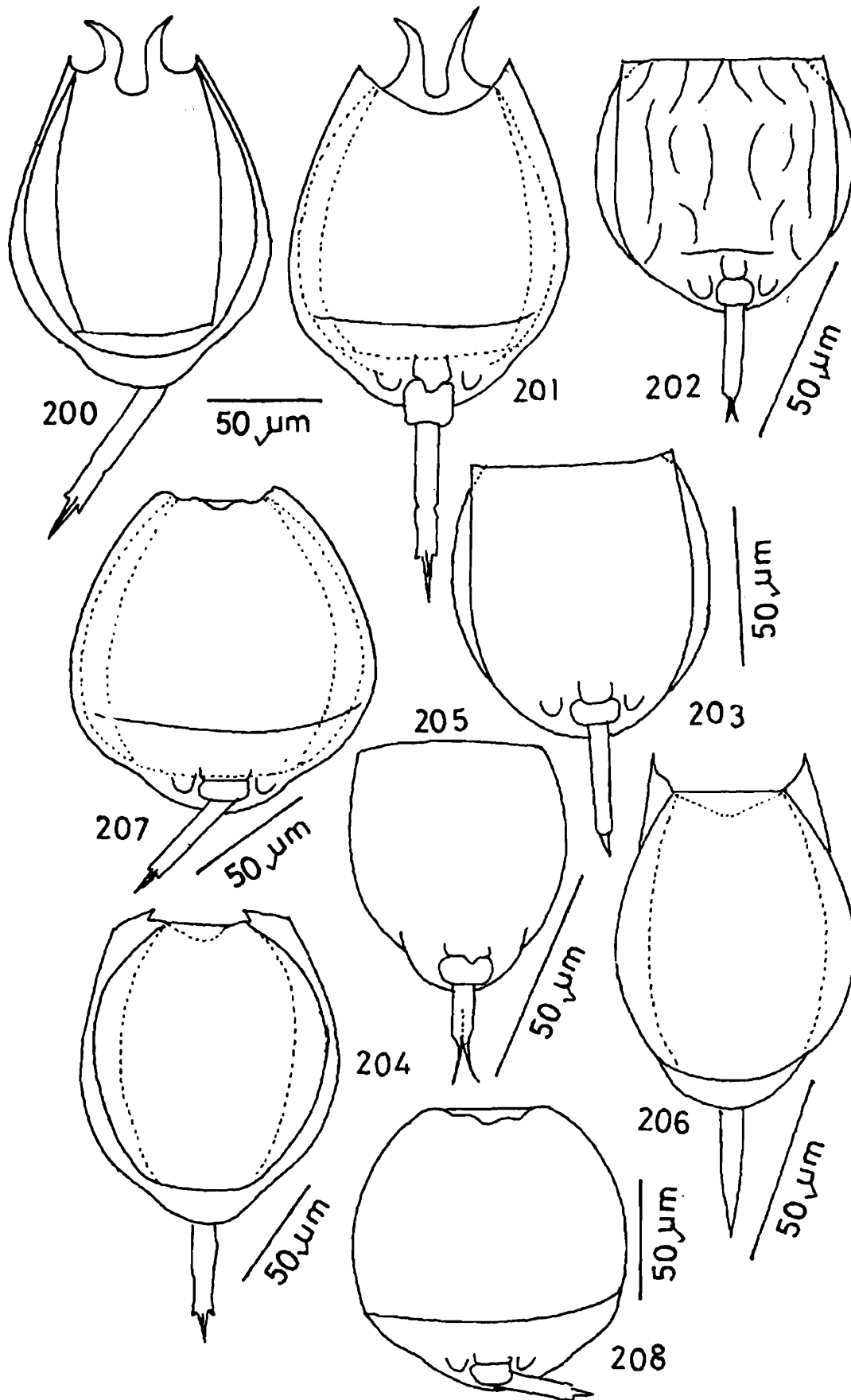
*Characters* : Lorica elongate-oval, anterior dorsal margin straight, anterior ventral margin with a shallow sinus and its external angles produced into two stout triangular spines. Dorsal plate broader than ventral plate. Toe parallel-sided for about half of its length and then tapering to an acute point.

*Distribution* : INDIA - Assam, Meghalaya, Tripura, West Bengal, Orissa and Gujarat.

*Elsewhere* : S. E. Asia.

119. *Lecane (Monostyla) unguitata* (Fadeev, 1925)  
(Figs. 207-208)

*Material examined* : 5 examples, Bhoispuri, 07. 01. 2003, coll. B. K. Sharma; 4 examples, Hakama, 02. 11. 2004, coll. B. K. Sharma; 3 examples, Horinchora, 08. 9. 2004, coll. B. K. Sharma; 3 examples, Fingua, 09. 01. 2003, coll. B. K. Sharma; 4 examples, Sagmara, 11. 03. 2003, coll. B. K. Sharma; 2 examples, Kamakhya, 12. 12. 2002, coll. B. K. Sharma; 3 examples, Rowmari, 10. 01. 2003, coll. B. K. Sharma; 6 examples, Deepor, 09. 09. 2004, coll. B. K. Sharma; 3 examples, Deepor, 06. 04. 2005, coll. Sumita Sharma; 5 examples, Dighali, 14. 03. 2003, coll. B. K. Sharma; 2 examples, Borbila, 13. 08. 2002, coll. B. K. Sharma; 3 examples, Kamranga, 03. 11. 2004, coll. B. K. Sharma; 4 examples, Ghorajan, 08. 12. 2004, coll. B. K. Sharma; 3 examples, Chatla, 10. 02. 2005, coll. B. K. Sharma; 2 examples, Hiragota, 10. 09. 2004, coll. B. K. Sharma; 2 examples, Urmal, 10. 02. 2005, coll. B. K. Sharma; 2 examples, Kakerikhola, 11. 09. 2004, coll. B. K. Sharma; 2 examples,



*Lecane (Monostyla) quadridentata* (Ehrenberg): Fig. 200, dorsal view, Fig. 201, ventral view; *L. (M.) rugosa* (Harring): Fig. 202, ventral view; *L. (M.) scutata* (Harring & Myers): Fig. 203, ventral view; *L. (M.) stenroosi* (Meissner): Fig. 204, ventral view; *L. (M.) solfatara* (Hauer) : Fig. 205, ventral view; *L. (M.) thienemanni* (Hauer): Fig. 206, dorsal view; *L. (M.) unguitata* (Fadeev): Figs. 207-208, ventral views.

Padma, 10. 12. 2004, coll. B. K. Sharma; 2 examples, Bamoni, 01. 09. 2006, coll. Sumita Sharma; 4 examples, Solmari, 12. 02. 2005, coll. B. K. Sharma; 3 examples, Sitalmari, 13. 11. 2004, coll. B. K. Sharma; 2 examples, Haduk, 01. 09. 2006, coll. Sumita Sharma; 2 examples, Duptoli, 05. 04. 2005, coll. Sumita Sharma; 2 examples, Jugdal, 01. 09. 2006, coll. Sumita Sharma; 3 examples, Mori, 06. 05. 2004, coll. B. K. Sharma; 2 examples, Thekera, 08. 11. 2004, coll. B. K. Sharma; 2 examples, Kujibalipatty, 11. 01. 2003, coll. B. K. Sharma; 2 examples, Bandha, 01. 12. 2005, coll. B. K. Sharma; 2 examples, Borbil-Tinsuki, 01. 12. 2005, coll. Sumita Sharma; 4 examples, Muijan, 29. 11. 2005, coll. Sumita Sharma; 2 examples, Sesa, 01. 12. 2005, coll. Sumita Sharma; 5 examples, Maghuri, 30. 11. 2005, coll. Sumita Sharma; 3 examples, Butikor, 02. 04. 2005, coll. B. K. Sharma; 5 examples, Samuajan, 18. 01. 2005, coll. B. K. Sharma; 3 examples, Salchakra, 09. 02. 2005, coll. B. K. Sharma.

**Characters** : Lorica almost circular, anterior opening relatively smaller; anterior dorsal margin straight, anterior ventral margin undulating and with a fairly deep median sinus with rounded external angles. Dorsal plate pyriform and smaller than ventral plate. Toe parallel-sided; claw pointed, with an indistinct furrow and with two distinct basal spicules.

**Distribution** : INDIA - Assam, Meghalaya, Tripura, West Bengal, Orissa, Bihar and Gujarat.

**Elsewhere** : Palaeotropical.

#### Family NOTOMMATIDAE Remane, 1933 (partim)

**Characters** : Corona ventral (*Notommata* - type), often with ciliated auricles. Trunk usually spindle-shaped. Foot generally not clearly set off from the body. Toes present. Trophi virgate and modified for suction.

Four genera belonging to this family are observed in the samples collected from the floodplain lakes of Assam.

#### Genus *Cephalodella* Bory de St. Vincent, 1826

**Characters** : Body cylindrical, slightly curved and cuticle somewhat stiffened; with a thin dorsal and a ventral plate. Foot short, toes slightly bent and pointed. Corona consists of a simple circum-apical band of cilia and with ventral buccal field. Trophi virgate, variously shaped in different species.

This genus is represented by four species in the sampled collected from the floodplain lakes of Assam.

#### 120. *Cephalodella forficula* (Ehrenberg, 1830)

(Figs. 209-210)

**Material examined** : 3 examples, Bhoispuri, 08. 8. 2002, coll. B. K. Sharma; 2 examples, Fingua, 09. 01. 2003, coll. B. K. Sharma; 2 examples, Sagmara, 11. 03. 2003, coll. B. K.

Sharma; 2 examples, Rowmari, 12. 12. 2002, coll. B. K. Sharma; 3 examples, Deepor, 04. 03. 2004, coll. B. K. Sharma; 4 examples, Ghorajan, 03. 11. 2004, coll. B. K. Sharma; 3 examples, Chatla, 10. 09. 2004, coll. B. K. Sharma; 2 examples, Hiragota, 09. 12. 2004, coll. B. K. Sharma; 2 examples, Mori, 06. 05. 2004, coll. B. K. Sharma; 2 examples, Bandha, 01. 12. 2005, coll. B. K. Sharma; 2 examples, Donga, 06. 09. 2006, coll. Sumita Sharma; 2 examples, Borbil-Tinsuki, 01. 12. 2005, coll. Sumita Sharma; 3 examples, Muijan, 29. 12. 2005, coll. Sumita Sharma; 3 examples, Salchapra, 11. 12. 2004, coll. B. K. Sharma.

*Characters* : Body elongate, slender and spindle-shaped and slightly compressed laterally. Head distinct and slightly oblique anteriorly. Lorica plates distinct; sulci narrow and parallel-sided. Foot distinct and almost rhomboidal. Toes short, stout, widely spaced at base, curved and acutely pointed; with characteristic knob-like basal spine and another small spine. Sub-unci fan shaped.

*Distribution* : INDIA - Assam, Meghalaya, Tripura, West Bengal and Andhra Pradesh.

*Elsewhere* : Cosmopolitan.

#### 121. *Cephalodella gibba* (Ehrenberg, 1830)

(Figs. 211-212)

*Material examined* : 2 examples, Barundanga, 08. 08. 2002, coll. B. K. Sharma; 3 examples, Dhir, 12. 02. 2002, coll. B. K. Sharma; 2 examples, Fingua, 09. 01. 2003, coll. B. K. Sharma; 2 examples, Sagmara, 11. 12. 2002, coll. B. K. Sharma; 3 examples, Deepor, 01. 03. 2005, coll. B. K. Sharma; 3 examples, Dighali, 06. 04. 2005, coll. Sumita Sharma; 2 examples, Borbila, 12. 01. 2003, coll. B. K. Sharma; 2 examples, Ghorajan, 03. 11. 2004, coll. B. K. Sharma; 2 examples, Siligurijan, 13. 01. 2003, coll. B. K. Sharma; 2 examples, Hiragota, 04. 11. 2004, coll. B. K. Sharma; 3 examples, Goranga, 10. 02. 2005, coll. B. K. Sharma; 2 examples, Duptoli, 05. 04. 2005, coll. Sumita Sharma; 2 examples, Borbil-Tinsuki, 01. 12. 2005, coll. Sumita Sharma; 3 examples, Raidong, 30. 11. 2005, coll. Sumita Sharma; 3 examples, Sone, 09. 02. 2005, coll. B. K. Sharma; 2 examples, Salchapra, 11. 12. 2004, coll. B. K. Sharma.

*Characters* : Body elongated, laterally compressed and gibbous dorsally. Lorica firm and plates distinct; sulci narrow anteriorly and widening distally to the posterior end. Toes long, curved, gradually tapering and with conical tips. Rami symmetrical, free ends of manubria curved.

*Distribution* : INDIA - Assam, Meghalaya, Tripura, West Bengal, Gujarat, Kashmir and Ladak.

*Elsewhere* : Cosmopolitan.

122. *Cephalodella mucronata* Myers, 1924

(Figs. 213-214)

*Material examined* : 3 examples, Kujibalipatty, 12. 08. 2002, coll. B. K. Sharma; 2 examples, Thekera, 08. 11. 2004, coll. B. K. Sharma; 3 examples, Sitalmari, 09. 09. 2004, coll. B. K. Sharma; 2 examples, Japara, 01. 12. 2005, coll. Sumita Sharma.

*Characters* : Body elongate, cylindrical, dorsally arched and laterally compressed. Lorica rigid and extending beyond end of foot. Longitudinal sulci deep. Foot sheath with triangular ventral pint and deep dorsal spine, separated by deep, rounded sinus. Toes very long, slender, recurved and tapering to pointed tips, Retro-cerebral sac present.

*Distribution* : INDIA Assam, Meghalaya, West Bengal and Orissa.

*Elsewhere* : Cosmopolitan.

123. *Cephalodella ventripes* Dixon-Nuttal, 1901

(Figs. 215-216)

*Material examined* : 2 examples, Hakoi, 29. 11. 2005, coll. Sumita Sharma; 2 examples, Maghuri, 30. 11. 2005, coll. Sumita Sharma.

*Characters* : Body short, stocky, gibbous and bulbous dorsally; abdomen extends beyond distal end of the foot. Plates and sulci distinct; dorsal sulcus with a distinct V-shaped groove. Foot small and ventrally directed. Toes short, stout and tapering to acute tips.

*Distribution* : INDIA - Assam and Meghalaya.

*Elsewhere* : Cosmopolitan.

Genus *Monommata* Bartsch, 1870

*Characters* : Body cylindrical or fusiform, with suture between head and abdomen. Cuticle thin and firm, laterally and dorsally with longitudinal striae. Foot indistinctly two segmented; toes distinctly long, always unequal; right toe longer than left. Trophi variable from simple virgate to intermediate between virgate and forcipate type. Corona with marginal whorl of cilia, lateral auricle like tufts, un-ciliated apical field and ciliate buccal field.

This genus is represented by two species in the samples collected from the floodplain lakes of Assam.

124. *Monommata longiseta* (O. F. Müller, 1786)

(Figs. 217-218)

*Material examined* : 3 examples, Bhoispuri, 07. 01. 2003, coll. B. K. Sharma; 4 examples, Dhir, 08. 01. 2003, coll. B. K. Sharma; 3 examples, Kamakhya, 10. 01. 2003, coll. B. K. Sharma; 2 5 examples, Deepor, 09. 01. 2004, coll. B. K. Sharma; 3 examples, Dighali, 11.

01. 2003, coll. B. K. Sharma; 2 examples, Borbila, 14. 12. 2002, coll. B. K. Sharma; 4 examples, Ghorajan, 03. 11. 2004, coll. B. K. Sharma; 2 examples, Chatla, 09. 12. 2004, coll. B. K. Sharma; 2 examples, Hiragota, 10. 02. 2005, coll. B. K. Sharma; 2 examples, Urmal, 09. 12. 2004, coll. B. K. Sharma; 3 examples, Padma, 11. 09. 2004, coll. B. K. Sharma; 3 examples, Kujibalipatty, 14. 03. 2003, coll. B. K. Sharma; 2 examples, Bandha, 01. 12. 2005, coll. B. K. Sharma; 2 examples, Memdubi, 30. 11. 2005, coll. Sumita Sharma; 4 examples, Maghuri, 30. 11. 2005, coll. Sumita Sharma; 3 examples, Baskandi, 19. 10. 2004, coll. B. K. Sharma.

**Characters** : Body slender and elongate, head short; transparent integument marked with closely spaced striae. Foot indistinctly two segmented; toes long and unequal. Rami bent at right angle in middle and each ramus with a long slender tooth. Right uncus with three slender teeth and left uncus with two teeth. Fulcrum without basal apophysis. Manubria broad proximally and rod like distally.

**Distribution** : INDIA - Assam, Meghalaya and West Bengal.

**Elsewhere** : Cosmopolitan.

125. *Monommata maculata* Harring & Myers, 1930  
(Figs. 219-220)

**Material examined** : 3 examples, Fingua, 09. 01. 2003, coll. B. K. Sharma; 4 examples, Karasing, 06. 9. 2006, coll. Sumita Sharma; 2 examples, Morakalong, 03. 12. 2005, coll. Sumita Sharma.

**Characters** : Body slender and fusiform; integument stiff and striated, Foot two segmented; toes variable but always unequal. Trophi intermediate between virgate and forcipate. Fulcrum short dagger like frontally, flat laterally with large conical basal apophysis. Inner margin of rami with unique denticulation and with three groups of teeth, ventral group with 12-14 comb like teeth, middle with four large interlocking teeth and inner group with three long needle-like teeth.

**Distribution** : INDIA - Assam.

**Elsewhere** : Cosmopolitan.

Genus *Notommata* Ehrenberg, 1930

**Characters** : Body variable in shape and size; cylindrical, spindle-shaped, sac-like, conical or with lateral alae; neck suture evident. Transverse and longitudinal folds on the trunk evident. Two-segmented foot ends in two more or less tapering toes. Foot often covered by cuticular expansion and frequently bears a sensory papilla or a short spur between toes. Corona *Notommata*-type. Trophi virgate, asymmetric in most species. Retro-cerebral organ generally well developed. Cerebral eye spots present or absent.

This genus is represented by two species in the present study.

126. *Notommata pachyura* (Gosse, 1886)  
(Figs. 221-222)

*Material examined* : 3 examples, Sagmara, 11. 03. 2003, coll. B. K. Sharma; 2 examples, Muijan, 29. 11. 2005, coll. Sumita Sharma.

*Characters* : Body fusiform, transparent, anterior sutures distinct; lobed tail covers first foot joint. Foot two-segmented, with small papilla between toes. Auricles large, post-oral chin prominent. Retrocerebral sac extremely long, sub-cerebral glands present. Large eye spot at posterior end of brain. Trophi virgate, asymmetric. Fulcrum long and stout. Right ramus with broad lamellar tooth, left with socket; alulae large and asymmetric. Unci with one main and four secondary teeth on left, one main and three secondary teeth on right and two sigmoid pleural rods.

*Distribution* : INDIA Assam.

*Elsewhere* : Cosmopolitan.

127. *Notommata spinata* Koste & Shiel, 1991  
(Figs. 223-224)

*Material examined* : 2 examples, Sarain Hubbi, 29. 11. 2005, coll. Sumita Sharma; 3 examples, Memdubi, 30. 11. 2005, coll. Sumita Sharma.

*Characters* : Body laterally expanded into two distinct alae and without dorsal hump; total width (in preserved material) slightly less than length. Lateral tip of each ala armed with stout triangular cusp. Head and neck sutures distinct. Foot two-segmented; toes conical, long and tapering to point. Triangular tail commences at level of lateral antennae, with distal end a blunt point at beginning of first foot joint. Trophi modified virgate, asymmetric. Fulcrum expanded into fan at distal end. Manubria curved posteriorly and dilated distally. Retrocerebral sac long, sub-cerebral sac large.

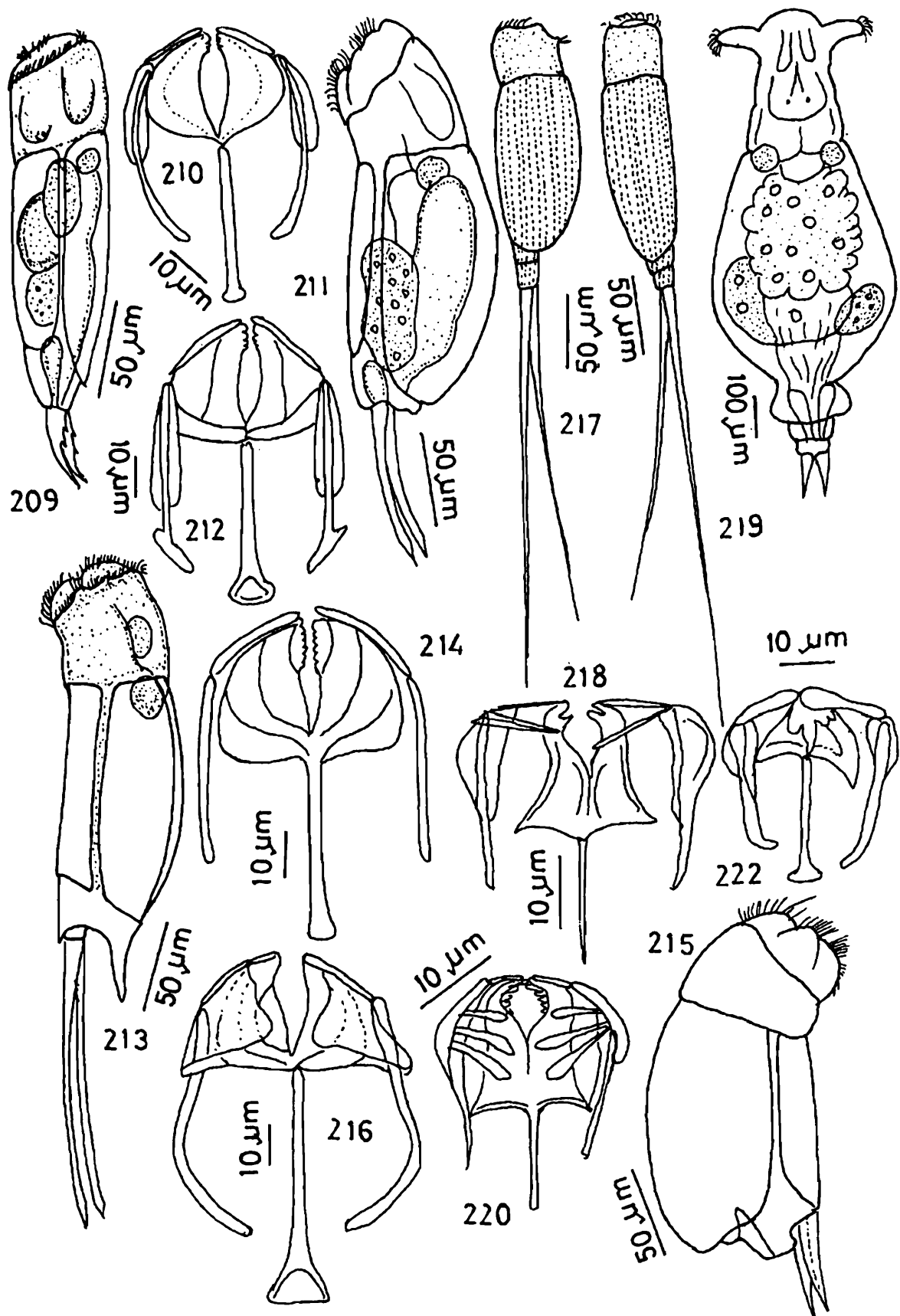
*N. spinata* is presently retained as a distinct species following Koste and Shiel (1991) pending further studies though it has been proposed (Nogrady and Pourriot, 1995) to be treated as *N. pachyura spinata*. The later authors, however, also indicated need for further studies.

*Distribution* : INDIA - Assam.

*Elsewhere* : Australia.

Genus *Taphrocampa* Gosse, 1851

*Characters* : Body cylindrical or fusiform with more or less distinct transverse plicae. Corona oblique on anterior surface of head, with lateral ciliated auricles. Trophi virgate, asymmetric; fulcrum long and slender, rami hemispherical and with large alulae, long and



*Cephalodella forficula* (Ehrenberg) : Fig. 209, lateral view, Fig. 210, trophi; *C. gibba* (Ehrenberg) : Fig. 211, lateral view, Fig. 212, trophi; *C. mucronata* Myers: Fig. 213, lateral view, Fig. 214, trophi; *C. ventripes* Dixon-Nuttal : Fig. 215, lateral view, Fig. 216, trophi; *Monommata longiseta* (O. F. Müller): Fig. 217, lateral view, Fig. 218, trophi; *M. maculata* Harring & Myers: Fig. 219, lateral view, Fig. 220, trophi; *Notommata pachyura* (Gosse) : Fig. 221, dorsal view, Fig. 222, trophi.

slender manubria with rudimentary basal plate and, unci with 2-3 narrow teeth. Hypopharynx muscle well developed.

This genus is represented by only one species in the samples collected from the floodplain lakes of Assam.

128. *Taphrocampa annulosa* (Gosse, 1851)  
(Figs. 225-226)

*Material examined* : 3 examples, Raidong, 30. 11. 2005, coll. Sumita Sharma; 2 examples, Maghuri, 30. 11. 2005, coll. Sumita Sharma.

*Characters* : Body elongate, cylindrical and tapering to foot. Integument leathery, dorsally with distinct transverse placations and ventral surface less distinctly plicate. Tail, foot and toes short. Auricles seldom extended. Trophi asymmetric; left ramus with indistinct inner single tooth, unci with two teeth each and, manubria of almost equal length.

*Distribution* : INDIA Assam.

*Elsewhere* : Cosmopolitan.

Family SCARIDIIDAE Manfredi, 1927

*Characters* : Trophi virgate, protrudable. Unci projecting through mouth opening; tips curved outwards. Corona modified *Notonunata*-type, retractable in dorso-ventral fissure, laterally bordered by pairs of lobes. Trochus specialized, with stiff setae.

This family includes only one genus i.e., *Scaridium* which is also represented in the samples collected from the floodplain lakes of Assam.

Genus *Scaridium* Ehrenberg, 1830

*Characters* : Body cylindrical or spindle-shaped; lorica thin Foot three-segmented, terminal foot-segment longest, strong transversely striated foot muscles present; toes very long and equal. Corona simple, with ventral ciliated zone. Trophi modified virgate. Vitellarium with eight nuclei.

Only one species belonging to this genus is examined presently from the samples collected from the floodplain lakes of Assam.

129. *Scaridium longicaudum* (O.F. Müller, 1786)  
(Fig. 227)

*Material examined* : 4 examples, Bhoispuri, 07.01. 2003, coll. B. K. Sharma; 3 examples, Barundanga, 11. 02. 2002, coll. B. K. Sharma; 2 examples, Horinchora, 02. 11. 2004, coll. B. K. Sharma; 2 examples, Sagmara, 09. 01. 2002, coll. B. K. Sharma; 3 examples, Kamakhya,

13. 03. 2003, coll. B. K. Sharma; 2 examples, Rowmari, 10. 01. 2003, coll. B. K. Sharma; 4 examples, Deepor, 08. 02. 2005, coll. B. K. Sharma; 3 examples, Dighali, 14. 03. 2003, coll. B. K. Sharma; 2 examples, Kamranga, 09. 09. 2004, coll. B. K. Sharma; 3 examples, Siligurijan, 13. 01. 2003, coll. B. K. Sharma; 2 examples, Chatla, 09. 12. 2004, coll. B. K. Sharma; 3 examples, Hiragota, 04. 11. 2004, coll. B. K. Sharma; 2 examples, Urmal, 10. 09. 2004, coll. B. K. Sharma; 3 examples, Kakerikhola, 05. 11. 2004, coll. B. K. Sharma; 2 examples, Padma, 11. 02. 2005, coll. B. K. Sharma; 3 examples, Goranga, 08. 12. 2004, coll. B. K. Sharma; 4 examples, Solmari, 13. 11. 2004, coll. B. K. Sharma; 3 examples, Borbil-Tinsuki, 01. 12. 2005, coll. Sumita Sharma; 3 examples, Muijan, 29. 11. 2005, coll. Sumita Sharma; 4 examples, Mihir, 02. 12. 2005, coll. Sumita Sharma; 3 examples, Maghuri, 30. 11. 2005, coll. Sumita Sharma; 3 examples, Samuajan, 01. 03. 2004, coll. B. K. Sharma; 3 examples, Salchapra, 11. 12. 2004, coll. B. K. Sharma.

**Characters** : Lorica thin and cylindrical; foot three-segmented, distal segment longest. Toes almost as long as foot, parallel-sided and with blunt tips. Trophi symmetrical, modified virgate; rami teeth large and alulae rounded, fulcrum with well developed basal plate, manubrium relatively broad and with straight ventral margin.

**Distribution** : INDIA - Assam, Meghalaya, Mizoram, Nagaland, West Bengal, Orissa, Bihar, Gujarat and Punjab.

**Elsewhere** : Cosmopolitan.

#### Family GASTROPODIDAE Remane, 1933

**Characters** : Body oval, sac- or bottle-shaped; foot present or absent. Apical field with or without tentacle. Trophi virgate. Gastric glands with blind sacs.

This family is represented by single genus in the material collected from the floodplain lakes of Assam.

#### Genus *Ascomorpha* Perty, 1850

**Characters** : Body sacciform to oval and with thin lorica. Corona with a single circum-apical ring of cilia; apical field with a finger or sickle-shaped stiff tentacle and tufts of cilia. Mastax modified for suction; trophi virgate.

Two species of this genus are noticed in the samples examined from Assam.

#### 130. *Ascomorpha saltans* Bartsch, 1870 (Figs. 228-229)

**Material examined** : 4 examples, Bhoispuri, 12. 02. 2003, coll. B. K. Sharma; 3 examples, Hakama, 03. 03. 2004, coll. B. K. Sharma; 2 examples, Kujibalipatty, 41. 03. 2003, coll. B. K. Sharma.

*Characters* : Body oval, elevated in cross-section and with four longitudinal folds. Styli on apical field long, palp finger-like and generally dorsally bent. Retrocerebral sac long. Protonephredia with three flame bulbs each. Only one irregular accretion body present.

*Distribution* : INDIA Assam, Meghalaya, Tripura, West Bengal and Ladak.

*Elsewhere* : Cosmopolitan.

### 131. *Ascomorpha ovalis* (Bergendal, 1892)

(Figs. 230-231)

*Material examined* : 5 examples, Dhir, 05.05. 2002, coll. B. K. Sharma; 3 examples, Fingua, 10. 08. 2002, coll. B. K. Sharma; 6 examples, Deepor, 07. 05. 2004, coll. B. K. Sharma; 4 examples, Ghorajan, 12. 07. 2004, coll. B. K. Sharma; 3 examples, Kamranga, 09. 09. 2004, coll. B. K. Sharma; 2 examples, Padma, 11. 02. 2005, coll. B. K. Sharma; 2 examples, Kujibalipatty, 08. 05. 2002, coll. B. K. Sharma; 4 examples, Sitalmari, 12. 07. 2004, coll. B. K. Sharma; 3 examples, Solmari, 09. 05. 2004, coll. B. K. Sharma; 3 examples, Thekera, 06. 05. 2004, coll. B. K. Sharma.

*Characters* : Body oval, moderately compressed dorso-ventrally; cuticle stiffened to form thin lorica. Dorsal and ventral plates of lorica bounded laterally by a thin membrane. Accretion bodies numerous.

*Distribution* : INDIA - Assam, Tripura, West Bengal and Madhya Pradesh.

*Elsewhere* : Pantropical.

### Family TRICHOCERCIDAE Remane, 1933

*Characters* : Body arched, cylindrical, asymmetrical and spindle-shaped or sacciform; often with a keel or striated area. Foot present, reduced or absent; with equal or unequal bristle-like toes. Corona of *Asplanchna*- or *Notommata*- type. Trophi virgate and asymmetrical. Lateral antennae usually placed asymmetrically.

This family is represented by genus *Trichocerca* in the examined material.

### Genus *Trichocerca* (Lamarck, 1801)

*Characters* : Body more or less elongated, cylindrical and asymmetrical; lorica thin to rigid and with one or two keels or striated areas. Foot short; with equal or unequal toes, substyles sometimes present. Corona simple, one or two palps on the apical buccal field. Lateral antennae often very asymmetrical. Trophi virgate, more or less asymmetrical.

Eleven species of *Trichocerca* are identified from the material collected from the floodplain lakes of Assam.

132. *Trichocerca bicristata* (Gosse, 1887)  
(Figs. 232-233)

**Material examined** : 4 examples, Barundanga, 08. 08. 2002, coll. B. K. Sharma; 3 examples, Kujibalipatty, 12. 8. 2002, coll. B. K. Sharma.

**Characters** : Lorica slender and elongated; with two characteristic distinct keels extending up to 2/3 the length of dorsum, separated by wide depression of dorsum. Left toe longer than body, right toe reduced; substyles present. Trophi asymmetrical; manubria terminally crooked and one side curved, supra-rami large, left ramus occasionally with two pointed alulae.

**Distribution** : INDIA - Assam, Bihar and Orissa.

**Elsewhere** : Cosmopolitan.

133. *Trichocerca capucina* (Wierzejski & Zacharias, 1893)  
(Figs. 234-235)

**Material examined** : 3 examples, Bhoispuri, 03. 05. 2002, coll. B. K. Sharma; 2 examples, Dhir, 11. 03. 2003, coll. B. K. Sharma; 2 examples, Hakama, 07. 02. 2005, coll. B. K. Sharma; 3 examples, Fingua, 06. 05. 2002, coll. B. K. Sharma; 3 examples, Sagmara, 10. 08. 2002, coll. B. K. Sharma; 4 examples, Kamakhya, 11. 08. 2002, coll. B. K. Sharma; 2 examples, Rowmari, 07. 05. 2002, coll. B. K. Sharma; 5 examples, Deepor, 12. 07. 2004, coll. B. K. Sharma; 4 examples, Dighali, 12. 08. 2002, coll. B. K. Sharma; 4 examples, Kamranga, 07. 05. 2004, coll. B. K. Sharma; 3 examples, Ghorajan, 08. 02. 2005, coll. B. K. Sharma; 3 examples, Siligurijan, 13. 08. 2002, coll. B. K. Sharma; 3 examples, Hiragota, 08. 05. 2004, coll. B. K. Sharma; 2 examples, Urmal, 05. 03. 2004, coll. B. K. Sharma; 2 examples, Padma, 11. 02. 2005, coll. B. K. Sharma; 4 examples, Goranga, 09. 09. 2004, coll. B. K. Sharma; 2 examples, Sitalmari, 09. 05. 2004, coll. B. K. Sharma; 2 examples, Mori, 05. 11. 2004, coll. B. K. Sharma; 3 examples, Kujibalipatty, 08. 05. 2002, coll. B. K. Sharma.

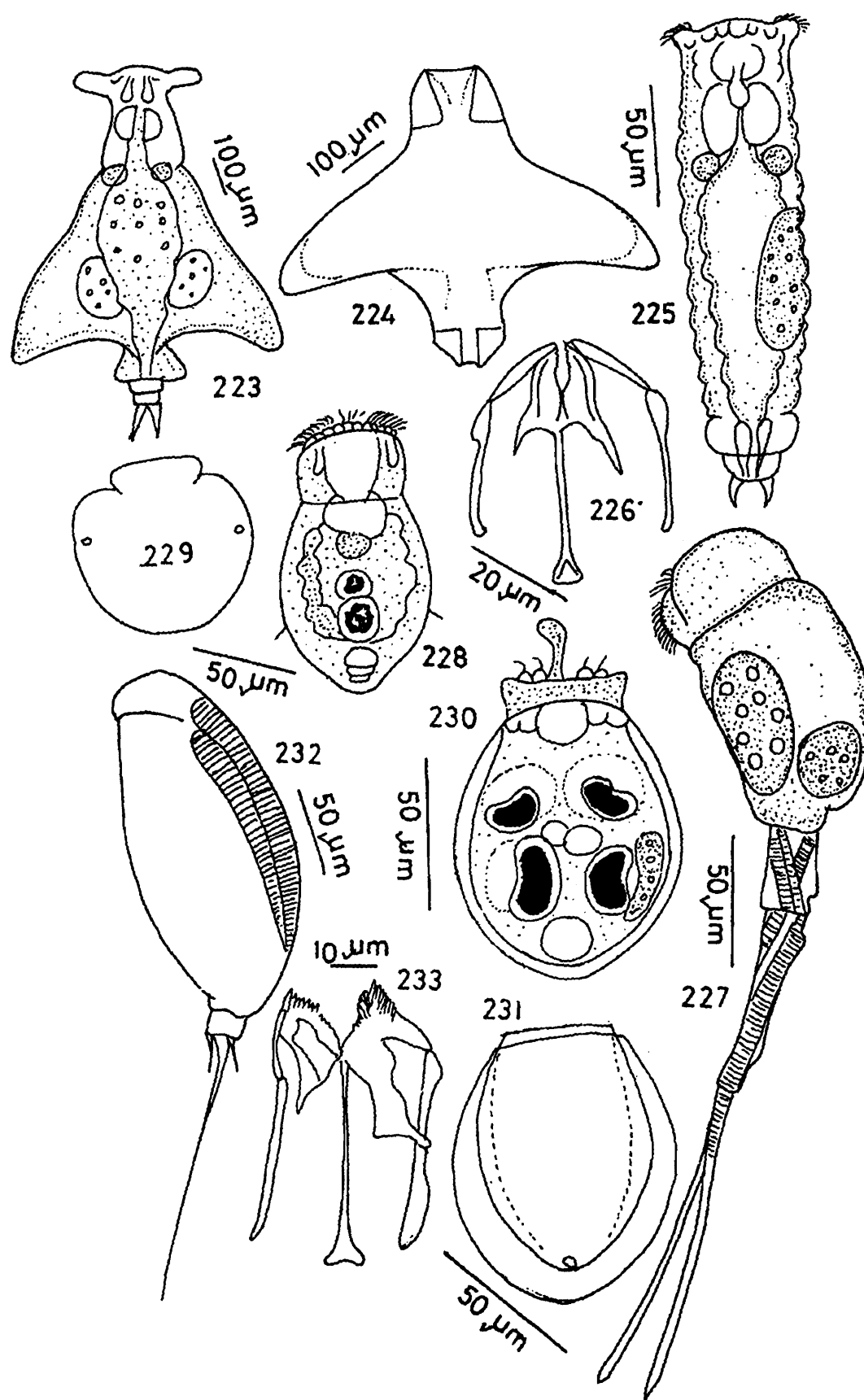
**Characters** : Body cylindrical, curved and with a dorsal keel. Head long, with five palps and two tentacles; with a dorsal plate-like projection and a number of folds in the contracted specimens. Left toe upto about 1/2 of the body length, right toe small. Trophi almost symmetrical; right manubrium more robust.

**Distribution** : INDIA - Assam, Meghalaya and Tripura.

**Elsewhere** : Cosmopolitan.

134. *Trichocerca cylindrica* (Imhof, 1891)  
(Figs. 236-237)

**Material examined** : 5 examples, Bhoispuri, 12. 03. 2003, coll. B. K. Sharma; 3 examples, Barundanga, 07. 01. 2003, coll. B. K. Sharma; 6 examples, Dhir, 05. 05. 2002, coll. B. K. Sharma; 4 examples, Hakama, 02. 11. 2004, coll. B. K. Sharma; 4 examples, Horinchora, 07.



*Notommata spinata* Koste & Shiel : Fig. 223, dorsal view, Fig. 224, dorsal view (contracted); *Taphrocampa annulosa* (Gosse) : Fig. 225, dorsal view, Fig. 226, trophi; *Scaridium longicaudum* (O.F. Müller) : Fig. 227, lateral view; *Ascomorpha saltans* Bartsch : Fig. 228, dorsal view, Fig. 229, cross-section; *A. ovalis* (Bergendal) : Fig. 230, dorsal view, Fig. 231, lorica (dorsal view); *Trichocerca bicristata* (Gosse): Fig. 232, lateral view, Fig. 233, trophi.

02. 2005, coll. B. K. Sharma; 3 examples, Sagmara, 11. 03. 2003, coll. B. K. Sharma; 3 examples, Kamakhya, 10. 01. 2003, coll. B. K. Sharma; 6 examples, Deepor, 12. 07. 2004, coll. B. K. Sharma; 2 examples, Deepor, 06. 04. 2005, coll. Sumita Sharma; 5 examples, Dighali, 11. 08. 2002, coll. B. K. Sharma; 3 examples, Borbila, 51. 03. 2003, coll. B. K. Sharma; 4 examples, Kamranga, 09. 09. 2004, coll. B. K. Sharma; 5 examples, Ghorajan, 07. 05. 2004, coll. B. K. Sharma; 3 examples, Chatla, 13. 07. 2004, coll. B. K. Sharma; 2 examples, Urmal, 08. 05. 2004, coll. B. K. Sharma; 4 examples, Padma, 06. 03. 2004, coll. B. K. Sharma; 3 examples, Goranga, 01. 09. 2006, coll. Sumita Sharma; 5 examples, Mori, 01. 12. 2005, coll. B. K. Sharma; 3 examples, Shitalpathar, 01. 12. 2005, coll. Sumita Sharma; 4 examples, Memdubi, 30. 11. 2005, coll. Sumita Sharma; 5 examples, Puwa Saikia, 10. 06. 2004, coll. B. K. Sharma; 3 examples, Baskandi, 09. 02. 2005, coll. B. K. Sharma.

**Characters** : Body long and cylindrical; anterior end with a median dorsal spine and a number of longitudinal folds. Lorica thin, with a striated area and a single dorsal keel. Left toe almost as long as lorica; right toe reduced to a small scaly spine. Lateral antennae located in the middle of the dorsal crest. Trophi symmetrical, manubria with curved free ends, unci moderately broad and rami curved.

**Distribution** : INDIA - Assam, Meghalaya, Tripura, West Bengal, Orissa and Kashmir.

**Elsewhere** : Palaearctic, Nearctic regions, and Sri Lanka.

### 135. *Trichocerca elongata* (Gosse, 1886)

(Figs. 238-239)

**Material examined** : 4 examples, Bhoispuri, 10. 02. 2002, coll. B. K. Sharma; 3 examples, Dhir, 08. 01. 2003, coll. B. K. Sharma; 2 examples, Hakama, 07. 02. 2005, coll. B. K. Sharma; 2 examples, Fingua, 09. 01. 2003, coll. B. K. Sharma; 2 examples, Sagmara, 04. 12. 2002, coll. B. K. Sharma; 3 examples, Rowmari, 13. 03. 2003, coll. B. K. Sharma; 4 examples, Deepor, 04. 03. 2004, coll. B. K. Sharma; 4 examples, Dighali, 11. 01. 2003, coll. B. K. Sharma; 2 examples, Kamranga, 10. 02. 2005, coll. B. K. Sharma; 3 examples, Ghorajan, 08. 12. 2004, coll. B. K. Sharma; 2 examples, Siligurijan, 16. 02. 2002, coll. B. K. Sharma; 2 examples, Hiragota, 05. 03. 2004, coll. B. K. Sharma; 2 examples, Urmal, 09. 12. 2004, coll. B. K. Sharma; 3 examples, Padma, 11. 02. 2005, coll. B. K. Sharma; 4 examples, Goranga, 13. 11. 2004, coll. B. K. Sharma; 3 examples, Solmari, 08. 02. 2005, coll. B. K. Sharma; 2 examples, Thekera, 05. 11. 2004, coll. B. K. Sharma; 3 examples, Daphlang, 05. 09. 2006, coll. Sumita Sharma; 3 examples, Sarain Hubbi, 29. 11. 2005, coll. Sumita Sharma; 4 examples, Bor beel, 01. 12. 2005, coll. Sumita Sharma; 4 examples, Diang, 01. 12. 2005, coll. Sumita Sharma; 5 examples, Samuajan, 18. 01. 2005, coll. B. K. Sharma; 3 examples, Baskandi, 19. 01. 2004, coll. B. K. Sharma.

**Characters** : Body elongated, cylindrical and with two keels extending unto 1/3 to 2/5 of the body length; anterior margin of body without any spine. Knob-like lateral antennae

located posteriorly. Foot short and distinct. Left toe about 1/2 of the total length, right toe about 1/3 of the left toe and substyles present.

*Distribution* : INDIA - Assam, Meghalaya and Tripura.

*Elsewhere* : Cosmopolitan.

136. *Trichocerca flagellata* Hauer, 1937

(Figs. 240-241)

*Material examined* : 3 examples, Fingua, 09. 01. 2005, coll. B. K. Sharma; 2 examples, Kamranga, 10. 02. 2005, coll. B. K. Sharma; 2 examples, Solmari, 13. 11. 2004, coll. B. K. Sharma; 3 examples, Thekera, 06. 05. 2004, coll. B. K. Sharma.

*Characters* : Body ovoid, head indistinctly demarcated; anterior margin raised in a smooth curve on the right side, the rest undulating. Keel high vaulted with wide striated area extending to the beginning of the short foot opening. Left lateral antenna slightly behind the middle region of the abdomen, dorsal antenna near beginning of 2/3 of trunk. Left toe longer and slightly sigmoid, right toe reduced and stylets present. Trophi robust and with strongly crooked fulcrum and left manubrium.

*Distribution* : INDIA - Assam, Meghalaya and Tamil Nadu.

*Elsewhere* : Tropicopolitan.

137. *Trichocerca iernis* (Gosse, 1887)

(Fig. 242)

*Material examined* : 3 examples, Rowmari, 10. 01. 2003, coll. B. K. Sharma.

*Characters* : Body elongate, cylindrical, slightly curved and with a short spine at anterior margin of lorica; head separated from trunk by a transverse fold. Striated keel extending from anterior margin to end of abdomen. Left antenna inserted higher than right. Left toe nearly ¾ of body length, right toe short, basal stylet present. Left manubrium not crooked, suprami small and left uncus bidentata.

*Distribution* : INDIA - Assam and Kashmir.

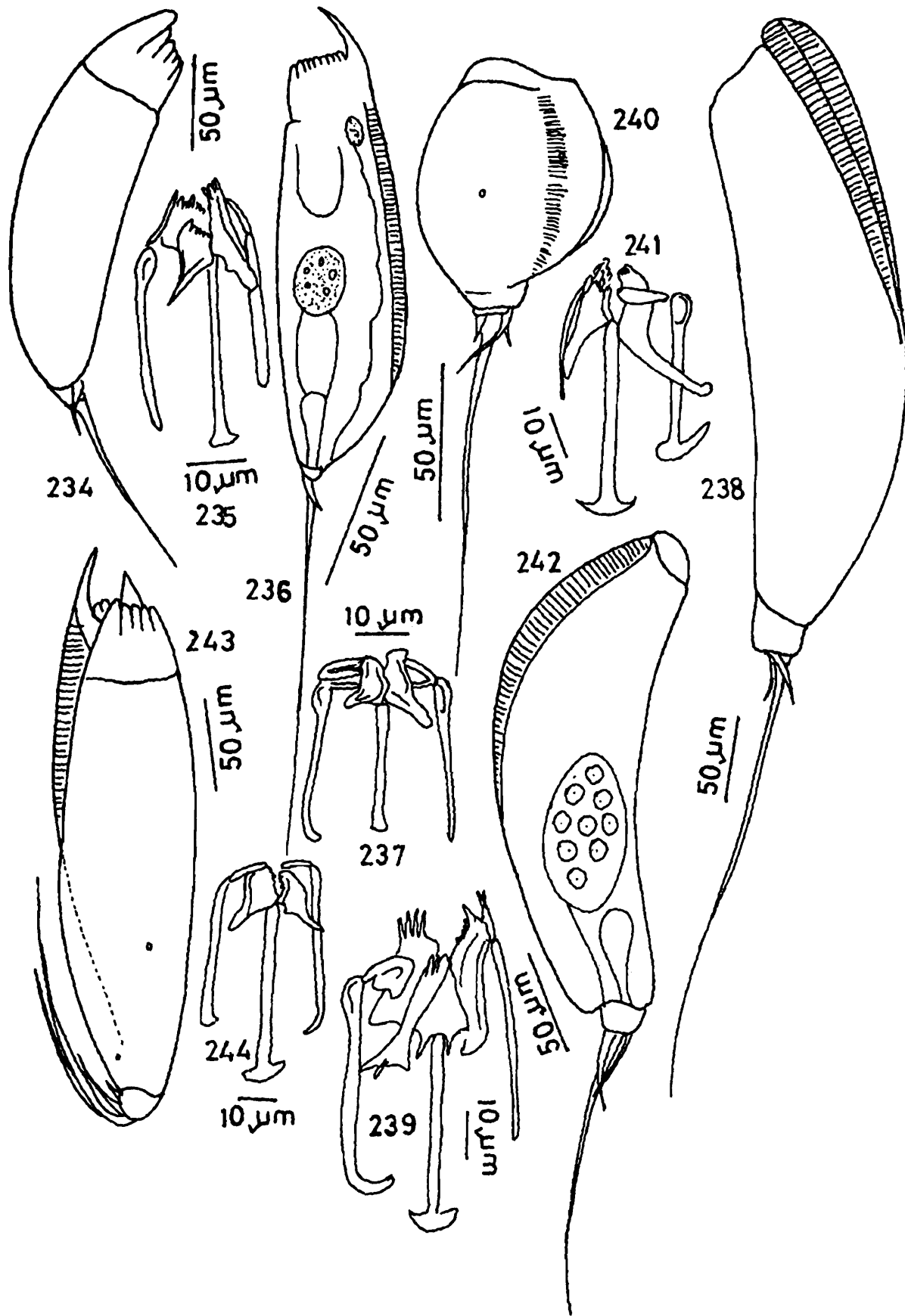
*Elsewhere* : Cosmopolitan.

138. *Trichocerca insignis* (Herrick, 1885)

(Figs. 243-244)

*Material examined* : 3 examples, Muijan, 29. 11. 2005, coll. Sumita Sharma; 3 examples, Maghuri, 30. 11. 2005, coll. Sumita Sharma.

*Characters* : Body elongated, cylindrical and tapering to foot in the posterior one-third part; lorica height: length ratio nearly 1:5. Lorica with two anterior projections / teeth of



*Trichocerca capucina* (Wierzejski & Zacharias) : Fig. 234, lateral view, Fig. 235, trophi; *T. cylindrica* (Imhof) : Fig. 236, lateral view, Fig. 237, trophi; *T. elongata* (Gosse) : Fig. 238, lateral view, Fig. 239, trophi; *T. flagellata* Hauer : Fig. 240, lateral view, Fig. 241, trophi; *T. iernis* (Gosse) : Fig. 242, lateral view; *T. insignis* (Herrick): Fig. 243, lateral view, Fig. 244, trophi.

similar length. Keel starts between anterior projections / teeth and runs to posterior end of lorica. Foot short, demarcated from trunk. Toes unequal and ventrally curved; left toe nearly half the length of lorica, right toe nearly 2/3 the left tow, substyli present. Trophi asymmetrical: fulcrum distally dilated, manubria rod-like, left manubrium curved inwards distally, rami and unci with denticles.

*Distribution* : INDIA - Manipur.

*Elsewhere* : Cosmopolitan.

139. *Trichocerca jenningsi* Voigt, 1957  
(Figs. 245-246)

*Material examined* : 3 examples, Dhir, 11. 03. 2003, coll. B. K. Sharma; 4 examples, Ghorajan, 08. 12. 2004, coll. B. K. Sharma; 3 examples, Goranga, 10. 02. 2005, coll. B. K. Sharma; 3 examples, Mori, 05. 11. 2004, coll. B. K. Sharma.

*Characters* : Body cylindrical; anterior end produced ventrally into a small anteriorly directed spine. Posterior end of lorica with a small projection over the foot. Foot small. Left toe long and right toe small; 2-3 substyles present at the base of foot. Trophi asymmetrical; left manubrium longer and curved.

*Distribution* : INDIA - Assam, Meghalaya and Tripura.

*Elsewhere* : Cosmopolitan.

140. *Trichocerca kostei* Segers, 1993  
(Figs. 247-248)

*Material examined* : 2 examples, Hiragota, 08. 05. 2004, coll. B. K. Sharma; 3 examples, Dholi, 01. 09. 2006, coll. Sumita Sharma; 4 examples, Solmari, 08.02.2005, coll. B. K. Sharma.

*Characters* : Body (lorica) elongated, slightly curved; dorsal keel extending to more than half the body length. Foot short. Right toe about half the length of left toe; each toe with 2-3 basal spines. Trophi strongly asymmetrical; right manubrium and unci reduced, left manubrium large and terminally widened, unci teeth fused and, fulcrum long and terminating into distal disc.

*Distribution* : INDIA - Kerala.

*Elsewhere* : Palaeotropical.

141. *Trichocerca longiseta* (Schrank, 1802)  
(Fig. 249)

*Material examined* : 3 examples, Bhoispuri, 03. 05. 2002, coll. B. K. Sharma; 4 examples, Barundanga, 08. 08. 2002, coll. B. K. Sharma; 4 examples, Dhir, 05. 5. 2002, coll. B. K.

Sharma; 3 examples, Hakama, 11. 07. 2004, coll. B. K. Sharma; 2 examples, Horinchora, 02. 11. 2004, coll. B. K. Sharma; 2 examples, Fingua, 13. 02. 2002, coll. B. K. Sharma; 2 examples, Sagmara, 06. 05. 2002, coll. B. K. Sharma; 3 examples, Kamakhya, 07. 05. 2002, coll. B. K. Sharma; 4 examples, Deepor, 04. 03. 2004, coll. B. K. Sharma; 2 examples, Kamranga, 12. 07. 2004, coll. B. K. Sharma; 3 examples, Ghorajan, 04. 03. 2004, coll. B. K. Sharma; 3 examples, Hiragota, 08. 05. 2004, coll. B. K. Sharma; 2 examples, Kakerikhola, 14. 07. 2004, coll. B. K. Sharma; 3 examples, Goranga, 08. 05. 2004, coll. B. K. Sharma; 4 examples, Sitalmari, 12. 07. 2004, coll. B. K. Sharma; 2 examples, Borbil-Tinsuki, 01. 12. 2005, coll. Sumita Sharma; 2 examples, Hakoi, 29. 11. 2005, coll. Sumita Sharma; 4 examples, Memdubi, 30. 11. 2005, coll. Sumita Sharma; 4 examples, Samuajan, 18. 01. 2005, coll. B. K. Sharma; 2 examples, Salchapra, 09. 02. 2005, coll. B. K. Sharma.

*Characters* : Lorica long and cylindrical; anterior margin with a long spine, another half long spine and two small projections. Head with longitudinal folds in contracted specimens. Keel and striated area extending up to middle of the trunk. Foot small and distinct. Lateral antennae at similar height in posterior part of abdomen. Left toe equal to about half of the body length or more and right toe small; substyli present. Left manubrium long, terminally thickened and curved inwards. Left ramus with pointed alula; supra-rami with acute points.

*Distribution* : INDIA - Assam, Meghalaya, Tripura, Kashmir and Ladak.

*Elsewhere* : Cosmopolitan.

142. *Trichocerca porcellus* (Gosse, 1851)  
(Figs. 250-251)

*Material examined* : 3 examples, Barundanga, 03. 05. 2002, coll. B. K. Sharma; 4 examples, Dhir, 11. 03. 2003, coll. B. K. Sharma; 3 examples, Hakama, 07. 02. 2005, coll. B. K. Sharma; 5 examples, Horinchora, 06. 05. 2004, coll. B. K. Sharma; 2 examples, Kamakhya, 13. 03. 2003, coll. B. K. Sharma; 3 examples, Rowmari, 11. 08. 2002, coll. B. K. Sharma; 5 examples, Deepor, 08. 02. 2005, coll. B. K. Sharma; 4 examples, Dighali, 15. 02. 2002, coll. B. K. Sharma; 4 examples, Ghorajan, 09. 09. 2004, coll. B. K. Sharma; 3 examples, Siligurijan, 12. 03. 2003, coll. B. K. Sharma; 3 examples, Chatla, 10. 02. 2005, coll. B. K. Sharma; 3 examples, Hiragota, 09. 12. 2004, coll. B. K. Sharma; 3 examples, Urmal, 10. 02. 2005, coll. B. K. Sharma; 4 examples, Padma, 05. 11. 2004, coll. B. K. Sharma; 3 examples, Sitalmari, 08. 12. 2004, coll. B. K. Sharma; 3 examples, Daphlang, 05. 09. 2006, coll. Sumita Sharma.

*Characters* : Body short, distinctly curved; head separated by constriction and with two anterior dorsal cusps, right one slightly longer. Striated keel extending backwards from the base of the largest tooth. Foot small, partly enclosed within lorica. Toes two; left toe longer. Trophi asymmetrical; left manubrium robust, right manubrium a slender rod and left ramus alula much longer than right.

*Distribution* : INDIA - Assam.

*Elsewhere* : Cosmopolitan.

143. *Trichocerca rattus* (O. F. Muller, 1776)  
(Figs. 252-253)

*Material examined* : 4 examples, Bhoispuri, 07. 01. 2003, coll. B. K. Sharma; 3 examples, Hakama, 08. 09. 2004, coll. B. K. Sharma; 3 examples, Mori, 01. 12. 2005, coll. B. K. Sharma; 3 examples, Kujibalipatty, 14. 03. 2003, coll. B. K. Sharma; 4 examples, Sitalmari, 09. 09. 2004, coll. B. K. Sharma; 5 examples, Bor beel, 01. 12. 2005, coll. Sumita Sharma; 3 examples, Diang, 01. 12. 2005, coll. Sumita. Sharma; 3 examples, Salchapra, 09. 02. 2005, coll. B. K. Sharma.

*Characters* : Body elongated and with a broad striated keel extending up to half of its length. Lateral antennae located in posterior trunk region. Left toe smaller than body; right toe reduced. Trophi asymmetrical; right manubrium slightly reduced, right ramus obtuse, left ramus strong, plank-shaped and with broad free end.

*Distribution* : INDIA - Assam, Meghalaya, Tripura, West Bengal, Kashmir, Ladak, Panjab and Gujarat.

*Elsewhere* : Cosmopolitan.

144. *Trichocerca similis* (Wierzejski, 1893)  
(Figs. 254-255)

*Material examined* : 5 examples, Bhoispuri, 03. 05. 2002, coll. B. K. Sharma; 2 examples, Barundanga, 08. 08. 2002, coll. B. K. Sharma; 6 examples, Dhir, 05. 05. 2002, coll. B. K. Sharma; 3 examples, Hakama, 11. 07. 2004, coll. B. K. Sharma; 4 examples, Horinchora, 02. 11. 2004, coll. B. K. Sharma; 3 examples, Kamakhya, 07. 05. 2002, coll. B. K. Sharma; 2 examples, Rowmari, 14. 02. 2002, coll. B. K. Sharma; 7 examples, Deepor, 12. 07. 2004, coll. B. K. Sharma; 3 examples, Deepor, 06. 04. 2005, coll. Sumita Sharma; 5 examples, Dighali, 08. 05. 2002, coll. B. K. Sharma; 3 examples, Borbila, 13. 08. 2002, coll. B. K. Sharma; 4 examples, Ghorajan, 07. 05. 2004, coll. B. K. Sharma; 2 examples, Siligurijan, 13. 08. 2002, coll. B. K. Sharma; 3 examples, Chatla, 10. 02. 2005, coll. B. K. Sharma; 4 examples, Hiragota, 05. 03. 2004, coll. B. K. Sharma; 2 examples, Urmal, 05. 03. 2004, coll. B. K. Sharma; 3 examples, Padma, 09. 05. 2004, coll. B. K. Sharma; 3 examples, Goranga, 07. 05. 2004, coll. B. K. Sharma; 3 examples, Mori, 03. 09. 3006, coll. Sumita Sharma; 2 examples, Thekera, 03. 12. 2005, coll. Sumita Sharma; 3 examples, Bandha, 03. 09. 2006, coll. Sumita Sharma; 3 examples, Daphlang, 02. 12. 2005, coll. Sumita Sharma; 4 examples, Muijan, 29. 11. 2005, coll. Sumita Sharma; 4 examples, Dhekia, 18. 01. 2005, coll. B. K. Sharma; 5 examples, Samuajan, 01. 03. 2004, coll. B. K. Sharma; 3 examples, Sone, 09. 02. 2005, coll. B. K. Sharma; 3 examples, Salchapra, 08. 08. 2004, coll. B. K. Sharma.

*Characters* : Body long and anterior end with two long spines dorsally separated by a small hump. Dorsal keel extending from base of anterior spines up to about 1/3 the body length. Foot two-segmented; first foot-segment overlapped by the projecting posterior end of lorica. Toes short and unequal, spines present at the base of the toes.

*Distribution* : INDIA - Assam, Meghalaya, Tripura, West Bengal, Orissa, Bihar and Gujarat.

*Elsewhere* : Cosmopolitan.

145. *Trichocerca sulcata* (Jennings, 1894)

(Figs. 256-257)

*Material examined* : 3 examples, Sitalmari, 09. 05. 2004, coll. B. K. Sharma; 4 examples, Bhoismari, 12. 03. 2003, coll. Sumita Sharma.

*Characters* : Lorica short, cylindrical and dorsally curved; anterior end with a number of longitudinal folds. Striated area extending up to 2/3 of the dorsum. Foot small and ventrally displaced. Toes very small and ventrally curved. Trophi asymmetrical; fulcrum robust, left manubrium distally dilated, right manubria short and slender rod and ramus with enlarged bifurcate alula.

*Distribution* : INDIA - Assam, Meghalaya and Tripura.

*Elsewhere* : Cosmopolitan

146. *Trichocerca weberi* (Jennings, 1903)

(Figs. 258-259)

*Material examined* : 3 examples, Barundanga, 12. 03. 2003, coll. B. K. Sharma; 4 examples, Horinchora, 07. 02. 2005, coll. B. K. Sharma; 3 examples, Thekera, 08. 11. 2004, coll. B. K. Sharma; 3 examples, Bandha, 01. 12. 2005, coll. B. K. Sharma; 4 examples, Solmari, 13. 12. 2004, coll. B. K. Sharma; 4 examples, Daphlang, 05. 09. 2006, coll. Sumita Sharma.

*Characters* : Body short and curved; head indistinctly marked and with broad rounded plate to left of head aperture and a prominent tooth to right of dorsal median line. Striated keel extending up to 2/3 of lorica length. Toes of similar length, with 3-4 inconspicuous substyli. Trophi asymmetrical; left manubrium distally bent, right manubrium slightly sigmoid rod, supra-rami distinctly elongated.

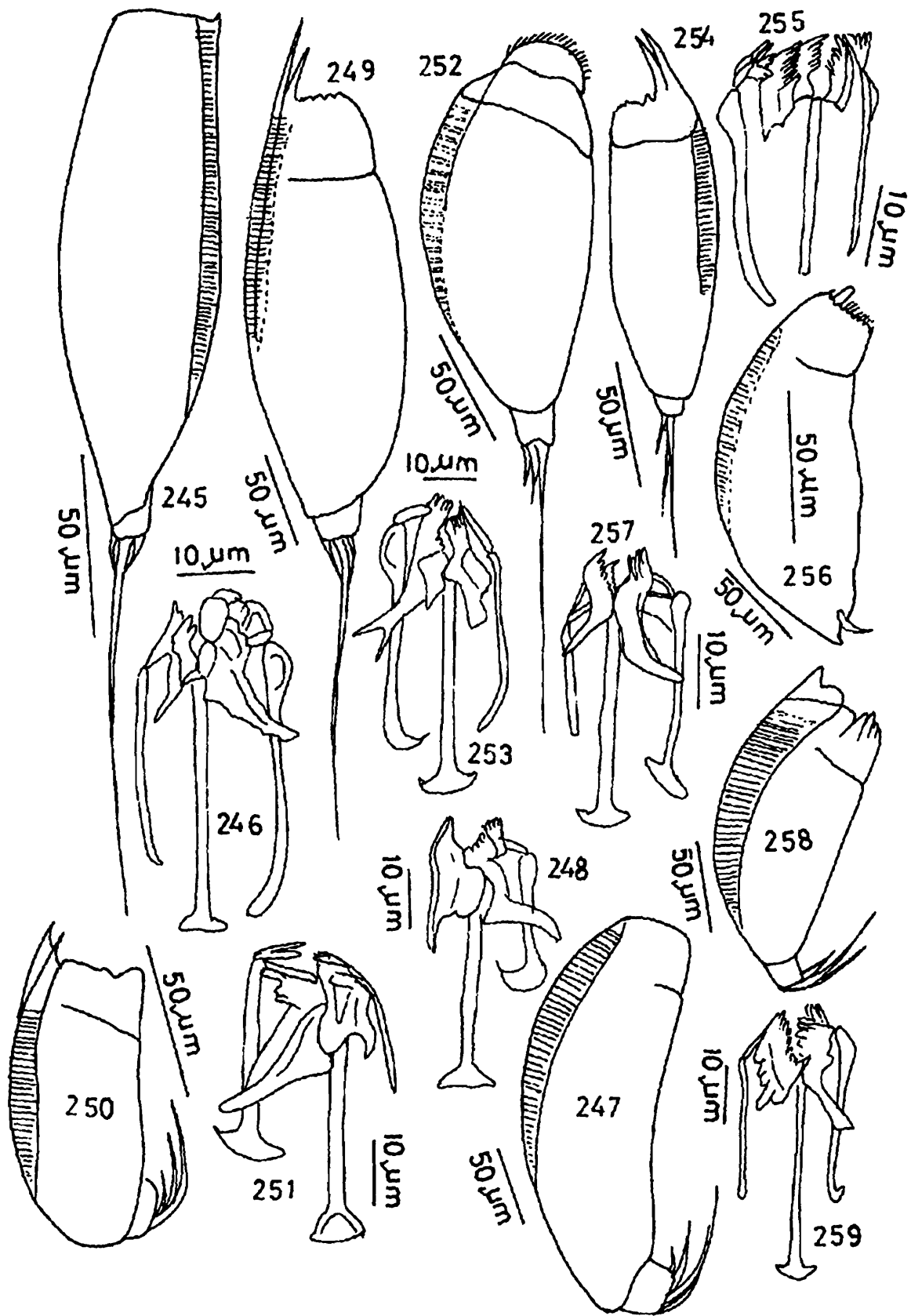
*Distribution* : INDIA - Assam, West Bengal, Punjab, Kashmir and Ladak.

*Elsewhere* : Cosmopolitan

Family ASPLANCHNIDAE Harring & Myers, 1926

*Characters* : Body large and without lorica; cuticle thin and transparent. Foot absent or present. Corona consists of a simple girdle of arcs and tufts of cirri around head a very small area around mouth. Intestine, cloaca and anus present or absent. Trophi incudate. Often viviparous.

This family is represented by only one genus in the present account.



*Trichoerca jenningsi* Voigt : Fig. 245, lateral view, Fig. 246, trophi; *T. kostei* Segers : Fig. 247, lateral view, Fig. 248, trophi; *T. longiseta* (Schrank) : Fig. 249, lateral view; *T. porcellus* (Gosse) : Fig. 250, lateral view, Fig. 251, trophi; *T. rattus* (O. F. Müller) : Fig. 252, lateral view, Fig. 253, trophi; *T. similis* (Wierzejski) : Fig. 254, lateral view, Fig. 255, trophi; *T. sulcata* (Jennings) : Fig. 256, lateral view, Fig. 257, trophi; *T. weberi* (Jennings) : Fig. 258, lateral view, Fig. 259, trophi.

Genus *Asplanchna* Gosse, 1850

**Characters** : Body illoricate, transparent and with thin cuticle; sacciform, bell-shaped or with humps or projections. Foot absent; pedal glands sometimes present. Corona consists of a broken single ring of cilia. Vitellarium horse-shoe shaped or globose. Often viviparous, with one or several embryos.

Two species belonging to this genus are observed in the samples collected from the floodplain lakes of Assam..

147. *Asplanchna brightwelli* Gosse, 1850  
(Figs. 260-261)

**Material examined** : 6 examples, Dhir, 09. 08. 2002, coll. B. K. Sharma; 5 examples, Ghorajan, 12. 07. 2004, coll. B. K. Sharma; 4 examples, Thekera, 06. 05. 2004, coll. B. K. Sharma; 3 examples, Bandha, 01. 02. 2005, coll. B. K. Sharma; 5 examples, Solmari, 07. 05. 2004, coll. B. K. Sharma; 5 examples, Daphlang, 05. 09. 2006, coll. Sumita Sharma.

**Characters** : Body large, thin, transparent and sacciform. Contractile vesicle irregular. Protonephredia long, each with 10-20 flame cells. Vitellarium horse-shoe shaped and with 20-32 nuclei. Inner margin of each ramus with a small tooth.

**Distribution** : INDIA - Assam, Meghalaya, Tripura, West Bengal, Orissa, Andhra Pradesh, Punjab, Kashmir and Ladak.

**Elsewhere** : Cosmopolitan.

148. *Asplanchna priodonta* Gosse, 1850  
(Figs. 262-263 )

**Material examined** : 4 examples, Bhoispuri, 07. 01. 2003, coll. B. K. Sharma; 5 examples, Barundanga, 12. 03. 2003, coll. B. K. Sharma; 3 examples, Hakama, 07. 02. 2005, coll. B. K. Sharma; 2 examples, Horinchora, 02. 11. 2004, coll. B. K. Sharma; 2 examples, Fingua, 12. 03. 2003, coll. B. K. Sharma; 4 examples, Kamakhya, 12. 01. 2003, coll. B. K. Sharma; 5 examples, Rowmari, 14. 02. 2004, coll. B. K. Sharma; 5 examples, Deepor, 07. 05. 2004, coll. B. K. Sharma; 4 examples, Dighali, 14. 03. 2003, coll. B. K. Sharma; 3 examples, Borbila, 12. 01. 2003, coll. B. K. Sharma; 3 examples, Kamranga, 10. 02. 2005, coll. B. K. Sharma; 5 examples, Ghorajan, 04. 03. 2004, coll. B. K. Sharma; 4 examples, Siligurijan, 13. 01. 2003, coll. B. K. Sharma; 3 examples, Chatla, 10. 02. 2005, coll. B. K. Sharma; 2 examples, Hiragota, 04. 11. 2004, coll. B. K. Sharma; 3 examples, Urmal, 09. 12. 2004, coll. B. K. Sharma; 3 examples, Padma, 10. 12. 2004, coll. B. K. Sharma; 3 examples, Goranga, 03. 11. 2004, coll. B. K. Sharma; 4 examples, Solmari, 06. 02. 2004, coll. B. K. Sharma; 4 examples, Kololua, 29. 11. 2005, coll. Sumita Sharma; 3 examples, Sarain Hubbi, 29. 11. 2005, coll. Sumita Sharma; 4 examples, Sesa, 01. 12. 2005, coll. Sumita Sharma; 3 examples,

Sohala, 05. 09. 2006, coll. Sumita Sharma; 3 examples, Kutri, 06. 09. 2006, coll. Sumita Sharma; 5 examples, Memdubi, 30. 11. 2005, coll. Sumita Sharma; 3 examples, Naruathan, 04. 04. 2005, coll. B. K. Sharma; 3 examples, Senijan, 17. 01. 2005, coll. B. K. Sharma; 4 examples, Samuajan, 18. 01. 2005, coll. B. K. Sharma.

*Characters* : Body thin, transparent and rounded to sacciform in its shape. Contractile vesicle small and rounded. Protonephredia with four flame bulbs each. Gastric glands rounded. Vitellarium rounded and with eight nuclei. Rami serrate on inner side, broad at free ends and each with lateral prolongation at the base.

*Distribution* : INDIA Assam, Meghalaya, Tripura, West Bengal, Bihar, Gujarat and Kashmir.

*Elsewhere* : Cosmopolitan.

#### Family SYNCHAETIDAE Remane, 1933

*Characters* : Body sacciform, bell-shaped or conical; lorica absent or present. Foot and toes present, sometimes strongly reduced or absent. Corona of *Asplanchna* - type, reduced to small zone around the mouth and on anterior lobes or auricles, if present. Trophi virgate, with or without *hypopharynx*.

Two genera belonging to the family Synchaetidae are examined in the samples collected from the floodplain lakes of Assam.

#### Genus *Synchaeta* Ehrenberg, 1832

*Characters* : Body illoricate, conical or fusiform. Foot short and un-segmented; toes two, short and pointed. Corona broad and with a broken circum-apical band; apical field usually with styli and ciliated auricles. Cerebral eye single or double. Digestive tract straight, with two spherical gastric glands. Vitellarium with 8-12 nuclei.

This genus is represented by only one species from Assam.

#### 149. *Synchaeta oblonga* Ehrenberg, 1832

(Figs. 264-265)

*Material examined* : 2 examples, Mori, 08. 11. 2004, coll. B. K. Sharma.

*Characters* : Body transparent, bell-shaped and laterally dilated. Foot conical; toes two, short and with pointed tips. Apical field less doomed. Lateral antennae located in the posterior third part of the body. Trophics symmetrical; unci with 6-8 teeth, rami with rounded alulae, fulcrum long and narrow.

*Distribution* : INDIA - Assam, Arunachal Pradesh and Kashmir.

*Elsewhere* : Cosmopolitan.

Genus *Pleosoma* Herrick, 1885

**Characters** : Lorica rigid, sculptured and with a ventral fissure or foot-opening, a head shield and occasionally a caudal extension. Corona with a simple band of cilia, two finger shaped palps. Dorsal antenna protruding through a dorsal aperture. Foot annulated, two toes. Trophi massive, virgate, with rami adapted to seizing prey. Oesophagus long.

This genus is represented by only one species in the examined material.

150. *Pleosoma lenticulare* Herrick, 1855  
(Figs. 266-268)

**Material examined** : 3 examples, Dhir, 11. 03. 2003, coll. B. K. Sharma; 3 examples, Dighali, 08. 05. 2002, coll. B. K. Sharma; 2 examples, Ghorajan, 08. 02. 2005, coll. B. K. Sharma; 2 examples, Bandha, 08. 11. 2004, coll. B. K. Sharma; 2 examples, Padma, 05. 11. 2004, coll. B. K. Sharma; 3 examples, Itakhuli, 01. 12. 2005, coll. Sumita Sharma; 2 examples, Samuajan, 09. 06. 2004, coll. B. K. Sharma.

**Characters** : Lorica elongate and bilaterally compressed. Head shield rounded with three shallow lobes and occasionally a small blunt central tooth. Anterior dorsal surface with a central longitudinal ridge and terminating in a semicircular arch surrounding the dorsal antenna. Posterior half of lorica with one or two prominent rounded central ridges. Dorsal surface covered with small round, slightly raised facets. Ventral fissure narrow. Foot stout, annulated and with two pointed toes.

**Distribution** : INDIA - Assam and Meghalaya.

**Elsewhere** : Cosmopolitan.

Genus *Polyarthra* Ehrenberg, 1834

**Characters** : Body illoricate, slightly flattened dorso-ventrally and with four groups of three feathered sword-shaped serrate blades or paddles each; two groups dorso-lateral and two groups ventro-lateral. Corona with a circumapical band of cilia and two cylindrical ciliated antennae. Trophi large and virgate. Cerebral eye large and red. Vitellarium with 4, 8, or 12 nuclei. Foot lacking.

Only one species belonging to this genus is observed in present study.

151. *Polyarthra vulgaris* Carlin, 1943  
(Fig. 269)

**Material examined** : 6 examples, Bhoispuri, 08. 08. 2002, coll. B. K. Sharma; 3 examples, Barundanga, 03. 05. 2002, coll. B. K. Sharma; 4 examples, Hakama, 11. 07. 2004, coll. B. K. Sharma; 5 examples, Horinchora, 08. 09. 2004, coll. B. K. Sharma; 2 examples, Fingua, 10. 08. 2002, coll. B. K. Sharma; 4 examples, Jogra, 06. 05. 2002, coll. B. K. Sharma; 3

examples, Sagmara, 10. 08. 2002, coll. B. K. Sharma; 4 examples, Kamakhya, 07. 05. 2002, coll. B. K. Sharma; 4 examples, Rowmari, 11. 08. 2002, coll. B. K. Sharma; 8 examples, Deepor, 12. 07. 2004, coll. B. K. Sharma; 4 examples, Deepor, 06. 04. 2005, coll. Sumita Sharma; 8 examples, Dighali, 08. 05. 2002, coll. B. K. Sharma; 2 examples, Borbila, 09. 05. 2002, coll. B. K. Sharma; 5 examples, Siligurijan, 12. 03. 2003, coll. B. K. Sharma; 5 examples, Ghorajan, 04. 03. 2004, coll. B. K. Sharma; 2 examples, Kamranga, 12. 07. 2004, coll. B. K. Sharma; 3 examples, Urmal, 08. 05. 2004, coll. B. K. Sharma; 3 examples, Akhepeti, 09. 05. 2004, coll. B. K. Sharma; 3 examples, Padma, 06. 03. 2004, coll. B. K. Sharma; 4 examples, Solmari, 04. 05. 2004, coll. B. K. Sharma; 5 examples, Sitalmari, 09. 05. 2004, coll. B. K. Sharma; 2 examples, Duptoli, 01. 09. 2006, coll. Sumita Sharma; 4 examples, Padmakhua, 01. 09. 2006, coll. Sumita Sharma; 5 examples, Sarang, 03. 09. 2006, coll. Sumita Sharma; 5 examples, Mihir, 02. 12. 2005, coll. Sumita Sharma; 2 examples, Bhoismari, 05. 09. 2006, coll. Sumita Sharma; 2 examples, Daphlang, 05. 09. 2006, coll. Sumita Sharma; 2 examples, Demon, 01. 12. 2005, coll. Sumita Sharma; 3 examples, Kololua, 29. 11. 2005, coll. Sumita Sharma; 2 examples, Hakoi, 29. 11. 2005, coll. Sumita Sharma; 2 examples, Diang, 01. 12. 2005, coll. Sumita Sharma; 6 examples, Memdubi, 30. 11. 2005, coll. Sumita Sharma; 5 examples, Dhekia, 03. 04. 2005, coll. B. K. Sharma; 4 examples, Batua, 09. 06. 2004, coll. B. K. Sharma; 8 examples, Samuajan, 07. 07. 2004, coll. B. K. Sharma; 3 examples, Sone, 08. 08. 2004, coll. B. K. Sharma; 4 examples, Baskandi, 19. 10. 2004, coll. B. K. Sharma.

*Characters* : Body cylindrical and with paired ventral appendages; blades pinnate to feather-shaped and slightly longer than body; each blade with a distinct mid-rib and lateral ribs. Apical field with two ciliated antennae. Lateral antennae located in the posterior third part of the body. Vitellarium with eight nuclei.

*Distribution* : INDIA Assam, Meghalaya, Tripura, West Bengal, Orissa, Bihar and Punjab.

*Elsewhere* : Cosmopolitan.

#### Family DICRANOPHORIDAE Remane, 1933

*Characters* : Forms illoricate or partly loricate. Corona similar to *Notommata*-type, under a hook-like rostrum; mouth almost in center of corona; lateral tufts like auricles. Trophi forcipate and protrusible.

Two genera of the family Dicranophoridae are included in the present account.

#### Genus *Dicranophoroides* De Smet, 1997

*Characters* : Body elongate, vase-shaped, fusiform or cylindrical; cuticle stiff. Head demarcated by distinct neck-fold. Trunk with longitudinal lines or ridges and lateral sulci. A narrow tail projecting over foot. Foot small, conical; toes short or long, tapering to acute tip or ending into acute claw. Two small eyespots, and blind sacs on stomach may be present.

Trophi symmetrical, forcipate. Rami lyrate; axis of each ramus composed of a sub-basal chamber only, basal chambers laterally on external margin of sub-basal ones and appearing lamellar. Fulcrum triangular or elongate-triangular. Unci single-toothed. Manubria straight or slightly curved; posterior end curved and slightly expanded.

This genus includes only four species which were formerly included under *Dicranophorus*. Only one species of *Dicranophoroides* is, however, recorded in the present account.

152. *Dicranophoroides caudatus* (Ehrenberg, 1834)  
(Figs. 270-271)

*Material examined* : 3 examples, Bhoispuri, 04. 12. 2002, coll. B. K. Sharma; 3 examples, Kujibalipatty, 12. 08. 2002, coll. B. K. Sharma; 2 examples, Thekera, 08. 11. 2004, coll. B. K. Sharma.

*Characters* : Body slender, cylindrical ; cuticle fairly stiff. Head with single finger-like palp. Rostrum absent. Trunk with lateral sulci and longitudinal folds. Tail prominent. Toes long and terminating into acute tips. Corona oblique. Two red, large eye spots presents. Pedal glands small. Stomach with blind sacs. Trophi large and stout.. Rami sub-basal chambers terminating in a knob-like expansion. Fulcrum short, triangular. Unci single-toothed. Manubria slightly curved; anterior end with small triangular lamella.

*Distribution* : INDIA - Assam.

*Elsewhere* : Cosmopolitan.

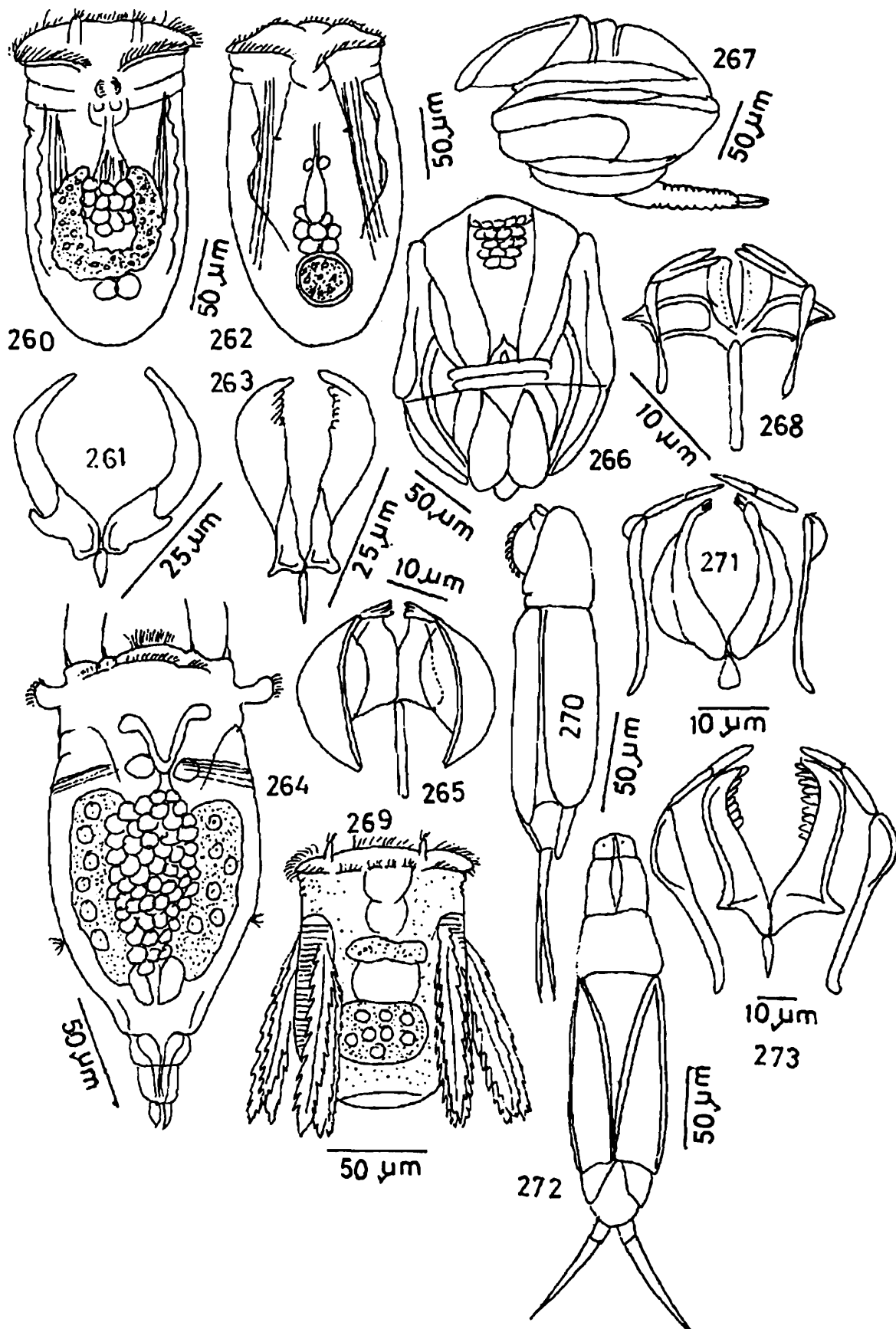
Genus *Dicranophorus* Nitzsch, 1827

*Characters* : Body usually elongate, fusiform; illoricate or semi-loricate. Rostrum usually present. Trunk sub-cylindrical, with latero-longitudinal and transverse folds. Tail small. Foot usually small; toes long or moderately long, ventrally directed and terminating into claws in some species. Corona with ventral broad field. Cerebral eye-spot present. Retro-cerebral sac usually large. Trophi forcipate. Rami lyrate, with or without alulae. Fulcrum short and plate-shaped. Unci single toothed, rare 2-toothed. Manubria long and stout.

The material examined from the floodplain lakes of Assam indicates only one species of *Dicranophorus*.

153. *Dicranophorus forcipatus* (O.F. Müller, 1786)  
(Figs. 272-273)

*Material examined* : 3 examples, Barundanga, 12. 03. 2003, coll. B. K. Sharma; 4 examples, Dhir, 09. 08. 2002, coll. B. K. Sharma; 2 examples, Fingua, 11. 12. 2002, coll. B. K. Sharma; 2 examples, Sagmara, 09. 01. 2003, coll. B. K. Sharma; 3 examples, Deepor, 11. 03. 2003, coll. B. K. Sharma; 2 examples, Dighali, 11. 01. 2003, coll. B. K. Sharma; 2 examples,



*Asplanchna brightwelli* Gosse: Fig. 260, dorsal view, Fig. 261, trophi; *A. priodonta* Gosse: Fig. 262, dorsal view, Fig. 263, trophi; *Synchaeta oblonga* Ehrenberg: Fig. 264, dorsal view, Fig. 265, trophi; *Pleosoma lenticulare* Herric: Fig. 266, dorsal view, Fig. 267, lateral view, Fig. 268, trophi; *Polyarthra vulgaris* Carlin: Fig. 269, dorsal view; *Dicranophoroides caudatus* (Ehrenberg): Fig. 270, lateral view, Fig. 271, trophi; *Dicranophorus forcipatus* (O.F. Müller): Fig. 272, dorsal view, Fig. 273, trophi.

**Borbila**, 15. 03. 2003, coll. B. K. Sharma; 3 examples, **Siligurijan**, 13. 01. 2003, coll. B. K. Sharma; 2 examples, **Maghuri**, 30. 11. 2005, coll. Sumita Sharma; 2 examples, **Butikor**, 02. 03. 2004, coll. B. K. Sharma.

**Characters** : Body elongated and with straight ventral margin; head and neck distinct. Rostrum short, broader, rounded anteriorly and with two small, red eye spots. Corona ventral and nearly as long as head. Trunk with well marked lateral sulci. Tail prominent. Foot short and two-segmented; toes moderately long, with folds and terminating into pointed tips. Retrocerebral organ narrow anteriorly. Rami with two terminal spines and 5-10 teeth in inner side. Unci with row of strong teeth.

**Distribution** : INDIA - Assam, Meghalaya, Tripura and West Bengal.

**Elsewhere** : Cosmopolitan.

### Order FLOSCULARIACEAE

**Characters** : Body loricate or illoricate. Trophi malleoramate. Corona of *Hexarthra* - or *Conochilus* - type. Foot, if present, without toes; in the living forms or in juvenile stages, it terminates into a ciliated cap. Numerous foot glands present. Includes solitary, free-swimming colonies or sessile forms; sessile forms often with a gelatinous sheath or tube made up of detritus.

Six families belonging to this order are documented in present account.

#### Family FLOSCULARIIDAE Bartos, 1959

**Characters** : Adults usually sessile (solitary or colonial) or pelagic. Wheel-organ *Hexarthra* type; corona circular or of different shapes, with 2 - 8 lobes. Foot present.

This family is represented by only one genus in the present account.

#### Genus *Sinantherina* Bory de St. Vincent, 1826

**Characters** : Sessile and form spherical aggregation of individuals radiating from a point; colony not in gelatinous matrix. Corona heart-shaped, with a shallow dorsal notch.

Two species of *Sinantherina* are observed in the samples examined from Assam.

#### 154. *Sinantherina spinosa* (Thorpe, 1893) (Fig. 274)

**Material examined** : 3 examples, **Bhoispuri**, 04. 12. 2002, coll. B. K. Sharma; 5 examples, **Dhir**, 11. 03. 2003, coll. B. K. Sharma; 2 examples, **Hakama**, 07. 02. 2005, coll. B. K. Sharma; 3 examples, **Sagmara**, 09. 01. 2003, coll. B. K. Sharma; 3 examples, **Kamakhya**, 13. 03. 2003, coll. B. K. Sharma; 2 examples, **Rowmari**, 10. 01. 2003, coll. B. K. Sharma; 6 examples, **Deepor**, 08. 02. 2005, coll. B. K. Sharma; 2 examples, **Borbila**, 11. 03. 2003, coll. B. K. Sharma; 4 examples, **Ghorajan**, 03. 11. 2004, coll. B. K. Sharma; 2 examples, **Chatla**,

10. 02. 2005, coll. B. K. Sharma; 2 examples, Hiragota, 09. 12. 2004, coll. B. K. Sharma; 2 examples, Urmal, 04. 11. 2004, coll. B. K. Sharma; 4 examples, Padma, 11. 09. 2004, coll. B. K. Sharma; 4 examples, Mori, 01. 12. 2005, coll. B. K. Sharma; 3 examples, Bandha, 03. 09. 2006, coll. Sumita Sharma; 2 examples, Daphlang, 05. 09. 2006, coll. Sumita Sharma; 3 examples, Senijan, 01. 11. 2004, coll. B. K. Sharma; 2 examples, Naruathan, coll. 19. 01. 2005, coll. B. K. Sharma.

*Characters* : With up to 30 individuals in colony, attached with their foot. Trunk with distinct hook-like spines on ventral side.

*Distribution* : INDIA - Assam and Tripura.

*Elsewhere* : Pantropical.

### 155. *Sinantherina socialis* (Linneaus, 1758)

(Figs. 275-276)

*Material examined* : 5 examples, Barundanga, 07. 01. 2003, coll. B. K. Sharma; 6 examples, Dhir, 10. 12. 2002, coll. B. K. Sharma; 2 examples, Horinchora, 07. 02. 2005, coll. B. K. Sharma; 4 examples, Fingua, 09. 01. 2003, coll. B. K. Sharma; 2 examples, Sagmara, 11. 03. 2003, coll. B. K. Sharma; 4 examples, Kamakhya, 10. 01. 2003, coll. B. K. Sharma; 3 examples, Rowmari, 12. 12. 2002, coll. B. K. Sharma; 6 examples, Deepor, 03. 11. 2004, coll. B. K. Sharma; 4 examples, Dighali, 13. 02. 2002, coll. B. K. Sharma; 5 examples, Ghorajan, 08. 02. 2005, coll. B. K. Sharma; 2 examples, Siligurijan, 13. 01. 2003, coll. B. K. Sharma; 2 examples, Chatla, 11. 11. 2004, coll. B. K. Sharma; 2 examples, Hiragota, 04. 11. 2004, coll. B. K. Sharma; 2 examples, Urmal, 10. 02. 2005, coll. B. K. Sharma; 2 examples, Kakerikhola, 05. 11. 2004, coll. B. K. Sharma; 2 examples, Padma, 10. 12. 2004, coll. B. K. Sharma; 3 examples, Sitalmari, 08. 02. 2005, coll. B. K. Sharma; 2 examples, Thekera, 06. 05. 2004, coll. B. K. Sharma; 2 examples, Sarang, 03. 09. 2006, coll. Sumita Sharma; 2 examples, Kololua, 29.11.2005, coll. Sumita Sharma; 4 examples, Diang, 01. 12. 2005, coll. Sumita Sharma; 3 examples, Senijan, 17.01.2005, coll. B. K. Sharma; 3 examples, Baskandi, 09.02.2005, coll. B. K. Sharma.

*Characters* : Colonial. Trunk not spinulated. Four tubercles present behind corona. Foot short or medium.

*Distribution* : INDIA - Assam and Tripura.

*Elsewhere* : Pantropical.

### Family CONOCHILIDAE Remane, 1933

*Characters* : Usually in colonies and often with a gelatinous case. Lorica absent; foot stout and without holdfast; toes absent. Corona unlobed, horse-shoe shaped, with mouth in middle or near dorsal edge. Trophi malleoramate.

This family is represented by one genus in the material examined from Assam.

Genus *Conochilus* Ehrenberg, 1834

**Characters** : Forms colonial but sometimes solitary and with gelatinous case. Body conical or vase-shaped and with long, contractile and un-segmented foot. Corona consists of a horse-shoe shaped double band of cilia; mouth near dorsal edge of corona. Digestive tract U-shaped, anus situated dorsally.

Only one species belonging to this genus is presently examined from Assam

156. *Conochilus unicornis* Rousselet, 1892

(Figs. 277-278)

**Material examined** : 4 examples, Bhoispuri, 08. 08. 2002, coll. B. K. Sharma; 5 examples, Dhir, 08. 01. 2003, coll. B. K. Sharma; 2 examples, Hakama, 02. 11. 2004, coll. B. K. Sharma; 2 examples, Horinchora, 03. 03. 2004, coll. B. K. Sharma; 3 examples, Fingua, 09. 01. 2003, coll. B. K. Sharma; 4 examples, Kamakhya, 14. 02. 2002, coll. B. K. Sharma; 2 examples, Rowmari, 10. 01. 2003, coll. B. K. Sharma; 6 examples, Deepor, 03. 11. 2004, coll. B. K. Sharma; 5 examples, Dighali, 14. 03. 2003, coll. B. K. Sharma; 2 examples, Kamranga, 08. 12. 2004, coll. B. K. Sharma; 4 examples, Ghorajan, 03. 11. 2004, coll. B. K. Sharma; 2 examples, Chatla, 09. 12. 2004, coll. B. K. Sharma; 3 examples, Hiragota, 04. 11. 2004, coll. B. K. Sharma; 2 examples, Urmal, 09. 12. 2004, coll. B. K. Sharma; 2 examples, Kakerikhola, 11. 02. 2005, coll. B. K. Sharma; 3 examples, Padma, 05. 11. 2004, coll. B. K. Sharma; 2 examples, Basana, 03. 09. 2006, coll. Sumita Sharma; 5 examples, Goranga, 10. 02. 2005, coll. B. K. Sharma; 3 examples, Solmari, 09. 09. 2004, coll. B. K. Sharma; 3 examples, Sitalmari, 13. 11. 2004, coll. B. K. Sharma; 2 examples, Daphlang, 05. 09. 2006, coll. Sumita Sharma; 5 examples, Muijan, 29. 11. 2005, coll. Sumita Sharma; 2 examples, Hakoi, 29. 11. 2005, coll. Sumita Sharma; 4 examples, Maghuri, 30. 11. 2005, coll. Sumita Sharma; 4 examples, Samuajan, 01. 03. 2004, coll. B. K. Sharma; 3 examples, Sone, 11. 12. 2004, coll. B. K. Sharma.

**Characters** : Forms colonial, with 5-25 individuals bounded by a gelatinous case. Body vase-shaped; foot contractile. Apical field conically domed and mouth located in its center. Lateral antennae fused and located on apical field.

**Distribution** : INDIA-Assam, Meghalaya, Tripura and West Bengal.

**Elsewhere** ; Cosmopolitan.

## Family HEXARTHRIIDAE Bartos, 1959

**Characters** : Forms pelagic. Body illoricate and with six arm-like mobile appendages; appendages with bristles and spines. Foot absent. Corona of *Hexarthra*-type. Trophi malleoramate.

This family is represented by only one genus in the present account.

Genus *Hexarthra* Schmarda, 1854

*Characters* : Body conical; six arm-like appendages with pinnate bristles at their tips. Corona wavy, with double band of cilia and with or without ventral lip. Some species with two club-shaped dorsal appendages located at the posterior end of the body. Unci with variable number of teeth. Subitaneous eggs attached to anal opening.

Only one species of this genus is observed in the material examined from Assam.

157. *Hexarthra intermedia* Wiszniewski, 1929  
(Fig. 279)

*Material examined* : 4 examples, Fingua, 12. 03. 2003, coll. B. K. Sharma; 2 examples, Thekera, 05. 11. 2004, coll. B. K. Sharma; 3 examples, Borbil-Tinsuki, 01. 12. 2005, coll. Sumita Sharma; 3 examples, Hakoi, 29. 11. 2005, coll. Sumita Sharma; 3 examples, Balak, 01. 04. 2005, coll. B. K. Sharma.

*Characters* : Body conical and transparent; with six arm-like appendages, each ending into pinnate bristles. Ventral arm with three pairs of spines and eight bristles. Lower lip absent. Two club-shaped appendages situated at the posterior end of the body. Trophy symmetrical; each uncus with 5 teeth.

*Distribution* : INDIA - Assam.

*Elsewhere* : Cosmopolitan.

158. *Hexarthra mira* (Hudson, 1871)  
(Fig. 280)

*Material examined* : 4 examples, Bhoispuri, 10. 02. 2002, coll. B. K. Sharma; 5 examples, Dhir, 11. 03. 2003, coll. B. K. Sharma; 2 examples, Hakama, 02. 11. 2004, coll. B. K. Sharma; 3 examples, Sagmara, 09. 01. 2003, coll. B. K. Sharma; 2 examples, Kamakhya, 13. 03. 2003, coll. B. K. Sharma; 3 examples, Rowmari, 10. 01. 2003, coll. B. K. Sharma; 5 examples, Deepor, 03. 11. 2004, coll. B. K. Sharma; 4 examples, Dighali, 15. 02. 2002, coll. B. K. Sharma; 3 examples, Ghorajan, 03. 11. 2004, coll. B. K. Sharma; 2 examples, Hiragota, 04. 11. 2004, coll. B. K. Sharma; 2 examples, Urmal, 09. 12. 2004, coll. B. K. Sharma; 2 examples, Padma, 11. 02. 2005, coll. B. K. Sharma; 4 examples, Goranga, 03. 11. 2004, coll. B. K. Sharma; 3 examples, Sitalmari, 06. 02. 2004, coll. B. K. Sharma; 3 examples, Bandha, 06. 05. 2004, coll. B. K. Sharma; 2 examples, Diang, 01. 12. 2005, coll. Sumita Sharma; 4 examples, Samuajan, 18. 01. 2005, coll. B. K. Sharma; 3 examples, Salchapra, 11. 12. 2004, coll. B. K. Sharma.

*Characters* : Body conical or bell-shaped. With six arm-like appendages (one dorsal, one ventral, two latero-dorsal and two latero-ventral) and each ending with pinnate bristles. Ventral arm with three pairs of spines and eight bristles. Two ciliated club-shaped appendages located at posterior end of the body. Each ramus with six teeth.

**Distribution** : INDIA - Assam, Meghalaya, Tripura, West Bengal, Bihar, Tamil Nadu, Rajasthan, Punjab and Kashmir.

**Elsewhere** : Cosmopolitan.

#### Family FILINIIDAE Bartos, 1959

**Characters** : Body without lorica and with three or four cuticular setae. Circumapical band with a single ring of cilia. Trophi malleoramate.

Only one genus belonging to this family is reported in the present account.

#### Genus *Filinia* Bory de St.Vincent, 1824

**Characters** : Body illoricate, cylindrical or sacciform; with two movable antero-lateral spines and one or two terminal or sub-terminal setae. Anus terminal; foot absent. Corona consists of a single circum-apical ring of cilia. Dorsal antenna at level with anterior setae; lateral antennae behind the middle region of the body. Eyes two, situated on apical field.

Six species of *Filinia* are observed in the samples examined from Assam.

#### 159. *Filinia brachiata* (Rousselet, 1901)

(Figs. 281-282)

**Material examined** : 4 examples, Dhir, 11. 03. 2003, coll. B. K. Sharma.

**Characters** : Body saccate, with very short lateral and caudal setae; all setae nearly equally long and about half of body length. Lateral setae inserted just below corona. A movable caudal seta inserted ventrally at a distance from the posterior end. Trophi small, with 12 - 14 unci teeth.

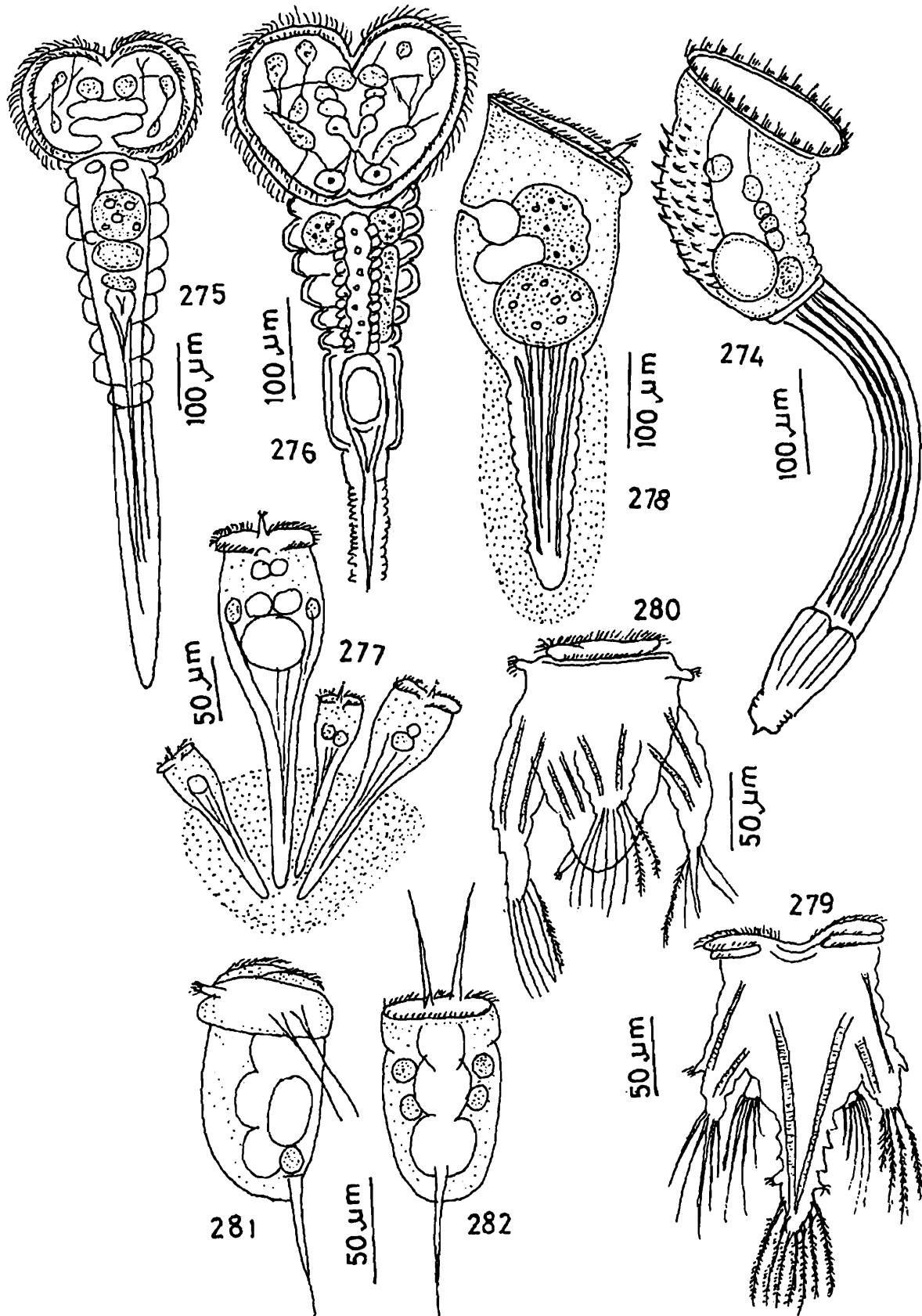
**Distribution** : INDIA - Assam and Meghalaya.

**Elsewhere** : Cosmopolitan.

#### 160. *Filinia camasecla* Myers, 1938

(Fig. 283)

**Material examined** : 4 examples, Bhoispuri, 04. 12. 2002, coll. B. K. Sharma; 5 examples, Barundanga, 11. 02. 2002, coll. B. K. Sharma; 6 examples, Dhir, 08. 01. 2003, coll. B. K. Sharma; 2 examples, Hakama, 02. 11. 2004, coll. B. K. Sharma; 4 examples, Fingua, 09. 01. 2003, coll. B. K. Sharma; 2 examples, Rowmari, 14. 02. 2002, coll. B. K. Sharma; 7 examples, Deepor, 08. 02. 2005, coll. B. K. Sharma; 6 examples, Dighali, 11. 01. 2003, coll. B. K. Sharma; 2 examples, Borbila, 16. 02. 2002, coll. B. K. Sharma; 3 examples, Kamranga, 04. 03. 2004, coll. B. K. Sharma; 4 examples, Ghorajan, 03. 11. 2004, coll. B. K. Sharma; 2 examples, Padma, 11. 09. 2004, coll. B. K. Sharma; 4 examples, Goranga, 01. 09. 2006, coll.



*Sinantherina spinosa* (Thorpe): Fig. 274, lateral view; *S. socialis* (Linnaeus): Fig. 275, dorsal view, Fig. 276, dorsal view (enlarged); *Conochilus unicornis* Rousselet : Fig. 277, colony (part), Fig. 278, individual (lateral view); *Hexarthra intermedia* Wiszniewski: Fig. 279, dorsal view; *H. mira* (Hudson): Fig. 280, dorsal view; *Filinia brachiata* (Rousselet): Fig. 281, lateral view, Fig. 282, ventral view.

Sumita Sharma; 3 examples, Solmari, 06. 02. 2004, coll. B. K. Sharma; 4 examples, Ghorkhonjan, 05. 03. 2005, coll. B. K. Sharma; 2 examples, Deopani, 06. 09. 2006, coll. Sumita Sharma; 2 examples, Dhekia, 18. 01. 2005, coll. B. K. Sharma; 4 examples, Naruathan, 04. 04. 2005, coll. B. K. Sharma; 3 examples, Salchapra, 11. 12. 2004, coll. B. K. Sharma.

**Characters** : Body vase-shaped, with thick cuticle; maximum width nearly in the middle region. Anterior dorsal margin straight, anterior ventral margin slightly elevated and with a shallow median sinus. Body with two lateral and one caudal stout and broad-based setae (spines). Lateral setae nearly double the length of body and inserted near the middle. Caudal seta immobile and inserted terminally.

**Distribution** : INDIA - Assam and Tripura.

**Elsewhere** : Tropics and subtropics.

### 161. *Filinia longiseta* (Ehrenberg, 1834)

(Fig. 284)

**Material examined** : 4 examples, Bhoispuri, 03. 05. 2002, coll. B. K. Sharma; 6 examples, Barundanga, 08. 08. 2002, coll. B. K. Sharma; 5 examples, Dhir, 09. 08. 2002, coll. B. K. Sharma; 3 examples, Hakama, 11. 07. 2004, coll. B. K. Sharma; 2 examples, Horinchora, 06.05. 2004, coll. B. K. Sharma; 4 examples, Fingua, 10. 08. 2002, coll. B. K. Sharma; 2 examples, Sagmara, 10. 08. 2002, coll. B. K. Sharma; 4 examples, Kamakhya, 07. 05. 2002, coll. B. K. Sharma; 2 examples, Rowmari, 13. 03. 2003, coll. B. K. Sharma; 8 examples, Deepor, 12. 07. 2004, coll. B. K. Sharma; 6 examples, Dighali, 08. 05. 2002, coll. B. K. Sharma; 4 examples, Kamranga, 09. 09. 2004, coll. B. K. Sharma; 6 examples, Ghorajan, 04. 03. 2004, coll. B. K. Sharma; 4 examples, Siligurijan, 09. 05. 2002, coll. B. K. Sharma; 2 examples, Hiragota, 08. 05. 2004, coll. B. K. Sharma; 3 examples, Padma, 14. 07. 2004, coll. B. K. Sharma; 2 examples, Bamoni, 01. 09. 2006, coll. Sumita Sharma; 4 examples, Goranga, 09. 09. 2004, coll. B. K. Sharma; 3 examples, Solmari, 04. 05. 2004, coll. B. K. Sharma; 4 examples, Sitalmari, 09. 05. 2004, coll. B. K. Sharma; 6 examples, Mori, 06. 05. 2004, coll. B. K. Sharma; 2 examples, Thekera, 01. 12. 2005, coll. B. K. Sharma; 3 examples, Daphlang, 05. 09. 2006, coll. Sumita Sharma; 4 examples, Mihir, 05. 09. 2006, coll. Sumita Sharma; 2 examples, Kutri, 06. 09. 2006, coll. Sumita Sharma; 2 examples, Kololua, 29. 11. 2005, coll. Sumita Sharma; 3 examples, Senijan, 09. 06. 2004, coll. B. K. Sharma; 5 examples, Samuajan, 11. 06. 2004, coll. B. K. Sharma; 5 examples, Sone, 08. 08. 2004, coll. B. K. Sharma; 3 examples, Baskandi, 19. 10. 2004, coll. B. K. Sharma.

**Characters** : Body cylindrical or saccate and with two long movable antero-lateral setae and one long immobile posterior seta. Length of setae variable but lateral setae 2-4 time as long as body. Anterior setae usually folded ventrally. Posterior seta inserted usually 25 $\mu$ m away from the caudal end of body. Lateral antennae situated in the middle part of the body. Vitellarium with 15-20 nuclei. Trophi with 18-22 unci teeth.

*Distribution* : INDIA - Assam, Meghalaya, Tripura, West Bengal, Bihar, Orissa, Madhya Pradesh, Gujarat, Rajasthan, Punjab and Haryana.

*Elsewhere* : Cosmopolitan

162. *Filinia opoliensis* (Zacharias, 1898)

(Fig. 285)

*Material examined* : 5 examples, Bhoispuri, 03. 05. 2002, coll. B. K. Sharma; 4 examples, Hakama, 11. 07. 2004, coll. B. K. Sharma; 5 examples, Horinchora, 08. 09. 2004, coll. B. K. Sharma; 3 examples, Fingua, 10. 08. 2002, coll. B. K. Sharma; 2 examples, Sagmara, 13. 02. 2002, coll. B. K. Sharma; 3 examples, Kamakhya, 07. 05. 2002, coll. B. K. Sharma; 4 examples, Rowmari, 11. 08. 2002, coll. B. K. Sharma; 7 examples, Deepor, 07. 05. 2004, coll. B. K. Sharma; 6 examples, Dighali, 12. 08. 2002, coll. B. K. Sharma; 4 examples, Kamranga, 09. 09. 2004, coll. B. K. Sharma; 2 examples, Ghorajan, 04. 03. 2004, coll. B. K. Sharma; 2 examples, Siligurijan, 13. 08. 2002, coll. B. K. Sharma; 3 examples, Chatla, 10. 09. 2004, coll. B. K. Sharma; 3 examples, Hiragota, 08.05. 2004, coll. B. K. Sharma; 4 examples, Urmal, 05. 03. 2004, coll. B. K. Sharma; 3 examples, Kakerikhola, 11. 09. 2004, coll. B. K. Sharma; 2 examples, Padma, 09. 05. 2004, coll. B. K. Sharma; 4 examples, Solmari, 12. 07. 2004, coll. B. K. Sharma; 2 examples, Hakoi, 29. 11. 2005, coll. Sumita Sharma; 3 examples, Sohala, 05. 09. 2006, coll. Sumita Sharma; 5 examples, Dhekia, 03. 04. 2005, coll. B. K. Sharma; 4 examples, Samuajan, 11. 06. 2004, coll. B. K. Sharma; 3 examples, Salchakra, 08. 08. 2004, coll. B. K. Sharma.

*Characters* : Body long, cylindrical or spindle-shaped; with two broad-based lateral and two caudal setae. Lateral setae equal or unequal. Caudal setae unequal; long caudal seta stiff and inserted terminally and an additional small seta or spine located at its base. Vitellarium with 8-14 nuclei. Trophi with 20-22 unci teeth.

*Distribution* : INDIA - Assam, Meghalaya, Tripura, West Bengal, Orissa, Bihar, Madhya Pradesh, Gujarat, Rajasthan and Punjab.

*Elsewhere* : Cosmopolitan.

163 *Filinia pejleri* Hutchinson, 1964

(Fig. 286)

*Material examined* : 5 examples, Bhoispuri, 12. 03. 2003, coll. B. K. Sharma; 5 examples, Barundanga, 11. 02. 2002, coll. B. K. Sharma; 3 examples, Fingua, 06. 05. 2002, coll. B. K. Sharma; 2 examples, Sagmara, 10. 08. 2002, coll. B. K. Sharma; 4 examples, Rowmari, 07. 05. 2002, coll. B. K. Sharma; 6 examples, Deepor, 08. 05. 2002, coll. B. K. Sharma; 3 examples, Borbila, 16. 02. 2002, coll. B. K. Sharma; 4 examples, Mori, 06. 05. 2004, coll. B. K. Sharma; 4 examples, Thekera, 03. 12. 2005, coll. Sumita Sharma; 3 examples, Puwa Saikia, 10. 06. 2004, coll. B. K. Sharma.

**Characters** : Body fusiform, about 3-4 times as long as wide, hardly rounded dorsally; with minutely spinulate appendages. Lateral seta equal, nearly twice the length of body, inserted behind corona and usually folded laterally. Caudal seta longest, stiff, with broad and oblique base and inserted terminally. Trophi with 16-19 unci teeth.

**Distribution** : INDIA - Assam, Tripura, West Bengal, Orissa, Bihar, Madhya Pradesh, and Punjab.

**Elsewhere** : Cosmopolitan.

164. *Filinia saltator* (Gosse, 1886)

(Fig. 287)

**Material examined** : 4 examples, Barundanga, 12. 03. 2003, coll. B. K. Sharma; 4 examples, Horinchora, 08. 09. 2004, coll. B. K. Sharma; 3 examples, Kakerikhola, 14. 07. 2004, coll. B. K. Sharma; 2 examples, Bandha, 01. 12. 2005, coll. B. K. Sharma; 3 examples, Sitalmari, 12. 07. 2004, coll. B. K. Sharma; 3 examples, Daphlang, 05. 09. 2006, coll. Sumita Sharma; 3 examples, Senijan, 17. 01. 2005, coll. B. K. Sharma.

**Characters** : Body cylindrical or spindle-shaped, with two long movable antero-lateral setae; caudal seta lacking. Lateral setae longer than body and inserted just below corona. Trophi with 5-6 unci teeth.

**Distribution** : INDIA - Assam, Tripura, Bihar and Orissa.

**Elsewhere** : Tropicopolitan.

Family TESTUDINELLIDAE Bartos, 1959

**Characters** : Creeping or semi-pelagial forms; not in tubes or in colonies. Body loricate, without any appendages; with a distinct foot-opening. Foot, if present, tubiform and terminally ciliated.

This family is represented by two genera in the present account.

Genus *Testudinella* Bory de St.Vincent, 1826

**Characters** : Body loricate, circular, elliptical, oval or vase-shaped and more or less compressed. Foot-opening ventral, located near middle or in the posterior half or posterior end of lorica. Foot annulated and terminating with a band of cilia. Corona with a circum-apical band of cilia. Position of lateral antennae diagnostic. Vitellarium horse-shoe shaped.

*Testudinella* is represented by six species in the samples collected from the floodplain lakes of Assam.

165. *Testudinella brevicaudata* (Yamamoto, 1951)  
(Fig. 288)

*Material examined* : 2 examples, Fingua, 06. 05. 2002, coll. B. K. Sharma; 4 examples, Deepor, 04. 03. 2004, coll. B. K. Sharma; 4 examples, Ghorajan, 09. 09. 2004, coll. B. K. Sharma; 3 examples, Kamranga, 07. 05. 2004, coll. B. K. Sharma; 3 examples, Hiragota, 04. 11. 2004, 2 examples, Urmal, 08. 05. 2004, coll. B. K. Sharma; 2 examples, Baghmari, 06. 09. 2006, coll. Sumita Sharma.

*Characters* : Lorica broadly oval, with maximum width behind its middle and produced posteriorly into a rectangular projection. Anterior dorsal margin with small median spine. Foot-opening almost semicircular and located ventrally at posterior projection of lorica.

*Distribution* : INDIA - Assam and Tripura.

*Elsewhere* : Palaeotropical.

166. *Testudinella emarginula* (Stenroos, 1898)  
(Figs. 289-290)

*Material examined* : 3 examples, Bhoispuri, 03. 05. 2002, coll. B. K. Sharma; 4 examples, Barundanga, 07. 01. 2003, coll. B. K. Sharma; 4 examples, Dhir, 09. 08. 2002, coll. B. K. Sharma; 4 examples, Hakama, 08. 09. 2004, coll. B. K. Sharma; 3 examples, Horinchora, 11. 07. 2004, coll. B. K. Sharma; 6 examples, Deepor, 08. 02. 2005, coll. B. K. Sharma; 5 examples, Dighali, 08. 05. 2002, coll. B. K. Sharma; 3 examples, Ghorajan, 04. 03. 2004, coll. B. K. Sharma; 2 examples, Hiragota, 08. 05. 2004, coll. B. K. Sharma; 2 examples, Urmal, 13. 07. 2004, coll. B. K. Sharma; 3 examples, Padma, 09. 05. 2004, coll. B. K. Sharma; 2 examples, Goranga, 07. 05. 2004, coll. B. K. Sharma; 3 examples, Solmari, 06. 02. 2004, coll. B. K. Sharma; 2 examples, Sitalmari, 09. 05. 2004, coll. B. K. Sharma; 4 examples, Haduk, 01. 09. 2006, coll. Sumita Sharma; 2 examples, Duptoli, 01. 09. 2006, coll. Sumita Sharma; 3 examples, Ghorkhonjan, 05. 03. 2005, coll. B. K. Sharma; 3 examples, Jugdal, 05. 04. 2005, coll. Sumita Sharma; 4 examples, Muijan, 29. 11. 2005, coll. Sumita Sharma; 2 examples, Diang, 01. 12. 2005, coll. Sumita Sharma; 3 examples, Mihir, 05. 09. 2006, coll. Sumita Sharma; 3 examples, Raidong, 30. 11. 2005, coll. Sumita Sharma; 3 examples, Naruathan, 04. 04. 2005, coll. B. K. Sharma; 3 examples, Samuajan, 18. 01. 2005, coll. B. K. Sharma; 2 examples, Sone, 08. 08. 2004, coll. B. K. Sharma; 3 examples, Salchapra, 09. 02. 2005, coll. B. K. Sharma.

*Characters* : Lorica vase-shaped and with maximum width slightly behind its anterior end; biconcave in cross-section. Anterior dorsal margin with a plate-like process and ventral margin with a shallow notch. Foot-opening slit-shaped and located near posterior end of lorica.

*Distribution* : INDIA Assam, Meghalaya, Tripura, West Bengal, Orissa and Bihar.

*Elsewhere* : Cosmopolitan.

167. *Testudinella greeni* Koste, 1981  
(Figs. 291-292)

**Material examined** : 3 examples, Bhoispuri, 07. 01. 2003, coll. B. K. Sharma; 2 examples, Fingua, 10. 08. 2002, coll. B. K. Sharma; 2 examples, Sagmara, 06. 05. 2002, coll. B. K. Sharma; 2 examples, Rowmari, 13. 03. 2003, coll. B. K. Sharma; 3 examples, Deepor, 09. 09. 2004, coll. B. K. Sharma; 2 examples, Dighali, 15. 02. 2002, coll. B. K. Sharma; 3 examples, Ghorajan, 04. 03. 2004, coll. B. K. Sharma; 2 examples, Siligurijan, 09. 05. 2002, coll. B. K. Sharma; 3 examples, Diang, 01. 12. 2005, coll. Sumita Sharma; 3 examples, Maghuri, 30. 11. 2005, coll. Sumita Sharma; 2 examples, Sone, 03. 01. 2004, coll. B. K. Sharma.

**Characters** : Lorica elongate-oval, distinctly arched dorsal; with maximum width in the middle. Anterior end with distinct median dorsal occipital spine and with a U-shaped median ventral sinus. Foot-opening elongated and situated at posterior end of lorica.

**Distribution** : INDIA - Assam, Meghalaya and Tripura.

**Elsewhere** : Cosmopolitan.

168. *Testudinella parva parva* (Ternetz, 1892)  
(Fig. 293)

**Material examined** : 3 examples, Barundanga, 04. 12. 2002, coll. B. K. Sharma; 3 examples, Horinchora, 07. 02. 2005, coll. B. K. Sharma; 2 examples, Hiragota, 04. 11. 2004, coll. B. K. Sharma; 4 examples, Goranga, 08. 02. 2005, coll. B. K. Sharma; 2 examples, Hakoi, 29. 11. 2005, coll. Sumita Sharma.

**Characters** : Lorica pear-shaped and with maximum width in the posterior region; convex in cross-section. Anterior dorsal margin slightly elevated and with a shallow depression; anterior ventral margin with median notch. Lateral antennae located behind the middle region of lorica. Foot-opening elliptical and located at a short distance from posterior margin of lorica.

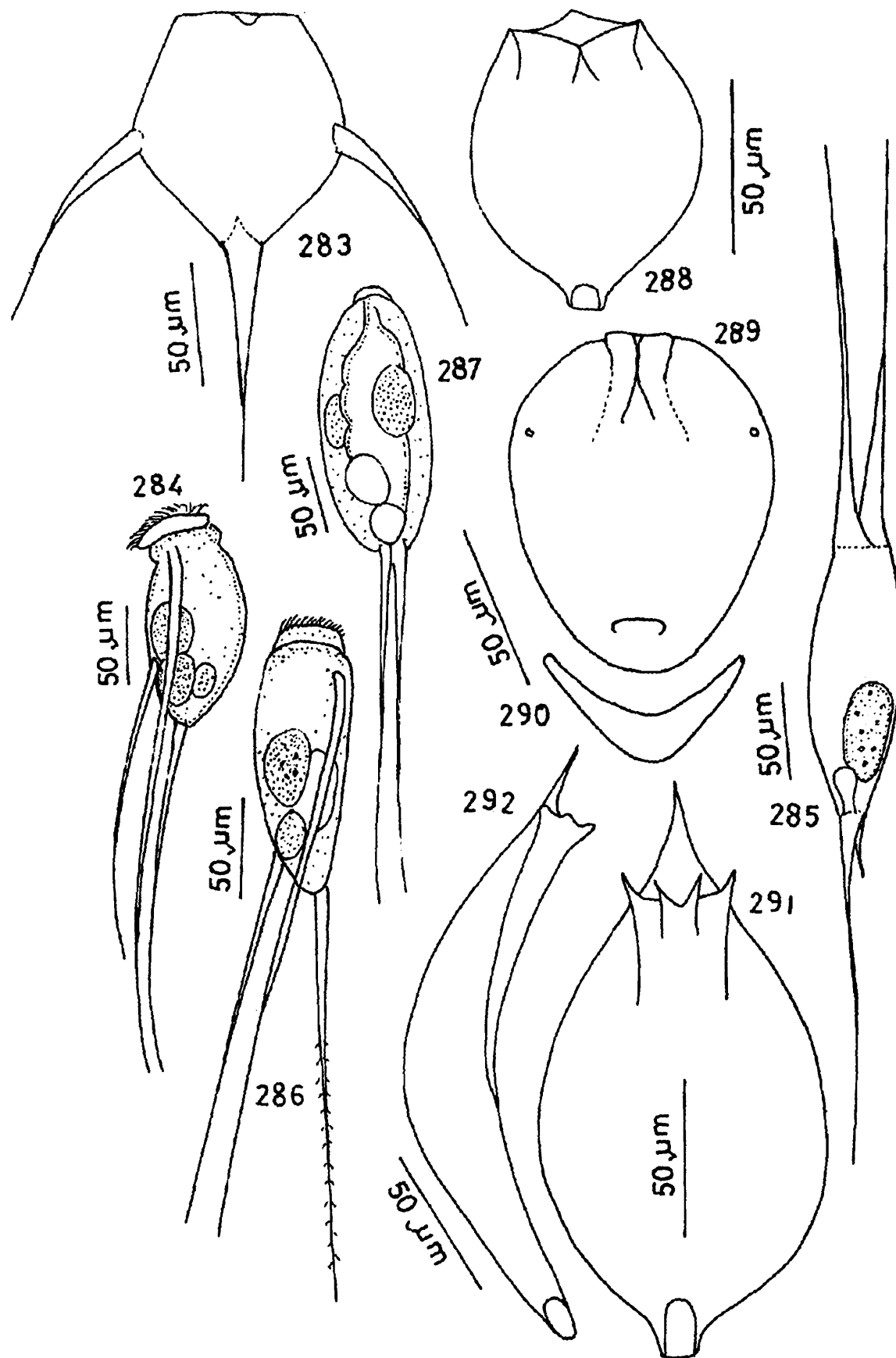
**Distribution** : INDIA - Meghalaya, Assam, Tripura and West Bengal.

**Elsewhere** : Cosmopolitan.

168a. *Testudinella parva bidentata* (Ternetz, 1892)  
(Fig. 294)

**Material examined** : 3 examples, Horinchara, 07. 02. 2005, coll. B. K. Sharma; 2 examples, Goranga, 08.12.2004, coll. B. K. Sharma; 3 examples, Hakoi, 29.11.2005, coll. Sumita Sharma.

**Characters** : Lorica pear-shaped and with maximum width in the posterior region; convex in cross-section; with pair of triangular spines at postero-lateral angles. Lateral antennae located behind the middle region of lorica. Foot-opening distinct, located at posterior end of lorica.



*Filinia camasecla* Myers: Fig. 283, ventral view; *F. longiseta* (Ehrenberg), Fig. 284, lateral view; *F. opoliensis* (Zacharias): Fig. 285, dorsal view; *F. pejleri* Hutchinson: Fig. 286, lateral view; *F. saltator* (Gosse): Fig. 287, lateral view; *Testudinella brevicaudata* Yamamoto: Fig. 288, ventral view; *T. emarginula* (Stenroos): Fig. 289, ventral view, Fig. 290, cross-section; *T. greeni* Koste: Fig. 291, ventral view, Fig. 292, lateral view.

**Distribution** : INDIA Assam, Meghalaya and Orissa.

**Elsewhere** : Cosmopolitan.

169. *Testudinella patina* (Hermann, 1783)

(Fig. 295)

**Material examined** : 5 examples, Bhoispuri, 04. 12. 2002, coll. B. K. Sharma; 4 examples, Barundanga, 12. 03. 2003, coll. B. K. Sharma; 6 examples, Dhir, 08. 01. 2003, coll. B. K. Sharma; 3 examples, Hakama, 07. 02. 2005, coll. B. K. Sharma; 2 examples, Horinchora, 02. 11. 2004, coll. B. K. Sharma; 4 examples, Sagmara, 11. 03. 2003, coll. B. K. Sharma; 4 examples, Kamakhya, 12. 01. 2003, coll. B. K. Sharma; 3 examples, Rowmari, 13. 03. 2003, coll. B. K. Sharma; 8 examples, Deepor, 07. 05. 2004, coll. B. K. Sharma; 4 examples, Deepor, 06. 04. 2005, coll. Sumita Sharma; 4 examples, Dighali, 08. 05. 2002, coll. B. K. Sharma; 4 examples, Borbila, 15. 03. 2003, coll. B. K. Sharma; 3 examples, Kamranga, 07. 05. 2004, coll. B. K. Sharma; 3 examples, Siligurijan, 13. 08. 2002, coll. B. K. Sharma; 2 examples, Hiragota, 08. 05. 2004, coll. B. K. Sharma; 3 examples, Kakerikhola, 06. 03. 2004, coll. B. K. Sharma; 2 examples, Padma, 14. 07. 2004, coll. B. K. Sharma; 4 examples, Sitalmari, 09. 05. 2004, coll. B. K. Sharma; 2 examples, Haduk, 01. 9. 2006, coll. Sumita Sharma; 2 examples, Jugdal, 05. 04. 2005, coll. Sumita Sharma; 2 examples, Padmakhua, 01. 09. 2006, coll. Sumita Sharma; 3 examples, Sarain Hubbi, 29. 11. 2005, coll. Sumita Sharma; 2 examples, Sesa, 01. 12. 2005, coll. Sumita Sharma; 2 examples, Kutri, 06. 09. 2006, coll. Sumita Sharma; 5 examples, Memdubi, 30. 11. 2005, coll. Sumita Sharma; 3 examples, Butikor, 02. 04. 2005, coll. B. K. Sharma; 4 examples, Samuajan, 18. 01. 2005, coll. B. K. Sharma; 3 examples, Sone, 11. 02. 2005, coll. B. K. Sharma; 5 examples, Baskandi, 09.02. 2005, coll. B. K. Sharma.

**Characters** : Lorica almost circular and dorso-ventrally flattened. Dorsum slightly convex and anterior dorsal margin rounded. Lateral antennae situated anterior to middle region of lorica. Foot-opening circular and located in the middle part on the ventral side; foot annulated, retractile, ventrally projecting and with a terminal ciliated cap.

**Distribution** : INDIA - Meghalaya, Assam, Tripura, West Bengal, Orissa, Bihar, Andhra Pradesh, Gujarat, Punjab and Kashmir.

**Elsewhere** : Cosmopolitan.

170. *Testudinella tridentata* Smirnov, 1931

(Fig. 296)

**Material examined** : 4 examples, Dhir, 11. 03. 2003, coll. B. K. Sharma; 3 examples, Ghorajan, 08. 02. 2005, coll. B. K. Sharma; 2 examples, Siligurijan, 13. 01. 2003, coll. B. K. Sharma; 2 examples, Basana, 03. 09. 2006, coll. Sumita Sharma; 3 examples, Thekera, 03. 12. 2005, coll. Sumita Sharma.

*Characters* : Lorica vase-shaped, compressed dorso-ventrally, with maximum width behind its middle and then tapering gradually to a posterior lobate projection. Anterior dorsal margin with long median spine. Foot-opening elongated, located a posterior ventral end of lorica; foot annulated and with ciliated tip.

*Distribution* : INDIA - Assam and Tripura.

*Elsewhere* : Cosmopolitan.

### Genus *Pompholyx* Gosse, 1851

*Characters* : Body oval or elliptical or shield-shaped, with thin lorica and without foot. Cloacal opening located at posterior end of lorica; eggs attached to posterior end with retractile threads. Corona consists of a simple circumapical band of cilia. Trophi malleoramate; unci with numerous teeth. Vitellarium with 12 nuclei.

*Pompholyx* is represented by only one species in the examined collections.

#### 171. *Pompholyx sulcata* Hudson, 1885

(Fig. 297)

*Material examined* : 6 examples, Dhir, 09. 08. 2002, coll. B. K. Sharma; 8 examples, Deepor, 04. 03. 2004, coll. B. K. Sharma; 5 examples, Ghorajan, 07. 05. 2004, coll. B. K. Sharma; 4 examples, Borbila, 09. 05. 2002, coll. B. K. Sharma; 4 examples, Padma, 11. 09. 2004, coll. B. K. Sharma; 3 examples, Daphlang, 05. 09. 2006, coll. Sumita Sharma; 4 examples, Samuajan, 11. 06. 2004, coll. B. K. Sharma.

*Characters* : Lorica broadly oval and tapering behind its middle region; with four longitudinal furrows and divided into dorsal and ventral bulges in cross-section. Anterior occipital margin with a lobe-like projection dorsally; ventral margin with two lateral elevations flanking a shallow median sinus. Cloacal aperture terminal.

*Distribution* : INDIA- Assam, Meghalaya, Tripura, West Bengal, Orissa, Punjab, Kashmir and Ladak.

*Elsewhere* : Cosmopolitan.

### Family TROCHOSPHAERIDAE Bartos, 1959

*Characters* : Body spherical or sacciform, without lorica. Corona as a single band of cilia encircling the body (*Trochosphaera*) or borne apically on a short neck (*Horaella*). Trophi malleoramate. Cloaca present; anus terminal or sub terminal. Foot lacking Vitellarium rounded or elongate; reproduction oviparous, ovoviviparous or viviparous.

Two genera belonging to this family are recorded in the samples collected from the floodplain lakes of Assam.

Genus *Horaella* Donner, 1949

**Characters** : Body egg shaped, apical field small. Corona small, dorsal gap small, occasionally indistinct but present. Two eye with lenses present. Vitellarium rounded, with eight nuclei. Trophi malleoramate; unci teeth numerous and differentiated.

Only one species of *Horaella* is observed in the material examined from Assam.

172. *Horaella brehmi* Donner, 1949  
(Fig. 298)

**Material examined** : 4 examples, Kujibalipatty, 12. 08. 2002, coll. B. K. Sharma; 3 examples, Thekera, 08. 11. 2004, coll. B. K. Sharma.

**Characters** : Body saccate, broadly elliptical and transparent. Apical field bare and arched. Corona simple, circum-apical band with small interruption dorsally, followed by a collar-like constriction. Ventral mouth distinct. Lateral antennae in anterior third of body. Cloaca without caeca. Vitellarium rounded, with eight nuclei. Trophi symmetrical; with two large and 14-15 small unci teeth. Ovoviviparous.

**Distribution** : INDIA - Assam, West Bengal, Tripura and Bihar.

**Elsewhere** : Pantropical.

Genus *Trochosphaera* Semper, 1872

**Characters** : Body spherical and transparent; apical field well developed, arched. Corona consists of a band of cilia encircling body around middle or towards one end. Vitellarium sickle-shaped, with numerous nuclei. Anus sub-terminal. Body musculature weakly developed. Mastax relatively small, with malleoramate trophi; unci teeth numerous and un-differentiated. Viviparous.

This genus includes only one species in the present account.

173. *Trochosphaera aequitorialis* Semper, 1872  
(Fig. 299)

**Material examined** : 4 examples, Bhoisnuri, 04. 12. 2002, coll. B. K. Sharma; 4 examples, Hakama, 07. 02. 2005, coll. B. K. Sharma; 3 examples, Ghorajan, 10. 02. 2005, coll. B. K. Sharma; 2 examples, Rowmari, 13. 03. 2003, coll. B. K. Sharma; 5 examples, Deepor, 08. 02. 2005, coll. B. K. Sharma; 3 examples, Hiragota, 09. 12. 2004, coll. B. K. Sharma; 2 examples, Padma, 11. 09. 2004, coll. B. K. Sharma; 3 examples, Bamoni, 01. 09. 2006, coll. Sumita Sharma; 3 examples, Sitalmari, 06. 02. 2004, coll. B. K. Sharma.

**Characters** : Body spherical, relatively large and transparent. Apical field well developed and arched. Corona equatorial, a circular band of cilia, with wide dorsal gap near dorsal

antenna. Ventral mouth distinct. Cloaca and bladder distinct. Anus almost terminal. Vitellarium band-shaped, with numerous nuclei. Trophi malleoramate, with uniform unci teeth.

*Distribution* : INDIA - Assam and Tripura.

*Elsewhere* : Pantropical.

#### Subclass BDELLOIDEA

*Characters* : Ovaries paired, with vitellarium. Reproduction asexual. Ciliated rostrum on head and with a dorsal antenna. Trophi ramate. Corona with two ciliated discs on pedicles (*Philodina* -type) or on a ventral ciliated area (*Adineta* -type).

This sub-class is represented by only one family in the present study.

#### Family PHILODINIDAE Remane, 1933

*Characters* : Corona *Philodina*-type. Rostrum retractile. Stomach lumen tube-shaped and ciliated. Food excrete not formed into pellets.

The material examined from Assam includes two genera of the *Philodinidae*.

#### Genus *Philodina* Ehrenberg, 1830

*Characters* : Corona with two separate trochal discs on pedicles. Cuticle of trunk thin and flexible. Foot small to moderately long, always less than half the body length; with 4 toes. Spurs usually short: if elongated, not flat or wide. Cerebral ganglion always present.

This genus is represented by one species in the presently examined material.

#### 174 *Philodina citrina* Ehrenberg, 1832 (Fig. 300)

*Material examined* : 4 examples, Dhir, 08. 01. 2003, coll. B. K. Sharma; 3 examples, Fingua, 12. 03. 2003, coll. B. K. Sharma; 5 examples, Deepor, 09. 09. 2004, coll. B. K. Sharma; 5 examples, Mori, 01. 02. 2005, coll. B. K. Sharma; 3 examples, Bandha, 03. 09. 2006, coll. Sumita Sharma.

*Characters* : Body yellow or yellow-green; with thin and flexible integument; trunk fusiform. Rostrum small. Foot small and broad; toes small and pointed.

*Distribution* : INDIA - Assam and West Bengal.

*Elsewhere* : Cosmopolitan.

#### Genus *Rotaria* Scopoli, 1777

*Characters* : Body fusiform and usually elongated; foot three-segmented. Eyes, if present, located on rostrum. Viviparous.

Two species belonging to this genus are recorded in the samples collected from the floodplain lakes of Assam.

175. *Rotaria neptunia* (Ehrenberg, 1830)  
(Fig. 301)

*Material examined* : 4 examples, Bhoispuri, 07. 01. 2003, coll. B. K. Sharma; 3 examples, Hakama, 02. 11. 2004, coll. B. K. Sharma; 5 examples, Dhir, 11. 03. 2003, coll. B. K. Sharma; 3 examples, Ghorajan, 08. 12. 2004, coll. B. K. Sharma; 2 examples, Sagmara, 09. 01. 2003, coll. B. K. Sharma; 2 examples, Kamakhya, 12. 12. 2002, coll. B. K. Sharma; 6 examples, Deepor, 08. 02. 2005, coll. B. K. Sharma; 4 examples, Dighali, 14. 03. 2003, coll. B. K. Sharma; 3 examples, Chatla, 09. 12. 2004, coll. B. K. Sharma; 3 examples, Siligurijan, 13. 01. 2003, coll. B. K. Sharma; 4 examples, Urmal, 05. 03. 2004, coll. B. K. Sharma; 3 examples, Padma, 11. 02. 2005, coll. B. K. Sharma; 2 examples, Bamoni, 01. 09. 2006, coll. Sumita Sharma; 3 examples, Solmari, 13. 11. 2004, coll. B. K. Sharma; 3 examples, Thekera, 01. 12. 2005, coll. B. K. Sharma.

*Characters* : Body long, slender and fusiform. Rostrum with two eyes and with an arched rostral papilla. Palp-like antennae on first neck segment. Trunk long, narrowing gradually. Foot long, slender and telescopic, with a pair of pointed spurs; last foot-segment with three slender and equal toes.

*Distribution* : INDIA - Assam, Meghalaya, Tripura, West Bengal, Bihar, Orissa and Andhra Pradesh.

*Elsewhere* : Cosmopolitan.

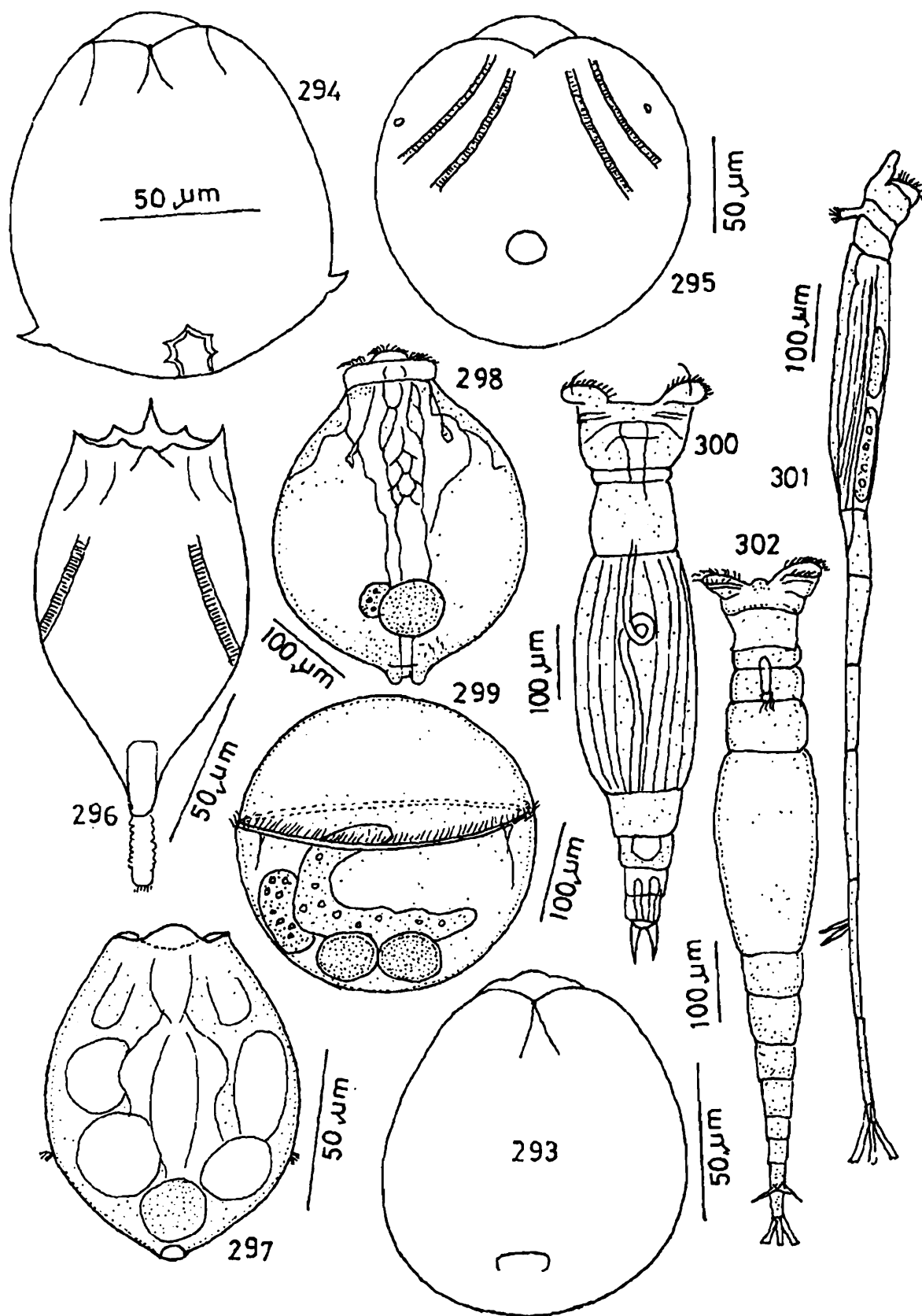
176. *Rotaria rotatoria* (Pallas, 1766)  
(Fig. 302)

*Material examined* : 4 examples, Barundanga, 12. 03. 2003, coll. B. K. Sharma; 3 examples, Horinchora, 07. 02. 2005, coll. B. K. Sharma; 4 examples, Kujibalipatty, 11. 01. 2003, coll. B. K. Sharma; 3 examples, Sitalmari, 13. 11. 2004, coll. B. K. Sharma; 3 examples, Bandha, 03. 09. 2006, coll. Sumita Sharma; 4 examples, Itakhuli, 01. 12. 2005, coll. Sumita Sharma; 5 examples, Samuajan, 01. 03. 2005, coll. B. K. Sharma; 3 examples, Baskandi, 17. 01. 2005, coll. B. K. Sharma.

*Characters* : Body fusiform and transparent. Trunk without striae, tapering into foot, not sharply demarcated. Dorsal antenna situated on the first neck segment. Foot moderately long; last foot-segment with three equal toes, spurs paired, short and acutely pointed.

*Distribution* : INDIA - Assam, Meghalaya, Tripura, West Bengal, Bihar, Orissa, Madhya Pradesh and Andhra Pradesh.

*Elsewhere* : Cosmopolitan.



*Testudinella parva parva* (Ternetz) : Fig. 293, ventral view; *T. parva bidentata* (Ternetz) : Fig. 294, ventral view; *T. patina* (Hermann) : Fig. 295, ventral view; *T. tridentata* Smirnov : Fig. 296, ventral view; *Pompholyx sulcata* Hudson : Fig. 297, dorsal view; *Horaella brehmi* Donner : Fig. 298, dorsal view; *Trochosphaera aequatorialis* Semper : Fig. 299, lateral view; *Philodina citrina* Ehrenberg : 300, dorsal view, *Rotaria neptunia* (Ehrenberg) : Fig. 301, lateral view; *R. rotatoria* (Pallas) : Fig. 302, dorsal view.

**2. CLADOCERA****SYSTEMATIC LIST OF REPORTED SPECIES**

Superclass CRUSTACEA

Class BRANCHIOPODA

Super-order CLADOCERA (*s. str.*)**Order CTENOPODA****Family SIDIDAE***Diaphanosoma excisum* Sars, 1885*D. sarsi* Richard, 1895*D. senegal* Gauthier, 1951*D. volzi* Stingelin, 1805*Pseudosida bidentata* Herrick, 1884*Sida crystallina* (O. F. Muller, 1776)**Order ANOMOPODA****Family DAPHNIIDAE***Ceriodaphnia cornuta* Sars, 1885*C. reticulata* (Jurine, 1820)*Daphnia lumholtzi* Sars, 1885*Scapholeberis kingi* Sars, 1901*Simocephalus (Echinocaudus) acutirostratus*  
(King, 1853)*S. (Echinocaudus) exspinosus* (De Geer, 1778)*S. (Coronocephalus) serrulatus* (Koch, 1841)*S. (Simocephalus) vetulus* (O.F.Müller, 1776)**Family BOSMINIDAE***Bosmina longirostris* (O. F. Muller, 1776)*Bosminopsis deitersi* Richard, 1895**Family MOINIDAE***Moina micrura* Kurz, 1874*Moinodaphnia macleayi* (King, 1853)**Family MACROTHRICIDAE***Macrothrix laticornis* (Fischer, 1857)*M. odiosa* (Gurney, 1907)*M. spinosa* King, 1853*M. triselialis* (Brady, 1886)*Grimaldina brazzai* Richard, 1892*Guernella raphaelis* Richard, 1892**Family ILYCRYPTIDAE***Ilyocryptus spinifer* Herrick, 1882**Family CHYDORIDAE****Subfamily CHYDORINAE***Alonella excisa* (Fischer, 1854)*A. nana* (Baird, 1850)*Chydorus faviformis* Birge, 1893*C. pubescens* Sars, 1901*C. reticulatus* Daday, 1898*C. sphaericus* (O. F. Muller, 1776)*Dadaya macrops* (Daday, 1898)*Disperalona caudata* Smirnov, 1996*Dunhevedia crassa* King, 1853*D. serrata* Daday, 1898*Ephemeroporus barroisi* (Richard, 1894)*Picripleuroxus laevis* Sars, 1861*P. similis* Vavra, 1900*Pseudochydorus globosus* (Baird, 1843)**Subfamily ALONINAE***Acroperus harpae* (Baird, 1834)*Alona affinis* (Leydig, 1860)*A. costata* Sars, 1862

|   |   |
|---|---|
| <i>A. davidi</i> Richard, 1895                | <i>Euryalona orientalis</i> (Daday, 1898)         |
| <i>A. globulosa</i> (Daday, 1898)             | <i>Graptoleberis testudinaria</i> (Fischer, 1854) |
| <i>A. guttata</i> Sars, 1862                  | <i>Karualona karua</i> (King, 1853)               |
| <i>A. quadrangularis</i> (O. F. Muller, 1776) | <i>Kurzia longirostris</i> (Daday, 1898)          |
| <i>A. rectangula</i> Sars, 1862               | <i>Leydigia acanthocercoides</i> (Fischer, 1854)  |
| <i>Camptocercus uncinatus</i> Smirnov, 1973   | <i>Leydigiosis curvirostris</i> Sars, 1901        |
| <i>C. rectirostris</i> Schoedler, 1862        | <i>Oxyurella singalensis</i> (Daday, 1898)        |

## SYSTEMATIC ACCOUNT

### Key to reported orders and families of CLADOCERA

1. With six pairs of similar thoracic legs ..... Order **Ctenopoda**.....2  
 With five or six pairs of dissimilar thoracic legs ..... Order **Anomopoda**.....3
2. Body elongated, head clearly delimited Antennae branched (biramus) .....  
 ..... Family **SIDIDAE**
3. Antennules fused with rostrum forming a snout-like process ... Family **BOSMINIDAE**  
 Antennules not fused with rostrum ..... 4
4. Dorsal ramus of antenna 3-segmented, ventral ramus 4-segmented ..... 5  
 Dorsal and ventral rami of antenna 3-segmented each ..... Family **CHYDORIDAE**
5. Antennules short and immovable ..... Family **DAPHNIIDAE**  
 Antennules mostly long and movable ..... 6
6. Antennules located on ventral side of head ..... Family **MOINIDAE**  
 Antennules located on anterior rim of head ..... 7
7. Antennules two- segmented. Postabdomen characteristically wide and with large anal spines ..... Family **ILYOCRYPTIDAE**  
 Antennules one-segmented. Postabdomen not wide, anal spines small .....  
 ..... Family **MACROTHRICIDAE**

### Family **SIDIDAE** Baird, 1850

*Characters* : Head large, cervical sinus present. Eye large and ocellus small or absent. Antennules large and movable; with 9 olfactory setae. Antennae biramus and with flattened rami; ventral ramus with terminal setae, dorsal ramus with both lateral and terminal setae.

Intestine straight, with a median hepatic caeca, rarely with two hepatic caeae. Six pairs of identical and flattened legs present.

This family is represented by three genera in the examined material.

### Genus *Diaphanosoma* Fischer, 1850

**Characters** : Head large and without rostrum, fornix or ocellus. Antennules small, with terminal olfactory setae and a single flagellum. Dorsal ramus of antenna two-segmented and ventral ramus three-segmented. Postabdomen with anal spines. Claw with three basal spines.

Four species of *Diaphanosoma* are noticed in the collections examined from the floodplain lakes of Assam.

#### 1. *Diaphanosoma excisum* Sars, 1885

(Figs. 303-305)

**Material examined** : 5 examples, Bhoispuri, 03. 05. 2003, coll. B. K. Sharma; 6 examples, Barundanga, 08. 08. 2002, coll. B. K. Sharma; 6 examples, Dhir, 11. 03. 2003, coll. B. K. Sharma; 4 examples, Hakama, 11. 07. 2004, coll. B. K. Sharma; 4 examples, Horinchora, 08. 09. 2004, coll. B. K. Sharma; 4 examples, Rowmari, 07. 05. 2002, coll. B. K. Sharma; 10 examples, Deepor, 12. 07. 2004, coll. B. K. Sharma; 4 examples, Deepor, 06. 04. 2005, coll. Sumita Sharma; 6 examples, Dighali, 12. 08. 2002, coll. B. K. Sharma; 4 examples, Kamranga, 12. 07. 2004, coll. B. K. Sharma; 5 examples, Ghorajan, 09. 09. 2004, coll. B. K. Sharma; 3 examples, Siligurijan, 13. 08. 2002, coll. B. K. Sharma; 5 examples, Hiragota, 10. 09. 2004, coll. B. K. Sharma; 6 examples, Urmal, 08. 05. 2004, coll. B. K. Sharma; 4 examples, Padma, 09. 05. 2004, coll. B. K. Sharma; 4 examples, Basana, 03. 09. 2006, coll. Sumita Sharma; 2 examples, Goranga, 01. 09. 2006, coll. B. K. Sharma; 6 examples, Solmari, 04. 05. 2004, coll. B. K. Sharma; 5 examples, Thekera, 06. 05. 2004, coll. B. K. Sharma; 5 examples, Bandha, 01. 12. 2005, coll. B. K. Sharma; 3 examples, Daphlang, 05. 09. 2006, coll. Sumita Sharma; 3 examples, Mora Daphlang, 03. 12. 2005, coll. Sumita Sharma; 4 examples, Donga, 06. 09. 2006, coll. Sumita Sharma; 3 examples, Hakoi, 29. 11. 2005, coll. Sumita Sharma; 3 examples, Sesa, 01. 12. 2005, coll. Sumita Sharma; 2 examples, Kutri, 06. 09. 2006, coll. Sumita Sharma; 6 examples, Memdubi, 30. 11. 2005, coll. Sumita Sharma; 6 examples, Maghuri, 30. 11. 2005, coll. Sumita Sharma; 7 examples, Dhekia, 03. 04. 2005, coll. B. K. Sharma; 8 examples, Samuajan, 11. 06. 2004, coll. B. K. Sharma; 4 examples, Salchapra, 08. 08. 2004, coll. B. K. Sharma; 4 examples, Baskandi, 10. 10. 2004, coll. B. K. Sharma.

**Characters** : Body oblong and its posterior end abruptly truncate. Head large; eyes relatively large and located in frontal portion of head close to its ventral margin. Antennae not reaching posterior margin of valves. Postero-ventral corner of valves with variable number of denticles followed by cilia; the number of denticles differs even on the two valves. Shell duplicator joining ventral margin of valves nearly at right angles. Postabdomen narrow and with fine hairs. Claw with three basal spines, decreasing in size proximally.

*Distribution* : INDIA - Assam, Meghalaya, Tripura, West Bengal, Bihar, Rajasthan and Kerala.

*Elsewhere* : Cosmotropical.

## 2. *Diaphanosoma sarsi* Richard, 1894

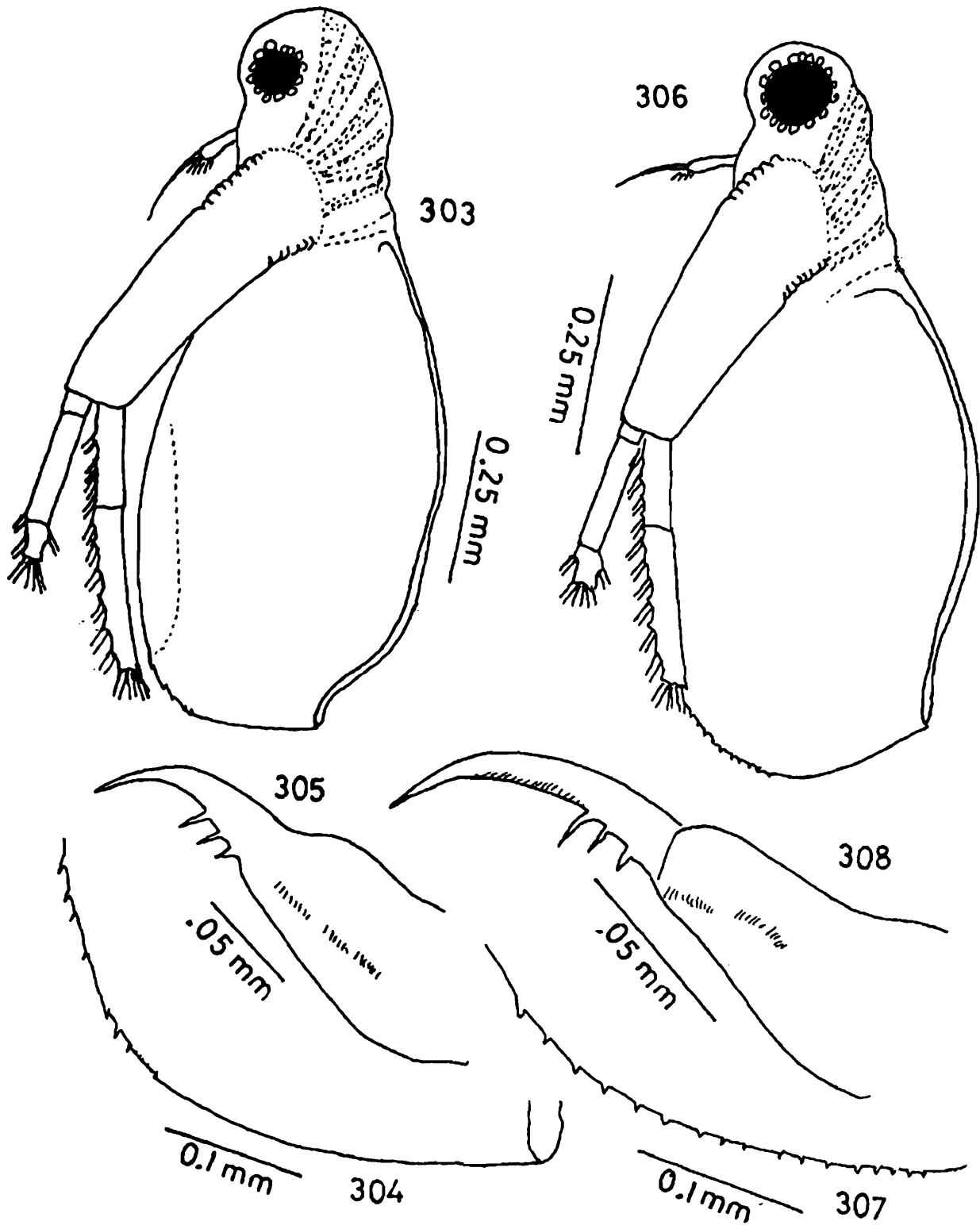
(Figs. 306-308)

*Material examined* : 6 examples, Barundanga, 12. 03. 2003, coll. B. K. Sharma; 8 examples, Dhir, 12. 02. 2002, coll. B. K. Sharma; 4 examples, Hakama, 06. 05. 2004, coll. B. K. Sharma; 6 examples, Horinchora, 11. 07. 2004, coll. B. K. Sharma; 5 examples, Fingua, 06. 05. 2002, coll. B. K. Sharma; 5 examples, Kamakhya, 13. 03. 2003, coll. B. K. Sharma; 9 examples, Deepor, 12. 07. 2004, coll. B. K. Sharma; 7 examples, Dighali, 08. 05. 2002, coll. B. K. Sharma; 3 examples, Borbila, 13. 08. 2002, coll. B. K. Sharma; 3 examples, Kamranga, 04. 03. 2004, coll. B. K. Sharma; 6 examples, Ghorajan, 07. 05. 2004, coll. B. K. Sharma; 4 examples, Siligurijan, 12. 03. 2003, coll. B. K. Sharma; 3 examples, Chatla, 10. 09. 2004, coll. B. K. Sharma; 4 examples, Urmal, 08. 05. 2004, coll. B. K. Sharma; 4 examples, Padma, 11. 02. 2005, coll. B. K. Sharma; 2 examples, Basana, 03. 09. 2006, coll. Sumita Sharma; 3 examples, Goranga, 07. 05. 2004, coll. B. K. Sharma; 5 examples, Solmari, 09. 09. 2004, coll. B. K. Sharma; 4 examples, Sitalmari, 05. 04. 2005, coll. Sumita Sharma; 4 examples, Thekera, 05. 11. 2004, coll. B. K. Sharma; 4 examples, Kujibalipatty, 12. 08. 2002, coll. B. K. Sharma; 3 examples, Diphlu, 06. 09. 2006, coll. Sumita Sharma; 2 examples, Japara, 01. 12. 2005, coll. Sumita Sharma; 5 examples, Muijan, 29. 11. 2005, coll. Sumita Sharma; 3 examples, Sarain Hubbi, 29. 11. 2005, coll. Sumita Sharma; 4 examples, Bor beel, 01. 12. 2005, coll. Sumita Sharma; 3 examples, Deopani, 06. 09. 2006, coll. Sumita Sharma; 5 examples, Mihir, 05. 09. 2006, coll. Sumita Sharma; 2 examples, Kutri, 06. 09. 2006, coll. Sumita Sharma; 5 examples, Memdubi, 30. 11. 2005, coll. Sumita Sharma; 4 examples, Senijan, 01. 04. 2004, coll. B. K. Sharma; 6 examples, Samuajan, 22. 06. 2004, coll. B. K. Sharma; 4 examples, Salchapra, coll. B. K. Sharma; 4 examples, Baskandi, 09. 02. 2005, coll. B. K. Sharma.

*Characters* : Body elongate and truncate posteriorly. Head well defined and rather narrow; eyes exceedingly large and situated near anterior margin of head. Antennules not reaching the posterior end of carapace. Postero-dorsal corner of valves rounded; postero-ventral corner with a series of small denticles (12 - 20) followed by small setae. Shell duplicator broad at distal end. Postabdomen narrow; claw with three basal spines, rapidly decreasing in size proximally.

*Distribution* : INDIA - Assam, Meghalaya, Tripura, West Bengal, Bihar, Uttar Pradesh, Rajasthan, Gujarat, Kerala and little Andaman.

*Elsewhere* : Cosmotropical.



*Diaphanosoma excisum* Sars : Fig. 303, parthenogenetic female (lateral view), Fig. 304, posterior ventral part of valve, Fig. 305, postabdomen; *D. sarsi* Richard : Fig. 306, parthenogenetic female (lateral view), Fig. 307, posterior ventral part of valve, Fig. 308, postabdomen.

### 3. *Diaphanosoma senegal* Gauthier, 1951

(Figs. 309-311)

*Material examined* : 3 examples, Jugdal, 01. 09. 2006, coll. Sumita Sharma; 4 examples, Lotha, 01. 09. 2006, coll. Sumita Sharma; 3 examples, Karasing, 02. 12. 2005, coll. Sumita Sharma.

*Characters* : Head large, strongly bent dorsally and almost half of total body length. Ventral part of carapace widely inflected, infringed with short and densely packed feathered setae. Postero-ventral part of valves deeply emarginated and with 8-18 rapidly decreasing setae. Posterior margin of valves almost straight, with two series of spines, posterior group larger than ventral. Antennae not reaching posterior end of valves. Claw short; with three basal spines increasing in length distally and with setae on its concave margin.

*Distribution* : INDIA - Meghalaya, Gujarat and Maharashtra.

*Elsewhere* : Africa and Bangladesh.

### 4. *Diaphanosoma volzi* Stingelin, 1905

(Figs. 312-314)

*Material examined* : 3 examples, Kakerikhola, 11. 09. 2004, coll. B. K. Sharma; 3 examples, Urmal, 05. 03. 2004, coll. B. K. Sharma; 2 examples, Daphlang, 05. 09. 2006, coll. Sumita Sharma.

*Characters* : Body massive and high. Head small, bent down and with convex ventral side. Eye large. Distal segment of antennal exopodite with only seven swimming setae and a long apical sensory seta. Ventral valve margins of carapace inflexed, forming a broad free flap. Postero-ventral and posterior margin of valves without denticles or setules. One large lanceolate dorsal spine near posterior margin of each valve. Postabdomen claw relatively short and massive; with three long basal spines.

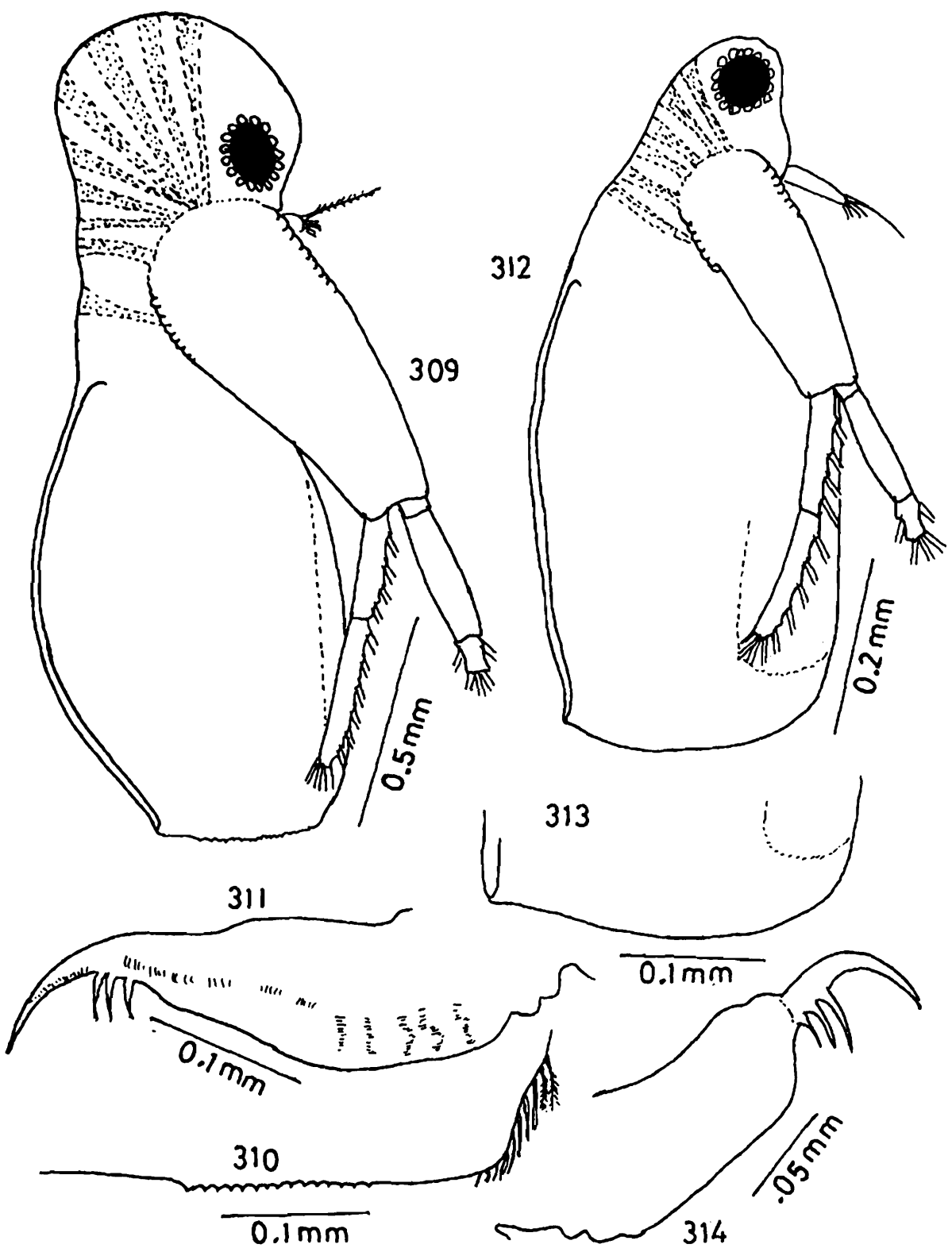
*Distribution* : INDIA - Meghalaya and Kerala.

*Elsewhere* : Tropical and subtropical parts of Australasia, and in Africa (Sudan).

### Genus *Pseudosida* Herrick, 1884

*Characters* : Antennules with a long flagellum; sensory setae lateral. Dorsal ramus of antenna two-segmented and ventral ramus three-segmented; antennal setae: 3-3 / 0-3-3. Postabdomen with bundles of spinules. Claws bidentate.

Only one species belonging to *Pseudosida* is documented in the present account.



*D. senegal* Gauthier: Fig. 309, parthenogenetic female (lateral view), Fig. 310, posterior ventral part of valve, Fig. 311, postabdomen; *D. volzi* Stingelin : Fig. 312, parthenogenetic female (lateral view), Fig. 313, posterior ventral part of valve, Fig. 314, postabdomen

5. *Pseudosida bidentata* Herrick, 1884  
(Figs. 315-317)

*Material examined* : 4 examples, Barundanga, 07. 01. 2003, coll. B. K. Sharma; 4 examples, Dhir, 11. 03. 2003, coll. B. K. Sharma; 2 examples, Sagmara, 13. 02. 2002, coll. B. K. Sharma; 3 examples, Rowmari, 13. 03. 2003, coll. B. K. Sharma; 5 examples, Deepor, 03. 11. 2004, coll. B. K. Sharma; 4 examples, Dighali, 11. 01. 2003, coll. B. K. Sharma; 4 examples, Ghorajan, 08. 02. 2005, coll. B. K. Sharma; 3 examples, Siligurijan, 13. 01. 2003, coll. B. K. Sharma; 3 examples, Hiragota, 10. 09. 2004, coll. B. K. Sharma; 4 examples, Kakerikhola, 11. 02. 2005, coll. B. K. Sharma; 3 examples, Bamoni, 01. 09. 2006, coll. Sumita Sharma; 4 examples, Solmari, 13. 11. 2004, coll. B. K. Sharma; 4 examples, Kujibalipatty, 14. 03. 2003, coll. B. K. Sharma; 3 examples, Daphlang, 02. 12. 2005, coll. Sumita Sharma; 3 examples, Borbil-Tinsuki, 01. 12. 2005, coll. Sumita Sharma; 4 examples, Mihir, 05. 09. 2006, coll. Sumita Sharma; 5 examples, Maghuri, 30. 11. 2005, coll. Sumita Sharma; 3 examples, Sone, 03. 01. 2004, coll. B. K. Sharma; 3 examples, Salchakra, 09. 02. 2005, coll. B. K. Sharma.

*Characters* : Body elongated and dorsally arched. Head short and depressed. Rostrum present; fornix or cervical glands lacking. Antennules attached to the ventral side of rostrum; with a long flexible flagellum and olfactory setae on each side. Postabdomen with 10-11 clusters of spinules. Claw with two large basal spines and a very small spine proximal to them.

*Distribution* : INDIA - Meghalaya, Tripura, Rajasthan, Tamil Nadu and Kerala.

*Elsewhere* : Pantropical.

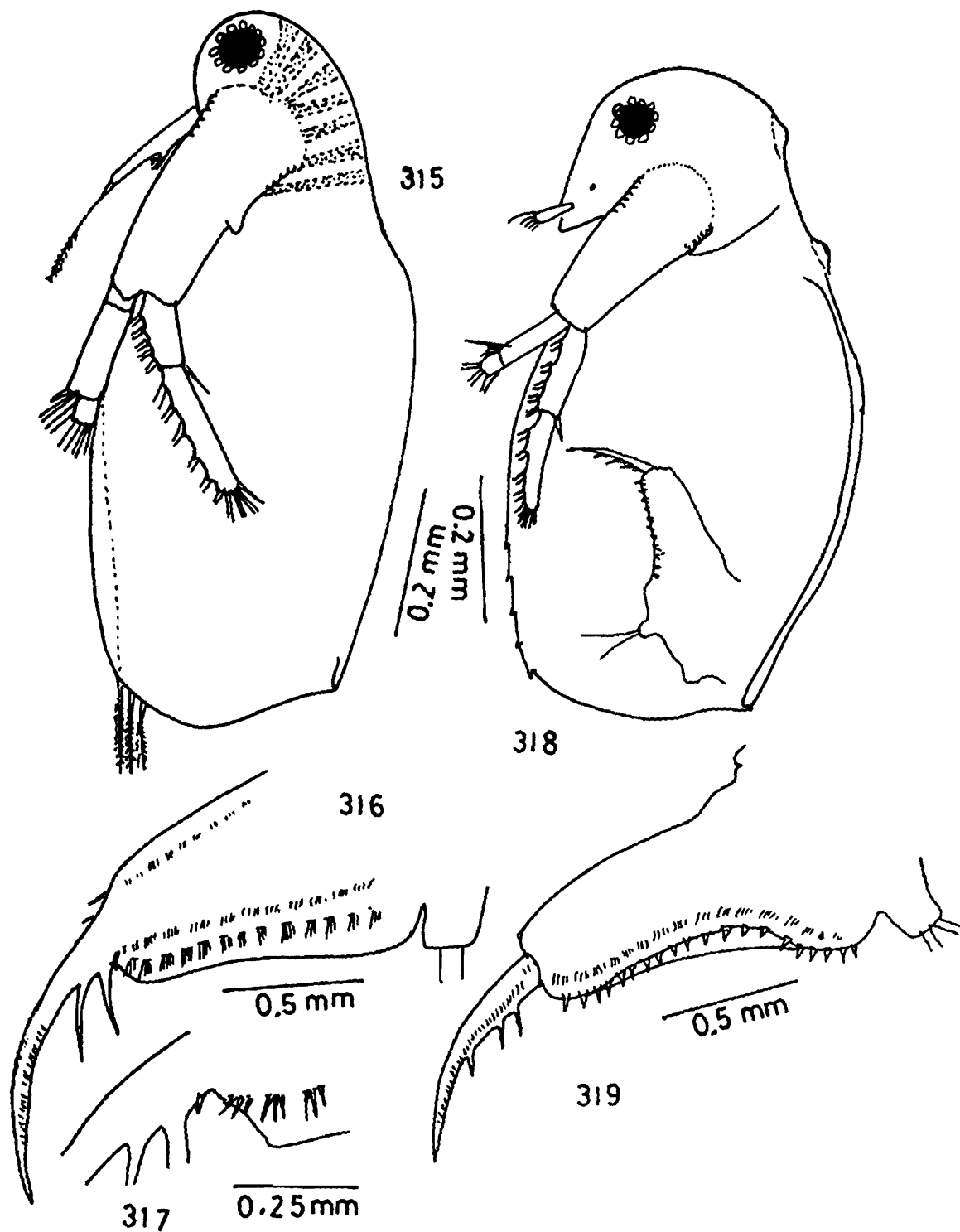
Genus *Sida* Straus, 1820

*Characters* : Dorsal ramus of antenna three-segmented, ventral ramus two-segmented. Head with large gland on dorsal side. Rostrum pointed. Antennules of female attached to the side of rostrum.

Only one species belonging to this genus is noticed in the examined samples.

6. *Sida crystallina* (O.F. Müller, 1776)  
(Figs. 318-319)

*Material examined* : 4 examples, Bhoispuri, 12. 03. 2003, coll. B. K. Sharma; 4 examples, Horinchora, 02. 03. 2004, coll. B. K. Sharma; 3 examples, Sagmara, coll. B. K. Sharma; 5 examples, Deepor, 08. 02. 2005, coll. B. K. Sharma; 4 examples, Dighali, 11. 01. 2003, coll. B. K. Sharma; 3 examples, Borbila, 12. 01. 2003, coll. B. K. Sharma; 4 examples, Ghorajan, 03. 11. 2004, coll. B. K. Sharma; 3 examples, Chatla, 09. 12. 2004, coll. B. K. Sharma; 2 examples, Hiragota, 09. 12. 2004, coll. B. K. Sharma; 3 examples, Goranga, 10. 02. 2005,



*Pseudosida bidentata* Herrick: Fig. 315, parthenogenetic female (lateral view), Fig. 316, postabdomen, Fig. 317, anal denticles (enlarged); *Sida crystallina* (O. F. Müller): Fig. 318, parthenogenetic female (lateral view), Fig. 319, postabdomen.

coll. B. K. Sharma; 4 examples, Solmari, 13. 11. 2004, coll. B. K. Sharma; 3 examples, Mori, 01. 02. 2005, coll. B. K. Sharma; 2 examples, Bandha, 05. 11. 2004, coll. B. K. Sharma; 4 examples, Padmakhua, 01. 09. 2006, coll. Sumita Sharma; 2 examples, Mohna, 03. 09. 2006, coll. Sumita Sharma; 4 examples, Bhoismari, 05. 09. 2006, coll. Sumita Sharma; 3 examples, Moona, 06. 09. 2006, coll. Sumita Sharma; 3 examples, Shitalpathar, 01. 12. 2005, coll. Sumita Sharma; 3 examples, Kololua, 29. 11. 2005, coll. Sumita Sharma; 4 examples, Diang, 01. 12. 2005, coll. Sumita Sharma; 4 examples, Raidong, 30. 11. 2005, coll. Sumita Sharma; 3 examples, Dhekia, 03. 04. 2005, coll. B. K. Sharma; 4 examples, Samuajan, 01. 03. 2004, coll. B. K. Sharma; 3 examples, Puwa Saikia, 17. 01. 2005, coll. B. K. Sharma; 3 examples, Salchapra, 09. 02. 2005, coll. B. K. Sharma.

*Characters* : Body slightly oblong, transparent or yellowish. Head large, quadrate and clearly separable from body by a distinct cervical sinus; with a large dorsal gland. Eye small and located in ventral region of head. Rostrum small and pointed. Antennules short, attached to side of rostrum and with short flagellum. Postabdomen with about 14 lateral anal spines; groups of lateral setae arranged in a row. Claw with four basal spines and with a row of setae distal to basal spines.

*Distribution* : INDIA - Assam, Meghalaya, and Kashmir.

*Elsewhere* : Palaearctic.

#### Family DAPHNIIDAE Straus, 1820

*Characters* : Antennae long and cylindrical; dorsal ramus four-segmented and ventral ramus three-segmented. Antennal setae: 0-0-1-3 / 1-1-3. Antennules small, immobile or rudimentary. Eye large, ocellus small or wanting. Postabdomen distinctly set off from body, usually more or less compressed and always with anal spines. Claws mostly denticulate, sometimes pectinate and with a basal spine. Intestine not convoluted and with two hepatic caece. Five pairs of different legs present; first two pairs prehensile and without branchial lamellae. Parthenogenetic eggs numerous; ephippium with one or two resting eggs.

Family Daphniidae is represented by four genera in the samples collected from the floodplain lakes of Assam.

#### Genus *Ceriodaphnia* Dana, 1853

*Characters* : Body rounded to oval in shape. Head small and depressed. Rostrum absent. Antennules small and not freely movable. Vertex with a rounded or angular projection. Valves oval, rounded to sub-quadrate and usually terminating posteriorly into a sharp dorsal angle or short spine. One abdominal process ordinarily developed. Postabdomen large and of variable shape.

Only two species belonging to this genus are recorded in this account.

7. *Ceriodaphnia cornuta* Sars, 1885  
(Figs. 320-321)

**Material examined** : 6 examples, Bhoispuri, 12. 03. 2003, coll. B. K. Sharma; 6 examples, Dhir, 08. 01. 2003, coll. B. K. Sharma; 5 examples, Horinchora, 02. 11. 2004, coll. B. K. Sharma; 5 examples, Fingua, 09. 01. 2003, coll. B. K. Sharma; 9 examples, Deepor, 08. 02. 2005, coll. B. K. Sharma; 4 examples, Deepor, 06. 04. 2005, coll. Sumita Sharma; 3 examples, Borbila, 16. 02. 2002, coll. B. K. Sharma; 4 examples, Kamranga, 07. 05. 2004, coll. B. K. Sharma; 5 examples, Ghorajan, 04. 03. 2004, coll. B. K. Sharma; 3 examples, Hiragota, 08. 05. 2004, coll. B. K. Sharma; 5 examples, Kakerikhola, 11. 02. 2005, coll. B. K. Sharma; 5 examples, Padma, 11. 02. 2005, coll. B. K. Sharma; 4 examples, Sitalmari, 13. 11. 2004, coll. B. K. Sharma; 4 examples, Mori, 01. 12. 2005, coll. B. K. Sharma; 3 examples, Thekera, 03. 12. 2005, coll. Sumita Sharma; 4 examples, Ghorkhonjan, 05. 03. 2005, coll. B. K. Sharma; 3 examples, Padmakhua, 01. 09. 2006, coll. Sumita Sharma; 3 examples, Bhoismari, 02. 12. 2005, coll. Sumita Sharma; 2 examples, Moona, 06. 09. 2006, coll. Sumita Sharma; 3 examples, Demon, 01. 12. 2005, coll. Sumita Sharma; 4 examples, Kololua, 29. 11. 2005, coll. Sumita Sharma; 5 examples, Memdubi, 30. 11. 2005, coll. Sumita Sharma; 5 examples, Raidong, 30. 11. 2005, coll. Sumita Sharma; 5 examples, Dhekia, 18. 01. 2005, coll. B. K. Sharma; 6 examples, Samuajan, 11. 06. 2004, coll. B. K. Sharma; 5 examples, Sone, 09. 02. 2005, coll. B. K. Sharma; 4 examples, Baskandi, 19. 10. 2004, coll. B. K. Sharma.

**Characters** : Body broadly oval in shape and produced posteriorly into a short projection lying slightly above the longitudinal axis. Head small and separated from body by a distinct cervical depression; produced anteriorly into a short beak and with a short horn dorsally. Eyes large, ocellus small and punctiform. Antennules small, fusiform and not extending to the tip of rostrum; lateral sensory seta somewhat distal to middle. Valves distinctly reticulate with large polygons and hexagons. Postabdomen moderately broad and with 5-6 anal spines. Claws short, stout and smooth.

**Distribution** : INDIA - Assam, Meghalaya, Tripura, West Bengal, Bihar, Punjab, Haryana, Himachal Pradesh, Rajasthan, Madhya Pradesh, Tamil Nadu, Kerala and little Andaman.

**Elsewhere** : Cosmotropical, also known from China and Japan.

8. *Ceriodaphnia reticulata* (Jurine, 1820)  
(Figs. 322-324)

**Material examined** : 4 examples, Dhir, 08. 01. 2003, coll. B. K. Sharma; 3 examples, Hakama, 07. 02. 2005, coll. B. K. Sharma; 4 examples, Deepor, 08. 02. 2005, coll. B. K. Sharma; 3 examples, Ghorajan, 04. 03. 2004, coll. B. K. Sharma; 3 examples, Siligurijan, 16. 02. 2002, coll. B. K. Sharma; 3 examples, Goranga, 05. 04. 2004, coll. Sumita Sharma; 4 examples, Maghuri, 30. 11. 2005, coll. Sumita Sharma; 3 examples, Samuajan, 18. 01. 2005, coll. B. K. Sharma; 3 examples, Baskandi, 03. 01. 2004, coll. B. K. Sharma.

*Characters* : Head small and rounded, with an obtuse angle in the rostral region. Eyes large and nearly filling frontal region of head. Fornix distinct. Cervical sinus deep. Carapace broadly rounded oval, valves with reticulate pattern; reticulations of ventral surface pronounced. Postabdomen broadest in middle, with lateral row of up to 8 spines on each side and with several groups of fine setae. Postabdomen claw with three pectens; the proximal pectin consists of small and fine spinules, the middle pectin of 4-5 robust teeth and the distal pectin of fine and diminishing setae.

*Distribution* : INDIA - Meghalaya, Rajasthan, Bihar and Gujarat.

*Elsewhere* : Holarctic, Afro-tropical and Neotropical.

### Genus *Daphnia* O. F. Müller, 1785

*Characters* : Body oval or elliptical in shape, compressed and modified by development of crest on head (helmet) in some species. Cervical sinus absent. Rostrum well marked and pointed. Antennules small or rudimentary, immobile and located behind rostrum. Valves reticulate, with posterior spine and spinules on dorsal and ventral margins of valves. Abdominal processes 3-4; anterior most abdominal process longest and horse-shoe shaped. Parthenogenetic eggs often numerous. Ehippium with two large eggs.

Only one species of the genus is noticed in zooplankton collections examined from the floodplain lakes of Assam.

#### 9. *Daphnia lumholtzi* Sars, 1885 (Figs. 325-328)

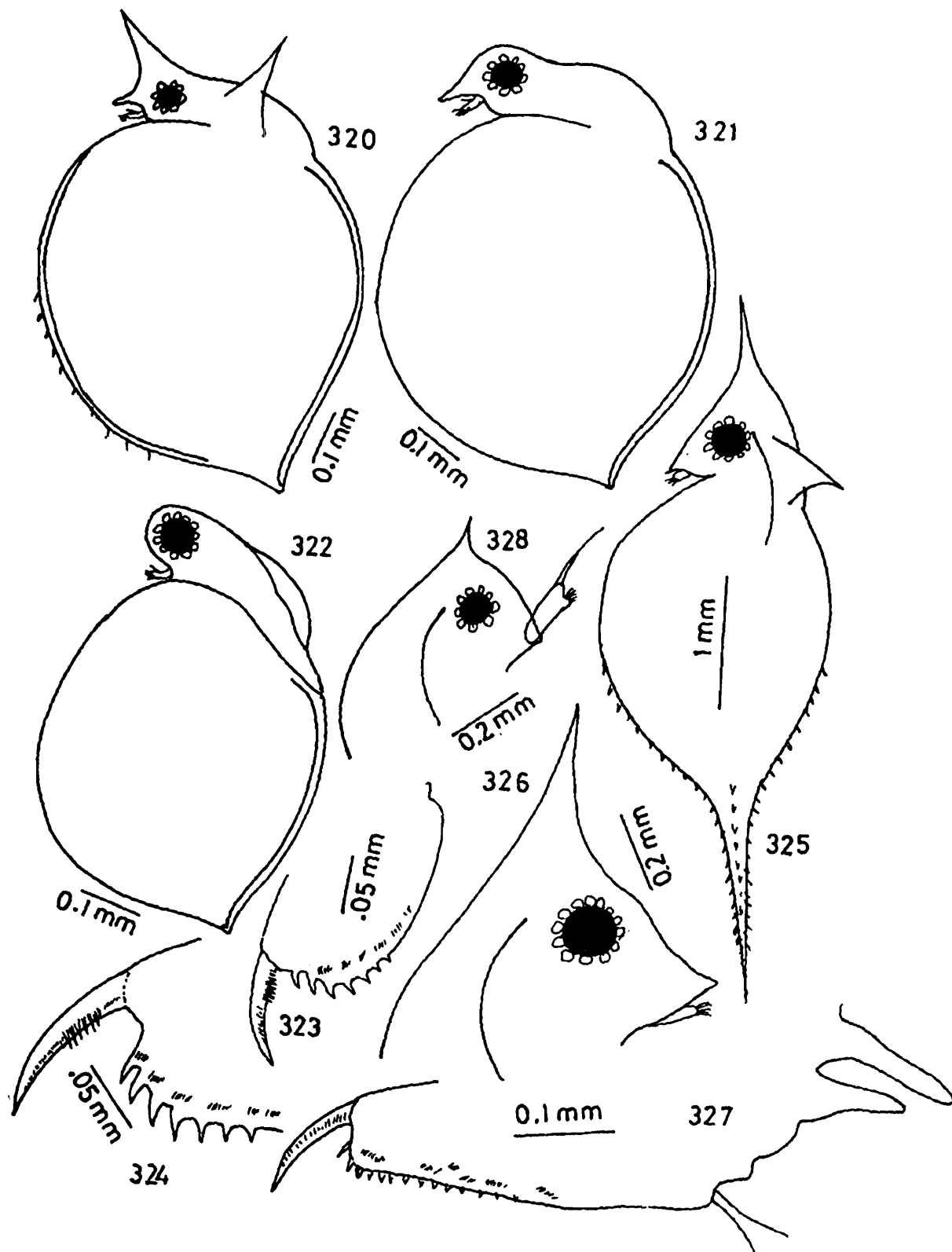
*Material examined* : 10 examples, Deepor, 08. 02. 2005, coll. B. K. Sharma

*Characters* : Female : Body oval and terminating into a long posterior spine; dorsal surface moderately arched and with long and distant spinules extending to the posterior spine and also up to the middle of the ventral margin of valves. Head almost triangular and produced anteriorly into a helmet of variable length. Rostrum small and pointed. Antennular mounds well developed and situated close to rostrum. Eyes large and ocellus small. Postabdomen tapering distally, weakly sinuate dorsally, with 10-13 anal spines and groups of lateral setae. Claw stout, curved and with three combs having 10, 18 and 40 teeth respectively. Ehippium broad and with two large obliquely placed eggs.

Male : Smaller in form and valves oblong; head produced anteriorly as in female. Antennules large and movable, each with a long flagellum. Postabdomen strongly sinuate. First leg with a hook.

*Distribution* : INDIA Assam, Meghalaya, Tripura, West Bengal, Orissa, Bihar, Andhra Pradesh, Punjab, Haryana, Rajasthan, Uttar Pradesh, Gujarat and Kerala.

*Elsewhere* : Australia, Africa, Egypt, wide spread in Asia.



*Ceriodaphnia cornuta* Sars: Figs. 320-321, parthenogenetic females (lateral views); *C. reticulata* (Jurine): Fig. 322, parthenogenetic female (lateral view), Fig. 323, postabdomen, Fig. 324, postabdomen (enlarged); *Daphnia lumholtzi* Sars: Fig. 325, parthenogenetic female (lateral view), Fig. 326, head (enlarged), Fig. 327, postabdomen, Fig. 328, head (male).

Genus *Scapholeberis* Schoedler, 1858

*Characters* : Body quadrate and slightly compressed. Head small and depressed, fornix and rostrum well developed. Cervical sinus deep. Antennules small and situated behind rostrum. Valves rectangular, postero-ventral corners of valves produced into a shorter or longer spine; ventral margins with free setae. One abdominal process developed. Postabdomen well marked and with anal spines. Claws denticulate, not pectinate.

The examined collections include only one species of *Scapholeberis*.

10. *Scapholeberis kingi* Sars, 1903

(Figs. 329-330)

*Material examined* : 5 examples, Bhoispuri, 03. 05. 2002, coll. B. K. Sharma; 6 examples, Dhir, 11. 03. 2003, coll. B. K. Sharma; 4 examples, Hakama, 06. 05. 2004, coll. B. K. Sharma; 4 examples, Horinchora, 03. 03. 2004, coll. B. K. Sharma; 3 examples, Kamakhya, 07. 05. 2002, coll. B. K. Sharma; 8 examples, Deepor, 08. 02. 2005, coll. B. K. Sharma; 6 examples, Dighali, 14. 03. 2003, coll. B. K. Sharma; 5 examples, Ghorajan, 08. 02. 2005, coll. B. K. Sharma; 4 examples, Urmal, 10. 02. 2005, coll. B. K. Sharma; 4 examples, Padma, 11. 02. 2005, coll. B. K. Sharma; 4 examples, Basana, 03. 09. 2006, coll. Sumita Sharma; 5 examples, Solmari, 07. 05. 2004, coll. B. K. Sharma; 3 examples, Sitalmari, 05. 04. 2005, coll. Sumita Sharma; 3 examples, Daphlang, 02. 12. 2005, coll. Sumita Sharma; 4 examples, Borbil-Tinsuki, 01. 12. 2005, coll. Sumita Sharma; 3 examples, Patoni, 01. 09. 2006, coll. Sumita Sharma; 3 examples, Sohala, 05. 09. 2006, coll. Sumita Sharma; 5 examples, Mihir, 05. 09. 2006, coll. Sumita Sharma; 6 examples, Samuajan, 11. 06. 2004, coll. B. K. Sharma; 5 examples, Sone, 11. 02. 2005, coll. B. K. Sharma; 4 examples, Salchapra, 11. 12. 2004, coll. B. K. Sharma.

*Characters* : Body oval-quadrangular in shape, transversely truncate posteriorly; postero-ventral corner of each valve with a short backwardly directed spine. Head narrowly rounded anteriorly and deeply concave ventrally; cervical sinus well marked. Rostrum short and blunt. Eyes large, ocellus relatively small and located close to tip of rostrum. Antennules short, almost immobile and located behind the rostrum. Valves with distinct transverse striae, particularly strong and ridge-like in posterior region. Postabdomen short and broad, rounded at posterior end and with 4-5 anal spines. Claw long, stout and with setae on its concave margin.

*Distribution* : INDIA-Assam, Meghalaya, Tripura, West Bengal, Kashmir, Rajasthan and Tamil Nadu.

*Elsewhere* : Africa, Australia, North America, Germany and South Asia.

Genus *Simocephalus* Schoedler, 1858

*Characters* : Body large and heavy; valves large, quadrate, with oblique striae and with rounded angles or sometimes with a short posterior protuberance or a short spine. Head and

rostrum small. Eyes of moderate size; ocellus rhomboidal, rounded or elongated. Two abdominal processes present. Postabdomen large, broad and truncate; with emarginated posterior end and bearing anal spines. Claw with setae on its concave margin, sometimes pectinate.

This genus is represented by three subgenera (*vide* Orlova-Bienkowskaja, 2001) i.e. *Simocephalus* (*s. str.*), *Simocephalus* (*Echinocaudus*), and *Simocephalus* (*Coronocephalus*) which, in turn include one, two and one species respectively.

### 11. *Simocephalus* (*Echinocaudus*) *acutirostratus* (King, 1853)

(Figs. 331-333)

*Material examined* : 5 examples, Dhir, 08. 01. 2003, coll. B. K. Sharma; 4 examples, Hakama, 07. 02. 2005, coll. B. K. Sharma; 4 examples, Fingua, 12. 03. 2003, coll. B. K. Sharma; 5 examples, Kamakhya, 14. 02. 2002, coll. B. K. Sharma; 8 examples, Deepor, 04. 03. 2004, coll. B. K. Sharma; 6 examples, Dighali, 14. 03. 2003, coll. B. K. Sharma; 6 examples, Ghorajan, 03. 11. 2004, coll. B. K. Sharma; 3 examples, Hiragota, 09. 12. 2004, coll. B. K. Sharma; 4 examples, Thekera, 05. 11. 2004, coll. B. K. Sharma; 2 examples, Haduk, 05. 04. 2005, coll. Sumita Sharma; 2 examples, Duptoli, 05. 04. 2005, coll. Sumita Sharma; 4 examples, Ghorkhonjan, 05. 03. 2005, coll. Sumita Sharma; 3 examples, Jugdal, 01. 09. 2006, coll. Sumita Sharma; 4 examples, Borbil-Tinsuki, 01.12. 2005, coll. Sumita Sharma; 5 examples, Muijan, 29. 11. 2005, coll. Sumita Sharma; 4 examples, Raidong, 30. 11. 2005, coll. Sumita Sharma; 4 examples, Salchapra, 09. 02. 2005, coll. B. K. Sharma.

*Characters* : Body broadly oval in shape, dorsal and ventral margins evenly arched; posterior protuberance obtuse and produced, situated in the longitudinal axis of body. Posterior region of dorsal surface and posterior protuberance with distinct denticles. Head small and produced anteriorly into an acute projection, ventral surface of head nearly straight. Rostrum small and pointed. Eyes moderately large, ocellus small and punctiform. Postabdomen broad, its posterior end forming an expansion in front of anal sinus; with seven anal spines, increasing in size distally. Claw long and slender; with a pecten of 10-12 teeth followed by cilia on its concave margin.

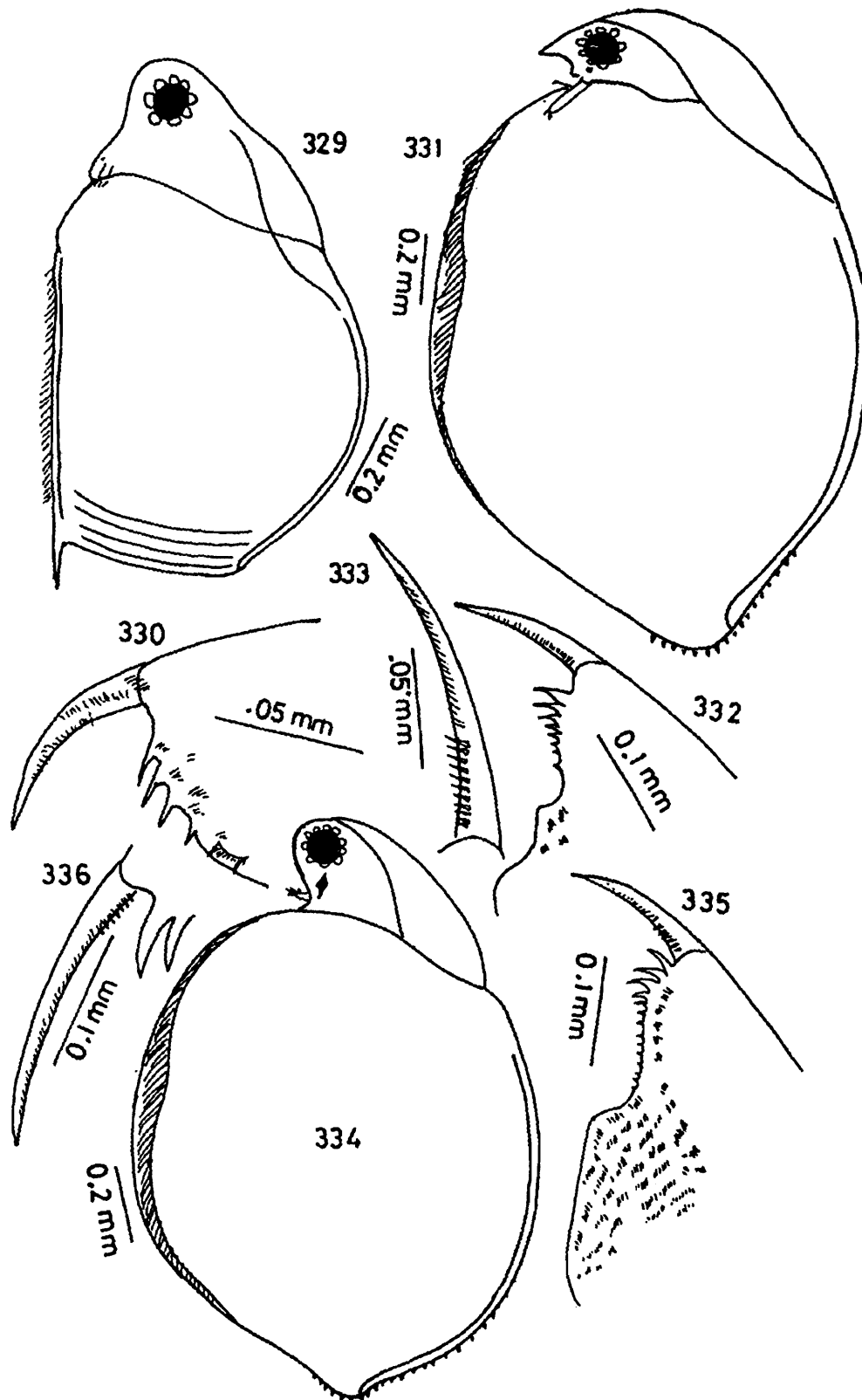
*Distribution* : INDIA - Meghalaya, Maharashtra and Tamil Nadu.

*Elsewhere* : Australia, and S. E. Asia

### 12. *Simocephalus* (*Echinocaudus*) *exspinosus* (De Geer, 1778)

(Figs. 334-336)

*Material examined* : 6 examples, Barundanga, 03. 05. 2002, coll. B. K. Sharma; 5 examples, Dhir, 11. 03. 2003, coll. B. K. Sharma; 5 examples, Hakama, 03. 03. 2004, coll. B. K. Sharma; 9 examples, Deepor, coll. B. K. Sharma; 6 examples, Dighali, coll. B. K. Sharma; 4 examples, Ghorajan, 03. 11. 2004, coll. B. K. Sharma; 4 examples, Siligurijan, 13. 01. 2003, coll. B. K. Sharma; 3 examples, Kakerikhola, 11. 02. 2005, coll. B. K. Sharma; 5



*Scapholeberis kingi* Sars : Fig. 329, parthenogenetic female (lateral view), Fig. 330, postabdomen (part);  
*Simocephalus (Echinocaudus) acutirostratus* (King) : Fig. 331, parthenogenetic female (lateral view), Fig.  
 332, postabdomen, Fig. 333, claw (enlarged); *S. (Echinocaudus) exspinosus* (De Geer) : Fig. 334,  
 parthenogenetic female (lateral view), Fig. 335, postabdomen, Fig. 336, claw (enlarged).

examples, Mori, 01. 12. 2005, coll. B. K. Sharma; 3 examples, Bandha, 03. 09. 2006, coll. Sumita Sharma; 4 examples, Jugdal, 05. 04. 2005, coll. Sumita Sharma; 2 examples, Demon, 01. 12. 2005, coll. Sumita Sharma; 2 examples, Sesa, 01. 12. 2005, coll. Sumita Sharma; 6 examples, Samuajan, 01. 03. 2004, coll. B. K. Sharma; 4 examples, Sone, 11. 12. 2004, coll. B. K. Sharma; 3 examples, Salchapra, 09. 02. 2005, coll. B. K. Sharma.

**Characters** : Body oval or sub-rhomboidal in outline; dorsal margin almost straight and forming an abrupt curve before joining distinct posterior protuberance, posterior part of dorsal margin distinctly denticulate. Head small and triangular, dorsal margin evenly arched and its ventral margin almost straight. Rostrum small. Eyes small, situated in vertex of head; ocellus small and rhomboidal. Postabdomen broad and deeply emarginated; 10-12 anal spines, increasing in size distally and larger anal spines ciliated. Claw long, with a distinct pecten at its base and with setae on its concave margin.

**Distribution** : INDIA - Assam, Meghalaya, Tripura, West Bengal and Rajasthan.

**Elsewhere** : Cosmopolitan.

### 13. *Simocephalus (Coronocephalus) serrulatus* (Koch, 1841)

(Fig. 337-338)

**Material examined** : 3 examples, Bhoispuri, 03. 05. 2002, coll. B. K. Sharma; 4 examples, Deepor, 07. 05. 2004, coll. B. K. Sharma; 2 examples, Hiragota, 05. 03. 2004, coll. B. K. Sharma; 2 examples, Moona, 06. 09. 2006, coll. Sumita Sharma; 2 examples, Shitalpathar, 01. 12. 2005, coll. Sumita Sharma; 4 examples, Maghuri, 30. 11. 2005, coll. Sumita Sharma; 3 examples, Butikor, 02. 04. 2005, coll. B. K. Sharma; 3 examples, Baskandi, 03. 01. 2004, coll. B. K. Sharma.

**Characters** : Body broadly oval, slightly widened posteriorly and its dorsal margin evenly arched; posterior protuberance slightly above the axis of body. Posterior part of dorsal margin and posterior protuberance denticulate. Head small, evenly arched dorsally and its front forming an acute angle marked with a number of minute denticles; rostral projection small. Eyes comparatively large; ocellus small and rhomboidal. Postabdomen less broad; with about eight anal denticles. Claw long, slender and with fine cilia on its concave margin.

**Distribution** : INDIA - Assam, Meghalaya and Tamil Nadu.

**Elsewhere** : Europe, Africa, Asia, N. & S. America and Australia.

### 14. *Simocephalus (Simocephalus) vetulus* (O.F. Müller, 1776)

(Figs. 339-340)

**Material examined** : 5 examples, Barundanga, 11. 02. 2002, coll. B. K. Sharma; 6 examples, Dhir, 11. 03. 2003, coll. B. K. Sharma; 4 examples, Hakama, 01. 12. 2005, coll. B. K. Sharma; 4 examples, Horinchora, 02. 11. 2004, coll. B. K. Sharma; 4 examples, Sagmara, 11. 03. 2003,

coll. B. K. Sharma; 8 examples, Deepor, 14. 03. 2003, coll. B. K. Sharma; 5 examples, Deepor, 08. 02. 2005, coll. B. K. Sharma; 4 examples, Deepor, 06. 04. 2005, coll. Sumita Sharma; 8 examples, Dighali, 14. 03. 2003, coll. B. K. Sharma; 4 examples, Kamranga, 07. 05. 2004, coll. B. K. Sharma; 5 examples, Ghorajan, 08. 02. 2005, coll. B. K. Sharma; 4 examples, Siligurijan, 13. 01. 2003, coll. B. K. Sharma; 4 examples, Goranga, 10. 02. 2005, coll. B. K. Sharma; 3 examples, Solmari, 05. 04. 1005, coll. Sumita Sharma; 2 examples, Thekera, 06. 05. 2004, coll. B. K. Sharma; 2 examples, Kujibalipatty, 14. 03. 2003, coll. B. K. Sharma; 3 examples, Bandha, 03. 09. 2006, coll. Sumita Sharma; 3 examples, Padmakhua, 01. 09. 2006, coll. Sumita Sharma; 3 examples, Bhoismari, 02. 12. 2005, coll. Sumita Sharma; 3 examples, Mona, 01. 12. 2005, coll. Sumita Sharma; 3 examples, Kololua, 29. 11. 2005, coll. Sumita Sharma; 2 examples, Diang, 01. 12. 2005, coll. Sumita Sharma; 5 examples, Memdubi, 30. 11. 2005, coll. Sumita Sharma; 4 examples, Raidong, 30. 11. 2005, coll. Sumita Sharma; 5 examples, Dhekia, 18. 01. 2005, coll. B. K. Sharma; 5 examples, Samuajan, 18. 01. 2005, coll. B. K. Sharma; 3 examples, Puwa Saikia, 02. 03. 2004, coll. B. K. Sharma; 3 examples, Salchapra, 09. 02. 2005, coll. B. K. Sharma; 3 examples, Baskandi, 03. 01. 2004, coll. B. K. Sharma.

*Characters* : Carapace rounded in outline, considerably extended posteriorly; posterior corner with blunt angle or its posterior extremity with a short and obtuse protuberance located at level of axis of dorsal margin. Dorsal margin moderately to strongly arched, posterior part of dorsal margin with distinct denticles. Head small and rounded anteriorly. Eyes moderately large; ocellus large and elongated. Postabdomen broad, deeply emarginated; with about 10 anal spines decreasing proximally; supra-anal angles prominent. Claw long, curved and ciliated.

*Distribution* : INDIA - Assam, Meghalaya, Tripura, West Bengal, Nagaland, Bihar, Uttar Pradesh, Madhya Pradesh, Punjab, Kashmir, Rajasthan, Karnataka and Tamil Nadu.

*Elsewhere* : Europe, parts of Asia and Africa, and North and South America.

#### Family BOSMINIDAE Sars, 1865

*Characters* : Body high or short, usually oval or rounded in its outline. Antennules of female large and immovably fixed to head. Ocellus or abdominal processes not present. Intestine without loops or any hepatic caeca. Six pairs of legs present.

The family Bosminidae is represented by two genera in the examined collections.

#### Genus *Bosmina* Baird, 1845

*Characters* : Forms usually transparent; valves thin and postero-ventral corner of each valve with a spine (mucro). Antennules almost parallel to each other, curving backwards and fixed to head; olfactory setae lateral and usually near the base of each antennule. Antenna with three- and four-segmented rami. Postabdomen almost quadrate; anus terminal, anal denticles small and inconspicuous.

Only one species belonging to this genus is documented in the present account.

15. *Bosmina longirostris* (O. F. Müller, 1785)  
(Figs. 341-342)

**Material examined** : 6 examples, Dhir, 05. 05. 2002, coll. B. K. Sharma; 5 examples, Hakama, 02. 11. 2004, coll. B. K. Sharma; 6 examples, Horinchora, 03. 03. 2004, coll. B. K. Sharma; 5 examples, Fingua, 09. 01. 2003, coll. B. K. Sharma; 8 examples, Deepor, 11. 03. 2003, coll. B. K. Sharma; 9 examples, Deepor, 08. 02. 2005, coll. B. K. Sharma; 5 examples, Deepor, 06. 04. 2005, coll. Sumita Sharma; 8 examples, Dighali, 11. 01. 2003, coll. B. K. Sharma; 4 examples, Borbila, 15. 03. 2003, coll. B. K. Sharma; 6 examples, Ghorajan, 08. 02. 2005, coll. B. K. Sharma; 4 examples, Ghorajan, 06. 04. 2005, coll. Sumita Sharma; 4 examples, Hiragota, 10. 02. 2005, coll. B. K. Sharma; 3 examples, Urmal, 09. 12. 2004, coll. B. K. Sharma; 3 examples, Goranga, 10. 02. 2005, coll. B. K. Sharma; 5 examples, Solmari, 06. 02. 2004, coll. B. K. Sharma; 4 examples, Bandha, 06. 05. 2004, coll. B. K. Sharma; 4 examples, Haduk, 05. 04. 2005, coll. Sumita Sharma; 4 examples, Duptoli, 01. 09. 2006, coll. Sumita Sharma; 4 examples, Donga, 02. 12. 2005, coll. Sumita Sharma; 5 examples, Borbil-Tinsuki, 01. 12. 2005, coll. Sumita Sharma; 6 examples, Muijan, 29. 11. 2005, coll. Sumita Sharma; 4 examples, Hakoi, 29. 11. 2005, coll. Sumita Sharma; 5 examples, Mihir, 02. 12. 2005, coll. Sumita Sharma; 6 examples, Dhekia, 03. 04. 2005, coll. B. K. Sharma; 6 examples, Naruathan, 04. 04. 2005, coll. B. K. Sharma; 8 examples, Samuajan, 01. 03. 2004, coll. B. K. Sharma; 5 examples, Sone, 09. 02. 2005, coll. B. K. Sharma.

**Characters** : Body almost oval in outline. Postero-dorsal corner of valves distinctly angular, postero-ventral corner with a backwardly directed spine (mucro). Head large, broadly rounded and more or less arched in front of eyes. Small sensory seta situated nearer to eyes than to base of antennule. Antennules almost parallel to each other and curved; olfactory setae inserted near their bases. Postabdomen almost quadrate. Claw with proximal pecten of 3 - 6 spinules and distal pecten of 7 - 10 spines, continued distally into minute spinules.

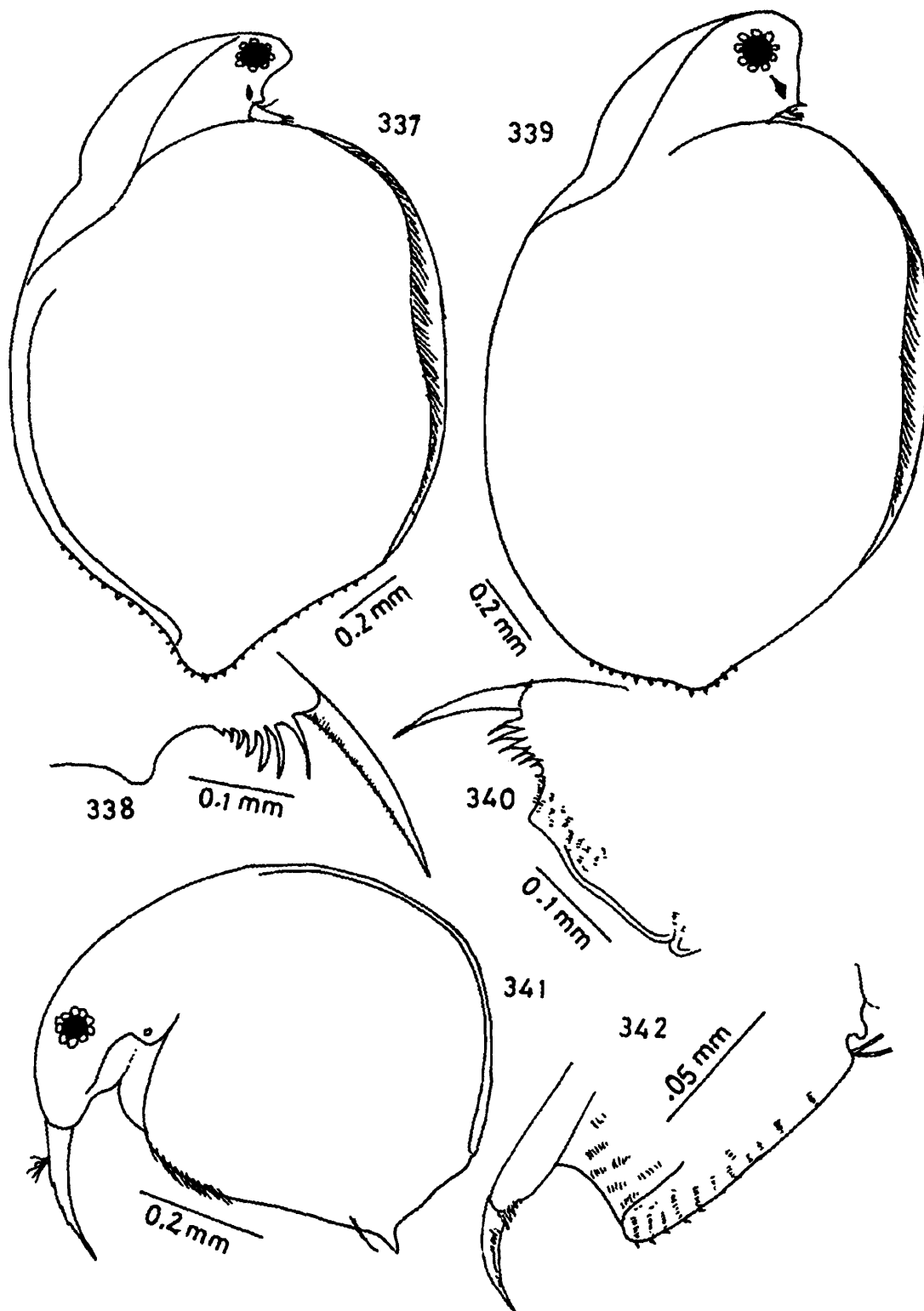
**Distribution** : INDIA - Assam, Meghalaya, West Bengal, Kashmir and Madhya Pradesh.

**Elsewhere** : Cosmopolitan.

Genus *Bosminopsis* Richard, 1895

**Characters** : Body oval or oblong in outline. Head large. Ocellus absent. Antennules united at base and diverging at apex, with sensory setae on ventral side of diverging portion. Postabdomen large and tapering at base of claws. Claws large and each with a basal spine. Intestine simple and broad in its anterior portion.

The material examined from the floodplain lakes of Assam includes only one species belonging to this genus.



*Simocephalus (Coronocephalus) serrulatus* (Koch) : Fig. 337, parthenogenetic female (lateral view), Fig. 338, postabdomen; *S. (s.str.) vetulus* (O.F.Müller): Fig. 339, parthenogenetic female (lateral view), Fig. 340, postabdomen; *Bosmina longirostris* (O. F. Muller): Fig. 341, parthenogenetic female (lateral view), Fig. 342, postabdomen.

16. *Bosminopsis deitersi* Richard, 1895  
(Figs. 343-344)

*Material examined* : 5 examples, Dhir, 11. 03. 2003, coll. B. K. Sharma; 4 examples, Hakama, 07. 02. 2005, coll. B. K. Sharma; 5 examples, Rowmari, 10. 01. 2003, coll. B. K. Sharma; 8 examples, Deepor, 08. 02. 2005, coll. B. K. Sharma; 4 examples, Deepor, 06. 04. 2005, coll. Sumita Sharma; 6 examples, Ghorajan, 04. 03. 2004, coll. B. K. Sharma; 3 examples, Bamoni, 01. 09. 2006, coll. Sumita Sharma; 3 examples, Basana, 03. 09. 2006, coll. Sumita Sharma; 4 examples, Thekera, 03. 12. 2005, coll. Sumita Sharma; 4 examples, Daphlang, 02. 12. 2005, coll. Sumita Sharma; 3 examples, Duptoli, 05. 04. 2005, coll. Sumita Sharma; 5 examples, Muijan, 29. 11. 2005, coll. Sumita Sharma; 3 examples, Diang, 01. 12. 2005, coll. Sumita Sharma; 4 examples, Kowaimari, 02. 12. 2005, coll. Sumita Sharma; 6 examples, Samuajan, 18. 01. 2005, coll. B. K. Sharma; 3 examples, Sone, 11. 12. 2004, coll. B. K. Sharma.

*Characters* : Body transparent, almost oval in outline. Postero-dorsal corners of valves distinct; postero-ventral corner of each valve with a small mucro-like projection and one or two spinules preceding it. Head very large, more or less broadly rounded dorsally, distinctly concave anteriorly and produced into a robust rostrum; with distinct supra-ocular depression. Antennules long, united at their bases; with about 5-6 sensory setae on ventral side near apex. Eyes moderately large, located in middle of head and close to its anterior margin. Postabdomen long and tapering distally; with about seven small spines on its post-anal edge, followed by a row of setae proximally. Claw large and with one large basal spine.

*Distribution* : INDIA - Meghalaya, Delhi, Rajasthan, Madhya Pradesh and Kerala.

*Elsewhere* : Pantropical.

Family MOINIDAE Goulden, 1968

*Characters* : Head prominent and with a pair of characteristic thin and long "cigarette-shaped" antennules. Postabdomen with a row of lateral teeth and one distal bident tooth. Claws smooth or with pectin. Abdominal processes lacking.

Two genera belong to the family Moinidae are recorded in the present study.

Genus *Moina* Baird, 1850

*Characters* : Body thick and heavy; valves thin, obscurely reticulated or striated, without any posterior spine. Antennules large, movable and arising from flat ventral surface of head; spindle-shaped and with a sensory setae on its anterior margin. Ocellus rarely present. Postabdomen with a bident tooth and with 16 lateral feathered teeth. Claw with or without pectin.

The collections examined from Assam include single species of the genus *Moina*.

17. *Moina micrura* Kurz, 1874  
(Figs. 345-346)

*Material examined* : 4 examples, Dhir, 09. 08. 2002, coll. B. K. Sharma; 4 examples, Hakama, 11. 07. 2004, coll. B. K. Sharma; 6 examples, Deepor, 07. 05. 2004, coll. B. K. Sharma; 4 examples, Ghorajan, 04. 03. 2004, coll. B. K. Sharma; 5 examples, Padma, 06. 03. 2004, coll. B. K. Sharma; 3 examples, Jugdal, 05. 04. 2005, coll. Sumita Sharma; 2 examples, Lotha, 01. 09. 2006, coll. Sumita Sharma; 3 examples, Karasing, 05. 09. 2006, coll. Sumita Sharma; 4 examples, Baghmari, 06. 09. 2006, coll. Sumita Sharma; 4 examples, Kutri, 03. 12. 2005, coll. Sumita Sharma; 6 examples, Samuajan, 11. 06. 2004, coll. B. K. Sharma; 4 examples, Salchapra, 08. 08. 2004, coll. B. K. Sharma.

*Characters* : Valves oblong and reticulated; ventral margin of valves with 11 - 25 long setae followed by groups of short setae on posterior margin. Head large and with a well developed supra-ocular depression. Antennules long, thin and with a long basal seta; originating well behind eyes. Postabdomen short, slender and with distinct conical part; with a bident tooth and 5-9 feathered teeth, decreasing in size proximally. Claw long and curved, its ventral base with 3 - 7 "basal dorn"; with setae on its concave margin; proximal setae larger and forming a distinct pecten.

*Distribution* : INDIA - Assam, Meghalaya, Tripura, West Bengal, Bihar, Punjab, Haryana, Rajasthan, Nilgiri Hills, Tamil Nadu and little Andaman.

*Elsewhere* : apparently Cosmopolitan.

Genus *Moinodaphnia* Herrick, 1887

*Characters* : Body compressed; valves quadrate, crested dorsally and very slightly angled above. Head strongly arched and angled in front; ocellus present. Antennules long and movable. Antennae with long, un-jointed spines on apical segment of four-segmented ramus. One large abdominal process present. Postabdomen with slender post-anal projection and bearing bident distally.

Only one species of this genus is documented in the present study.

18. *Moinodaphnia macleayi* (King, 1853)  
(Figs. 347-348)

*Material examined* : 4 examples, Bhoispuri, 07. 01. 2003, coll. B. K. Sharma; 3 examples, Horinchora, 02. 11. 2004, coll. B. K. Sharma; 5 examples, Deepor, 04. 03. 2004, coll. B. K. Sharma; 3 examples, Ghorajan, 03. 11. 2004, coll. B. K. Sharma; 3 examples, Chatla, 09. 12. 2004, coll. B. K. Sharma; 3 examples, Borbil-Tinsuki, 01. 12. 2005, coll. Sumita Sharma; 4 examples, Muijan, 29. 11. 2005, coll. Sumita Sharma; 3 examples, Mora Daphlang, 03. 12. 2005, coll. Sumita Sharma; 5 examples, Naruathan, 19. 01. 2005, coll. B. K. Sharma; 3 examples, Salchapra, 09. 02. 2005, coll. B. K. Sharma.

**Characters** : Body large and compressed. Head small and sub-triangular in shape; eyes large and filling frontal part of head, ocellus present. Antennules elongated, thin and movable. Three apical long swimming setae on last exopodite segment of antenna and one rather long spine (modified seta). Carapace rounded and with a slight dorsal keel. Abdominal process large and horse-shoe shaped. Postabdomen elongated distally, with 7-10 feathered teeth and a distinct bident tooth; claw distinct and with setae on concave margin.

**Distribution** : INDIA- Meghalaya, West Bengal, Bihar and Kerala.

**Elsewhere** : Tropical and subtropical regions of America, Africa and Southeast Asia.

#### Family MACROTHRICIDAE Norman and Brady, 1867

**Characters** : Head well marked, valves often crested. Antennule one-segmented and attached to ventro-anterior side of the head. Antenna with 4-segmented exopod and 3-segmented endopod; distal segments of antennal branches elongated. Labrum usually with a keel or marked projection. Eyes and ocellus present. Intestine simple or convoluted. Postabdomen marked off from body; large and of various forms but not widely semicircular; no long lateral setae on distal part of postabdomen. Five pairs of thoracic legs present.

Three genera of the family Macrothricidae are represented in the studied material.

#### Genus *Macrothrix* Baird, 1843

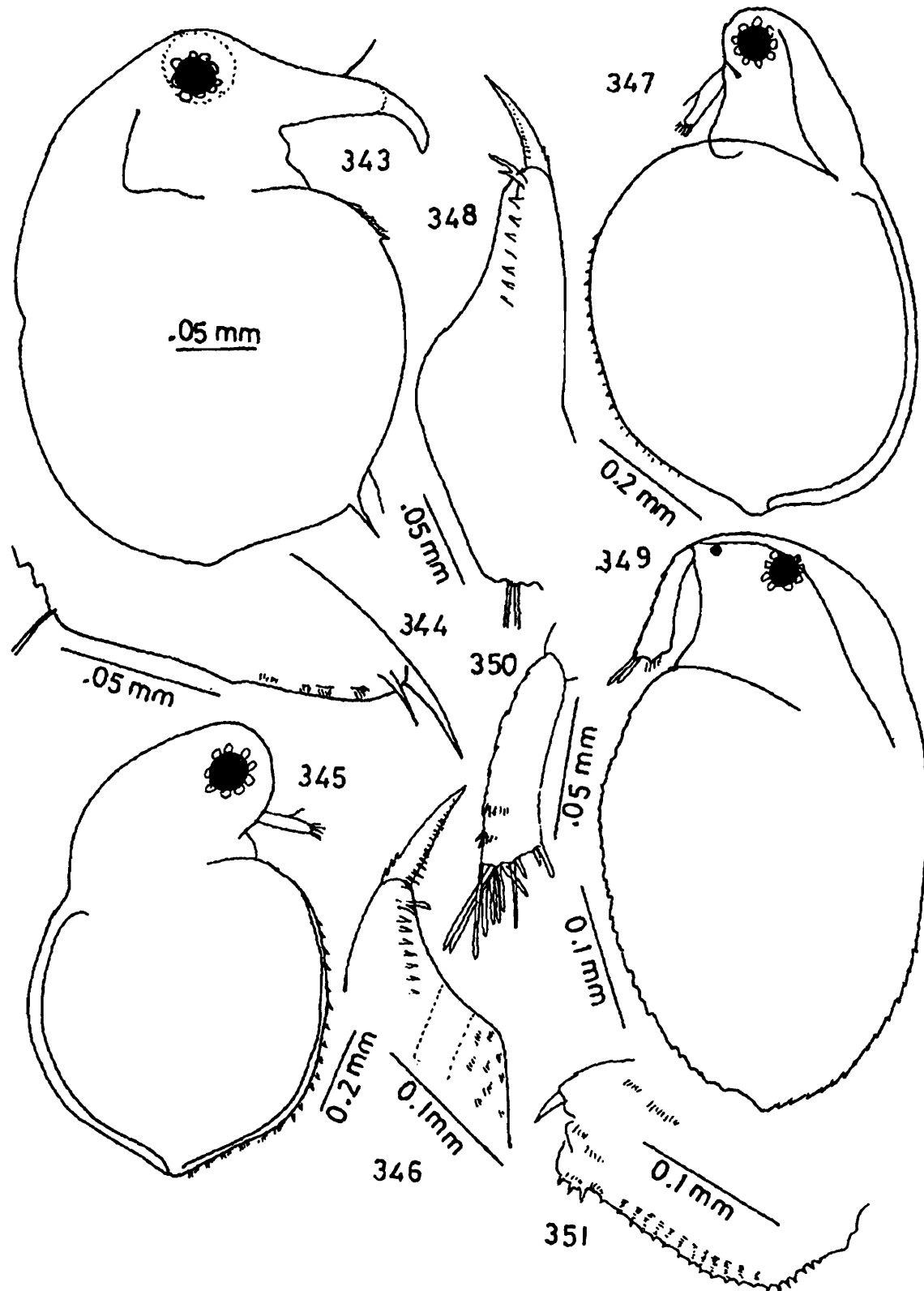
**Characters** : Body slightly compressed and with a dorsal crest. Head large, usually not depressed; rostrum short. Antennules large and located at tip of rostrum. Antennal setae : 0-0-1-3 / 1-1-3; basal seta of three-segmented ramus stout and stiff. Ventral margin of valves with long, stout and movable bristles. Postabdomen small and often bilobed; claw small. Intestine without loops and caeca. Five pairs of legs present, exopodite of leg IV with 2-3 setae.

The collections examined from Assam include four species of this genus.

#### 19. *Macrothrix laticornis* (Jurine, 1820)

(Figs. 349-351)

**Material examined** : 5 examples, Barundanga, 08. 08. 2002, coll. B. K. Sharma; 6 examples, Dhir, 05. 05. 2002, coll. B. K. Sharma; 5 examples, Hakama, 06. 05. 2004, coll. B. K. Sharma; 5 examples, Horinchora, 11. 07. 2004, coll. B. K. Sharma; 8 examples, Deepor, 12. 08. 2002, coll. B. K. Sharma; 8 examples, Deepor, 07. 05. 2004, coll. B. K. Sharma; 4 examples, Deepor, 06. 04. 2005, coll. Sumita Sharma; 4 examples, Ghorajan, 12. 07. 2004, coll. B. K. Sharma; 4 examples, Kakerikhola, 09. 05. 2004, coll. B. K. Sharma; 5 examples, Kujibalipatty, 14. 03. 2003, coll. B. K. Sharma; 3 examples, Duptoli, 01. 09. 2006, coll. Sumita Sharma; 3 examples, Kanduli, 05. 04. 2005, coll. Sumita Sharma; 4 examples, Dubratoli, 03. 09. 2006, coll. Sumita Sharma; 4 examples, Padmakhua, 01. 09. 2006, coll. Sumita



*Bosminopsis deitersi* (Richard) : Fig. 343, parthenogenetic female (lateral view), Fig. 344, postabdomen; *Moina micrura* Kurz : Fig. 345, parthenogenetic female (lateral view), Fig. 346, postabdomen; *Moinodaphnia macleayi* (King) : Fig. 347, parthenogenetic female (lateral view), Fig. 348, postabdomen; *Macrothrix laticornis* (Fischer) : Fig. 349, parthenogenetic female (lateral view), Fig. 350, antennule, Fig. 351, postabdomen.

Sharma; 4 examples, Sarang, 03. 09. 2006, coll. Sumita Sharma; 4 examples, Bhoismari, 02. 12. 2005, coll. Sumita Sharma; 3 examples, Moona, 02. 12. 2005, coll. Sumita Sharma; 5 examples, Muijan, 29. 11. 2005, coll. Sumita Sharma; 3 examples, Kololua, 29. 11. 2005, coll. Sumita Sharma; 5 examples, Maghuri, 30. 11. 2005, coll. Sumita Sharma; 6 examples, Dhekia, 03. 04. 2005, coll. B. K. Sharma; 4 examples, Batua, 17. 01. 2005, coll. B. K. Sharma; 6 examples, Samuajan, 01. 03. 2004, coll. B. K. Sharma; 5 examples, Puwa Saikia, 17. 01. 2005, coll. B. K. Sharma; 4 examples, Baskandi, 19. 10. 2004, coll. B. K. Sharma.

**Characters** : Body broadly oval; valves crested, reticulated, with distinct serrations in postero-dorsal corner and with a small posterior protuberance. Head evenly arched, its ventral margin straight; head shield widening gently from tip of rostrum onwards, head pore large. Antennules broadening apically and with distinct ventral angulation; anterior margin with several fine incisions and rows of hairs. Labrum with large triangular process. Eyes very near to margin of head. Postabdomen broad, not bilobed, with numerous fine spines and hairs. Claw small and with setae on its concave margin.

**Distribution** : INDIA - Meghalaya, Ladak, West Bengal, Tamil Nadu and Kerala.

**Elsewhere** : Holarctic, Neotropical and Oriental regions.

## 20. *Macrothrix odiosa* (Gurney, 1907)

(Figs. 352-354)

**Material examined** : 4 examples, Barundanga, 12. 03. 2003, coll. B. K. Sharma; 5 examples, Deepor, 08. 02. 2005, coll. B. K. Sharma; 4 examples, Ghorajan, 03. 11. 2004, coll. B. K. Sharma; 3 examples, Kujibalipatty, 11. 01. 2003, coll. B. K. Sharma; 3 examples, Padmakhua, 01. 09. 2006, coll. Sumita Sharma; 3 examples, Shitalpathar, 01. 12. 2005, coll. Sumita Sharma; 5 examples, Raidong, 30. 11. 2005, coll. Sumita Sharma; 3 examples, Baskandi, 03. 01. 2004, coll. B. K. Sharma.

**Characters** : Body oval in outline; head slightly delimited dorsally from rest of the body. Dorsal outline of shell smooth, posterior outline of valves widely oval; posterior dorsal corner just noticeable. Ventral margin of head with a semispherical protuberance behind base of antennules. Antennule of equal width along its length. Postabdomen sub-quadrangular, its distal side truncated; preanal part setaceous, post-anal part with row of anal spines. Notatory setae with short distal segment. Claw short and curved.

**Distribution** : INDIA - Bihar and Rajasthan.

**Elsewhere** : India, Sri Lanka, Africa, Sunda Islands, Madagascar, South Europe.

## 21. *Macrothrix spinosa* King, 1853

(Figs. 355-357)

**Material examined** : 5 examples, Bhoispuri, 07. 01. 2003, coll. B. K. Sharma; 4 examples, Barundanga, 11. 02. 2002, coll. B. K. Sharma; 5 examples, Dhir, 11. 03. 2003, coll. B. K.

Sharma; 3 examples, Hakama, 07. 02. 2005, coll. B. K. Sharma; 4 examples, Horinchora, 03. 03. 2004, coll. B. K. Sharma; 4 examples, Kamakhya, 13. 03. 2003, coll. B. K. Sharma; 7 examples, Deepor, 11. 03. 2003, coll. B. K. Sharma; 6 examples, Deepor, 08. 02. 2005, coll. B. K. Sharma; 3 examples, Goranga, 10. 02. 2005, coll. B. K. Sharma; 2 examples, Daphlang, 02. 12. 2005, coll. Sumita Sharma; 3 examples, Japara, 01. 12. 2005, coll. Sumita Sharma; 2 examples, Diang, 01. 12. 2005, coll. Sumita Sharma; 4 examples, Memdubi, 30. 11. 2005, coll. Sumita Sharma; 4 examples, Samuajan, 18. 01. 2005, coll. B. K. Sharma; 3 examples, Sone, 09. 02. 2005, coll. B. K. Sharma; 3 examples, Salchapra, 08. 08. 2004, coll. B. K. Sharma; 3 examples, Baskandi, 03. 01. 2004, coll. B. K. Sharma.

*Characters* : Body rounded oval; dorsal margin of head and carapace serrated; dorsal outline of body evenly convex and squamose. Head laterally depressed in rostral region and abruptly widened at level of compound eye; its ventral margin straight. Dorsal head pore small, transversally oval. Antennules distally dilated, with 7-9 serrated dorsal notches along dorsal margin and two subapical rows of setules. Labrum with apical, obtusely pointed protuberance. Valves distinctly reticulated and with narrow dorsal keel. Postabdomen with several rows of strong spinules and with groups of setules around anus and near apex. Claws short and finely ciliated along concave margin. Notatory setae with short distal portion carrying long, bristle-like setae.

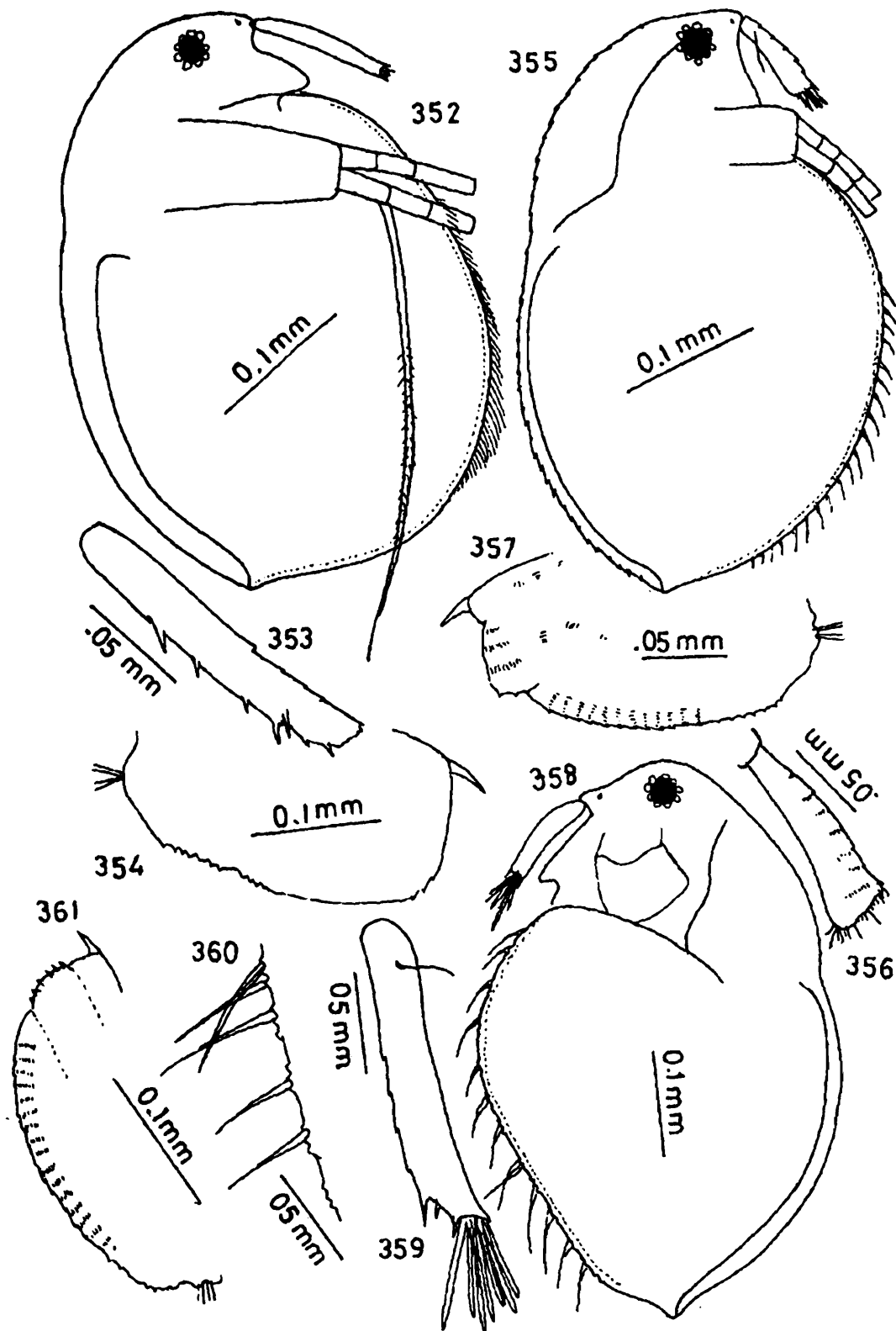
*Distribution* : INDIA - Meghalaya, Tripura, Manipur Rajasthan, Tamil Nadu, Andaman & Nicobar islands.

*Elsewhere* : Circumtropical and circum-subtropical.

## 22. *Macrothrix triserialis* (Brady, 1886)

(Figs. 358-361)

*Material examined* : 5 examples, Bhoispuri, 03. 05. 2003, coll. B. K. Sharma; 6 examples, Barundanga, 0. 08. 2002, coll. B. K. Sharma; 4 examples, Dhir, 05. 05. 2002, coll. B. K. Sharma; 4 examples, Hakama, 11. 07. 2004, coll. B. K. Sharma; 9 examples, Deepor, 08. 05. 2002, coll. B. K. Sharma; 7 examples, Deepor, 07. 05. 2004, coll. B. K. Sharma; 4 examples, Deepor, 06. 04. 2005, coll. Sumita Sharma; 4 examples, Dighali, 12. 08. 2002, coll. B. K. Sharma; 4 examples, Borbila, 09. 05. 2002, coll. B. K. Sharma; 5 examples, Kamranga, 10. 02. 2005, coll. B. K. Sharma; 6 examples, Ghorajan, 09. 09. 2004, coll. B. K. Sharma; 2 examples, Padma, 11. 02. 2005, coll. B. K. Sharma; 2 examples, Goranga, 10. 02. 2005, coll. B. K. Sharma; 4 examples, Sitalmari, 09. 05. 2004, coll. B. K. Sharma; 4 examples, Thekera, 08. 11. 2004, coll. B. K. Sharma; 3 examples, Donga, 06. 09. 2006, coll. Sumita Sharma; 3 examples, Japara, 01. 12. 2005, coll. Sumita Sharma; 3 examples, Hakoi, 29. 11. 2005, coll. Sumita Sharma; 4 examples, Sarain Hubbi, 29. 11. 2005, coll. Sumita Sharma; 3 examples, Bor beel, 01. 12. 2005, coll. Sumita Sharma; 3 examples, Kutri, 06. 09. 2006, coll. Sumita Sharma; 5 examples, Maghuri, 30. 11. 2005, coll. Sumita Sharma; 4 examples, Dhekia, 03. 04. 2005, coll. B. K. Sharma; 5 examples, Samuajan, 18. 01. 2005, coll. B. K. Sharma; 3 examples, Sone, 09. 02. 2005, coll. B. K. Sharma; 3 examples, Baskandi, 03. 01. 2004, coll. B. K. Sharma.



*Macrothrix odiosa* (Gurney) : Fig. 352, parthenogenetic female (lateral view), Fig. 353, antennule, Fig. 354, postabdomen; *M. spinosa* King: Fig. 355, parthenogenetic female (lateral view), Fig. 356, antennule, Fig. 357, postabdomen; *M. triselialis* (Brady): Fig. 358, parthenogenetic female (lateral view), Fig. 359, antennule, Fig. 360, valve (ventral margin), Fig. 361, postabdomen.

*Characters* : Body almost oval; dorsal margin slightly arched, ventral margin strongly arched and posterior angle distinctly produced. Valves reticulate, dorsal margin of valves with serrations particularly in posterior region; ventral margin with serrations and bristles, bristles arranged in groups of three along postero-ventral margin. Head large, moderately arched and with a conspicuous ridge over its edges; ventral edge without prominence. Eyes large and ocellus small. Antennules cylindrical; anterior margin with notches, a sensory seta located near base and olfactory setae unequal. Postabdomen large, not bilobed and with anal spines on both lobes; lateral setae arranged in transverse rows. Notatory setae with a very short distal segment. Claw short and curved.

*Distribution* : INDIA - Meghalaya, Tripura, West Bengal, Bihar, Rajasthan, Kerala and little Andaman.

*Elsewhere* : Pantropical and subtropical.

#### Genus *Grimaldina* Richard, 1892

*Characters* : Body broadly oval; head not separated. Antenna rod-like. Antennal seta: 0-0-1-3 / 1-1-3. Postabdomen wide. Intestine without convolutions. Hepatic caeca very small. Five pairs of thoracic legs present. Exopodite of leg IV with 4 setae.

This genus is represented by only one species and the same is also recorded in the present study.

#### 23. *Grimaldina brazzai* Richard, 1892

(Figs. 362-364)

*Material examined* : 4 examples, Deepor, 08.02.2005, coll. B. K. Sharma; 4 examples, Basana, 03. 09. 2006, coll. Sumita Sharma; 3 examples, Teliadanga, 01. 12. 2005, coll. B. K. Sharma.

*Characters* : Body broadly oval in outline. Head and valves slightly squamose. Head not separated from body; ventral margin of head with an outgrowth at the base of the antennule. Antennule rod-like, not dilated distally. Posterior dorsal and ventral corners of valves broadly rounded. Postabdomen wide; pre-anal part divided by a deep depression. Notatory setae with long distal segment. A group of denticles present at the distal side of anal aperture and a large sigmoid tooth present at the posterior side of the anal aperture; preanal margin with teeth. Claw large and curved.

*Distribution* : INDIA - Rajasthan and West Bengal.

*Elsewhere* : Circumtropical.

#### Genus *Guernella* Richard, 1892

*Characters* : Body almost rounded in outline; head not delimited. Antennule thick, with transverse groups of setae. Antennal setae: 0-1-1-3/1-1-3. Postabdomen widely oval. Intestine without convolutions. Five pairs of thoracic legs present. Exopodite of leg IV with 4 setae.

This monotypic genus is represented by only single species; the same is also noticed in the material examined from the floodplain lakes of Assam.

24. *Guernella raphaelis* Richard, 1892  
(Figs. 365-367)

*Material examined* : 4 examples, Japara, 01. 12. 2005, coll. Sumita Sharma; 4 examples, Raidong, 30. 11. 2005, coll. Sumita Sharma.

*Characters* : Carapace small and oval in outline; valves with reticulations. Head broad, with distinct eye and small ocellus. Head with shallow embayment at apex for insertion of antennules, rostral margin broad. Well developed fornix along head-shield and over antenna. Antennules short and robust, with incisions and serrulations on anterior margin. Antennae weak, with fine and short swimming setae. Postabdomen small, tapering distally and with transverse row of spinules. Claw short.

*Distribution* : INDIA - Meghalaya, West Bengal, Bihar and Rajasthan.

*Elsewhere* : Circumtropical.

Family ILYOCRYPTIDAE Smirnov, 1992

*Characters* : Head small. Antennules 2-segmented. Antennae with 4-segmented exopod and 3-segmented endopod. Valves with distinct marginal setae. Postabdomen wide and semicircular; distal part with long lateral setae and shorter margin anal teeth, and proximal part with long teeth. Claw long, with two thin basal spines.

This family is represented by single genus; the same is also recorded in the present account.

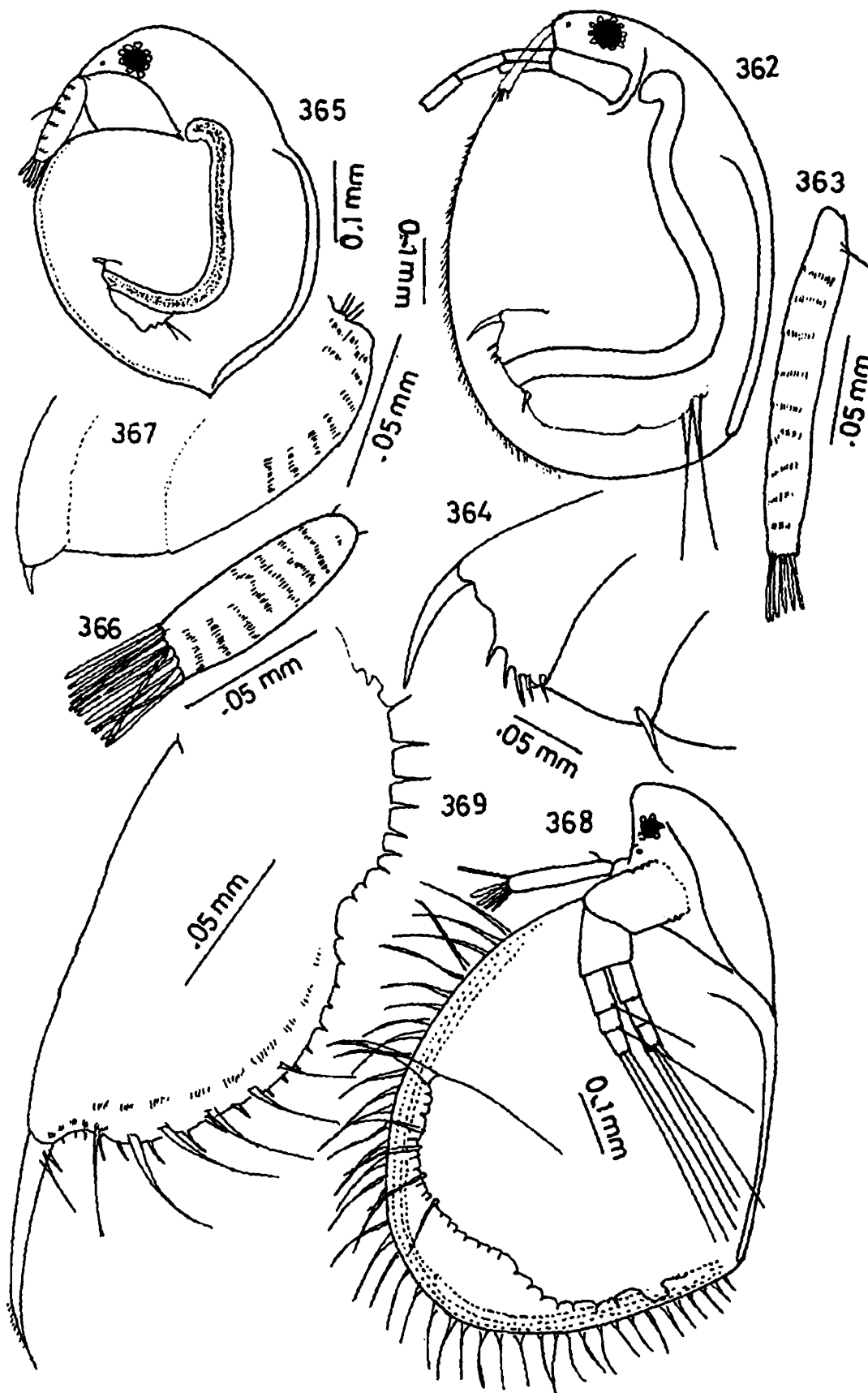
Genus *Ilyocryptus* Sars, 1862

*Characters* : Head with a keel; dorsal crest on valves absent or small. Vertex of head forming a sharp angle in front of insertion of antennules. Antennules long and biarticulate. Antennal setae:0-0-0-3 / 1-1-3. Abdominal process long and tongue shaped. Intestine without loops and enlarged near rectum; hepatic caeca present. Postabdomen large, broad and compressed; with numerous long spines.

Only one species belonging to this genus is reported in the collections examined from Assam.

25. *Ilyocryptus spinifer* Herrick, 1882  
(Figs. 368-369)

*Material examined* : 3 examples, Barundanga, 07. 01. 2003, coll. B. K. Sharma; 3 examples, Dhir, 11. 03. 2003, coll. B. K. Sharma; 4 examples, Horinchora, 06. 05. 2004, coll. B. K. Sharma; 4 examples, Deepor, 04. 03. 2004, coll. B. K. Sharma; 3 examples, Ghorajan, 07.



*Grimaldina brazzai* Richard : Fig. 362, parthenogenetic female (lateral view), Fig. 363, antennule, Fig. 364, postabdomen; *Guernella raphaelis* Richard: Fig. 365, parthenogenetic female (lateral view), Fig. 366, antennule, Fig. 367, postabdomen; *Ilyocryptus spinifer* Herrick: Fig. 368, parthenogenetic female (lateral view), Fig. 369, postabdomen.

05. 2004, coll. B. K. Sharma; 2 examples, Siligurijan, 12. 03. 2003, coll. B. K. Sharma; 2 examples, Padma, 06. 03. 2004, coll. B. K. Sharma; 3 examples, Kujibalipatty, 14. 03. 2003, coll. B. K. Sharma; 2 examples, Shitalpathar, 01. 12. 2005, coll. Sumita Sharma; 2 examples, Itakhuli, 01. 12. 2005, coll. Sumita Sharma; 2 examples, Mona, 01. 12. 2005, coll. Sumita Sharma; 4 examples, Memdubi, 30. 11. 2005, coll. Sumita Sharma; 3 examples, Raidong, 30. 11. 2005, coll. Sumita Sharma; 3 examples, Dhekia, 03. 04. 2005, coll. B. K. Sharma; 2 examples, Baskandi, 09. 02. 2005, coll. B. K. Sharma.

*Characters* : Body oval-triangular in outline. Posterior and ventral margin of valves rounded into each other. Valves dilated; with long, branched and feathered setae along ventral and posterior margins. Head small and triangular, with a keel starting from anterior rim of head and extending up to its back. Eyes relatively small and located near anterior produced margin of head; ocellus small. Antennules long, biarticulate and attached to ventral side of head behind vertex. Antennal setae very long. Postabdomen large, broad, with 5-7 pre-anal spines and 4-8 post-anal lateral spines situated in a row; anus opening in depression on dorsal margin of postabdomen. Claw long, slightly curved and with two unequal basal spines.

*Distribution* : INDIA - Meghalaya, Tripura, West Bengal, Rajasthan, Kerala and little Andaman.

*Elsewhere* : Pantropical, also recorded from USA, China, Australia and Cuba.

#### Family CHYDORIDAE Stebbing, 1902

*Characters* : Forms generally oval or rounded in outline, completely enclosed by a shell and head shield. Head shield with pores, with rare exceptions. Antennules one-segmented, movable and generally not extending beyond the tip of rostrum. Antennae short, rami three-segmented; antennal setae: 0-0-3 / 0-1-3 or 0-0-3 / 1-1-3. Labrum with an expanded and ventrally projecting plate; differs in shape in different species. Ocellus present. Intestine forming loops. Postabdomen with anal spines; also with lateral seta in some species. Five or six pairs of legs present.

#### Subfamily CHYDORINAE Stebbing, 1902

*Characters* : Height of body slightly larger than width. Horizontal keels present in some species. Mandibles articulated with head shield at some distance from its margin. Head pores separated and situated in median line of head shield; two small pores present between main pores, small pores without canals. Anus situated in proximal part of postabdomen. Claw with two basal spines in most species; with only one basal spine in some species. Hepatic caece absent. Five or six pairs of legs present. Leg VI, if present, without epipodite.

Eight genera of the Chydorinae are represented in the sampled collected from the floodplain lakes of Assam.

Genus *Alonella* Sars, 1862

*Characters* : Body almost oval, reticulations of valves in form of polygons or lines. Setae situated on ventral margin of valves but not on their inner side. Antennules extending behind apex of rostrum or projecting beyond it. Antennal setae: 0-0-3/0-1-3. Head pores situated near posterior margin of head shield; distance of head pores to posterior margin of head shield less than distance between main pores. Five pairs of legs present.

This genus is represented by two species in the present account.

**26. *Alonella excisa* (Fischer, 1854)**  
(Figs. 370-371)

*Material examined* : 4 examples, Barundanga, 12. 03. 2003, coll. B. K. Sharma; 3 examples, Hakama, 03. 03. 2004, coll. B. K. Sharma; 5 examples, Deepor, 04. 03. 2004, coll. B. K. Sharma; 3 examples, Borbila, 15. 03. 2003, coll. B. K. Sharma; 3 examples, Kamranga, 01. 02. 2005, coll. B. K. Sharma; 3 examples, Siligurijan, 09. 05. 2002, coll. B. K. Sharma; 4 examples, Hiragota, 05. 03. 2004, coll. B. K. Sharma; 3 examples, Kakerikhola, 09. 05. 2004, coll. B. K. Sharma; 2 examples, Basana, 03. 09. 2006, coll. Sumita Sharma; 2 examples, Goranga, 01. 09. 2006, coll. Sumita Sharma; 3 examples, Mohna, 03. 09. 2006, coll. Sumita Sharma; 2 examples, Demon, 01. 12. 2005, coll. Sumita Sharma; 2 examples, Kololua, 29. 11. 2005, coll. Sumita Sharma; 2 examples, Diang, 01. 12. 2005, coll. Sumita Sharma; 4 examples, Raidong, 30. 11. 2005, coll. Sumita Sharma; 4 examples, Samuajan, 09. 02. 2005, coll. B. K. Sharma.

*Characters* : Body almost oval in outline, posterior margin of valves straight. Postero-dorsal corner distinct; postero-ventral corner with one blunt denticle and with a row of setae on inner side of posterior margin. Valves with longitudinal lines formed by polygons; fine longitudinal lines and dots inside each polygon. Rostrum moderately long, blunt and ventrally directed. Head shield with rounded posterior margin. Antennules with a sensory seta distal to middle of margin. Labral plate with distinctly convex anterior margin and more or less blunt apex. Ocellus slightly nearer to eye than to apex of rostrum. Postabdomen short, with about 10 anal spines, anal margin with setae; preanal corner blunt. Claw with two basal spines.

*Distribution* : INDIA - Meghalaya, Tripura, Kashmir, Uttar Pradesh, Bihar and Kerala.

*Elsewhere* : Cosmopolitan.

**27. *Alonella nana* (Baird, 1850)**  
(Figs. 372-373)

*Material examined* : 3 examples, Jogra, 10. 08. 2002, coll. B. K. Sharma; 2 examples, Memdubi, 30. 11. 2005, coll. Sumita Sharma.

*Characters* : Body oval to globose in outline, posterior margin straight; postero-ventral corner of valves with one or sometimes two posteriorly directed denticles. Lines of valves

directed antero-ventrally and postero-dorsally. Rostrum moderately long. Head shield with rounded posterior margin. Antennules with a sensory seta distal to middle of posterior margin. Labral plate with pointed apex. Ocellus nearer to eye than to apex of rostrum. Postabdomen short, with about six marginal anal spines; pre-anal corner strongly projecting. Claw with two basal spines.

*Distribution* : INDIA - Meghalaya and Kashmir.

*Elsewhere* : Cosmopolitan.

### Genus *Chydorus* Leach, 1816

*Characters* : Body ovate to spherical in outline; posterior part of ventral margin of valves with setae on inner surface. Antennules not reaching apex of rostrum. Antennal setae: 0-0-3 / 0 (1)-1-3. Head shield with two separate main pores and two small pores between them; head pores absent in some species. Ocellus smaller than eye. Intestine with a caecum. Postabdomen usually broad, rarely long and narrow; with anal spines or rarely with fine lateral setae. Claw with two basal spines; proximal basal spine often minute, rarely absent.

The collections examined from the floodplain lakes of Assam indicate four species belonging to this genus.

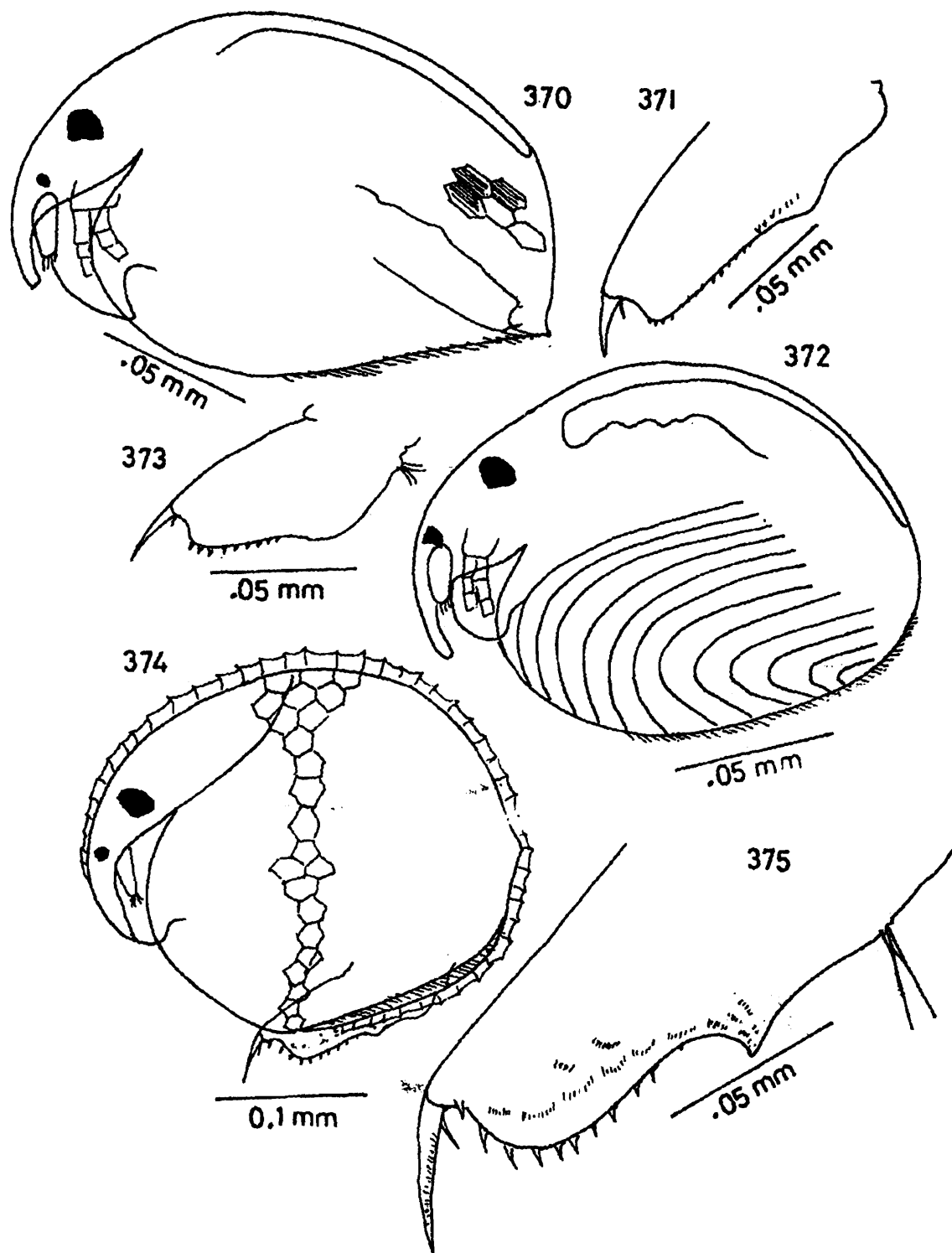
#### 28. *Chydorus faviformis* Birge, 1893 (Figs. 374-375)

*Material examined* : 4 examples, Barundanga, 12. 03. 2003, coll. B. K. Sharma; 4 examples, Horinchora, 06. 05. 2004, coll. B. K. Sharma; 3 examples, Siligurijan, 12. 02. 2003, coll. B. K. Sharma; 2 examples, Urmal, 08. 05. 2004, coll. B. K. Sharma; 3 examples, Bamoni, 01. 09. 2006, coll. Sumita Sharma; 5 examples, Deepor, 04. 03. 2004, coll. B. K. Sharma; 3 examples, Sitalmari, 05. 04. 2005, coll. Sumita Sharma; 3 examples, Ghorkhonjan, 05. 03. 2005, coll. B. K. Sharma; 2 examples, Borbil-Tinsuki, 01. 12. 2005, coll. Sumita Sharma; 3 examples, Mihir, 05. 09. 2006, coll. Sumita Sharma; 3 examples, Salchapra, 09. 02. 2005, coll. B. K. Sharma.

*Characters* : Body broadly rounded in outline; postero-dorsal and postero-ventral corners of valves not distinct. Valves and head shield with deep polygonal cells. Head shield with rounded posterior margin; head pores typical of the subfamily. Antennules not reaching apex of rostrum, Labral plate with convex anterior margin and pointed apex. Ocellus situated almost midway between eye and apex of rostrum. Postabdomen wide and with rounded apex; with 9-10 anal spines and groups of lateral setae. Claw with two basal spines and setae on its concave margin.

*Distribution* : INDIA - Meghalaya, Tripura and Kashmir.

*Elsewhere* : Cosmotropical.



*Alonella excisa* (Fischer) : Fig. 370, parthenogenetic female (lateral view), Fig. 371, postabdomen; *A. nana* (Baird) : Fig. 372, parthenogenetic female (lateral view), Fig. 373, postabdomen; *Chydorus faviformis* Birge: Fig. 374, parthenogenetic female (lateral view), Fig. 375, postabdomen.

29. *Chydorus pubescens* Sars, 1901  
(Figs. 376-377)

**Material examined** : 3 examples, Hakama, 02. 11. 2004, coll. B. K. Sharma; 2 examples, Bamoni, 01. 09. 2006, coll. Sumita Sharma; 3 examples, Raidong, 30. 11. 2005, coll. Sumita Sharma; 3 examples, Salchapra, 05. 04. 2005, coll. B. K. Sharma.

**Characters** : Body almost globular; valves reticulated and covered with diagnostic velvet-like coating of short, stiff setules. Head with sharply pointed rostrum; head-shield with apical notch and doubled anterior rim. Antennules short and tapering distally; terminal setae reaching rostrum apex. Labral plate broadly rounded, with thin antero-dorsal keel. Postabdomen slightly tapering distally, with 8-10 marginal anal spines increasing distally and groups of lateral setae; with distinct preanal corner. Claw with two basal spines and setae on concave margin.

**Distribution** : INDIA - Assam, Meghalaya, Tripura, Bihar and West Bengal.

**Elsewhere** : Cosmotropical.

30. *Chydorus reticulatus* Daday, 1898  
(Figs. 378-379)

**Material examined** : 3 examples, Horinchora, 03. 03. 2004, coll. B. K. Sharma; 5 examples, Deepor, 07. 05. 2004, coll. B. K. Sharma; 3 examples, Basana, 03. 09. 2006, coll. B. K. Sharma; 3 examples, Kandhi, 01. 09. 2006, coll. Sumita Sharma; 2 examples, Sesa, 01. 12. 2005, coll. Sumita Sharma; 3 examples, Sohala, 05. 09. 2006, coll. Sumita Sharma; 4 examples, Mihir, 05. 09. 2006, coll. Sumita Sharma.

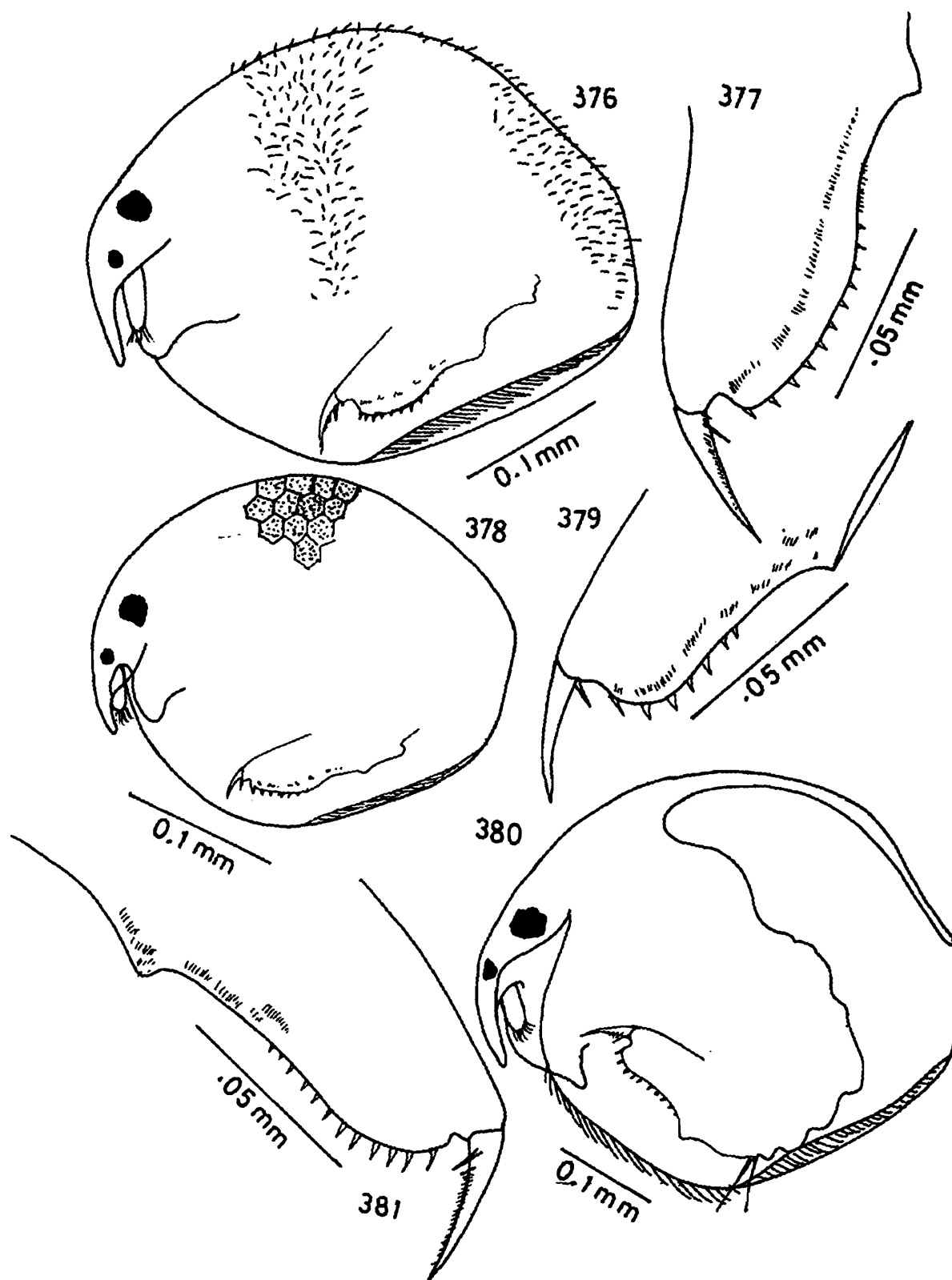
**Characters** : Body broadly oval in outline; postero-dorsal corner of valves well marked. Valves reticulated; boundaries of polygons build low vertical walls. Head shield with blunt tip of rostrum. Labral plate oval, with blunt apex. Antennal setae: 0-0-3 / 0-1-3; spines: 0-0-1/ 0-0-1. Postabdomen short with distinct pre-anal corner; with 7-10 anal teeth and lateral setae in crescentic groups. Claw with two basal spines and setae on its concave margin.

**Distribution** : INDIA - Tripura and Tamil Nadu.

**Elsewhere** : Sri Lanka, Malaysia, Thailand.

31. *Chydorus sphaericus* (O.F. Müller, 1776)  
(Figs. 380-381)

**Material examined** : 5 examples, Bhoispuri, 12. 03. 2003, coll. B. K. Sharma; 4 examples, Barundanga, 03. 05. 2002, coll. B. K. Sharma; 8 examples, Dhir, 05. 05. 2002, coll. B. K. Sharma; 5 examples, Hakama, 11. 07. 2004, coll. B. K. Sharma; 4 examples, Horinchora, 08. 09. 2004, coll. B. K. Sharma; 4 examples, Fingua, 06. 05. 2002, coll. B. K. Sharma; 4 examples, Sagmara, 10. 08. 2002, coll. B. K. Sharma; 5 examples, Kamakhya, 11. 08. 2002, coll. B. K. Sharma; 5 examples, Rowmari, 13.03. 2003, coll. B. K. Sharma; 6 examples, Deepor, 08. 05.



*Chydorus pubescens* Sars : Fig. 376, parthenogenetic female (lateral view), Fig. 377, postabdomen; *C. reticulatus* Daday : Fig. 378, parthenogenetic female (lateral view), Fig. 379, postabdomen; *C. sphaericus* (O. F. Muller) : Fig. 380, parthenogenetic female (lateral view), Fig. 381, postabdomen.

2003, coll. B. K. Sharma; 9 examples, Deepor, 07. 05. 2004, coll. B. K. Sharma; 5 examples, Deepor, 06. 04. 2005, coll. Sumita Sharma; 8 examples, Dighali, 12. 08. 2002, coll. B. K. Sharma; 4 examples, Borbila, 09. 05. 2002, coll. B. K. Sharma; 4 examples, Kamranga, 07. 05. 2004, coll. B. K. Sharma; 6 examples, Ghorajan, 04. 03. 2004, coll. B. K. Sharma; 5 examples, Siligurijan, 13. 08. 2002, coll. B. K. Sharma; 4 examples, Hiragota, 10. 09. 2004, coll. B. K. Sharma; 4 examples, Urmal, 10. 02. 2005, coll. B. K. Sharma; 3 examples, Kakerikhola, 11. 02. 2005, coll. B. K. Sharma; 3 examples, Padma, 11. 09. 2004, coll. B. K. Sharma; 3 examples, Bamoni, 01. 09. 2006, coll. Sumita Sharma; 4 examples, Goranga, 05. 04. 2005, coll. Sumita Sharma; 4 examples, Sitalmari, 01. 09. 2005, coll. Sumita Sharma; 6 examples, Mori, 03. 09. 2006, coll. Sumita Sharma; 5 examples, Kujibalipatty, 41. 03. 2003, coll. B. K. Sharma; 3 examples, Daphlang, 05. 09. 2006, coll. Sumita Sharma; 3 examples, Bandha, 03. 09. 2006, coll. Sumita Sharma; 3 examples, Deopani, 02. 12. 2005, coll. Sumita Sharma; 4 examples, Shitalpathar, 01. 12. 2005, coll. Sumita Sharma; 4 examples, Mona, 01. 12. 2005, coll. Sumita Sharma; 3 examples, Diang, 01. 12. 2005, coll. Sumita Sharma; 5 examples, Memdubi, 30. 11. 2005, coll. Sumita Sharma; 4 examples, Raidong, 30. 11. 2005, coll. Sumita Sharma; 6 examples, Dhekia, 03. 04. 2005, coll. B. K. Sharma; 6 examples, Senijan, 05. 04. 2005, coll. B. K. Sharma; 8 examples, Samuajan, 09. 02. 2005, coll. B. K. Sharma; 5 examples, Puwa Saikia, 05. 04. 2005, coll. B. K. Sharma; 5 examples, Sone, 08. 08. 2004, coll. B. K. Sharma; 4 examples, Baskandi, 10. 10. 2004, coll. B. K. Sharma.

**Characters** : Body broadly spherical in outline; postero-dorsal corner of valves distinct; postero-ventral corner of valves rounded and with denticles. Valves reticulated with pentagonal or hexagonal cells and without pits or dots. Rostrum pointed. Head shield with rounded posterior margin. Antennules with a sensory seta near middle of anterior margin. Labral plate with convex anterior margin and pointed apex. Ocellus nearer to eye than to apex of rostrum. Postabdomen short, with 7-10 anal spines; lateral setae in several groups and arranged in a single row. Claw with two basal spines and setae on its concave margin.

**Distribution** : INDIA - Assam, Meghalaya, Tripura, West Bengal, Kashmir, Ladak, Uttar Pradesh and Nilgiri Hills in South India.

**Elsewhere** : Cosmopolitan.

#### Genus *Dadaya* Sars, 1901

**Characters** : Body oval. Posterior margin of head shield rounded, anterior margin produced into an elongated rostrum. Main head pore single. Ocellus and eye very large. Valves with hexagons. Setae on posterior margin of valves interested on inner surface. Labrum elongated. Antennules projecting beyond tip of rostrum. Antennal setae : 0-0-3 / 0-1-3. Postabdomen without lateral setae. Claw with a single basal spine. Five pairs of legs present; exopodite of III and IV legs with seven setae.

The collections examined from Assam record only one species of this genus in the present account.

32. *Dadaya macrops* (Daday, 1898)  
(Figs. 382-383)

*Material examined* : 4 examples, Dhir, 11. 03. 2003, coll. B. K. Sharma; 4 examples, Horinchora, 07. 02. 2005, coll. B. K. Sharma; 2 examples, Kamranga, 04. 03. 2004, coll. B. K. Sharma; 3 examples, Ghorajan, 04. 03. 2004, coll. B. K. Sharma; 4 examples, Hiragota, 08. 05. 2004, coll. B. K. Sharma; 2 examples, Basana, 03. 09. 2006, coll. Sumita Sharma; 2 examples, Bandha, 03. 09. 2006, coll. Sumita Sharma; 2 examples, Borbil-Tinsuki, 01. 12. 2005, coll. Sumita Sharma; 4 examples, Muijan, 29. 11. 2005, coll. Sumita Sharma; 3 examples, Maghuri, 30. 11. 2005, coll. Sumita Sharma; 3 examples, Dhekia, 02. 03. 2004, coll. B. K. Sharma.

*Characters* : Body oval in outline. Posterior ventral corner of valve rounded, without a denticle. Valves marked with a pattern of hexagons. Rostrum long and ventrally directed. Ocellus and eye unusually large. Posterior margin of head shield rounded. Antennules distinctly projecting beyond apex of rostrum. Antennal setae: 0-0-3 / 0-1-3. Distal segment of antennae not reaching apex of rostrum. Labrum with a long, beak-like process. Postabdomen with 15 anal spines, proximal spines small; pre-anal corner projecting. Claw with a basal spine.

*Distribution* : INDIA - Tripura, Rajasthan and Tamil Nadu.

*Elsewhere* : Cosmotropical

Genus *Disperalona* Fryer, 1968

*Characters* : Body elongated, valves striated or reticulated; broadly rounded posterior ventral corner with one or more denticles. Rostrum elongate. Head shield with two head pores and two closely set small pores between them. Antennae with seven notatory setae. Five pairs of thoracic legs present. Postabdomen with sharply pointed marginal denticles and minute lateral setules. Intestine with caecum.

This genus is represented by only one species in the present account.

33. *Disperalona caudata* Smirnov, 1996  
(Figs. 384-385)

*Material examined* : 4 examples, Deepor, 09. 09. 2004, coll. B. K. Sharma; 3 examples, Raidong, 30. 11. 2005, coll. Sumita Sharma.

*Characters* : Body elongated; posterior dorsal angle expressed and posterior ventral angle of rounded. Valves longitudinally striated. Rostrum long, pointed and ventrally directed. Head shield with two main head pores and two small pores between them. Antennule reaching half-way the tip of rostrum. Postabdomen relatively elongated, with distinct dorso-distal corner and preanal angle not distinct. Postabdomen with 14 anal teeth, proximal teeth small. Claw with two basal spines; second basal spine smaller than the diameter of the base of claw. IDL with 3 setae, one hook-like and one much shorter than the others.

*Distribution* : INDIA - new record.

*Elsewhere* : Australia and Thailand.

Genus *Dunhevedia* King, 1853

**Characters** : Body oval in outline. Postero-ventral corner of valves with a distinct denticle, sometimes without denticle. Posterior part of ventral margin with setae on inner side of valves. Head pores typical for the subfamily; distance from head pores to posterior margin of head shield shorter than distance between head pores. Antennal setae: 0-0-3 / 0-1-3. Ocellus smaller than eye. Postabdomen wide and with anal spines. Claw with a single basal spine. Five pairs of legs present.

The collections examined from Assam include two species of this genus.

34. *Dunhevedia crassa* King, 1853

(Figs. 386-387)

**Material examined** : 4 examples, Barundanga, 07. 01. 2003, coll. B. K. Sharma; 3 examples, Dhir, 11. 03. 2003, coll. B. K. Sharma; 3 examples, Hakama, 07. 02. 2005, coll. B. K. Sharma; 4 examples, Horinchora, 02. 03. 2004, coll. B. K. Sharma; 2 examples, Fingua, coll. B. K. Sharma; 5 examples, Deepor, 07. 05. 2004, coll. B. K. Sharma; 3 examples, Deepor, 06. 04. 2005, coll. Sumita Sharma; 4 examples, Dighali, 14. 03. 2003, coll. B. K. Sharma; 4 examples, Chatla, 08. 05. 2004, coll. B. K. Sharma; 3 examples, Kakerikhola, 11. 02. 2005, coll. B. K. Sharma; 3 examples, Padma, 06. 03. 2004, coll. B. K. Sharma; 2 examples, Ghorkhonjan, 05. 03. 2005, coll. B. K. Sharma; 4 examples, Demon, 01. 12. 2005, coll. Sumita Sharma; 4 examples, Muijan, 29. 11. 2005, coll. Sumita Sharma; 3 examples, Hakoi, 29. 11. 2005, coll. Sumita Sharma; 3 examples, Itakhuli, 01. 12. 2005, coll. Sumita Sharma; 4 examples, Samuajan, 81. 01. 2005, coll. B. K. Sharma; 3 examples, Salchapra, 09. 02. 2005, coll. B. K. Sharma.

**Characters** : Body almost oval in outline; postero-ventral corner of each valve with a denticle. Head shield with rounded anterior and posterior margins. Antennules terminating slightly before apex of rostrum. Labral plate without denticles and with pointed apex. Postabdomen oval, with 15-18 anal spines and numerous groups of lateral setae. Claw with a basal spine and with setae on its concave margin.

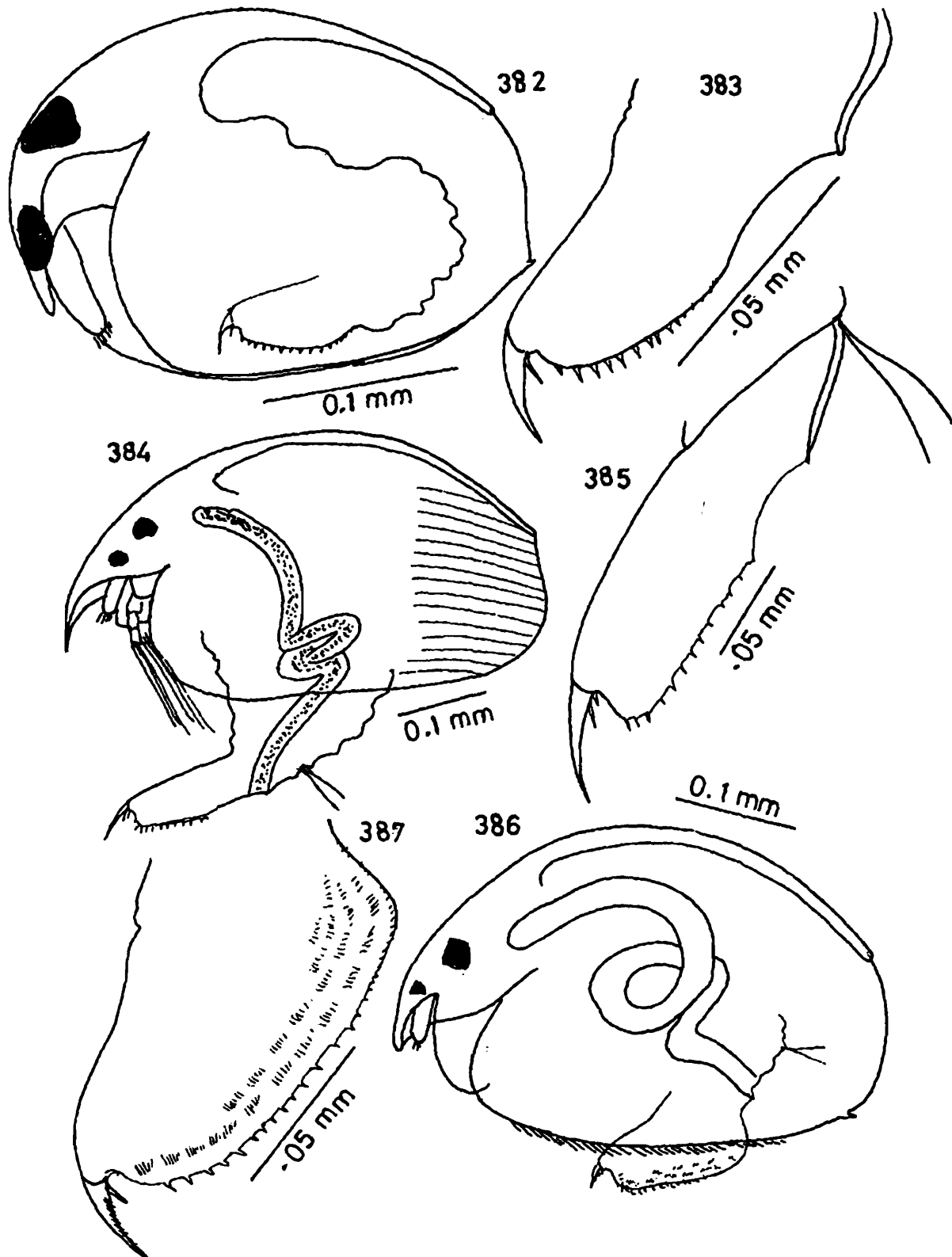
**Distribution** : INDIA - Meghalaya, Tripura, West Bengal, Rajasthan, Gujarat, Tamil Nadu, Kerala and little Andaman.

**Elsewhere** : Cosmotropical.

35. *Dunhevedia serrata* Daday, 1898

(Figs. 388-389)

**Material examined** : 4 examples, Hakama, 06. 05. 2004, coll. B. K. Sharma; 5 examples, Deepor, 04. 03. 2004, coll. B. K. Sharma; 3 examples, Kamranga, 10. 02. 2005, coll. B. K. Sharma; 3 examples, Siligurijan, 16. 02. 2002, coll. B. K. Sharma; 3 examples, Shitalpathar,



*Dadaya macrops* (Daday) : Fig. 382, parthenogenetic female (lateral view), Fig. 383, postabdomen; *Disperalona caudata* Smirnov: Fig. 384, parthenogenetic female (lateral view), Fig. 385, postabdomen; *Dunhevedia crassa* King: Fig. 386, parthenogenetic female (lateral view), Fig. 387, postabdomen.

01. 12. 2005, coll. Sumita Sharma; 4 examples, Memdubi, 30. 11. 2005, coll. Sumita Sharma; 4 examples, Baskandi, 09. 02. 2005, coll. B. K. Sharma.

**Characters** : Body almost oval in outline; with maxim height in middle region. Valves with longitudinal lines and dots; postero-ventral corner with two denticles, dorsal denticle smaller than ventral. Labral plate with serrated anterior margin with 10-15 denticles. Postabdomen oval; with 13-15 anal denticles and several groups of lateral setae. Claw with basal spine and setae on concave margin.

**Distribution** : INDIA - Tripura, Meghalaya, West Bengal, Gujarat, Rajasthan, Tamil Nadu and Andhra Pradesh.

**Elsewhere** : Africa, Sri Lanka, India, Indonesia, Thailand, Philippines, New Guinea.

### Genus *Ephemeroporus* Frey, 1982

**Characters** : Body oval in outline; postero-ventral corners of valves with a denticle. Antennules not reaching tip of rostrum Labral plate with denticles on its anterior margin. Postabdomen short and with unequal anal spines. Claw with two unequal basal spines.

This genus is represented by only single species in the present account.

#### 36. *Ephemeroporus barroisi* (Richard, 1894) (Figs. 390-391)

**Material examined** : 4 examples, Barundanga, 08. 08. 2002, coll. B. K. Sharma; 5 examples, Dhir, 05. 05. 2002, coll. B. K. Sharma; 5 examples, Hakama, 06. 05. 2004, coll. B. K. Sharma; 4 examples, Horinchora, 11. 07. 2004, coll. B. K. Sharma; 3 examples, Kamakhya, 11. 08. 2002, coll. B. K. Sharma; 3 examples, Rowmari, 07. 05. 2002, coll. B. K. Sharma; 6 examples, Deepor, 08. 05. 2002, coll. B. K. Sharma; 8 examples, Deepor, 07. 05. 2004, coll. B. K. Sharma; 4 examples, Deepor, 06. 04. 2005, coll. Sumita Sharma; 5 examples, Dighali, 12. 08. 2002, coll. B. K. Sharma; 4 examples, Dighali, 06. 04. 2005, coll. Sumita Sharma; 4 examples, Ghorajan, 07. 05. 2004, coll. B. K. Sharma; 3 examples, Chatla, 13. 07. 2004, coll. B. K. Sharma; 3 examples, Urmal, 10. 09. 2004, coll. B. K. Sharma; 4 examples, Padma, 14. 07. 2004, coll. B. K. Sharma; 3 examples, Basana, 03. 09. 2006, coll. Sumita Sharma; 3 examples, Goranga, 03. 09. 2006, coll. Sumita Sharma; 4 examples, Thekera, 06. 05. 2004, coll. B. K. Sharma; 3 examples, Kujibalipatty, 08. 05. 2002, coll. B. K. Sharma; 5 examples, Padmakhua, 01. 09. 2006, coll. Sumita Sharma; 4 examples, Kololua, 29. 11. 2005, coll. Sumita Sharma; 3 examples, Diang, 01. 12. 2005, coll. Sumita Sharma; 3 examples, Memdubi, 30. 11. 2005, coll. Sumita Sharma; 4 examples, Dhekia, 10. 06. 2004, coll. B. K. Sharma; 4 examples, Samuajan, 11. 06. 2004, coll. B. K. Sharma; 5 examples, Puwa Saikia, 10. 06. 2004, coll. B. K. Sharma; 3 examples, Baskandi, 19. 10. 2004, coll. B. K. Sharma.

**Characters** : Body broadly elliptical in outline; postero-dorsal corner rounded and postero-ventral corner of each valve with a denticle. Rostrum with an apical notch. Head shield with

rounded posterior margin. Antennules short and not reaching apex of rostrum. Labral plate with 3-5 denticles on anterior margin and pointed apex. Ocellus smaller than eye and situated halfway between eye and apex of rostrum. Postabdomen short, with 9 unequal anal spines and pre-anal corner projecting. Claw with two basal spines and with setae on its concave margin.

*Distribution* : INDIA - Meghalaya, Tripura, West Bengal, Gujarat, Tamil Nadu and Kerala.

*Elsewhere* : Cosmotropical.

### Genus *Picripleuroxus* Frey, 1993

*Characters* : Body distinctly elongated. Postabdomen elongated and slightly bent; post-anal margin slightly concave. Antennules without a peg at its base. Posterior ventral setae of valve slightly submarginal. Posterior ventral angle of valve mostly with one or several denticles.

The collections examined Assam indicated two species belonging to this genus.

#### 37. *Picripleuroxus laevis* (Sars, 1861) (Figs. 392-393)

*Material examined* : 3 examples, Ghorajan, 08. 12. 2004, coll. B. K. Sharma; 2 examples, Hiragota, 10. 02. 2005, coll. B. K. Sharma; 3 examples, Padma, 11. 02. 2005, coll. B. K. Sharma; 3 examples, Bamoni, 01. 09. 2006, coll. Sumita Sharma; 3 examples, Memdubi, 30. 11. 2005, coll. Sumita Sharma.

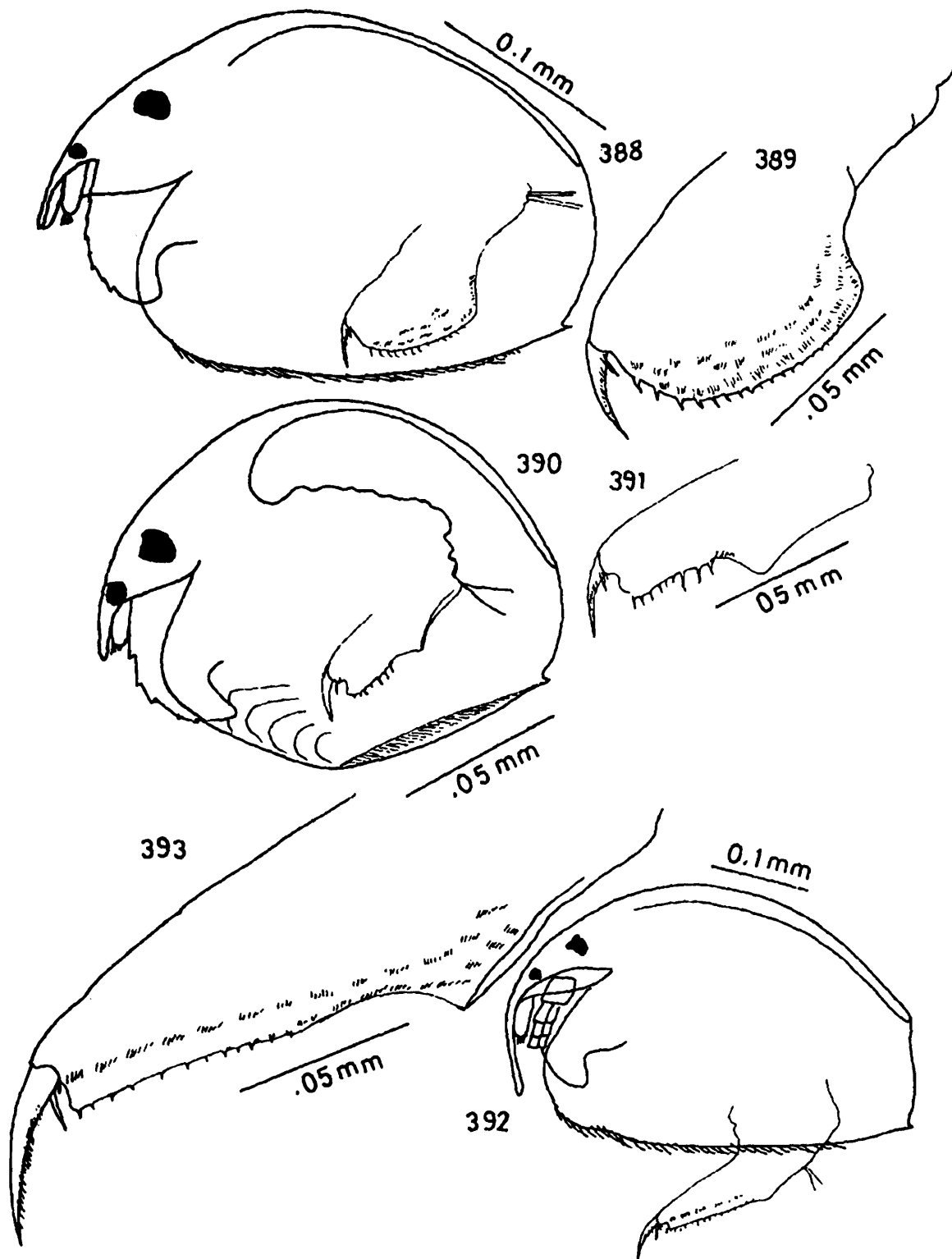
*Characters* : Body elongated-oval in outline. Posterior dorsal corner distinct and slightly projecting. Posterior ventral corner rounded, with a sub-terminal denticles. Small setae present along inner side of posterior margin of valve. Rostrum long and pointed. Antennal setae: 0-0-3 / 1-1-3. Labral plate cuneiform, its apex not pointed. Postabdomen elongated, slightly curved and narrowing distally. Pre-anal angle distinct. Anal teeth small, irregularly situated; distal teeth much longer than other teeth. Lateral setae small and in crescent groups. Claw long, with two basal spines and setae on its concave margin.

*Distribution* : INDIA - Kashmir.

*Elsewhere* : Palaearctic region..

#### 38. *Picripleuroxus similis* Vavra, 1900 (Figs. 394-395)

*Material examined* : 4 examples, Dhir, 08. 01. 2003, coll. B. K. Sharma; 4 examples, Hakama, 07. 02. 2005, coll. B. K. Sharma; 6 examples, Deepor, 08. 02. 2005, coll. B. K. Sharma; 4 examples, Ghorajan, 03. 11. 2004, coll. B. K. Sharma; 3 examples, Siligurijan, 12. 03. 2003, coll. B. K. Sharma; 3 examples, Padma, 11. 02. 2005, coll. B. K. Sharma; 3 examples, Goranga, 10. 02. 2005, coll. Sumita Sharma; 4 examples, Kujibalipatty, 01. 03. 2003, coll. B. K. Sharma; 3 examples, Bandha, 03. 09. 2006, coll. Sumita Sharma; 2 examples,



*Dunhevedia serrata* Daday : Fig. 388, parthenogenetic female (lateral view), Fig. 389, postabdomen;  
*Ephemeroporus barroisi* (Richard) : Fig. 390, parthenogenetic female (lateral view), Fig. 391, postabdomen;  
*Picripleuroxus laevis* Sars : Fig. 392, parthenogenetic female (lateral view), Fig. 393, postabdomen.

Daphlang, 02. 12. 2005, coll. Sumita Sharma; 4 examples, Ghorkhonjan, 05. 03. 2005, coll. B. K. Sharma; 3 examples, 01. 12. 205, Sesa, coll. Sumita Sharma; 3 examples, Morakalong, 03. 12. 2005, coll. Sumita Sharma; 4 examples, Bhoismari, 02. 12. 2005, coll. Sumita Sharma; 3 examples, Sohala, 05. 09. 2006, coll. Sumita Sharma; 3 examples, Raidong, 30. 11. 2005, coll. Sumita Sharma; 4 examples, Naruathan, 04. 04. 2005, coll. B. K. Sharma; 5 examples, Samuajan, 11. 06. 2004, coll. B. K. Sharma; 3 examples, Sone, 09. 02. 2005, coll. B. K. Sharma; 4 examples, Salchapra, 09. 02. 2005, coll. B. K. Sharma.

*Characters* : Body almost elongated-oval in outline; dorsal margin evenly arched. Postero-ventral corner with 1-3 denticles; the number of denticles often variable on both valves in the same specimen. Valves smooth. Rostrum long and ventrally pointed, reaching level of ventral margin of valves. Head pores typical of the subfamily. Antennules not reaching middle of rostrum. Distal joints of antennae reaching end of antennules. Distance of ocellus to eye about half of its distance to apex of rostrum. Labral plate with convex anterior margin. Postabdomen elongated, tapering distally; distal dorsal corner of postabdomen situated slightly behind base of claws. Anal spines 10-13 and increase in size gradually to distal end. Claw with two basal spines.

*Distribution* : INDIA - Meghalaya, Tripura, West Bengal, Kashmir and little Andaman.

*Elsewhere* : Australia, Sri Lanka, Chile and Northern Caucasus.

#### Genus *Pseudochydorus* Fryer, 1968

*Characters* : Body spherical, ventral margin of valves closed and without any gap; ventral setae situated on inner surface along whole length and those in posterior half located at a distance from the margin. Rostrum pointed. Head pores typical of the subfamily. Postabdomen narrow, with anal spines and groups of lateral setae. Claw with two basal spines; distal basal spine long. Legs II - IV with non-filtering setae.

Only one species belonging to this genus is reported in the present account.

#### 39. *Pseudochydorus globosus* (Baird, 1843) (Figs. 396-397)

*Material examined* : 3 examples, Japara, 01.12. 2005, coll. Sumita Sharma; 4 examples, Deepor, 08.02. 2005, coll. B. K. Sharma; 3 examples, Muijan, 29. 11. 2005, coll. Sumita Sharma; 2 examples, Bor beel, 01.12. 2005, coll. Sumita Sharma.

*Characters* : Body broadly spherical in outline, slightly longer than its height and postero-ventral corner of valves rounded. Valves with a pattern of polygons. Head shield with rounded posterior margin. Antennules not reaching apex of rostrum. Labrum without plate shaped process. Ocellus smaller than eye and situated nearer to eye than to apex of rostrum. Postabdomen narrow, almost uniformly wide and with produced distal corner. Anal spines about 20 and decreasing in size proximally; groups of lateral setae present. Claw with two basal spines and a row of setae on its concave margin.

**Distribution** : INDIA - Meghalaya, West Bengal, Rajasthan and Tamil Nadu.

**Elsewhere** : Holarctic, Ethiopian, Indo-Malayan, Australian regions and European USSR.

#### Subfamily ALONINAE Frey, 1967

**Characters** : With two or three main head pores situated in median line of head shield and small pores lateral to them; canals extending from lateral pores. Mandibles articulated between head shield and valves. Claw with a single basal spine; sometimes with basal spine. Hepatic processes absent. Anus situated in proximal part of postabdomen. Five or six pairs of legs present; leg VI, if present, with epipodite.

Eleven genera of the subfamily Aloninae are documented in the present account.

#### Genus *Acroperus* Baird, 1843 emend. Smirnov, 1966

**Characters** : Body oval and strongly compressed laterally. Valves marked with oblique lines. Three connected main head pores, small pores situated at a considerable distance from them. Antennules not reaching apex of rostrum. Antennal setae : 0-0-3/0(1)-1-3. Ocellus smaller than eye. Postabdomen with anal denticles and with a row of lateral setae arranged in groups. Claw with a tubercle, bearing setae on dorsal side; with one basal spine. Intestine forming loops and with a caecum. Six pairs of legs present; leg VI in form of a small lobe.

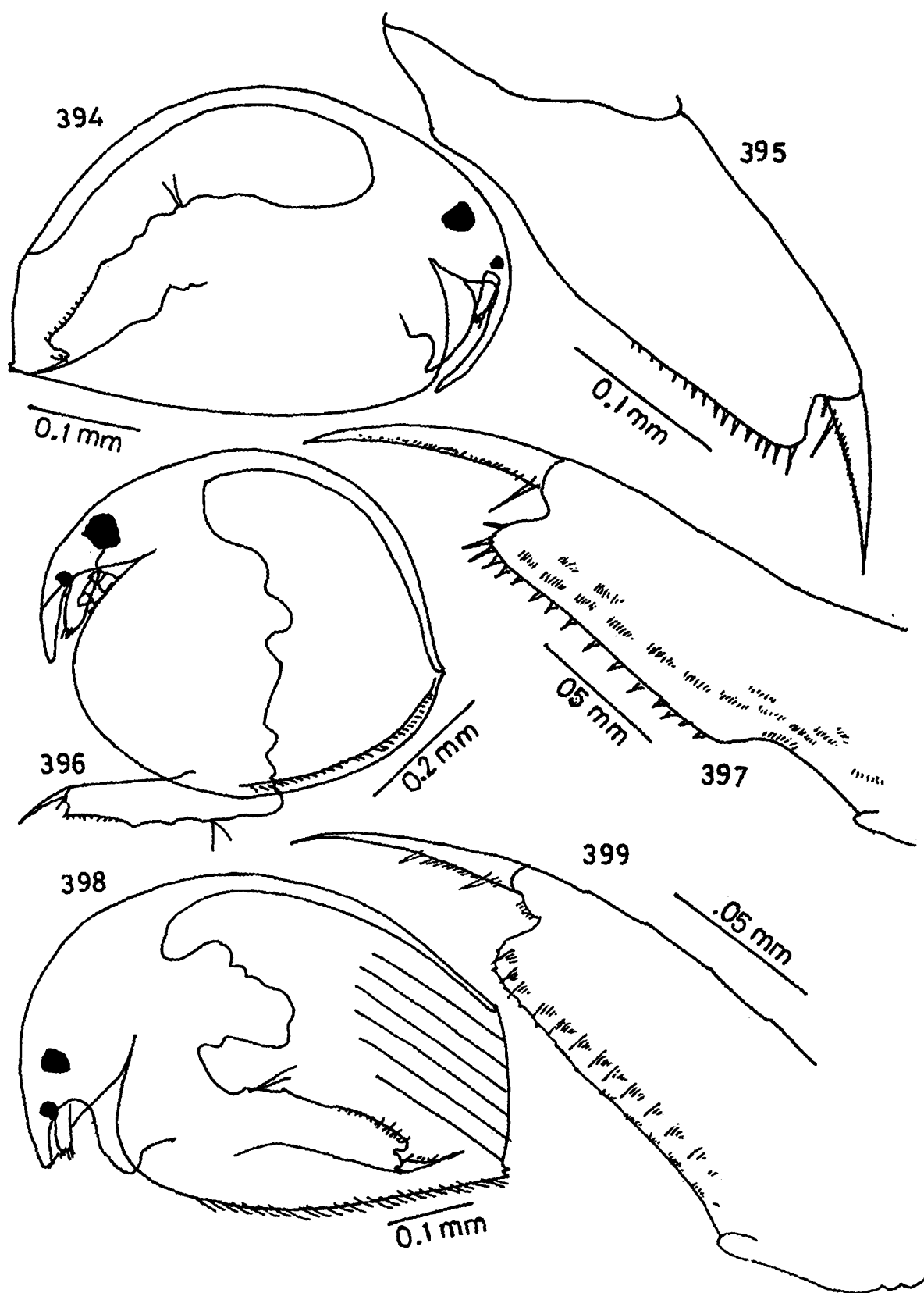
Only one species belonging to this genus is documented in the present account.

#### 40. *Acroperus harpae* (Baird, 1834)

(Figs. 398-399)

**Material examined** : 3 examples, Bhoispuri, 03. 05. 2002, coll. B. K. Sharma; 3 examples, Fingua, 10. 08. 2002, coll. B. K. Sharma; 5 examples, Deepor, 09. 09. 2004, coll. B. K. Sharma; 3 examples, Dighali, 12. 08.2002, coll. B. K. Sharma; 4 examples, Siligurijan, 15. 02. 2003 coll. B. K. Sharma; 4 examples, Hiragota, 10. 02. 2005, coll. B. K. Sharma; 3 examples, Urmal, 05. 03. 2004, coll. B. K. Sharma; 3 examples, Kujibalipatty, 01. 03. 2003, coll. B. K. Sharma; 2 examples, Bandha, 03. 09. 2006, coll. Sumita Sharma; 2 examples, 29. 11. 2005, Hakoi, coll. Sumita Sharma; 3 examples, Morakalong, 03. 12. 2005, coll. Sumita Sharma; 3 examples, Raidong, 30.11. 2005, coll. Sumita Sharma.

**Characters** : Body broadly ovate in outline and maximum height about 64% of its length; postero-ventral corners of valves with 2-5 denticles. Valves marked with oblique lines. Dorsal keel and head keel present. Head shield with three connected main head pores, lateral pores situated before anterior main pore; main pores located in crest of head shield which becomes slightly wider in this region. Antennules not reaching apex of rostrum; anterior margin of antennules with incisions and setae. Ocellus smaller than eye and situated nearer to eye than to apex of rostrum. Labral plate triangular, with convex anterior margin and blunt apex. Postabdomen with very small anal spines. Lateral setae in groups; distal groups of lateral



*Pleuroxus similis* Vavra : Fig. 394, parthenogenetic female (lateral view), Fig. 395, postabdomen;  
*Pseudochydorus globosus* (Baird) : Fig. 396, parthenogenetic female (lateral view), Fig. 397, postabdomen;  
*Acroperus harpae* (Baird): Fig. 398, parthenogenetic female (lateral view), Fig. 399, postabdomen.

setae longer than others. Claw with a basal spine and setae on its proximal margin, distal seta longest than others.

**Distribution** : INDIA - Assam, Meghalaya, Tripura, West Bengal, Kashmir and Tamil Nadu.

**Elsewhere** : Holarctic, Afro-tropical, Oriental and Neotropical.

**Genus *Alona* Baird, 1843 emend. Smirnov, 1971**

**Characters** : Body oval to subquadrate in outline and compressed, not crested. Valves rectangular and marked with lines. Rostrum short and blunt. Antennal setae: 0-0-3 / 1-1-3. Postabdomen with post-anal spines and lateral setae; anus situated in proximal part of postabdomen. Five to six pairs of legs present. Leg VI, if present, in form of a small lobe and without epipodite.

The collections examined from Assam include seven species of the genus *Alona*.

**41. *Alona affinis* (Leydig, 1860)  
(Figs. 400-401)**

**Material examined** : 4 examples, Barundanga, 12. 03. 2003, coll. B. K. Sharma; 2 examples, Horinchora, 07. 02. 2005, coll. B. K. Sharma; 3 examples, Fingua, 13. 02. 2002, coll. B. K. Sharma; 5 examples, Deepor, 04. 03. 2004, coll. B. K. Sharma; 2 examples, Kamranga, 07. 05. 2004, coll. B. K. Sharma; 3 examples, Ghorajan, 08. 02. 2005, coll. B. K. Sharma; 3 examples, Siligurijan, 12. 03. 2003, coll. B. K. Sharma; 4 examples, Padma, 11. 02. 2005, coll. B. K. Sharma; 3 examples, Thekera, 01. 12. 2005, coll. B. K. Sharma; 3 examples, Bandha, 03. 09. 2006, coll. Sumita Sharma; 2 examples, Haduk, 05. 04. 2005, coll. Sumita Sharma; 3 examples, Duptoli, 05. 04. 2005, coll. Sumita Sharma; 3 examples, Jugdal, 01. 09. 2006, coll. Sumita Sharma; 2 examples, Sesa, 01. 12. 2005; coll. Sumita Sharma; 4 examples, Raidong, 30. 11. 2005, coll. Sumita Sharma; 3 examples, Naruathan, 04. 04. 2005, coll. B. K. Sharma; 4 examples, Samuajan, 18. 01. 2005, coll. B. K. Sharma; 3 examples, Salchapra, 09. 02. 2005, coll. B. K. Sharma.

**Characters** : Body broadly oblong in outline; postero-ventral corner of valves with a row of setae which continue in a row of spinules on inner side of posterior margin. Valves marked with longitudinal lines. Head shield with pointed posterior margin. Antennules not reaching apex of rostrum. Antennal setae: 0-0-3 / 1-1-3. Labral plate with convex anterior margin. Ocellus smaller than eye and situated nearer to eye than to apex of rostrum. Postabdomen almost uniformly wide; dorsal margin rounded and with 12-16 anal spines; lateral groups of setae present. Claw with a basal spine and setae on its concave margin.

**Distribution** : INDIA - Meghalaya, West Bengal and Gujarat.

**Elsewhere** : Cosmopolitan.

42. *Alona costata* Sars, 1862

(Figs. 402-403)

*Material examined* : 4 examples, Bhoispuri, 12. 03. 2003, coll. B. K. Sharma; 4 examples, Hakama, 07. 02. 2005, coll. B. K. Sharma; 5 examples, Horinchora, 02. 11. 2004, coll. B. K. Sharma; 2 examples, Jogra, 10. 12. 2002, coll. B. K. Sharma; 3 examples, Fingua, 12. 03. 2003, coll. B. K. Sharma; 3 examples, Rowmari, 13. 03. 2003, coll. B. K. Sharma; 5 examples, Deepor, 08. 20. 2005, coll. B. K. Sharma; 3 examples, Deepor, 06. 04. 2005, coll. Sumita Sharma; 4 examples, Kamranga, 04. 03. 2004, coll. B. K. Sharma; 3 examples, Ghorajan, 03. 11. 2004, coll. B. K. Sharma; 3 examples, Hiragota, 01. 02. 2005, coll. B. K. Sharma; 2 examples, Urmal, 09. 12. 2004, coll. B. K. Sharma; 3 examples, Kakerikhola, 11. 02. 2005, coll. B. K. Sharma; 2 examples, Basana, 03. 09. 2006 coll. Sumita Sharma; 4 examples, Goranga, 10. 02. 2005, coll. B. K. Sharma; 3 examples, Thekera, 05. 11. 2004, coll. B. K. Sharma; 4 examples, Kujibalipatty, 01. 03. 2003, coll. B. K. Sharma; 3 examples, Karasing, 02. 12. 2005, coll. Sumita Sharma; 3 examples, Itakhuli, 01. 12. 2005, coll. Sumita Sharma; 3 examples, Kutri, 03. 12. 2005, coll. Sumita Sharma; 3 examples, Kololua, 29. 11. 2005, coll. Sumita Sharma; 4 examples, Dhekia, 03. 04. 2005, coll. B. K. Sharma; 4 examples, Naruathan, 04. 04. 2005, coll. B. K. Sharma; 5 examples, Samuajan, 01. 01. 2004, coll. B. K. Sharma; 3 examples, Baskañdi, 09. 02. 2005, coll. B. K. Sharma.

*Characters* : Body broadly oval in outline and with rounded poster-dorsal and postero-ventral corners of valves; posterior margin of valves with a row of spinules on inner margin. Valves marked with longitudinal lines, with interconnections. Head shield with rounded posterior margin; three main connected head pores and lateral pores with chitinous thickening. Antennules not reaching apex of rostrum. Labral plate with rounded anterior margin. Ocellus smaller than eye and situated halfway between eye and apex of rostrum. Postabdomen short, slightly tapering distally and its dorsal margin nearly straight; pre-anal corner slightly projecting beyond base of claws. Anal spines 11-12 and decreasing in size proximally; groups of lateral setae present in a row, distal seta longest in each group. Claw with single basal spine.

*Distribution* : INDIA - Meghalaya, Tripura, Arunachal Pradesh, Manipur, West Bengal, Himachal Pradesh, Uttar Pradesh and Tamil Nadu.

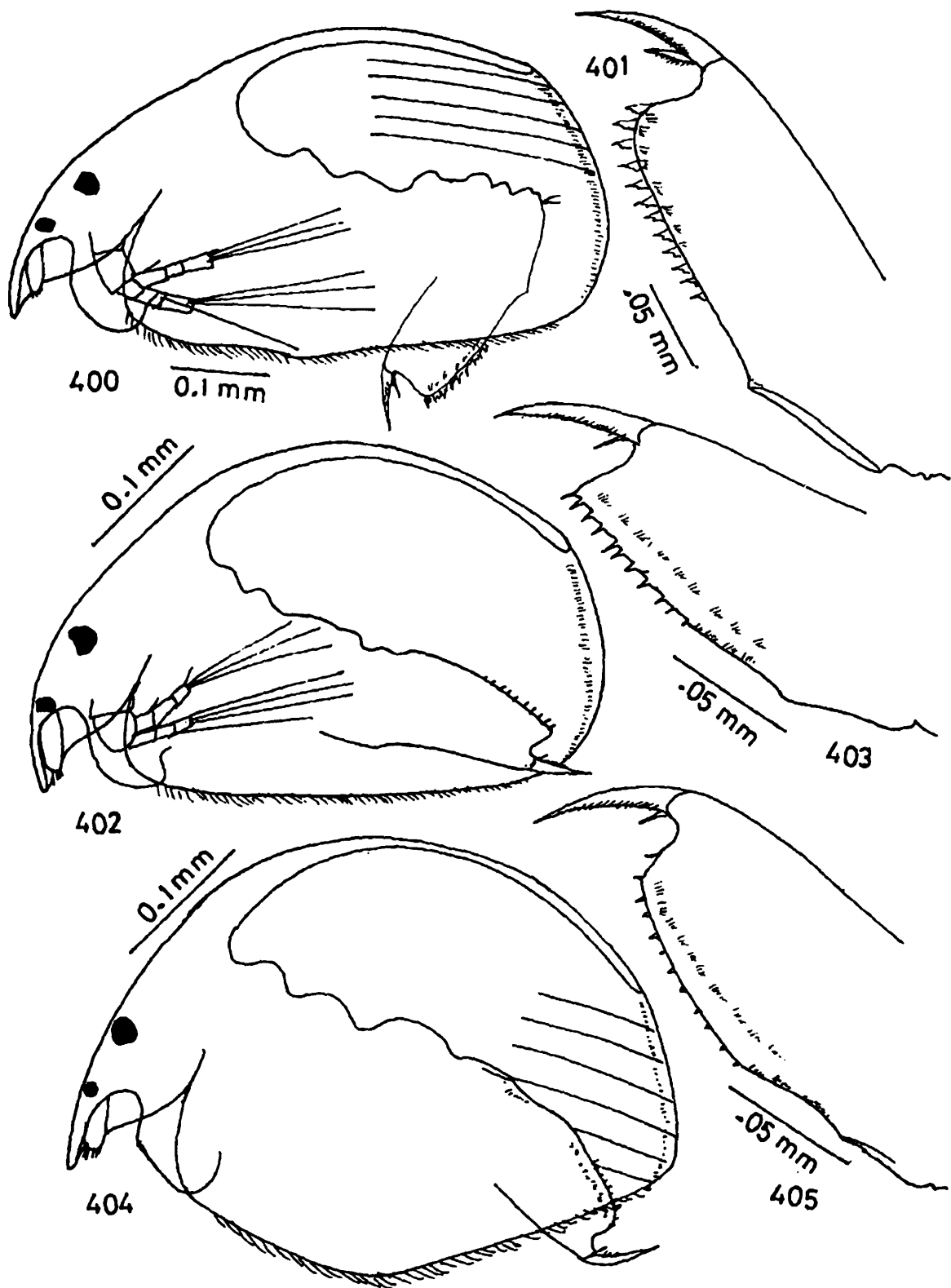
*Elsewhere* : Holarctic, Ethiopian, Indo-Malayan and Neotropical regions.

43. *Alona davidi* Richard, 1895

(Figs. 404-405)

*Material examined* : 4 examples, Hakama, 06. 05. 2004, coll. B. K. Sharma; 3 examples, Itakhuli, 01. 12. 2005, coll. Sumita Sharma; 3 examples, Kololua, 29. 12. 2005, coll. Sumita Sharma.

*Characters* : Body oval in outline; valves with a pattern of polygons. Posterior dorsal and ventral corners of valves rounded. Feathered setae on ventral margin of valve continued into



*Alona affinis* (Leydig) : Fig. 400, parthenogenetic female (lateral view), Fig. 401, postabdomen; *A. costata* Sars : Fig. 402, parthenogenetic female (lateral view), Fig. 403, postabdomen; *A. davidi* Richard: Fig. 404, parthenogenetic female (lateral view), Fig. 405, postabdomen.

a row of short setae on posterior margin. Rostrum blunt. Head-shield with three main connected head pores and two small pores situated laterally; posterior margin of head-shield rounded. Labral plate rounded. Postabdomen widest in middle and tapering distally, anal spines in 10-11 groups with 2-4 teeth each; with groups of lateral setae, distal seta longer in each group. Claw with a basal spine and setae on its concave margin.

*Distribution* : INDIA - West Bengal.

*Elsewhere* : Ethiopian region and Haiti.

44. *Alona globulosa* (Daday, 1898)  
(Figs. 406-407)

*Material examined* : 5 examples, Hakama, 11. 07. 22004, coll. B. K. Sharma; 5 examples, Deepor, 07. 05. 2004, coll. B. K. Sharma; 4 examples, Ghorajan, 07. 05. 2004, coll. B. K. Sharma; 4 examples, Hiragota, 13. 07. 2004, coll. B. K. Sharma; 4 examples, Urmal, 08. 05. 2004, coll. B. K. Sharma; 3 examples, Goranga, 07. 05. 22004, coll. B. K. Sharma; 3 examples, Kujibalipatty, 12. 08. 2002, coll. B. K. Sharma; 2 examples, Bandha, 03. 09. 2006, coll. Sumita Sharma; 3 examples, Daphlang, 05. 09. 2006, coll. Sumita Sharma; 3 examples, Diang, 06. 09. 2006, coll. Sumita Sharma; 5 examples, Teliadanga, 01.12. 2005, coll. Sumita Sharma; 4 examples, Sohala, 05. 09. 2006, coll. Sumita Sharma; 5 examples, Naruathan, 11. 06. 2004, coll. B. K. Sharma; 4 examples, Samuajan, 11. 06. 2004, coll. B. K. Sharma; 3 examples, Sone, 08. 08. 2004, coll. B. K. Sharma; 4 examples, Salchapra, 08. 08. 2004, coll. B. K. Sharma.

*Characters* : Body almost oval in outline, with maximum height slightly before its middle. Postero-dorsal corner of valves distinct and postero-ventral corners rounded. Valves marked with distinct lines. Rostrum blunt. Head shield with angular posterior margin. Antennules not reaching apex of rostrum. Labral plate denticulate anteriorly and with pointed apex. Ocellus smaller than eye and situated nearer to eye than to apex of rostrum. Postabdomen with rounded dorsal margin; broadest near anus and with distinct pre-anal corner; with about 11-13 groups of lateral setae and anal spines very small. Claw with one basal spine.

*Distribution* : INDIA - Meghalaya, Tripura, West Bengal, Orissa, Madhya Pradesh, Tamil Nadu and Kerala.

*Elsewhere* : Indo-Malayan, Ethiopian, Neotropical and Nearctic regions.

45. *Alona guttata* Sars, 1862  
(Figs. 408-409)

*Material examined* : 3 examples, Horinchora, 11. 07. 2004, coll. B. K. Sharma; 4 examples, Ghorajan, 09. 09. 2004, coll. B. K. Sharma; 3 examples, Kanduli, 05. 12. 2005, coll. B. K. Sharma; 4 examples, Ghorkhonjan, 08. 07. 2004, coll. B. K. Sharma; 3 examples, Padmakhua, 01. 09. 2006, coll. Sumita Sharma; 3 examples, Deopani, 06. 09. 2006, coll. Sumita Sharma; 2 examples, Morakalong, 06. 05. 2004, coll. B. K. Sharma; 3 examples, Baghmari, 06. 09. 2006, coll. Sumita Sharma; 4 examples, Kutri, 06. 09. 2006, coll. Sumita Sharma; 4 examples,

Dhekia, 03. 04. 2005, coll. B. K. Sharma; 3 examples, Senijan, 05. 04. 2005, coll. B. K. Sharma; 3 examples, Baskandi, 12. 04. 2005, coll. B. K. Sharma.

**Characters** : Body almost oval in outline; postero-dorsal and postero-ventral corners of valves rounded. Valves marked with longitudinal lines. Head shield with rounded posterior margin; three main head pores with a narrow connection between them. Antennules not reaching apex of rostrum. Ocellus smaller than eye and situated halfway between eye and apex of rostrum. Labral plate with convex anterior margin. Postabdomen short, slightly tapering distally, with nearly straight dorsal and ventral margins and distal dorsal margin projecting beyond base of claws; with 9 anal spines and groups of lateral setae. Claw with one basal spine.

**Distribution** : INDIA - Meghalaya, Tripura, Ladak, Kashmir and Nilgiri Hills in South India.

**Elsewhere** : Cosmopolitan.

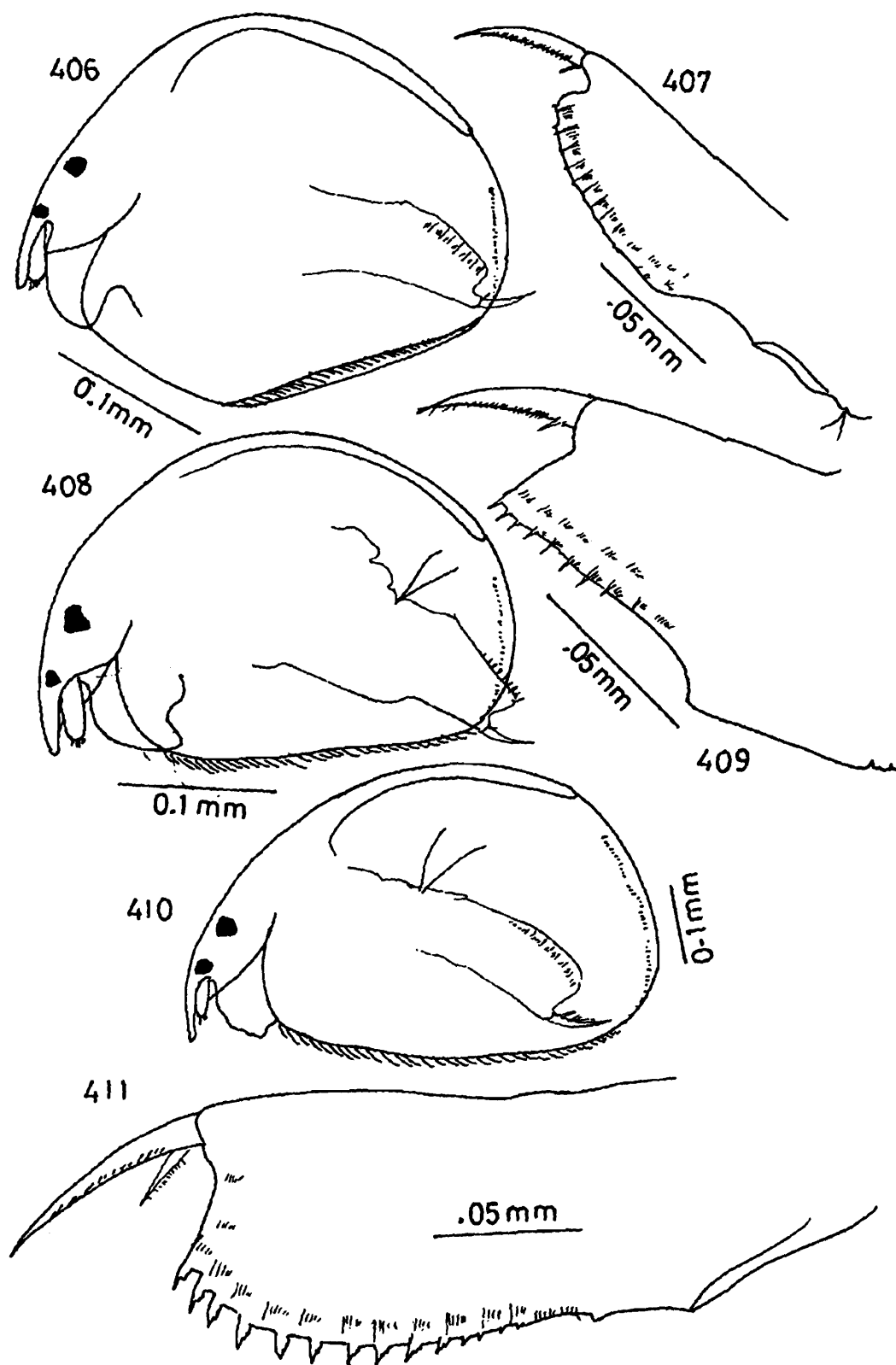
**46. *Alona quadrangularis* (O.F. Müller, 1785)**  
(Figs. 410-411)

**Material examined** : 5 examples, Bhoispuri, 8. 08. 2002, coll. B. K. Sharma; 4 examples, Barundanga, 03. 05. 2002, coll. B. K. Sharma; 4 examples, Hakama, 11. 07. 2004, coll. B. K. Sharma; 5 examples, Horinchora, 06. 05. 2004, coll. B. K. Sharma; 3 examples, Sagmara, 11. 03. 2003, coll. B. K. Sharma; 4 examples, Kamakhya, 13. 03. 2003, coll. B. K. Sharma; 5 examples, Deepor, 12. 07. 2004, coll. B. K. Sharma; 3 examples, Deepor, 06. 04. 2005, coll. Sumita B. K. Sharma; 3 examples, Kamranga, 07. 05. 2004, coll. B. K. Sharma; 4 examples, Ghorajan, 04. 03. 2004, coll. B. K. Sharma; 4 examples, Hiragota, 08. 05. 2004, coll. B. K. Sharma; 4 examples, Urmal, 10. 09. 2004, coll. B. K. Sharma; 3 examples, Goranga, 12. 07. 2004, coll. B. K. Sharma; 4 examples, Thekera, 06. 05. 2004, coll. B. K. Sharma; 3 examples, Duptoli, 01. 09. 2006, coll. Sumita Sharma; 3 examples, Kanduli, 01. 09. 2006, coll. Sumita Sharma; 3 examples, Padmakhua, 01. 09. 2006, coll. Sumita Sharma; 3 examples, Sarang, 03. 09. 2006, coll. Sumita Sharma; 3 examples, Diphlu, 06. 09. 2006, coll. Sumita Sharma; 3 examples, Dhekia, 10. 06. 2004, coll. B. K. Sharma; 4 examples, Batua, 09. 06. 2004, coll. B. K. Sharma; 5 examples, Samuajan, 11. 06. 2004, coll. B. K. Sharma; 5 examples, Puwa Saikia, 10. 06. 2004, coll. B. K. Sharma; 4 examples, Sone, 19. 10. 2004, coll. B. K. Sharma.

**Characters** : Body broadly rectangular in outline, postero-dorsal and postero-ventral corners of valves rounded and posterior margin of valves with a row of spinules on its inner margin. Valves marked with longitudinal lines connected by transverse lines and thus forming cells. Head shield with rounded posterior margin; three main connected head pores and lateral pores located at level of median main pore. Antennules with distal setae and a sensory papilla on posterior margin. Labral plate with convex anterior margin. Ocellus slightly smaller than eye and situated nearer to eye than to apex of rostrum. Postabdomen broadened distally; with 14-16 anal spines; lateral setae in groups and arranged in a row. Claw with one basal spine.

**Distribution** : INDIA - Assam, Meghalaya, Tripura, West Bengal and South India.

**Elsewhere** : Holarctic, Ethiopian, Indo-Malayan and Neotropical regions.



*Alona globulosa* (Daday) : Fig. 406, parthenogenetic female (lateral view), Fig. 407, postabdomen; *A. guttata* Sars : Fig. 408, parthenogenetic female (lateral view), Fig. 409, postabdomen; *A. quadrangularis* (O. F. Muller) : Fig. 410, parthenogenetic female (lateral view), Fig. 411, postabdomen.

47. *Alona rectangula* Sars, 1862  
(Figs. 412-413)

**Material examined** : 4 examples, Hakama, 08. 09. 2004, coll. B. K. Sharma; 3 examples, Fingua, 12. 03. 2003, coll. B. K. Sharma; 5 examples, Deepor, 09. 09. 2004, coll. B. K. Sharma; 3 examples, Deepor, 06. 04. 2005, coll. Sumita. Sharma; 4 examples, Dighali, 41. 03. 2003, coll. B. K. Sharma; 4 examples, Ghorajan, 09. 09.2004, coll. B. K. Sharma; 3 examples, Hiragota, 10. 09. 2004, coll. B. K. Sharma; 3 examples, Urmal, 13. 07. 2004, coll. B. K. Sharma; 3 examples, Thekera, 06. 05. 2004, coll. B. K. Sharma; 3 examples, Daphlang, 05. 09. 2006, coll. Sumita Sharma; 4 examples, Mora Daphlang, 03. 12. 2005, coll. Sumita Sharma; 3 examples, Muijan, 29. 11. 2005, coll. Sumita Sharma; 3 examples, Sarain Hubbi, 29. 11. 2005, coll. Sumita Sharma; 3 examples, Sesa, 01. 12. 2005, coll. Sumita Sharma; 3 examples, Diang, 01. 12. 2005, coll. Sumita Sharma; 4 examples, Mihir, 05. 09. 2006, coll. Sumita Sharma; 4 examples, Maghuri, 30.11. 2005, coll. Sumita Sharma; 3 examples, Baskandi, 19. 10. 2004, coll. B. K. Sharma.

**Characters** : Body broadly oval, postero-dorsal and postero-ventral corners of valves rounded; valves marked with longitudinal lines. Head shield with rounded posterior margin. Labral plate with convex anterior margin. Antennules not reaching apex of rostrum. Ocellus slightly smaller than eye and situated halfway between eye and apex of rostrum. Postabdomen wide, with rounded distal end; with 7 anal spines accompanied by setae; distal groups of lateral setae extending beyond distal margin of postabdomen. Claw with a basal spine and with setae on 3/4 of its concave margin.

**Distribution** : INDIA - Meghalaya, Tripura, West Bengal, Kashmir, Ladak, Gujarat and Rajasthan.

**Elsewhere** : apparently cosmopolitan.

Genus *Camptocercus* Baird, 1843

**Characters** : Body oval, greatly compressed and often with a keel on head and back. Valves with longitudinal lines. Distance between head pores and posterior margin of head shield shorter than distance between main pores. Antennules not reaching apex of rostrum. Antennal setae: 0-0-3 / 0-1-3. Ocellus smaller than eye. Postabdomen long and tapering distally; with anal spines and lateral setae. Claw long, with large basal spine and setae on its concave margin. Intestine forming loops and with a caecum. Five to six pairs of legs present.

Two species belonging to *Camptocercus* are observed in the collections examined from the floodplain lakes of Assam.

48. *Camptocercus uncinatus* Smirnov, 1971  
(Figs. 414-417)

**Material examined** : 3 examples, Horinchora, 11. 07. 2004, coll. B. K. Sharma; 6 examples, Deepor, 07. 05. 2004, coll. B. K. Sharma; 5 examples, Ghorajan, 09. 09. 2004, coll. B. K.

Sharma; 5 examples, Hiragota, 10. 09. 2004, coll. B. K. Sharma; 3 examples, Bamoni, 01. 09. 2006, coll. Sumita Sharma; 4 examples, Kanduli, 05. 04. 2005, coll. Sumita Sharma; 4 examples, Padmakhua, 01. 09. 2006, coll. Sumita Sharma; 3 examples, Bandha, 03. 09. 2006, coll. Sumita Sharma; 3 examples, Demon, 01. 12. 2005, coll. Sumita Sharma; 3 examples, Kololua, 29. 11. 2005, coll. Sumita Sharma; 3 examples, Diang, 01. 12. 2005, coll. Sumita Sharma; 4 examples, Memdubi, 30. 11. 2005, coll. Sumita Sharma; 5 examples, Samuajan, 18. 01. 2005, coll. B. K. Sharma; 4 examples, Sone, 09. 02. 2005, coll. B. K. Sharma; 3 examples, Salchapra, 09. 02. 2005, coll. B. K. Sharma.

**Characters** : Female : Body elongated, postero-ventral corner of valves with 2 - 5 denticles distinctly separated by margin of valves. Rostrum acute, directed downwards. Valves with longitudinal lines. Antennules almost reaching apex of rostrum. Postabdomen with 19 - 20 anal denticles and a row of lateral groups of setae. Claw with setae on concave margin and with a basal spine at some distance from the base of each claw.

Male : Claw sigmoid and with a basal spine, both with setules. IDL of limb I with three setae and a hook.

**Distribution** : INDIA - Meghalaya and Madhya Pradesh.

**Elsewhere** : Romania, S. W. Africa, Israel, Iraq, Ethiopia, Guatemala and Egypt. Male of this species is being reported for the first time from the Oriental Region.

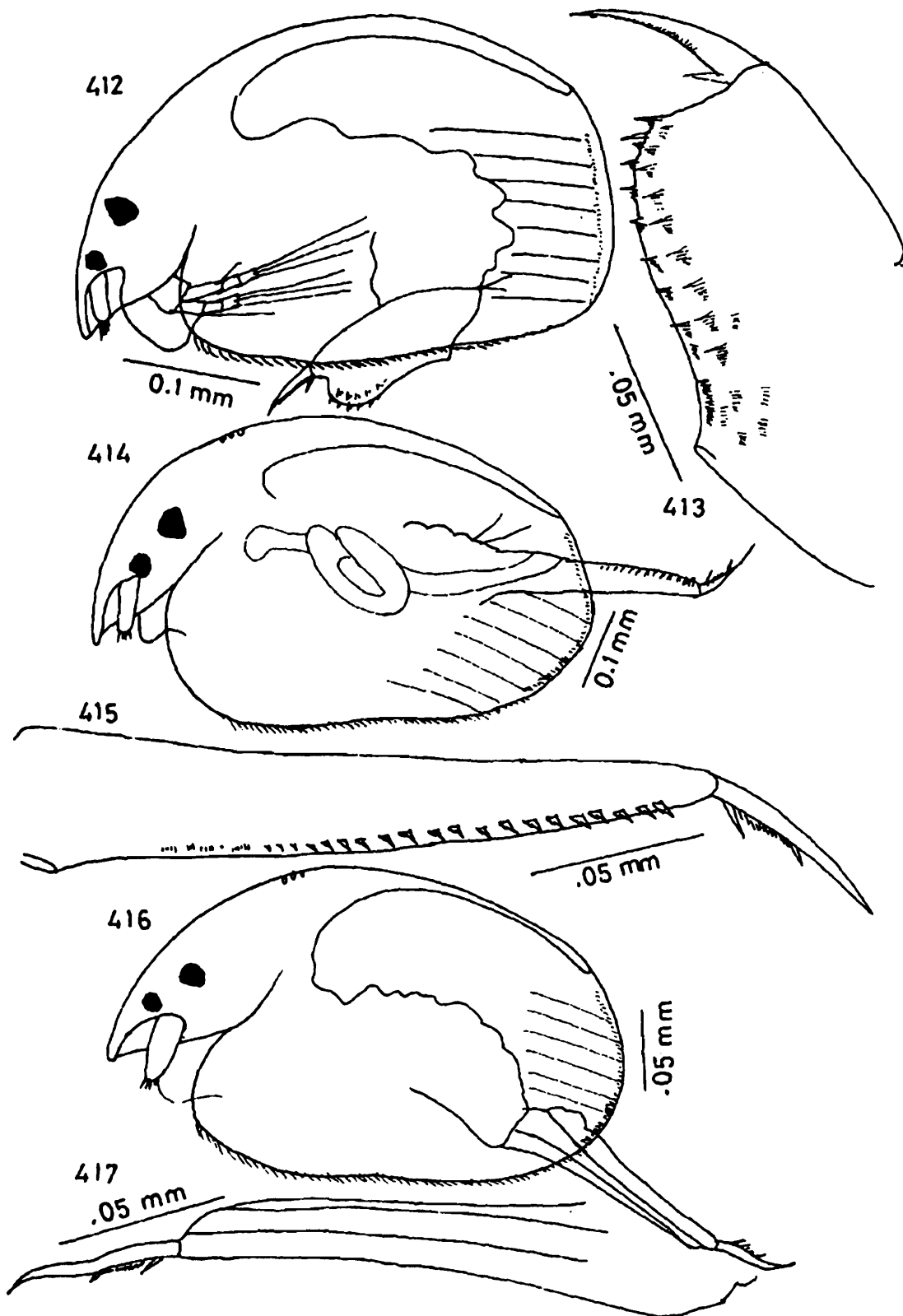
#### 49. *Camptocercus rectirostris* Schoedler, 1862 (Figs. 418-421)

**Material examined** : 4 examples, Barundanga, 07. 01. 2003, coll. B. K. Sharma; 4 examples, Kamakhya, 13. 03. 2003, coll. B. K. Sharma; 4 examples, Deepor, 08. 02. 2005, coll. B. K. Sharma; 3 examples, Ghorajan, 10. 02. 2005, coll. B. K. Sharma; 3 examples, Hiragota, 05. 03. 2004, coll. B. K. Sharma; 3 examples, Urmal, 10. 02. 2005, coll. B. K. Sharma; 2 examples, Kujibalipatty, 14. 03. 2005, coll. B. K. Sharma; 3 examples, Kololua, 29. 11. 2005, coll. Sumita Sharma; 4 examples, Memdubi, coll. Sumita Sharma; 4 examples, Samuajan, 18. 01. 2005, coll. B. K. Sharma.

**Characters** : Body oval in outline, strongly compressed laterally; with maximum height before its middle region. Postero-dorsal corner of valves distinct and postero-ventral corners with 3-4 distinctly separated denticles. Valves marked with oblique longitudinal lines. Head shield with three connected main head pores and lateral pores situated opposite to median main pore. Rostrum pointed and ventrally directed. Antennules not reaching apex of rostrum. Ocellus slightly smaller than eye and situated nearer to eye than to apex of rostrum. Postabdomen long, narrow and tapering distally; with about 20 anal denticles decreasing in size proximally and pre-anal corner blunt. Claw with a basal spine and setae on its concave margin, distal seta longest than others.

**Distribution** : INDIA - Meghalaya, Kashmir, West Bengal and Gujarat.

**Elsewhere** : Palaearctic, Oriental and Afro-tropical (?).



*Alona rectangula* Sars : Fig. 412, parthenogenetic female (lateral view), Fig. 413, postabdomen; *Camptocercus uncinatus* Smirnov : Fig. 414, parthenogenetic female (lateral view), Fig. 415, postabdomen, Fig. 416, parthenogenetic male (lateral view), Fig. 417, postabdomen (male).

Genus *Euryalona* Sars, 1901

*Characters* : Body almost quadrangular and valves with indistinct sculpture. Head shield with single head pore. Antennal setae: 1-1-3/ 0-0-3. Ocellus smaller than eye. Postabdomen long and narrow; with anal spines and lateral setae. Claw with one basal spine. Anus located in proximal part of postabdomen.

Only one species belonging to this genus is included in the present account.

50. *Euryalona orientalis* (Daday, 1898)

(Figs. 422-423)

*Material examined* : 3 examples, Barundanga, 07. 01. 2003, coll. B. K. Sharma; 4 examples, Horinchora, 07. 02. 2005, coll. B. K. Sharma; 4 examples, Kamakhya, 31. 03. 2003, coll. B. K. Sharma; 4 examples, Deepor, 03. 11. 2004, coll. B. K. Sharma; 3 examples, Siligurijan, 13. 01. 2003, coll. B. K. Sharma; 3 examples, Padma, 11. 02. 2005, coll. B. K. Sharma; 4 examples, Goranga, 05. 04. 2005, coll. Sumita Sharma; 4 examples, Kujibalipatty, 11. 01. 2003, coll. B. K. Sharma; 3 examples, Padmakhua, 01. 09. 2006, coll. Sumita Sharma; 2 examples, Shitalpathar, 01. 12. 2005, coll. Sumita Sharma; 4 examples, Samuajan, 18. 01. 2005, coll. B. K. Sharma; 3 examples, Puwa Saikia, 05. 04. 2005, coll. B. K. Sharma; 3 examples, Salchapra, 09. 02. 2005, coll. B. K. Sharma.

*Characters* : Body broadly quadrangular, ventral margin of valves with a blunt process before its middle and margins of valves with several concentric rows of weak dots. Head shield with blunt anterior and rounded posterior margin. Labral plate with convex anterior margin and blunt apex. Postabdomen long, narrow, slightly curved and with produced distal dorsal margin; with 20 anal spines decreasing in size proximally; groups of lateral setae arranged in a row. Claw with a basal spine and with setae on proximal half of its concave margin.

*Distribution* : INDIA - Meghalaya, Tripura, West Bengal and Rajasthan.

*Elsewhere* : Pantropical

Genus *Graptoleberis* Sars, 1862

*Characters* : Body semicircular in outline. Posterior ventral corner of valves usually with denticles. Rostrum wide, spatula-shaped. Posterior margin of head shield pointed. Distance between main head pores larger than distance from pores to posterior margin of head-shield. Valves reticulated with distinct large cells. Antennules not reaching apex of rostrum. Antennal seta: 0-0-3 / 0-1-3. Plate of labrum rounded. Postabdomen narrowing distally. Claw short. Six pairs of thoracic legs present; leg IV in form of a small process.

The collections examined from Assam indicated only one species of this genus in the present account.

51. *Graptoleberis testudinaria* (Fischer, 1851)  
(Figs. 424-425)

**Material examined** : 3 examples, Bhoispuri, 03. 05. 2002, coll. B. K. Sharma; 4 examples, Barundanga, 11. 02. 2002, coll. B. K. Sharma; 4 examples, Horinchora, 07. 02. 2005, coll. B. K. Sharma; 6 examples, Deepor, 08. 02. 2005, coll. B. K. Sharma; 3 examples, Siligurijan, 31. 01. 2003, coll. B. K. Sharma; 3 examples, Hiragota, 10. 09. 2004, coll. B. K. Sharma; 3 examples, Goranga, 10. 02. 2005, coll. B. K. Sharma; 3 examples, Kujibalipatty, 11. 01. 2005, coll. B. K. Sharma; 3 examples, Diphlu, 06. 09. 2006, coll. Sumita Sharma; 3 examples, Sarain Hubbi, 29. 11. 2005, coll. Sumita Sharma; 3 examples, Kutri, 06. 09. 2006, coll. Sumita Sharma; 4 examples, Dhekia, coll. B. K. Sharma; 4 examples, Senijan, 05. 04. 2005, coll. B. K. Sharma; 5 examples, Samuajan, 17. 01. 2005, coll. B. K. Sharma.

**Characters** : Body oblong, maximum height in the middle; dorsal margin of body convex, ventral margin nearly straight and with setae decreasing in size. Postero-ventral corner of valves with variable number of teeth. Head shield and valves with tetragonal, pentagonal or hexagonal cells. Rostrum broad and its ventral margin almost at level of ventral margin of valves. Labral plate with rounded apex. Ocellus situated nearer to eye than to apex of rostrum. Postabdomen tapering distally and with distinct preanal corner. Anal margin with row of anal spines increasing in size distally and groups of lateral setae. Claw with small basal spine and seta on concave margin.

**Distribution** : INDIA - Meghalaya, Kashmir, Uttaranchal and Andhra Pradesh.

**Elsewhere** : Cosmopolitan.

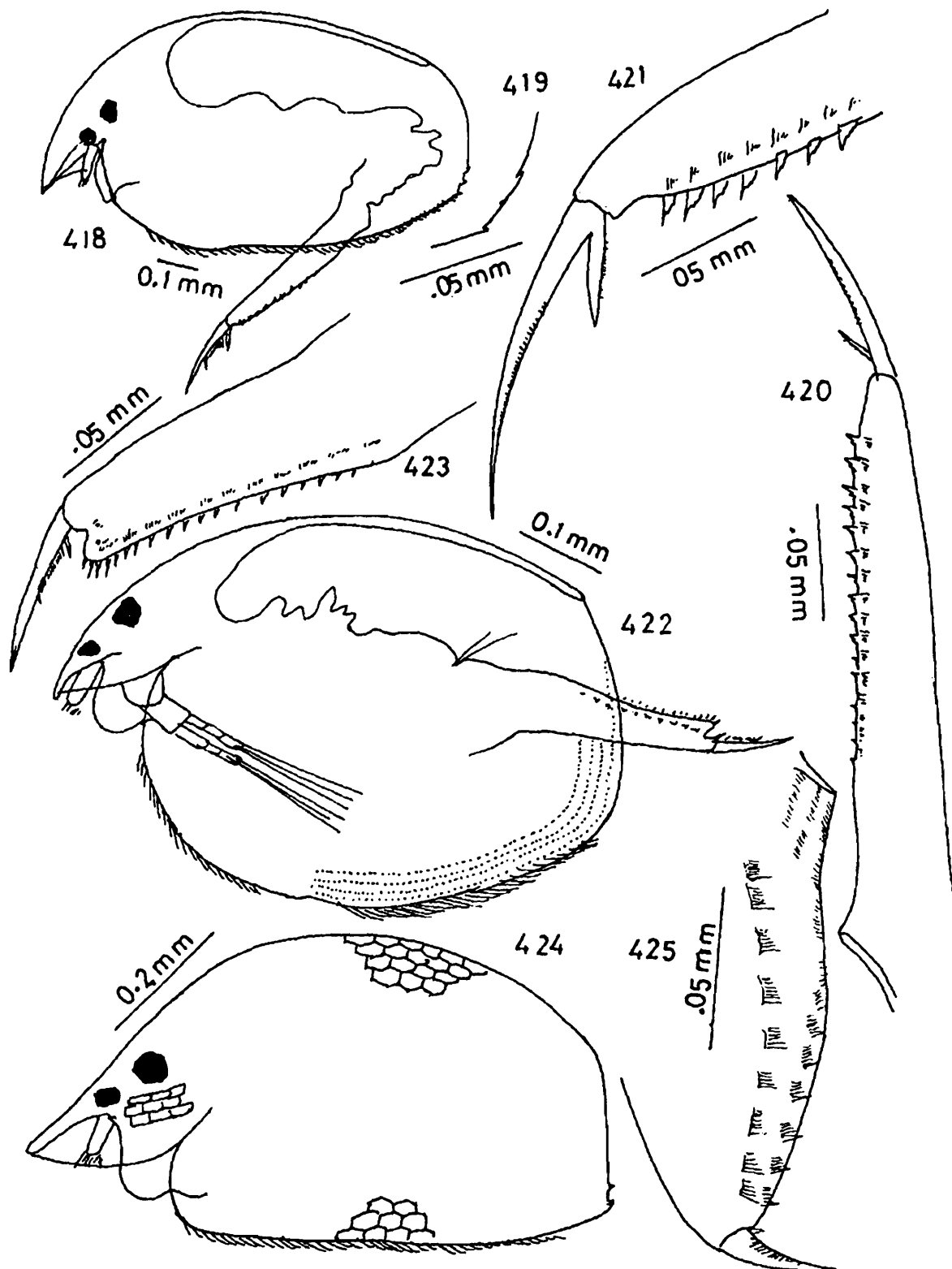
Genus *Karualona* Dumont and Silva-Briano, 2000

**Characters** : Head shield with two connected main pores and two small lateral pores. Valves densely reticulated; posterior ventral corner of each valve with 2-5 denticles. Labrum helmet shaped, with strong keel. Setae on legs I, III and IV characteristic. Postabdomen with sub-marginal group of spines and lateral fascicles of spine-setae.

The collections examined from Assam indicate only one species of this genus in the present account.

52. *Karualona karua* (King, 1853)  
(Figs. 426-428)

**Material examined** : 5 examples, Bhoispuri, 12. 03. 2003, coll. B. K. Sharma; 5 examples, Barundanga, 07.01. 2003, coll. B. K. Sharma; 6 examples, Hakama, 02. 11. 2004, coll. B. K. Sharma; 4 examples, Horinchora, 07. 02. 2005, coll. B. K. Sharma; 4 examples, Kamakhya, 13. 03. 2003, coll. B. K. Sharma; 6 examples, Deepor, 08. 02. 2005, coll. B. K. Sharma; 5 examples, Deepor, 06. 04. 2005, coll. Sumita Sharma; 2 examples, Kamranga, 12. 07. 2004, coll. B. K. Sharma; 5 examples, Ghorajan, 09. 09. 2004, coll. B. K. Sharma; 3 examples, Siligurijan, 12. 03. 2003, coll. B. K. Sharma; 4 examples, Hiragota, 10. 09. 2004, coll. B. K.



*Camptocercus rectirostris* Schoedler: Fig. 418, parthenogenetic female (lateral view), Fig. 419, valve (posterior ventral corner); Fig. 420, postabdomen; Fig. 421, postabdomen (enlarged); *Euryalona orientalis* (Daday) : Fig. 422, parthenogenetic female (lateral view), Fig. 423, postabdomen; *Graptoleberis testudinaria* (Fischer) : Fig. 424, parthenogenetic female (lateral view), Fig. 425, postabdomen.

Sharma; 4 examples, Padma, 14. 04. 2004, coll. B. K. Sharma; 3 examples, Goranga, 12. 07. 2004, coll. B. K. Sharma; 4 examples, Kujibalipatty, 01. 03. 2003, coll. B. K. Sharma; 4 examples, Bandha, coll. B. K. Sharma; 3 examples, Padmakhua, 01. 09. 2006, coll. Sumita Sharma; 4 examples, Sarang, 03. 09. 2006, coll. Sumita Sharma; 4 examples, Mihir, 05. 09. 2006, coll. Sumita Sharma; 3 examples, Mora Daphlang, 03. 12. 2005, coll. Sumita Sharma; 5 examples, Memdubi, 30. 11. 2005, coll. Sumita Sharma; 5 examples, Maghuri, 30. 11. 2005, coll. Sumita Sharma; 5 examples, Butikor, 02. 04. 2005, coll. B. K. Sharma; 6 examples, Samuajan, 18. 01. 2005, coll. B. K. Sharma; 4 examples, Sone, 08. 08. 2004, coll. B. K. Sharma; 3 examples, Baskandi, 19. 10. 2004, coll. B. K. Sharma

**Characters** : Female : Body broadly oval in outline; with maximum width slightly before its middle; postero-ventral corner of valves with 3-5 denticles separated from each other by margin of valves. Valves marked with lines interconnected to give a pattern of polygons. Head shield with rounded anterior and posterior margins. Antennules almost reaching apex of rostrum. Antennal setae: 0-0-3/ 0-1-3. Labral plate with rounded anterior margin. Ocellus smaller than eye and situated nearer to eye than to apex of rostrum. Postabdomen wide and with almost rounded distal margin; with 7-8 anal spines; lateral setae in groups and first seta of few distal groups projecting beyond margin of postabdomen. Claw with a very small basal spine.

Male : Smaller than female. Postero-ventral corner of valves with denticles. Antennules reaching apex of rostrum. Leg I modified and with a hook. Postabdomen only with a row of lateral setae. Vas deferens opening ventrally near base of claws. Claw with small basal spine.

**Distribution** : INDIA - Meghalaya, Tripura, Kashmir, West Bengal, Gujarat, Rajasthan, Tamil Nadu, Kerala and little Andaman.

**Elsewhere** : Cosmopolitan between 40° latitude North and South, also reported from USSR and Central Asia.

#### Genus *Kurzia* Dybowski and Grochowski, 1894

**Characters** : Body oval in outline. Head shield with three median head pores and small pores lateral to them; distance from small pores to posterior margin of head shield shorter than distance between pores. Rostrum long and ventrally directed. Antennules narrow and elongate. Ocellus smaller than eye. Intestine forming loops and with a caecum. Postabdomen long and narrow; with many anal spines. Claw with one basal spine. Five pairs of legs present.

This genus is represented by only one species in the present account.

#### 53. *Kurzia longirostris* (Daday, 1898) (Figs. 429-430)

**Material examined** : 5 examples, Deepor, 08. 02. 2005, coll. B. K. Sharma; 3 examples, Ghorajan, 04. 03. 2004, coll. B. K. Sharma; 4 examples, Hiragota, 08. 05. 2004, coll. B. K. Sharma; 4 examples, Padma, 11. 02. 2005, coll. B. K. Sharma; 4 examples, Kujibalipatty,

01. 03. 2005, coll. B. K. Sharma; 3 examples, Karasing, 02. 12. 2005, coll. Sumita Sharma; 3 examples, Itakhuli, 01. 12. 2005, coll. Sumita Sharma; 5 examples, Maghuri, 30. 11. 2005, coll. Sumita Sharma; 5 examples, Samuajan, 18. 01. 2005, coll. B. K. Sharma; 3 examples, Baskandi, 03. 01. 2004, coll. B. K. Sharma.

*Characters* : Body broadly oval in outline and compressed; postero-ventral corner of valves rounded. Valves marked with longitudinal lines. Rostrum long, ventrally curved and extending up to median line of body. Three main head pores connected by open channel and expanded at anterior end. Antennules reaching middle of rostrum. Ocellus smaller than eye and its distance from eye half as much as from rostrum. Labral plate with convex anterior margin and pointed apex. Postabdomen long, tapering distally and its distal corner produced, pre-anal corner not projecting; with 18-20 anal denticles. Claw with a basal spine and setae on its concave margin.

*Distribution* : INDIA - Meghalaya, West Bengal, Rajasthan, Tamil Nadu, Kerala and little Andaman.

*Elsewhere* : Cosmotropical.

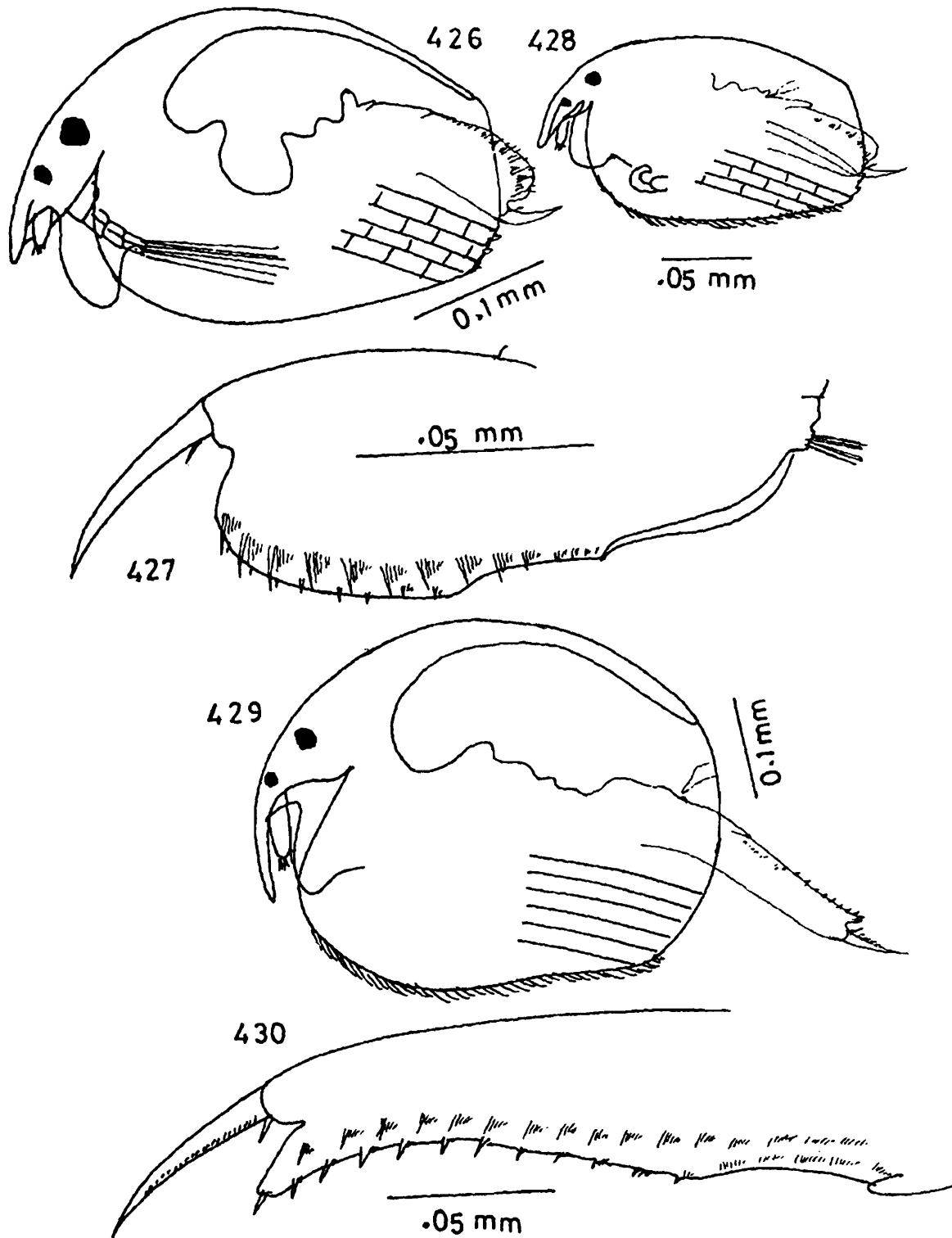
#### Genus *Leydigia* Kurz, 1875

*Characters* : Body almost oval in outline. Postero-dorsal corner of valves near level of highest point of dorsal margin. Rostrum short and blunt. Head shield with three connected main head pores and small pores located very close to main pores; distance from head pores to posterior margin of head shield longer than distance between main pores. Antennal setae: 0-0-3 / 1-1-3. Plate of labrum rounded. Postabdomen wide and flattened; anal spines very small; lateral setae well developed and in groups. Claw with or without basal spine. Five pairs of legs present.

The collections examined from Assam included only one species of this genus.

#### 54. *Leydigia acanthocercoides* (Fischer, 1854) (Figs. 431-432)

*Material examined* : 4 examples, Horinchora, 02. 11. 2004, coll. B. K. Sharma; 5 examples, Deepor, 08. 02. 2005, coll. B. K. Sharma; 3 examples, Kamranga, 10. 02. 2005, coll. B. K. Sharma; 3 examples, Ghorajan, 08. 12. 2004, coll. B. K. Sharma; 3 examples, Padma, 11. 02. 2005, coll. B. K. Sharma; 4 examples, Goranga, 03. 11. 2004, coll. B. K. Sharma; 3 examples, Thekera, 08. 11. 2004, coll. B. K. Sharma; 3 examples, Ghorkhonjan, 05. 03. 2005, coll. Sumita Sharma; 2 examples, Jugdal, 05. 04. 2005, coll. Sumita Sharma; 3 examples, Morakalong, 03. 12. 2005, coll. Sumita Sharma; 4 examples, Naruathan, 19. 01. 2005, coll. B. K. Sharma; 3 examples, Samuajan, 18. 01. 2005, coll. B. K. Sharma; 3 examples, Sone, 19. 10. 2004, coll. B. K. Sharma.



*Karualona karua* (King) : Fig. 426, parthenogenetic female (lateral view), Fig. 427, postabdomen, Fig. 428, male (lateral view); *Kurzia longirostris* (Daday) : Fig. 429, parthenogenetic female (lateral view), Fig. 430, postabdomen.

*Characters* : Body broadly oblong and laterally compressed. Valves and head with longitudinal lines; intervals between lines with fine striations. Head shield with rounded posterior margin; distance from posterior main pore to posterior margin of head shield about four times than distance between marginal main pores. Rostrum short, blunt and anteriorly directed. Labral plate with cilia on its convex anterior margin. Ocellus larger than eye and situated nearer to eye than to apex of rostrum. Postabdomen large, broadly rounded and with small anal spines; lateral setae in groups, with two setae in each group and with two small terminal groups near base of claws. Claw with a basal spine.

*Distribution* : INDIA - Assam, Meghalaya, Tripura, West Bengal, Rajasthan and Gujarat.

*Elsewhere* : Holarctic, Neotropical, Oriental and Afro-tropical.

### Genus *Leydigiopsis* Sars, 1901

*Characters* : Body oval. Head shield of female with long rostrum; two main broadly connected head pores and small pores situated near the main pores. Antennules short. Labral plate triangular. Postabdomen large, with convex dorsal margin; with a double row of anal spines and a row of lateral spines on each side. Intestine with a double loop.

This rare genus is represented by only one species in plankton samples collected from the floodplain lakes of Assam.

#### 55. *Leydigiopsis curvirostris* Sars, 1901 (Figs. 433-434)

*Material examined* : 5 examples, Deepor, 07. 05. 2005, coll. B. K. Sharma.

*Characters* : Body oval in outline and with maximum height in the middle. Postero-dorsal and postero-ventral corner of valves rounded. Ventral margin of valves protruding before the middle; entire ventral margin with setae which continue along posterior margin in a row of fine hairs, margin of valves with concentric rows of dots. Rostrum very long and curved posteriorly. Distance from apex of rostrum to apex of rostrum nearly twice the length of antennule. Head-shield with two broadly connected main head pores and two small pores close to them. Plate of labrum triangular and with slightly pointed apex. Fornices with slightly curved margin. Ocellus about as large as the eye. Endopodite of antenna slightly shorter than exopodite when directed posteriorly; the lowest seta on the apical segment of the exopodite longest than the two others and reaching the posterior margin of the valve.

Postabdomen large and characteristic; its dorsal margin distinctly convex distal to the anus; distal end of postabdomen rounded, preanal corner distinct. Postabdomen with double row of 16-20 anal denticles, decreasing in size proximally and a row of lateral spinules on each side. Claw large, with a small basal denticle and with setae on the concave margin.

Leg II with uniform thin, hook-shaped setae. Leg III with a square exopodite with 2 setae on the dorsal side and 5 setae on the posterior side; the dorsal posterior seta twice as long

as the others. Leg IV with rounded endopodite with 6 setae. Leg V with a large exopodite with 4 setae, one on the anterior side and three on the posterior side.

*Distribution* : INDIA - new record.

*Elsewhere* : Brazil and Thailand.

#### Genus *Oxyurella* Dybowski and Grochowski, 1894

*Characters* : Body oval and rostrum blunt. Head shield with two separate main head pores with two small pores in between them and two small lateral pores. Antennules not reaching apex of rostrum. Antennal setae: 0-0-3 / 1-1-3. Ocellus slightly smaller than eye. Postabdomen slender, slightly tapering distally; with anal spines and lateral setae. Claw with one or more basal spines located at some distance from its base. Five pairs of legs present.

The collections examined from Assam include only one species of this genus in the present account.

#### 56. *Oxyurella singalensis* (Daday, 1898)

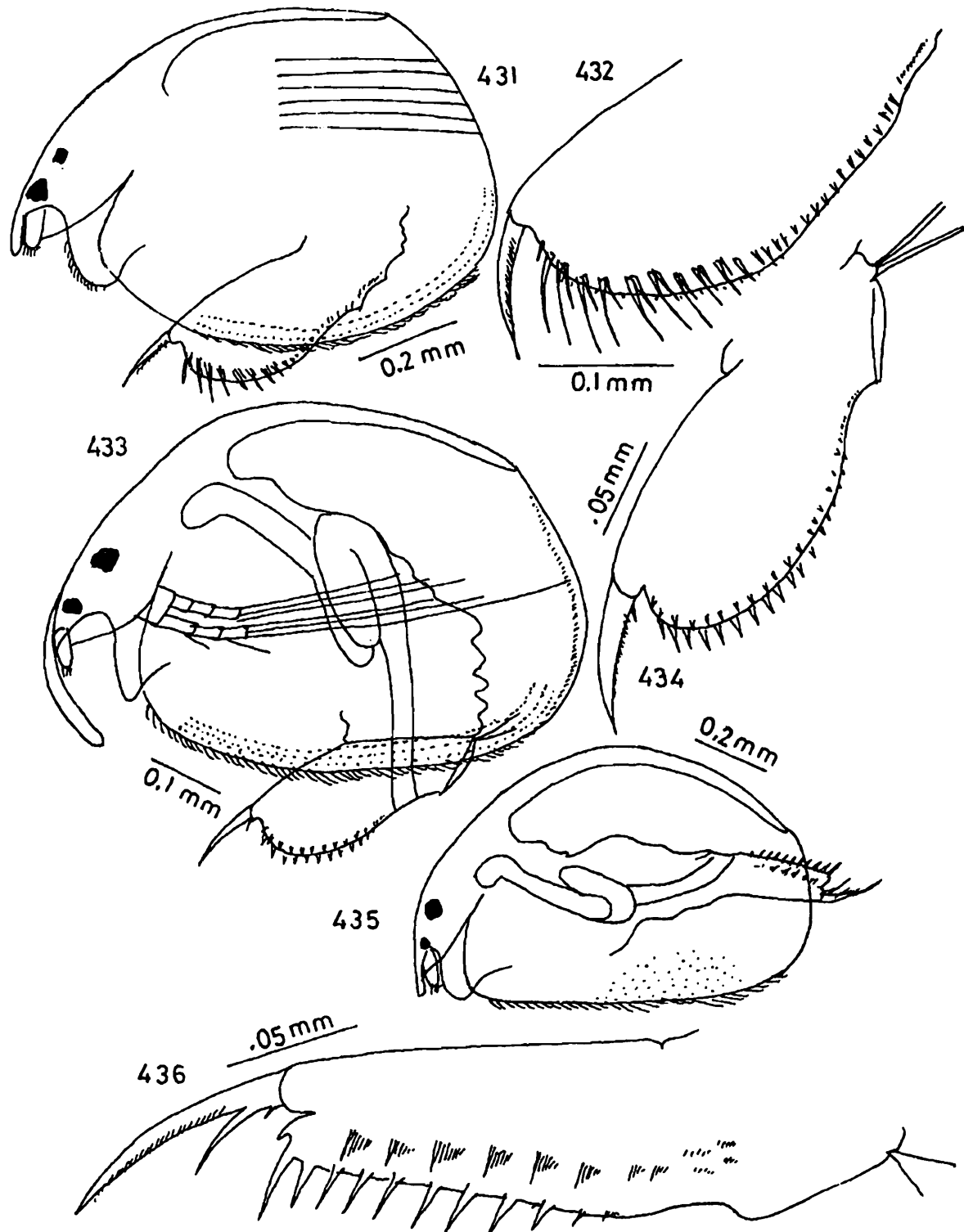
(Figs. 435-436)

*Material examined* : 4 examples, Barundanga, 12. 03. 2003, coll. B. K. Sharma; 4 examples, Horinchora, 07. 02. 2005, coll. B. K. Sharma; 3 examples, Kamakhya, 31. 03. 2003, coll. B. K. Sharma; 5 examples, Deepor, 08. 02. 2005, coll. B. K. Sharma; 3 examples, Ghorajan, 04. 03. 2004, coll. B. K. Sharma; 3 examples, Siligurijan, 12. 03. 2003, coll. B. K. Sharma; 3 examples, Goranga, 07. 05. 2004, coll. B. K. Sharma; 3 examples, Thekera, 06. 05. 2004, coll. B. K. Sharma; 3 examples, Bandha, 01. 12. 2005, coll. B. K. Sharma; 3 examples, Padmakhua, 01. 09. 2006, coll. Sumita Sharma; 2 examples, Diang, 01. 12. 2005, coll. Sumita Sharma; 4 examples, Raidong, 30. 11. 2005, coll. Sumita Sharma; 3 examples, Dhekia, 03. 04. 2005, coll. B. K. Sharma; 4 examples, Samuajan, 05. 04. 2005, coll. B. K. Sharma; 3 examples, Puwa Saikia, 17. 01. 2005, coll. B. K. Sharma; 3 examples, Salchapra, 09. 02. 2005, coll. B. K. Sharma; 3 examples, Baskandi, 09. 02. 2005, coll. B. K. Sharma.

*Characters* : Body broadly oval in outline and valves with rounded postero-dorsal and postero-ventral corners. Valves marked with dots and with lines parallel to ventral margin. Head shield with more or less rounded posterior margin and blunt anterior margin. Rostrum blunt and ventrally directed. Labral plate with convex anterior margin and blunt apex. Ocellus smaller than eye and situated nearer to eye than to apex of rostrum. Postabdomen long, slightly tapering distally; with 11-13 anal spines decreasing in size proximally, distal longest anal spine preceded by a short denticle at extreme distal end. Lateral setae in groups and arranged in a row. Claw large and with setae on its concave margin; with a large basal spine situated at some distance from its base and with a small additional spine at its base.

*Distribution* : INDIA - Meghalaya, Tripura, West Bengal and Rajasthan.

*Elsewhere* : Cosmotropical.



*Leydigia acanthocercoides* (Fischer): Fig. 431, parthenogenetic female (lateral view), Fig. 432, postabdomen;  
*Leydigiopsis curvirostris* Sars: Fig. 433, parthenogenetic female (lateral view), Fig. 434, postabdomen;  
*Oxyurella singalensis* (Daday): Fig. 435, parthenogenetic female (lateral view), Fig. 436, postabdomen.

**3. COPEPODA****SYSTEMATIC LIST OF REPORTED SPECIES**

Phylum ARTHOPODA  
 Superclass CRUSTACEA  
 Class COPEPODA

**Order CALANOIDA****Family DIAPTOMIDAE****Subfamily DIAPTOMINAE***Heliodiaptomus cinctus* (Gurney, 1907)*H. contortus* (Gurney, 1907)*H. viduus* (Gurney, 1916)*Neodiaptomus schmackeri* (Poppe &  
Richard, 1892)*Phyllodiaptomus annae* (Apstein, 1907)**Order CYCLOPOIDA****Family CYCLOPIDAE****Subfamily EUCYCLOPINAE***Tropocyclops prasinus* (Fischer, 1860)**Subfamily CYCLOPINAE***Mesocyclops leuckarti* (Claus, 1857)*M. splendidus* Lindberg, 1943*Microcyclops varicans* Sars, 1863*Thermocyclops crassus* (Fischer, 1853)*T. decipiens* Kiefer, 1929**SYSTEMATIC ACCOUNT****Key to the reported Orders, Families and Subfamilies of COPEPODA**

1. Antennules 20-25-segmented. Antennae, mandibles and maxillulae biramous. In adult males one antennule geniculate. Leg 5 modified into a copulatory organ in male. Female with a single median genital pore. Abdomen narrow. Single egg-sac present.....  
 ..... Order CALANOIDA.....2  
 Antennules 9-17 segmented; both antennules of male geniculate. Antennae uniramous. Maxilliped simplified, without prehensile claw. Leg V reduced, identical in both sexes. Two genital pores, often sub-dorsally situated. Two egg sacs present. ....  
 ..... Order CYCLOPOIDA.....3
2. Antennules 25-segmented. Endopodite of leg I two-segmented, of legs II-IV three-segmented. Female leg V with endopodite ..... Family DIAPTOMIDAE  
 Exopodite of leg I with only one marginal outer spine. Right antenna of male with four segments after geniculation ..... Subfamily DIAPTOMINAE
3. Palp of mandible poorly developed, represented by one process with three setae .....  
 ..... Family CYCLOPIDAE.....4
4. Terminal segment of leg V with 3 setae or spines ..... Subfamily EUCYCLOPINAE  
 Terminal segment of leg V with 2 setae or spines ..... Subfamily CYCLOPINAE

## Order CALANOIDA

*Characters* : Antennules 20-25-segmented. Antennae, mandibles and maxillulae biramous. In adult males one antennule geniculate and used for grasping, another always reaching urosome. Caudal part of body often asymmetrical. Leg 5 modified into a copulatory organ in male. Female with a single median genital pore. Abdomen narrow. Single egg-sac present.

The Calanoida are represented by only one family in the present account.

### Family DIAPTOMIDAE Baird, 1850

*Characters* : Antennules 25-segmented. Endopodite of leg I two-segmented, of legs II-IV three-segmented. Female leg V with endopodite.

This family includes two sub-families while only one i.e., Diaptominae is represented in the samples collected from the floodplain lakes of Assam.

### Subfamily DIAPTOMINAE Kiefer, 1932

*Characters* : Exopodite of leg I with only one marginal outer spine. Right antenna of male with four segments after geniculation.

This sub-family includes five species belonging to three genera in the present account.

### Genus *Heliodiaptomus* Kiefer, 1932

*Characters* : Female : Antennules extending slightly beyond or only to base of caudal setae. Endopodite of leg IV without apical setae; end claw with hairy or spinulose margins, rarely denticulate. Exopodite of leg I with only one marginal outer spine.

Male : Right antenna with four segments after geniculation. Right caudal ramus without chitinous tooth on ventral side. Right leg V with endopodite generally cylindrical, lateral spine of exopodite usually proximal; exopodite of left leg V with a short or elongate digitiform process and a well developed seta apically.

Three species of this genus are recorded in the present study.

#### 1. *Heliodiaptomus cinctus* (Gurney, 1907) (Figs. 437-441)

*Material examined* : 3 examples, Jogra, 10. 08. 2002, coll. B. K. Sharma; 6 examples, Deepor, 09. 09. 2004, coll. B. K. Sharma 4 examples, Dubratoli, 03. 09. 2006, coll. Sumita Sharma; 5 examples, Mohna, 03. 09. 2006, Sumita Sharma; 3 examples, Baghmari, 06. 09. 2006, Sumita Sharma; 6 examples, Samuajan, 11. 06. 2004, coll. B. K. Sharma.

*Characters* : Female : Fourth and fifth pedigers demarcated by an uninterrupted transverse row of spinules; lateral wings of 5th pediger small, left wing larger than right and constricted

at base; spines of left wing larger than those of right wing. Genital somite dilated sub-proximally, asymmetrical laterally directed slender spine on right and a chitinous projection carrying thick spine on left. Antennules extending caudal seta by 3-4 segments. Leg V : lateral spine of second exopodite tooth-like, third exopodite replaced by a spine and a seta.

**Male :** Genital pore small. Second and third urosomites with ventral hairs. Left caudal ramus slender than right. Right antennule with spine on each side of segments 8 and 9-16, penultimate segment with a hyaline membrane along outer margin. Exopodite of right leg V with one proximal lateral spine, endopodite conical and longer than first exopodite segment. Endopodite of right leg V smaller than that of right.

**Distribution :** INDIA Assam, West Bengal, Bihar, Delhi, Orissa, Tamil Nadu, Kerala and Andhra Pradesh.

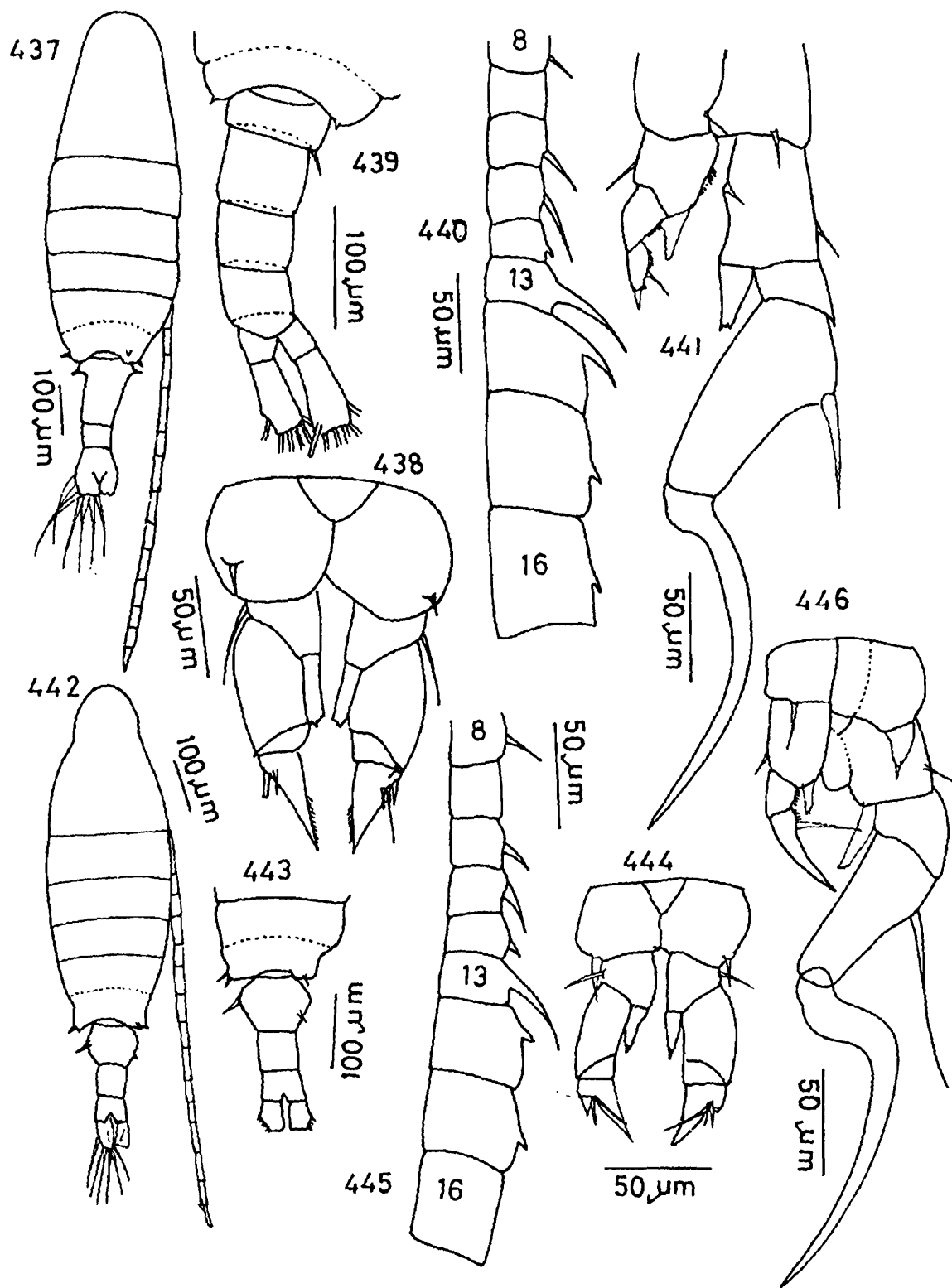
**Elsewhere :** India, Sri Lanka and Myanmar.

## 2. *Heliodiaptomus contortus* (Gurney, 1907) (Figs. 442-446)

**Material examined :** 5 examples, Hakama, 02. 11. 2004, coll. B. K. Sharma; 8 examples, Deepor, 09. 09. 2004, coll. B. K. Sharma; 6 examples, Dighali, 12. 10. 2002, coll. B. K. Sharma; 4 examples, Ghorajan, 03. 11. 2004, coll. B. K. Sharma; 3 examples, Kamranga, 09. 09. 2004, coll. B. K. Sharma; 4 examples, Hiragota, 10. 09. 2004, coll. B. K. Sharma; 4 examples, Urmal, 04. 11. 2004, coll. B. K. Sharma; 4 examples, Padma, 11. 02. 2005, coll. B. K. Sharma; 3 examples, Sitalmari, 13. 11. 2004, coll. B. K. Sharma; 4 examples, Solmari, 10. 02. 2005, coll. B. K. Sharma; 5 examples, Gorkhonjan, 05. 03. 2005, coll. B. K. Sharma; 4 examples, Demon, 01. 12. 2005, coll. Sumita Sharma; 3 examples, Hakoi, 29. 11. 2005, coll. Sumita Sharma; 3 examples, Sesa, 01. 12. 2005, coll. Sumita Sharma; 5 examples, Salchakra, 11. 12. 2004, coll. B. K. Sharma.

**Characters :** Female : Lateral wings of 5th pediger small, rounded, symmetrical and with 2 unequal spines; right wing small. Genital somite shorter and asymmetrical; left genital spine longer than anterior in position to right spine. Caudal rami with outer hairy margins. Antennules extending caudal setae by last 1 or 2 segments. Second exopodite of left leg V with large tooth-like lateral spine near base; third exopodite vestigial; endopodite 2/3 as long as exopodite and with pointed apex.

**Male :** Postero-lateral border of 5th pediger with only few spinules. Genital somite extending slightly beyond succeeding segment. Caudal rami symmetrical, with hairless lateral margins. Right antennule with spine on each of 8 and 10-15 segments; spinus process of penultimate segment straight or curved apically. First exopodite of leg IV with 2 hyaline lobes, second segment of characteristic shape, end claws very strong. Second exopodite of leg V with chela-like shape, endopodite much shorter than its counterpart of right leg.



*Heliodiaptomus cinctus* (Gurney): Fig. 437, female, Fig. 438, leg V, Fig. 439, Male pedigers 4, 5 and urosome, Fig. 440, right antennule segments 8-18 (male), Fig. 441 leg V (male); *Heliodiaptomus contortus* (Gurney): Fig. 442, female, Fig. 443, pedigers 4, 5 and urosome, Fig. 444, leg V, Fig. 445, antennule segments 8-16 (male), Fig. 446, leg V (male).

**Distribution** : INDIA West Bengal, Bihar, Orissa, Delhi, Andhra Pradesh, Maharashtra and Goa.

**Elsewhere** : Endemic to India.

### 3. *Heliodiaptomus viduus* (Gurney, 1916) (Figs. 447-450)

**Material examined** : 5 examples, Bhoispuri, 04. 12. 2002, coll. B. K. Sharma; 6 examples, Barundanga, 12. 03. 2003, coll. B. K. Sharma; 4 examples, Fingua, 09. 01. 2003, coll. B. K. Sharma; 8 examples, Deepor, 08. 02. 2005, coll. B. K. Sharma; 4 examples, Hakama, 07. 02. 2005, coll. B. K. Sharma; 4 examples, Horinchora, 02. 11. 2004, coll. B. K. Sharma; 5 examples, Ghorajan, 08. 02. 2005, coll. B. K. Sharma; 4 examples, Kakerikhola, 11. 02. 2005, coll. B. K. Sharma; 3 examples, Sarang, 03. 09. 2006, coll. Sumita Sharma; 3 examples, Ghorkhonjan, 05. 03. 2005, coll. Sumita Sharma; 4 examples, Goranga, 05. 04. 2005, coll. Sumita Sharma; 4 examples, Kowaimari, 02. 12. 2005, coll. Sumita Sharma; 4 examples, Teliadanga, 01. 12. 2005, coll. Sumita Sharma; 5 examples, Muijan, 29. 11. 2005, coll. Sumita Sharma; 4 examples, Itakhuli, 01. 12. 2005, coll. Sumita Sharma; 2 examples, Maghuri, 30. 11. 2005, coll. Sumita Sharma; 5 examples, Dhekia, 03. 04. 2005, coll. B. K. Sharma; 6 examples, Puwa Saikia, 18. 01. 2005, coll. B. K. Sharma; 6 examples, Samuajan, 05. 04. 2005, coll. B. K. Sharma; 4 examples, Baskandi, 09. 02. 2005, coll. B. K. Sharma.

**Characters** : Female : Lateral wings of 5th pediger short, each wing with 2 short, lateral directed hyaline spines. Genital somite slightly asymmetrical, right spine somewhat anterior to left spine, left spine bifid. Caudal rami slightly longer than wide and with hirsute lateral margins. Caudal setae short, stout, and outermost 2 setae distinctly arched. Antennules extending caudal rami by 3-4 segments. Left leg V with shorter left coxal spine, lateral margins of claw denticulate; endopodite about half the length of first exopodite segment.

**Male** : Fourth and fifth pedigers separated by transverse row of dorsal spinules. Caudal rami 1.4 times as long as wide and with hirsute inner margins. Right antennule with one spine each on 8 and 10-16 segments; spinus process on penultimate segment straight. First exopodite of right leg V produced into spinus process at distal outer corner and armed with conical chitinous process; second exopodite segment elongate, end claw dilated at base and with angular outer margin. Left leg V- basis with 2 small hyaline lobes, endopodite about as long as its counterpart on right leg.

**Distribution** : INDIA Assam, West Bengal, Bihar, Kerala, Tamil Nadu, Andhra Pradesh Madhya Pradesh and Maharashtra.

**Elsewhere** : India, Sri Lanka, Pakistan, Bangladesh, Myanmar and Thailand.

### Genus *Neodiaptomus* Kiefer, 1932

**Characters** : Female : Antennules extending beyond caudal setae. Fifth legs mostly

asymmetrical, right leg shorter than left; end claws with coarsely denticulate margins; third exopodite segment reduced or absent, apex of endopodite pointed and without setae.

Male : Right antennule with spine each on 10, 11, 13-15 segments; penultimate segment with long or short spinus process; lateral spine on second exopodite of right leg V inserted medially. Second exopodite of left leg V with small thumb-like process and a short seta apically. Right caudal ramus with tooth-like chitinous structure at inner ventro-distal corner.

This genus is represented by only one species in the examined samples.

4. *Neodiaptomus schmackeri* (Poppe & Richard, 1892))  
(Figs. 451-454)

*Material examined* : 4 examples, Muijan, 29. 11. 2005, coll. Sumita Sharma; 4 examples, Bor beel, 01. 12. 2005, coll. Sumita Sharma; 4 examples, Maghuri, 30. 11. 2005, coll. Sumita Sharma.

*Characters* : Female : Lateral wings asymmetrical, left wing slightly more extensive than right. Genital somite asymmetrical, sub-proximal part dilated into a lobe on each side. Caudal rami with hirsute inner margins. Antennules extending beyond caudal setae by last 2-3 segments. First exopodite of leg V with bulge at proximal inner angle; right claw with 6-8 denticles on inner margin and 0-1 on outer margin; left end claw with 8-11 denticles on inner margin and 0-2 on outer margin. Third exopodite segment distinct. Endopodite shorter than first exopodite segment.

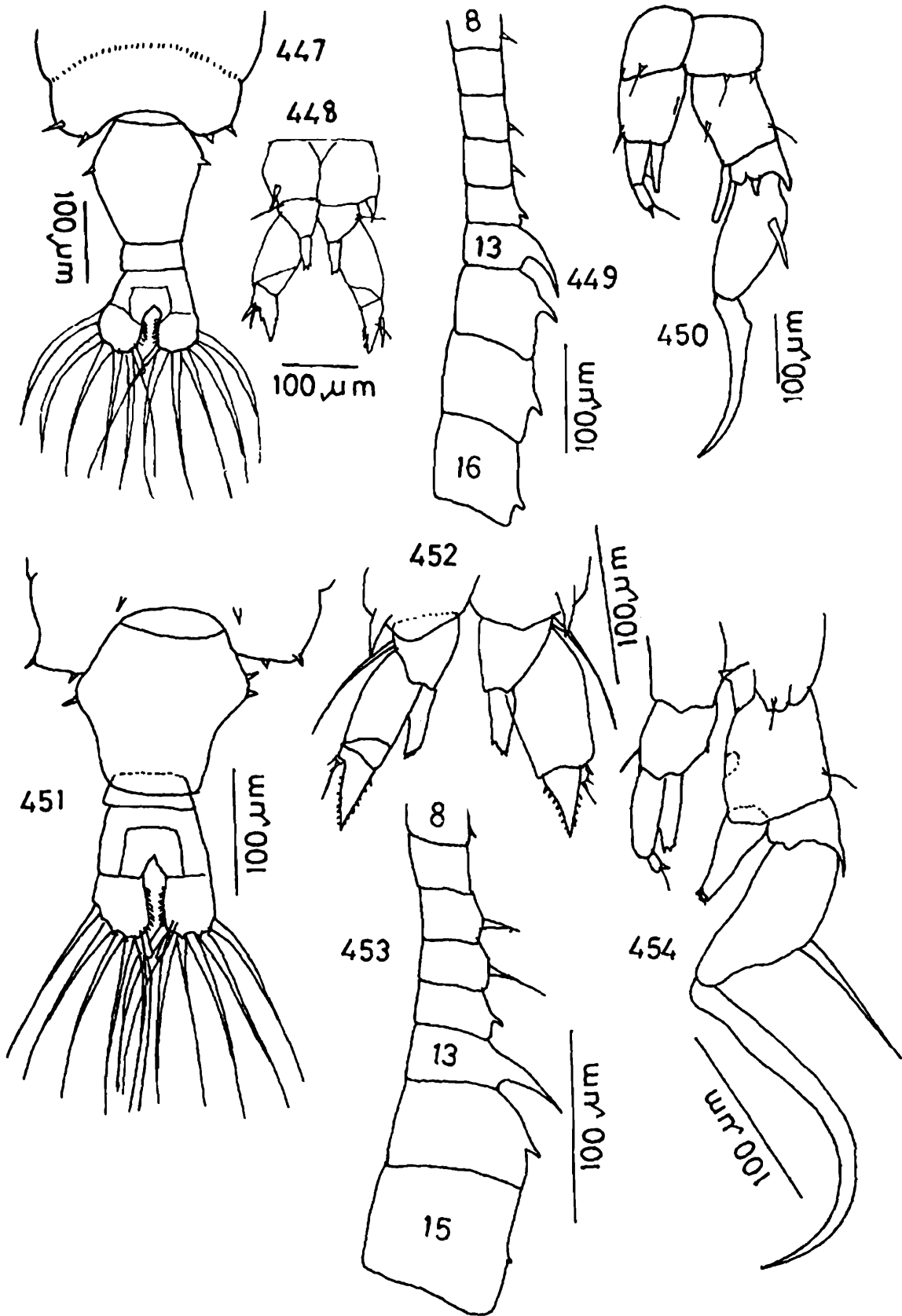
Male : Second and third urosomites with ventral hair. Caudal rami symmetrical, right ramus with small dentiform process at distal, inner corner on ventral surface. Right antennule with spine each on 8 and 10-15 segments; spinus process on penultimate segment straight. Coxa of leg V with bifid hyaline lobe at distal inner corner; end claw sickle shaped; endopodite flask-shaped. Basis with hyaline lamella on inner margin of left leg V.

*Distribution* : INDIA- N.W. India, West Bengal, Tamil Nadu and Andhra Pradesh.

*Elsewhere* : Sri Lanka, Nepal, Bangladesh, Malaysia, Singapore, Thailand, Philippines, Korea, China and east Siberia.

Genus *Phyllodiaptomus* Kiefer, 1936

*Characters* : Female : Lateral wings of 5th pediger moderately developed; left wing longer than right wing; urosome of 3 somites, genital somite longer than the rest. Antennules extending to end of caudal setae or slightly longer. Leg V-coxal spine strong; endopodite long 2-segmented and with spinules on rounded apex, end claw with hairy or spinulose margins, third exopodite small but distinct.



*Heliodiaptomus viduus* (Gurney) : Fig. 447, pedigers 4, 5 and urosome, Fig. 448, leg V, Fig. 449, antennule segments 8-16 (male), Fig. 450, leg V (male); *Neodiaptomus schmackeri* (Poppe & Richard): Fig. 451 pedigers 4, 5 and urosome, Fig. 452, leg V, Fig. 453, antennule segments 8-15 (male), Fig. 454, leg V (male).

Male : Right antennule with spine each on 8, 10-16 segments and short comb-like serrate process on penultimate segment. Right caudal ramus without chitinous tooth on ventral side. Leg V: coxa produced into prominent conical tongue-shaped hyaline plate at distal inner corner; second exopodite-segment with a bent digitiform distal spinus process. Second exopodite-segment of left leg V with thumb-like apical process and inner modified seta, between which lies a serrate, membranous hyaline process.

This genus includes only one species in the present study.

**5. *Phyllodiaptomus annae* (Apstein, 1907)**  
(Figs. 455-459)

*Material examined* : 4 examples. Jugdal, 01. 09. 2006, coll. Sumita Sharma; 5 examples, Sohala, 05. 09. 2006, coll. Sumita Sharma; 3 examples, Moona, 06. 09. 2006, coll. Sumita Sharma; 5 examples, Bamoni, 01. 09. 2006, coll. Sumita Sharma.

*Characters* : Female : Lateral wings of 5th pediger asymmetrical; left wing triangular and laterally directed, right wing wide and bi-lobed. Genital somite asymmetrical and longer than rest of urosome; genital spines small. Antennule extending to end of lateral caudal setae. Leg V: coxa of both legs small and pointed, sensory seta on basis shorter than first exopodite segment. Third exopodite segment with 2 unequal spines, inner spine long and extending beyond end claw. Endopodite 2 -segmented, slightly shorter than first exopodite segment.

Male : Caudal rami symmetrical. Right antennule with spine each on 8, 10-16 segments; penultimate segment produced into comb-like structure with 2-8 teeth. Right leg V: produced apically with short, triangular, apically blunt hyaline plate; first exopodite with distal pointed, spinus process; second segment dilated characteristically in the distal half of outer margin, lateral spine digitiform and barely reaching end claw. Left leg V: coxal spine very small; second exopodite with apically serrate, membranous hyaline structure between apical digitiform process and modified seta.

*Distribution* : INDIA - West Bengal, Tamil Nadu and Andhra Pradesh.

*Elsewhere* : Sri Lanka and Thailand.

**Order *Cyclopoida***

*Characters* : Antennules 9-17 segmented; both antennules of male geniculate. Antennae uniramous. Maxilliped simplified, without prehensile claw. Leg V reduced, identical in both sexes. Two genital pores, often sub-dorsally situated on each side of the seminal receptacle. Two egg sacs present.

Among three known families of this order, only family Cyclopidae is represented in the present account.

## Family CYCLOPIDAE Dana, 1853

*Characters* : Palp of mandible poorly developed and represented by one process with three setae.

This family is represented by two subfamilies in the studied collections.

## Subfamily EUCYCLOPINAE Kiefer, 1929

*Characters* : Terminal segment of leg V with 3 setae or spines.

Eucyclopinae is represented by only one genus in the present account.

Genus *Tropocyclops* Kiefer, 1927

*Characters* : Body slender; metastome ob-ovate and epimeral plates well defined and prominent. Antennule 12-segmented. Caudal rami elongate and without spinules on outer margin. Fifth leg small and one segmented; inner seta very long. Urosome slender. Genital segment swollen anteriorly and narrowed posteriorly.

Only one species of *Tropocyclops* is documented in the samples collected from the floodplain lakes of Assam.

6. *Tropocyclops prasinus* (Fischer, 1860)

(Figs. 460-464)

*Material examined* : 4 examples, Horinchora, 08. 09. 2004, coll. B. K. Sharma; 5 examples, Ghorajan, 10. 02. 2005, coll. B. K. Sharma; 3 examples, Padmakhua, 01. 09. 2006, coll. Sumita Sharma; 3 examples, Patoni, 01. 09. 2006, coll. Sumita Sharma; 5 examples, Kutri, 06. 09. 2006, coll. Sumita Sharma.

*Characters* : Female : Metasome about two times longer than wide. Antennule reaching nearly end of third metasomal segment. Caudal rami short, about 3 times longer than wide and without bristles on inner margin or outer margins. Leg V tri-lobed and inner spine shorter than outer. Inner terminal spine of leg IV long. Genital segment little dilated anteriorly.

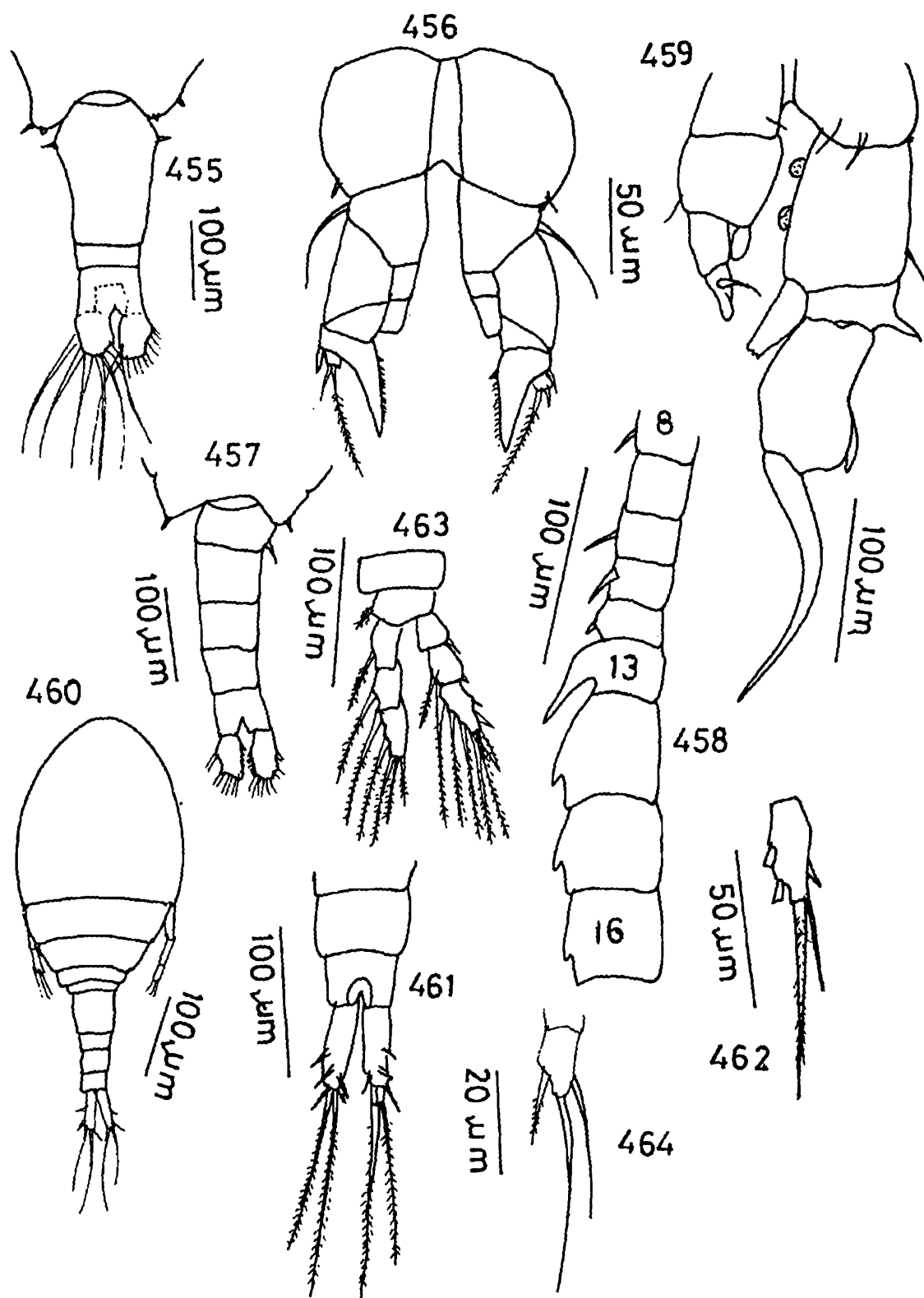
Male : Body small in size than that of female. Antennules geniculate on both sides. Leg V tri-lobed, inner spine longer. Genital segment as wide as 5th urosomal segment and narrowed posteriorly. Caudal rami symmetrical.

*Distribution* : INDIA-West Bengal, Himachal Pradesh, Madhya Pradesh and Rajasthan.

*Elsewhere* : Sri Lanka, Europe and USA.

## Subfamily CYCLOPINAE Kiefer, 1929

*Characters* : Terminal segment of leg V with 2 setae or spines.



*Phyllodiaptomus annae* (Apstein) : Fig. 455 pedigers 4, 5 and urosome, Fig. 456, leg V, Fig. 457, pedigers 4, 5 and urosome (male), Fig. 458, antennule segments 8-16 (male), Fig. 459, leg V (male); *Tropocyclops prasinus* (Fischer): Fig. 450, female, Fig. 461, urosome, Fig. 462, distal endopodite leg III, Fig. 463, right leg IV, Fig. 464, leg V.

The Cyclopinae are represented by three genera in the samples collected from the floodplain lakes of Assam.

Genus *Mesocyclops* G. O. Sars, 1914

**Characters** : Body slender. Medial most terminal seta conspicuously longer than caudal ramus and lateral most terminal seta. Lateral caudal seta inserted at about distal 1/3 of caudal ramus. Female antennule 17-segmented; last two segments bearing serrate hyaline membrane. Male antennule 16-segmented. Apical spines of third endopodite of leg IV usually unequal. Leg V 2-segmented, first segment bearing lateral seta, second segment with slender apical and spiniform medial setae.

Two species of *Mesocyclops* are recorded in the samples collected from the floodplain lakes of Assam.

7. *Mesocyclops leuckarti* (Claus, 1857)

(Figs. 465-470)

**Material examined** : 5 examples, Bhoispuri, 07. 01. 2003, coll. B. K. Sharma; 6 examples, Barundanga, 12. 03. 2003, coll. B. K. Sharma; 6 examples, Hakama, 07. 02. 2005, coll. B. K. Sharma; 6 examples, Horinchora, 02. 11. 2004, coll. B. K. Sharma; 5 examples, Dhir, 08. 01. 2003, coll. B. K. Sharma; 4 examples, Jogra, 11. 03. 2003, coll. B. K. Sharma; 8 examples, Deepor, 11. 01. 2003, coll. B. K. Sharma; 8 examples, Deepor, 08. 02. 2005, coll. B. K. Sharma; 4 examples, Deepor, 06. 04. 2005, coll. Sumita Sharma; 8 examples, Dighali, 14. 03. 2003, coll. B. K. Sharma; 6 examples, Ghorajan, 08. 02. 2005, coll. B. K. Sharma; 5 examples, Kamranga, 08. 12. 2004, coll. B. K. Sharma; 6 examples, Hiragota, 10. 09. 2004, coll. B. K. Sharma; 4 examples, Akhepeti, 11. 02. 2005, coll. B. K. Sharma; 4 examples, Kakerikhola, 05. 11. 2004, coll. B. K. Sharma; 4 examples, Padma, 10. 12. 2004, coll. B. K. Sharma; 5 examples, Sitalmari, 08. 02. 2005, coll. B. K. Sharma; 4 examples, Jugdal, 01. 09. 2006, coll. Sumita Sharma; 4 examples, Kanduli, 05. 04. 2005, coll. Sumita Sharma; 2 examples, Bamoni, 01. 09. 2006, coll. Sumita Sharma; 3 examples, Basana, 03. 9. 2006, coll. Sumita Sharma; 6 examples, Mori, coll. B. K. Sharma; 5 examples, Thekera, 05. 11. 2004, coll. B. K. Sharma; 5 examples, Kujibalipatty, 14. 03. 2003, coll. B. K. Sharma; 4 examples, Daphlang, 05. 9. 2006, coll. Sumita Sharma; 6 examples, Muijan, 29. 11. 2005, coll. Sumita Sharma; 4 examples, Hakoi, 29. 11. 2005, coll. Sumita Sharma; 5 examples, Maghuri, 30.11. 2005, coll. Sumita Sharma; 4 examples, Batua, 01. 04. 2005, coll. B. K. Sharma; 5 examples, Senijan, 05. 04. 2005, coll. B. K. Sharma; 6 examples, Samuajan, 18. 01. 2005, coll. B. K. Sharma; 5 examples, Sone, 09. 02. 2005, coll. B. K. Sharma; 4 examples, Baskandi, 09. 02. 2005, coll. B. K. Sharma.

**Characters** : Female : Body with prosome / urosome: 1.4-1.7; cephalothorax width / double genital somite width: 2.9-3.4. Pedigers 5 without hairs, dorsal surface with 2 sensilla

medially and 2 sensilla laterally. Genital double somite 1.2-1.5 times as long as wide; without hairs. Seminal receptacle: lateral arms relatively short, copulatory pore horse-shoe shaped, copulatory duct broad and strongly sinuously curved. Caudal ramus without medial hairs. Dorsal caudal seta shorter and terminal caudal seta longest. Median expansion of leg I basipodite without spine. Couplers of legs I-IV bare on frontal and caudal surfaces. Leg IV coxopodite seta distinctly longer, mediate expansion of basipodite with distal hairs. Leg V with apical seta slightly longer than spiniform medial seta.

Male : Pediger 5 without hairs. Caudal ramus usually 2.7-4.0 times as long and wide, without medial hairs. Antennule with ventral spinules only on first segment. Leg IV coupler with large prominences, apical hairs on medial expansion of leg IV basipodite present or absent.

*Distribution* : INDIA West Bengal, Uttar Pradesh, Punjab, Delhi, Andhra Pradesh, Tamil Nadu, Kerala, Karnataka, Maharashtra, Jammu & Kashmir.

*Elsewhere* : Palaearctic.

#### 8. *Mesocyclops splendidus* Lindberg, 1943

(Figs. 471-473)

*Material examined* : 4 examples, Horinchora, 06. 05. 2004, coll. B. K. Sharma; 4 examples, Ghorajan, 04. 03. 2004, coll. B. K. Sharma; 3 examples, Kamranga, 09. 09. 2004, coll. B. K. Sharma; 3 examples, Chatla, 08. 05. 2004, coll. B. K. Sharma; 4 examples, Solmari, 07. 05. 2004, coll. B. K. Sharma.

*Characters* : Female : Pediger 5 without hairs. Genital double somite without hairs and ventrally with a row of shallow pits. Seminal receptacle with long lateral arms curved backwards, anterior and posterior margins parallel, anterior margin sinuate in middle. Posterior margin of anal somite with continuous row of spinules. Caudal rami short, without hairs; no spinules at implantations of lateral and lateral most terminal caudal setae. Serrate hyaline membrane on last antennular segment, ventral spinules present only on first segment. Leg I basipodite with medial spine reaching proximal of endopodal segment. Distal hairs on medial expansions of basipodites present in leg I-IV. Couplers of leg I-IV bare on frontal and caudal surfaces.

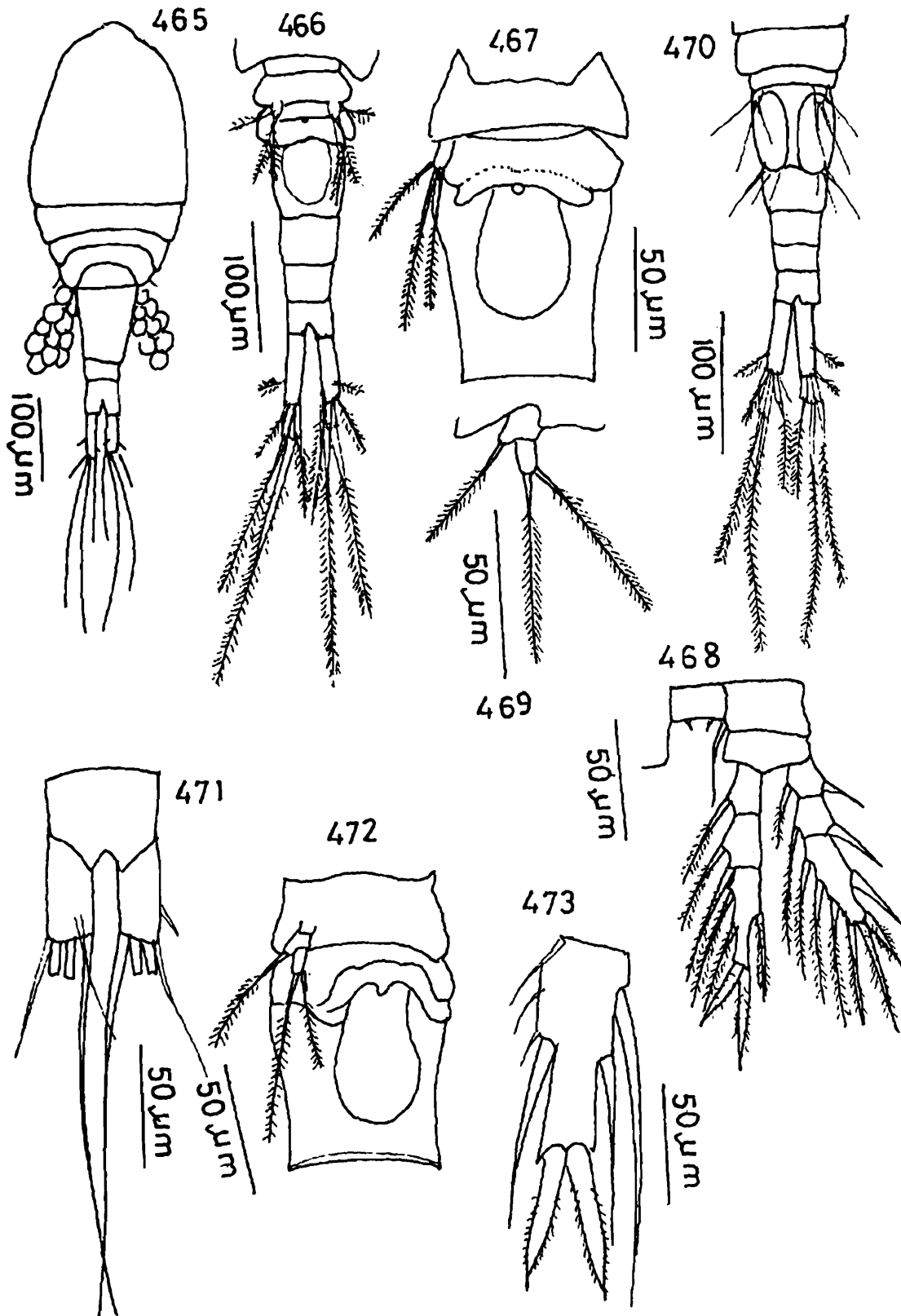
Male : unknown.

*Distribution* : INDIA Malabar coast.

*Elsewhere* : Sri Lanka, Bangladesh and Thailand.

#### Genus *Microcyclops* Claus, 1863

*Characters* : Antennule 12-segmented. Urosome slender, genital segment scarcely dilated anteriorly. Leg V one-segmented. Caudal rami with lateral seta inserted in the last third part



*Mesocyclops leuckarti* (Claus) : Fig. 465, female, Fig. 466, urosome, Fig. 467, pediger 5 and genital double somite, Fig. 468, right leg IV, Fig. 469, leg V, Fig. 470, urosome (male); *M. splendidus* Lindberg : Fig. 471, anal somite and caudal rami, Fig. 472, pediger 5 and genital double somite, Fig. 473, endopodite 3 leg IV.

of ramus or even more distally. Endopodite of leg IV with two spines distally and inner spine half or less as long as outer spine.

This genus is represented by only one species in the present study.

#### 9. *Microcyclops varicans* Sars, 1863

(Figs. 474-477)

*Material examined* : 4 examples, Hakama, 08. 09. 22004, coll. B. K. Sharma; 5 examples, Kakerikhola, 11. 09. 2004, coll. B. K. Sharma; 4 examples, Hiragota, 04. 11. 2004, coll. B. K. Sharma; 4 examples, Daphlang, 05. 09. 2006, coll. Sumita Sharma.

*Characters* : Female : Cephalic segment large and rounded. Metasome oval and little more than half as wide as long. Antennule smaller in length. Genital segment wider anteriorly and narrow. Caudal rami symmetrical and nearly equal in length of last two segments of urosome combined. Leg V with proximal joint totally confluent with segment and its seta originates from lateral corner; distal joint small and with minute spinules in middle of inner edge.

Male : Body slender than female. Antennules hinged at 5th and 10 th segments. Genital segment swollen. Caudal rami longer than wide. Basal segment of leg V fused with body. Leg VI present at posterior corners of genital segment.

*Distribution* : INDIA-West Bengal, Andhra Pradesh, Punjab and Ladak.

*Elsewhere* : Old world.

#### Genus *Thermocyclops* Kiefer, 1937

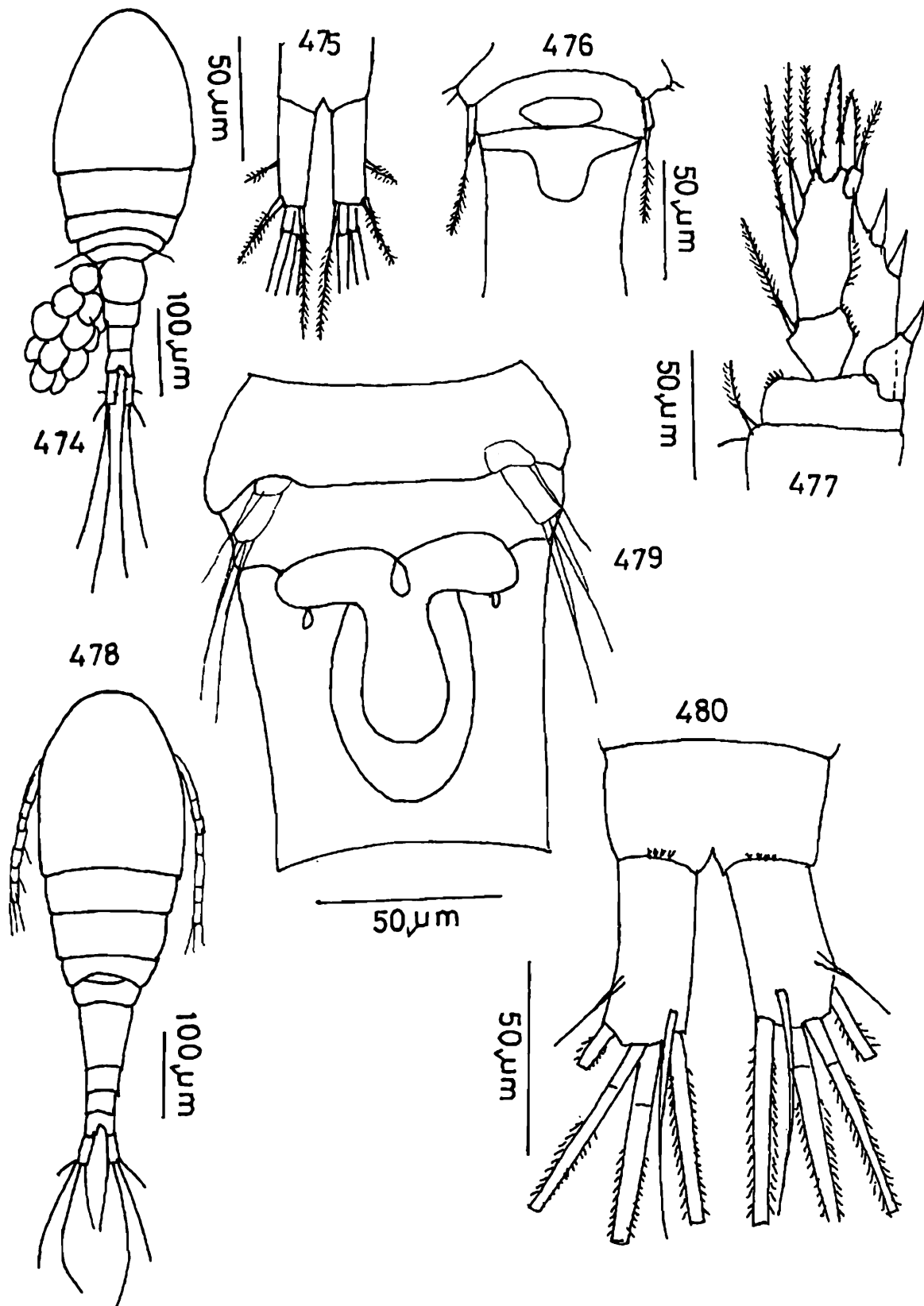
*Characters* : Small or medium size cyclopoids. Body slender. Medial most terminal caudal seta longer and sometimes with ventrally curved tips. Lateral caudal seta inserted at 0.5-0.7 of length of caudal ramus. Seminal receptacle usually hammer form. Female antennule 17-segmented, last two segments bearing serrate hyaline membrane; membrane of last segment with notches. Medial margin of basipodite of leg I usually with long spine-like seta. Medial spine of leg IV third endopodite usually longer than lateral spine. Leg V two-segmented, with basal segment bearing one lateral seta, terminal segment bearing one apical and one sub-apical long spine.

Two species belonging to *Thermocyclops* are observed in the present study.

#### 10. *Thermocyclops crassus* (Fischer, 1853)

(Figs. 478-480)

*Material examined* : 5 examples, Horinchora, 06. 05. 2004, coll. B. K. Sharma; 4 examples, Kamranga, 10. 02. 2005, coll. B. K. Sharma; 4 examples, Chatla, 13. 07. 2004, coll. B. K.



*Microcyclops varicans* Sars: Fig. 474, female, Fig. 475, anal somite and caudal rami, Fig. 476, pediger 5 and genital double somite, Fig. 477, leg IV; *Thermocyclops crassus* (Fischer) : Fig. 478, female, Fig. 479, anal somite and caudal rami, Fig. 480, pediger 5 and genital double somite.

Sharma; 4 examples, Padma, 11. 09. 2005, coll. B. K. Sharma; 5 examples, Solmari, 09. 09. 2004, coll. B. K. Sharma; 4 examples, Kowaimari, 06. 09. 2006, coll. Sumita Sharma.

*Characters* : Female : Lateral sides of pediger 5 bearing short hair-like spinules. Relatively short and broad arms of seminal receptacle slightly curved posteriorly. Caudal rami with smooth medial surface, implantations of lateral and lateral most terminal caudal seta without spinules, lateral seta inserted after middle of caudal ramus. Antennule hardly reaching posterior margin of pediger 2. Medial spine of leg I basipodite reaching third endopodite. Leg IV coupler with two rows of hairs on caudal surface. Medial margins of legs I-IV with hairs. Medial spine of second segment of leg V as long as lateral seta.

Male: Leg VI lateral seta nearly two times as long as medial spine. Tips of medial median terminal caudal setae strongly curved ventrally.

*Distribution* : INDIA - new record.

*Elsewhere* : Europe, Asia, Australia and America.

#### 11. *Thermocyclops decipiens* Kiefer, 1929

(Figs. 482-485)

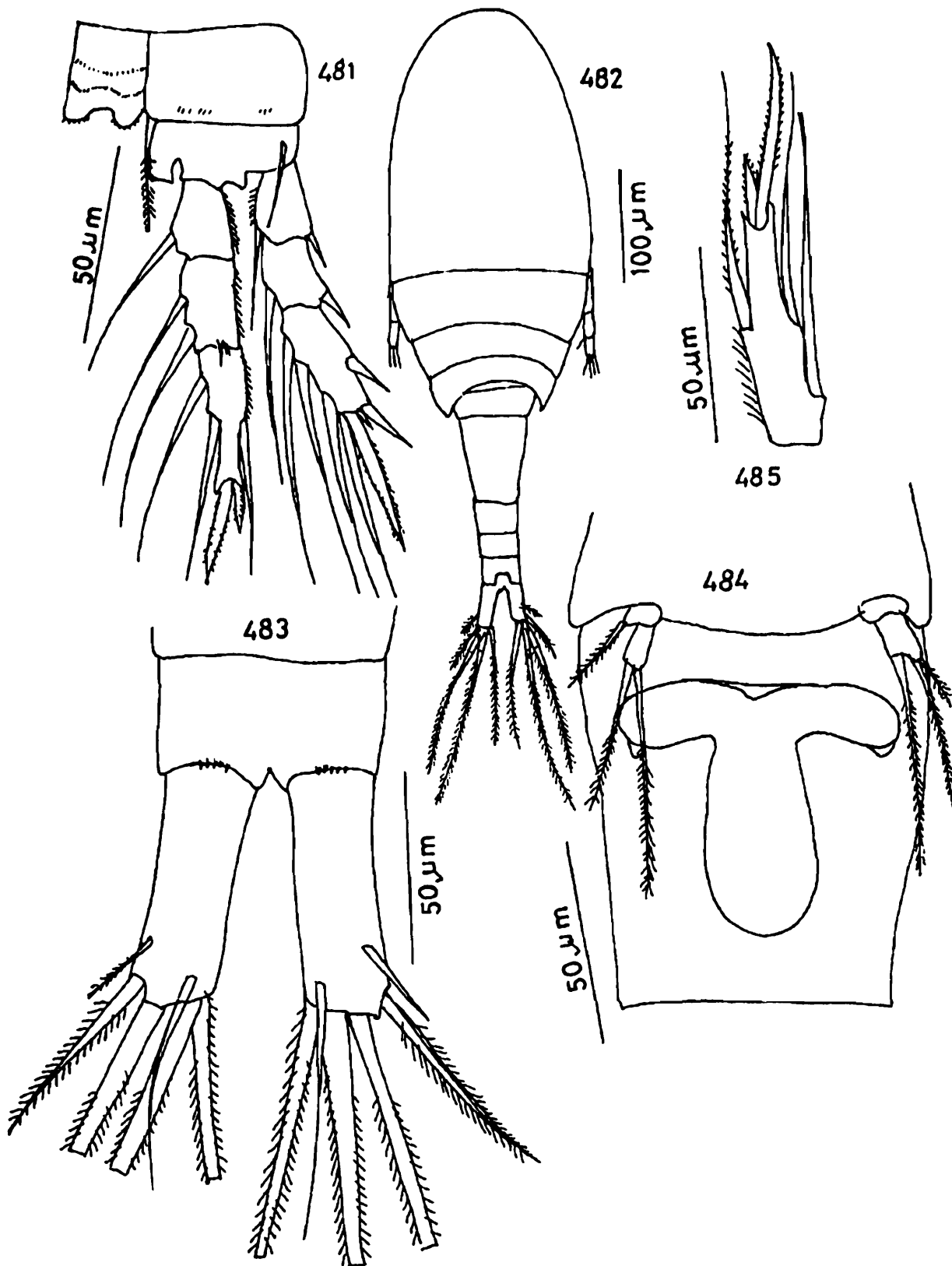
*Material examined* : 6 examples, Ghorajan, 12. 07. 2004, coll. B. K. Sharma; 5 examples, Urmal, 10. 09.2004, coll. B. K. Sharma; 5 examples, Jugdal, 01. 09. 2006, coll. Sumita Sharma; 4 examples, Salchakra, 08. 08. 2004, coll. B. K. Sharma.

*Characters* : Female : Lateral sides of pediger 5 with hair like spinules. Genital double somite longer than wide. Lateral arms of seminal receptacle slightly curved posteriorly. Postero-ventral margin of anal somite with two groups of 4-6 spinules. Caudal rami with smooth medial surface, implantations of lateral and later almost terminal caudal setae without spinules, lateral caudal seta after middle region of caudal ramus. Antennules hardly reaching posterior margin of pediger 2. Medial spine of leg I basipodite reaching third endopodite. Leg IV coupler bearing two rows of hairs on caudal surface. Medial margins of leg I-III basipodites with hairs, those of leg IV basipodite with small spinules. Medial spine of second segment of leg V nearly 1.5 times as long as lateral seta.

Male : Leg VI lateral seta nearly twice as long as medial spine.

*Distribution* : INDIA Ladak.

*Elsewhere* : Pantropical.



*Thermocyclops crassus* (Fischer): Fig. 481, right leg V; *T. decipiens* Kiefer: Fig. 482, female, Fig. 483, anal somite and caudal rami, Fig. 484, pediger 5 and genital double somite, Fig. 485, endopodite 3 leg IV.

## 4. RHIZOPODA

## SYSTEMATIC LIST OF REPORTED SPECIES

Sub-Kingdom PROTOZOA

Phylum SARCOMASTIGOPHORA

Sub-Phylum SARCODINA

Super-class RHIZOPODA

Class LOBOSEA

Order ARCELLINIDA

Family ARCELLIDAE

*Arcella discoides* Ehrenberg, 1843*A. hemispherica* Perty, 1809*A. vulgaris* Ehrenberg, 1830

Family CENTROPYXIDAE

*Centropyxis aculeata* (Ehrenberg, 1830)*C. cassis* (Wallich, 1864)*C. ecornis* (Ehrenberg, 1843)*C. minuta* Deflandre, 1929*C. oblonga* (Deflandre, 1929)*Cyclopyxis eurysterna* (Deflandre, 1929)*Trignopyxis arcula* (Leidy, 1879)

Family DIFFLUGIDAE

*Diffflugia acuminata* Ehrenberg, 1838*D. corona* Wallich, 1864*D. oblonga* Ehrenberg, 1838*D. urceolata* Carter, 1864

Family NEBELIDAE

*Awerintzewia cyclostoma* (Penard, 1902)*Heleopera rosea* Pennard, 1890*Lesquereusia spiralis* (Ehrenberg, 1830)*Nebela caudata* Leidy, 1876*N. dentistoma* Pennard, 1850*Quadrutella symmetrica* (Wallich, 1824)

Class FILOSEA

Order GROMIIDA

Family CYPHODERIIDAE

*Cyphoderia ampulla* (Ehrenberg, 1840)

Family EUGLEPHIDAE

*Euglypha acanthophora* Dujardin, 1841*E. laevis* (Ehrenberg, 1845)*E. tuberculata* Dujardin, 1841*Tracheleuglypha dentata* (Vejdowsky, 1882)*Trinema enchelys* (Ehrenberg, 1838)*T. lineare* Penard, 1840

## SYSTEMATIC ACCOUNT

Super-class RHIZOPODA

Protozoa with pseudopodia or fine long radial pseudopodia or complex external shell (test); without cilia or flagella, mostly free-living.

Rhizopoda are represented by two classes namely Lobosea and Filosea in the examined material.

### Key to the reported Classes, Orders and Families of RHIZOPODA

1. Pseudopodia form lobose or fingerlike, rarely branching never fine and thread-like ...  
..... Class LOBOSEA.....2  
Pseudopodia very fine, thread-like and branching ..... Class FILOSEA.....5
2. Test membranous and rigid, with distinct oral aperture ..... Family ARCELLIDAE  
Test with mineral or organic particles and oral aperture ..... 3
3. Test with plates or scales separated by cytoplasm. Sometimes with foreign particles  
.....Family NEBELIDAE  
Test with foreign particles, without any plate or scale ..... 4
4. Test with dorso-ventral symmetry, oral aperture on one side (eccentric) or ventral ....  
.....Family CENTROPYXIDAE  
Test with axial symmetry, oral aperture terminal ..... Family DIFFLUGIDAE
5. Test composed of siliceous scales or plates cemented together; body hyaline, pseudopodia  
filiform often branching, sometimes anastomosing ..... Family EUGLEPHIDAE  
Test formed of thin chitinous membrane covered with discs or scales, devoid of adherent  
extraneous matter .....Family CYPHODERIIDAE

#### Family ARCELLIDAE

*Characters* : Test membranous, rigid, encrusted with chitinous particles; having a distinct oral aperture.

This family is represented by only one genus in the present account.

#### Genus *Arcella* Ehrenberg, 1832

*Characters* : Test membranous, rigid, yellowish or brown in color; either smooth or in some cases variously ornamented, encrusted with chitinous particles. Circular or oval in shape in dorsal or ventral view and plano-convex to hemispherical in lateral view. Oral aperture central, usually circular, rarely of different shape; turned inwards and appearing as an inverted funnel; nuclei two or more.

This genus is represented by three species in the present study.

#### 1. *Arcella discoides* Ehrenberg, 1843 (Fig. 486)

*Material examined* : 4 examples, Bhoispuri, 12. 03. 2003, coll. B. K. Sharma; 5 examples, Barundanga, 07. 01. 2003, coll. B. K. Sharma; 5 examples, Dhir, 11. 03. 2003, coll. B. K.

Sharma; 4 examples, Horinchora, 07. 02. 2005, coll. B. K. Sharma; 4 examples, Fingua, 09. 01. 2003, coll. B. K. Sharma; 4 examples, Sagmara, 11. 03. 2003, coll. B. K. Sharma; 5 examples, Kamakhya, 07. 05. 2002, coll. B. K. Sharma; 5 examples, Rowmari, 11. 08. 2004, coll. B. K. Sharma; 8 examples, Deepor, 08. 02. 2005, coll. B. K. Sharma; 6 examples, Dighali, 13. 12. 2002, coll. B. K. Sharma; 5 examples, Borbila, 15. 03. 2003, coll. B. K. Sharma; 4 examples, Kamranga, 08. 02. 2005, coll. B. K. Sharma; 5 examples, Ghorajan, 04. 03. 2004, coll. B. K. Sharma; 4 examples, Siligurijan, 12. 03. 2003, coll. B. K. Sharma; 4 examples, 09. 12. 2004, Chatla, coll. B. K. Sharma; 4 examples, Hiragota, 04. 11. 2004, coll. B. K. Sharma; 4 examples, Kakerikhola, 10. 12. 2004, coll. B. K. Sharma; 4 examples, Padma, 11. 02. 2005, coll. B. K. Sharma; 3 examples, Goranga, 10. 02. 2005, coll. B. K. Sharma; 5 examples, Mori, 01. 02. 2005, coll. B. K. Sharma; 5 examples, Thekera, 06. 05. 2004, coll. B. K. Sharma; 4 examples, Kujibalipatty, 12. 01. 2003, coll. B. K. Sharma; 4 examples, Duptoli, 05. 04. 2005, coll. Sumita Sharma; 4 examples, Kanduli, 05. 04. 2005, coll. Sumita Sharma; 4 examples, Ghorkhonjan, 05. 03. 2005, coll. B. K. Sharma; 4 examples, Padmakhua, 01. 09. 2006, coll. Sumita Sharma; 4 examples, Bhoismari, 02. 12. 2005, coll. Sumita Sharma; 4 examples, Moona, 02. 12. 2005, coll. Sumita Sharma; 4 examples, Shitalpathar, 01. 12. 2005, coll. Sumita Sharma; 5 examples, Diang, 02. 12. 2005, coll. Sumita Sharma; 5 examples, Memdubi, 30. 11. 2005, coll. Sumita Sharma; 5 examples, Raidong, 30. 11. 2005, coll. Sumita Sharma; 4 examples, Dhekia, 03. 04. 2005, coll. B. K. Sharma; 5 examples, Senijan, 17. 01. 2005, coll. B. K. Sharma; 6 examples, Samuajan, 18. 01. 2005, coll. B. K. Sharma; 4 examples, Baskandi, 09. 02. 2005, coll. B. K. Sharma.

*Characters* : Test yellow, smooth, flattened, circular in front view and plano-convex in lateral view. Height of test about 1/3 to 1/4 its diameter. Oral aperture large and circular.

*Distribution* : INDIA Meghalaya, Arunachal Pradesh, Tripura, Nagaland, Sikkim and West Bengal.

*Elsewhere* : Cosmopolitan.

## 2. *Arcella hemispherica* Perty, 1809

*Material examined* : 4 examples, Ghorajan, 09. 09. 2004, coll. B. K. Sharma; 4 examples, Basana, 03. 09. 2006, coll. Sumita Sharma.

*Characters* : Test yellow, distinctly hemispherical in lateral and circular in front view. Surface of test with more or less fine areoles. Mouth without or with short buccal ooze.

*Distribution* : INDIA - Manipur, West Bengal, Orissa and Andhra Pradesh.

*Elsewhere* : Cosmopolitan.

### 3. *Arcella vulgaris* Ehrenberg, 1830 (Fig. 487)

**Material examined** : 5 examples, Barundanga, 04. 12. 2002, coll. B. K. Sharma; 7 examples, Deepor, 03. 11. 2004, coll. B. K. Sharma; 4 examples, Borbila, 12. 01. 2003, coll. B. K. Sharma; 6 examples, Ghorajan, 08. 01. 2005, coll. B. K. Sharma; 4 examples, Siligurijan, 14. 12. 2002, coll. B. K. Sharma; 4 examples, Goranga, 03. 11. 2004, coll. B. K. Sharma; 4 examples, Kujibalipatty, 11. 01. 2003, coll. B. K. Sharma; 4 examples, Daphlang, 02. 12. 2005, coll. Sumita Sharma; 5 examples, Karasing, 02. 12. 2005, coll. Sumita Sharma; 4 examples, Itakhuli, 01. 12. 2005, coll. Sumita Sharma; 6 examples, Muijan, 29. 11. 2005, coll. Sumita Sharma; 5 examples, Kutri, 03. 12. 2005, coll. Sumita Sharma; 4 examples, Kololua, 29. 11. 2005, coll. Sumita Sharma; 6 examples, Samuajan, 18. 01. 2005, coll. B. K. Sharma; 4 examples, Sone, 09. 02. 2005, coll. B. K. Sharma; 4 examples, Baskandi, 09. 02. 2005, coll. B. K. Sharma.

**Characters** : Test usually light yellow, discoid, evenly convex; circular in front view, low bell-shaped or hemispherical in lateral view. Basal border rounded or slightly prominent and rounded. Height of the test about half is diameter. Test surface with large areoles. Mouth circular, central and often without buccal tube.

**Distribution** : INDIA-Meghalaya, Manipur, Arunachal Pradesh, Nagaland, Sikkim, Himachal Pradesh and West Bengal.

**Elsewhere** : Cosmopolitan.

### Family CENTROPYXIDAE

**Characters** : Test with mineral and organic particles. Symmetry of test dorso-ventral; oral aperture at one side of test (eccentric).

This family is represented by three genera the samples examined from Assam.

### Genus *Centropyxis* Stein, 1857

**Characters** : Test mostly membranous, encrusted with foreign particles or covered with sandy material; dorso-ventrally flattened, swollen at posterior portion and tapering towards apertural region. Oral aperture eccentric, invaginated and without a raised rim.

Five species of *Centropyxis* are observed in the samples collected from the floodplain lakes of Assam

### 4. *Centropyxis aculeata* (Ehrenberg, 1830) (Fig. 488)

**Material examined** : 5 examples, Bhoispuri, 08. 08. 2002, coll. B. K. Sharma; 5 examples, Barundanga, 03. 05. 2002, coll. B. K. Sharma; 6 examples, Horinchora, 08. 09. 2004, coll.

B. K. Sharma; 4 examples, Fingua, 10. 08. 2002, coll. B. K. Sharma; 4 examples, Kamakhya, 07. 05. 2002, coll. B. K. Sharma; 4 examples, Rowmari, 11. 08. 2002, coll. B. K. Sharma; 7 examples, Deepor, 09. 09. 2004, coll. B. K. Sharma; 6 examples, Dighali, 08. 05. 2002, coll. B. K. Sharma; 4 examples, Borbila, 13. 08. 2002, coll. B. K. Sharma; 4 examples, Siligurijan, 13. 08. 2002, coll. B. K. Sharma; 2 examples, Kakerikhola, 14. 07. 2004, coll. B. K. Sharma; 4 examples, Bandha, 03. 09. 2006, coll. Sumita Sharma; 3 examples, Padmakhua, 01. 09. 2006, coll. Sumita Sharma; 5 examples, Mohna, 03. 09. 2006, coll. Sumita Sharma; 3 examples, Moona, 06. 09. 2006, coll. Sumita Sharma; 3 examples, Shitalpathar, 01. 12. 2005, coll. Sumita Sharma; 2 examples, Demon, 01. 12. 2005, coll. Sumita Sharma; 4 examples, Diang, 01. 12. 2005, coll. Sumita Sharma; 4 examples, Memdubi, 30. 11. 2005, coll. Sumita Sharma; 5 examples, Samuajan, 18. 01. 2005, coll. B. K. Sharma; 4 examples, Baskandi., 19. 10. 2004, coll. B. K. Sharma.

*Characters* : Test brownish, cup-shaped; frequently encrusted with quartz crystals and sometimes with admixture of diatoms and sand particles. Fundus of test obtusely rounded and furnished usually with 4-6 divergent spines at the border, arranged in a single and somewhat regular row.

*Distribution* : INDIA - Arunachal Pradesh, Meghalaya, Mizoram, Manipur, Nagaland, West Bengal, Andhra Pradesh and Himachal Pradesh.

*Elsewhere* : Cosmopolitan.

### 5. *Centropyxis cassis* (Wallich, 1864)

(Fig. 489)

*Material examined* : 4 examples, Hakama, 02. 11. 2004, coll. B. K. Sharma; 4 examples, Jogra, 08. 01. 2003, coll. B. K. Sharma; 4 examples, Fingua, 12. 03. 2003, coll. B. K. Sharma; 4 examples, Sagmara, 09. 01. 2003, coll. B. K. Sharma; 3 examples, Urmal, 10. 02. 2005, coll. B. K. Sharma; 4 examples, Ghorkhonjan, 05. 03. 2005, coll. B. K. Sharma; 4 examples, Hakoi, 29. 11. 2005, coll. Sumita Sharma; 3 examples, Sesa, 01. 12. 2005, coll. Sumita Sharma; 3 examples, Morakalong, 03. 12. 2005, coll. Sumita Sharma; 3 examples, Sohala, 05. 09. 2006, coll. Sumita Sharma; 5 examples, Mihir, 02. 12. 2005, coll. Sumita Sharma; 3 examples, Balak, 02. 04. 2005, coll. B. K. Sharma; 4 examples, Samuajan, 18. 01. 2005, coll. B. K. Sharma; 3 examples, Salchapra, 09. 02. 2005, coll. B. K. Sharma.

*Characters* : Test grayish or yellowish brown, formed of quartz particles intermixed with small pebbles. Test elliptical in ventral view with widely rounded posterior part; flank less arched or straight, parallel or sub-parallel. Oral aperture semi-circular, oral margin provided with well oriented thicker pebbles.

*Distribution* : INDIA - Meghalaya, West Bengal, Orissa, Uttaranchal and Andhra Pradesh.

*Elsewhere* : Cosmopolitan.

6. *Centropyxis ecornis* (Ehrenberg, 1843)  
(Fig. 490)

*Material examined* : 3 examples, Dhir, 08. 01. 2003, coll. B. K. Sharma; 4 examples, Hakama, 07. 02. 2005, coll. B. K. Sharma; 4 examples, Fingua, 09. 01. 2003, coll. B. K. Sharma; 4 examples, Rowmari, 13. 03. 2003, coll. B. K. Sharma; 4 examples, Ghorajan, 4 examples, Hiragota, 10. 02. 2005, coll. B. K. Sharma; 3 examples, Padma, 10. 12. 2004, coll. B. K. Sharma; 3 examples, Thekera, 01. 12. 2005, coll. B. K. Sharma; 3 examples, Bandha, 08. 11. 2005, coll. B. K. Sharma; 3 examples, Daphlang, 02. 12. 2005, coll. Sumita Sharma.

*Characters* : Test relatively large, discoidal or elliptical, sometimes irregular in outline; without any spine and covered with quartz grains. Dorsal surface slightly arched and more elevated at posterior part. Oral aperture usually circular, sometimes irregularly lobed and much eccentric.

*Distribution* : INDIA - Arunachal Pradesh, Meghalaya, Mizoram, Sikkim, Himachal Pradesh, Uttaranchal and West Bengal.

*Elsewhere* : apparently Cosmopolitan.

7. *Centropyxis minuta* Deflandre, 1929  
(Fig. 491)

*Material examined* : 4 examples, Horinchora, 11. 07. 2004, coll. B. K. Sharma; 3 examples, Ghorajan, 07. 05. 2004, coll. B. K. Sharma; 3 examples, Hiragota, 05. 03. 2004, coll. B. K. Sharma; 4 examples, Karasing, 02. 12. 2005, coll. Sumita Sharma; 3 examples, Itakhuli, 01. 12. 2005, coll. Sumita Sharma; 3 examples, Kololua, 29. 11. 2005, coll. Sumita Sharma.

*Characters* : Test small, grayish or brown, less conspicuous and encrusted with siliceous particles; more or less circular in ventral view and sub-spherical in lateral view with slightly more elevated posterior part. Oral aperture circular, eccentric and, in general, obliquely invaginated (plagiostomic).

*Distribution* : INDIA - Arunachal Pradesh, Meghalaya, Nagaland, Tripura, Sikkim, Jammu & Kashmir, Himachal Pradesh, Uttaranchal and West Bengal.

*Elsewhere* : apparently Cosmopolitan.

8. *Centropyxis oblonga* (Deflandre, 1929)  
(Fig. 492)

*Material examined* : 2 examples, Bhoispuri, 07. 01. 2003, coll. B. K. Sharma; Borbila, 51. 03. 2003, coll. B. K. Sharma; 2 examples, Urmal, 10. 02. 2005, coll. B. K. Sharma; Goranga, 08. 12. 2004, coll. B. K. Sharma; 2 examples, Maghuri, 30. 11. 2005, coll. Sumita Sharma; 2 examples, Dhekia, 18. 01. 2005, coll. Sumita Sharma; 2 examples, Samuajan, coll. Sumita Sharma; 2 examples, Sone, 09. 02. 2005, coll. Sumita Sharma.

*Characters* : Test grayish, oblong-elliptical or oval in outline; with 3-6 divergent spines located in the distal part. Fundus of the test more elevated. Oral aperture elliptical and eccentric.

*Distribution* : INDIA - Meghalaya, Manipur, Sikkim and Andhra Pradesh.

*Elsewhere* : Cosmopolitan.

#### Genus *Cyclopyxis* Deflandre, 1929

*Characters* : Test mostly membranous, with encrusted foreign particles or covered with sandy material; regularly arched. Oral aperture centrally located.

This genus is represented by only one species in the material examined from the floodplain lakes of Assam.

#### 9. *Cyclopyxis eurysterna* (Deflandre, 1929) (Fig. 493)

*Material examined* : 3 examples, Sitalmari, 08. 02. 2005, coll. B. K. Sharma; 4 examples, Japara, 01. 12. 2005, coll. Sumita Sharma.

*Characters* : Test brownish, encrusted with quartz particles; hemispherical in lateral view and circular or elliptical in ventral view. Oral aperture central, circular and slightly invaginated with regular smooth edge; nearly half the diameter of the test.

*Distribution* : INDIA - Arunachal Pradesh and Orissa.

*Elsewhere* : apparently cosmopolitan.

#### Genus *Trignopyxis* (Leidy, 1879)

*Characters* : Test hemispherical; oral aperture central and eccentric, occasionally irregular. Only one species belonging to this genus is included in the present account.

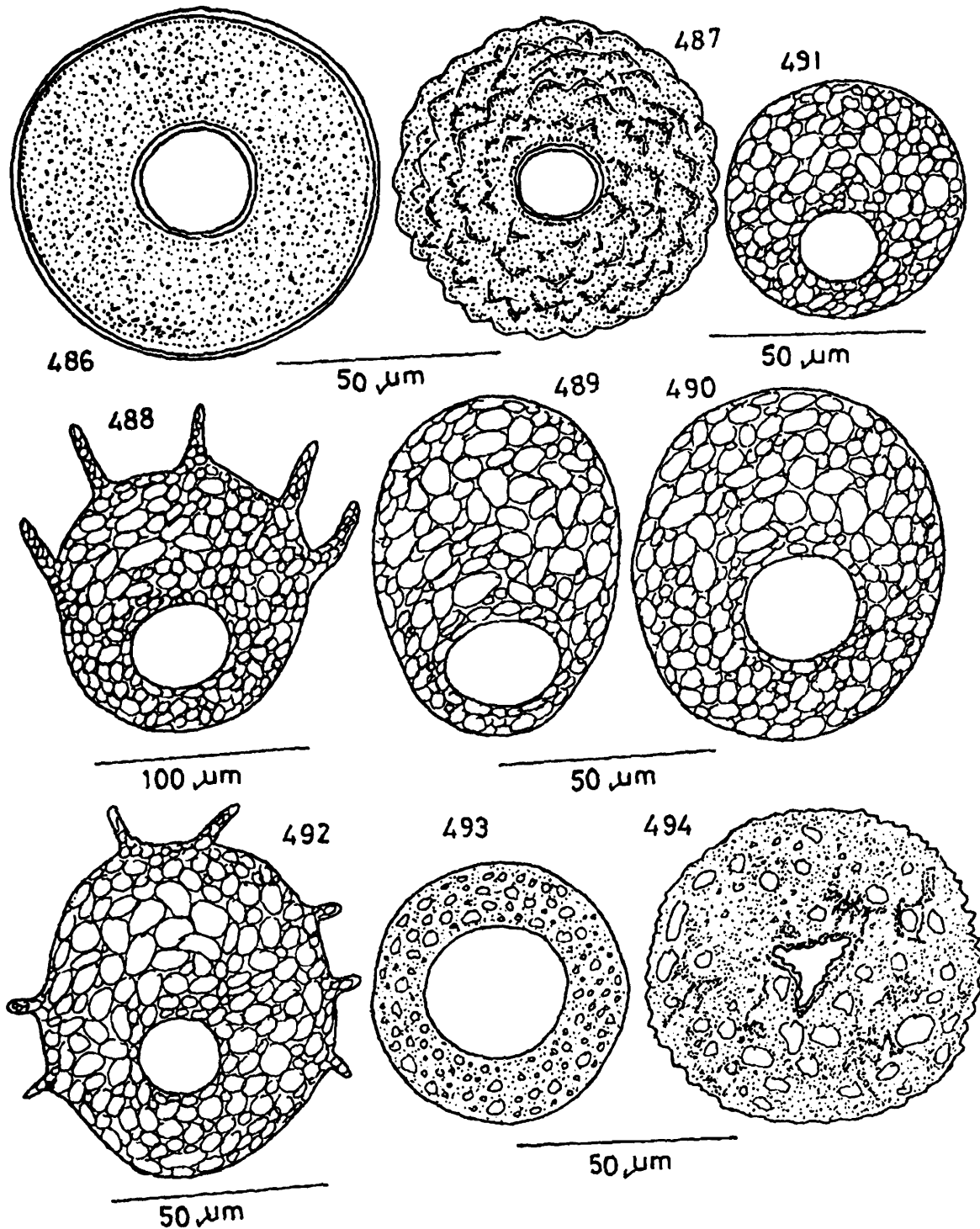
#### 10. *Trignopyxis arcula* (Leidy, 1879) (Fig. 494)

*Material examined* : 4 examples, Karasing, 02. 12. 2005, coll. Sumita Sharma; 3 examples, Itakhuli, 01. 12. 2005, coll. Sumita Sharma.

*Characters* : Test brownish; hemispherical in lateral view. Oral aperture central, invaginated, irregular but sometimes triangular, usually surrounded by a small ring of organic cement.

*Distribution* : INDIA - Manipur, Sikkim and West Bengal.

*Elsewhere* : Tropics and subtropics.



*Arcella discoides* Ehrenberg : Fig. 486, ventral view; *A. vulgaris* Ehrenberg: Fig. 487, ventral view; *Centropyxis aculeata* (Ehrenberg) : Fig. 488, ventral view; *C. cassis* (Wallich) : Fig. 489, ventral view; *C. ecornis* (Ehrenberg) : Fig. 490, ventral view; *C. minuta* Deflandre : Fig. 491, ventral view; *C. oblonga* (Deflandre) : Fig. 492, ventral view; *Cyclopyxis eurysterna* (Deflandre) : Fig. 493, ventral view; *Trignopyxis arcula* (Leidy) : Fig. 494, ventral view.

## Family DIFFLUGIDAE

*Characters* : Test with foreign particles and without any plate or scale; with axial symmetry. Oral aperture at extremity of the test (terminal).

This family is represented by only one genus in the examined collections.

Genus *Diffflugia* Leclerc, 1815

*Characters* : Test made of or containing sandy particles, globular to elongate pyriform or acuminate in shape; possessing axial symmetry. Oral aperture at the extremity of the test.

Four species belonging to the genus *Diffflugia* are recorded in the present study.

11. *Diffflugia acuminata* Ehrenberg, 1838  
(Fig. 495)

*Material examined* : 2 examples, Hakama, 08. 09. 2004, coll. B. K. Sharma; 2 examples, Ghorajan, 03. 11. 2005, coll. B. K. Sharma; 2 examples, Siligurijan, 13. 08. 2002, coll. B. K. Sharma; 2 examples, Urmal, 10. 09. 2004, coll. B. K. Sharma; 2 examples, Padma, 05. 11. 2004, coll. B. K. Sharma; 2 examples, Bamoni, 01. 09. 2006, coll. Sumita Sharma; 2 examples, Daphlang, 05. 09. 2006, coll. Sumita Sharma; 2 examples, Donga, 06. 09. 2006, coll. Sumita Sharma; 2 examples, Sohala, 05. 09. 2006, coll. Sumita Sharma; 2 examples, Salchapra, 08. 08. 2004, coll. B. K. Sharma.

*Characters* : Test cylindrical, without any collar and with pointed 'horn' like extension at the base; horn straight and differentiated from the base. Quartz crystals of test big; some even projecting out of the margin of the test giving an irregular appearance of its margin.

*Distribution* : INDIA - Meghalaya, Manipur, West Bengal and Andhra Pradesh.

*Elsewhere* : Cosmopolitan.

12. *Diffflugia corona* Wallich, 1864  
(Fig. 496)

*Material examined* : 4 examples, Jogra, 11. 03. 2003, coll. B. K. Sharma; 3 examples, Kakerikhola, 11. 02. 2005, coll. B. K. Sharma; 4 examples, Goranga, 10. 02. 2005, coll. B. K. Sharma; 3 examples, Kujibalipatty, 11. 01. 2005, coll. B. K. Sharma; 4 examples, Karasing, 02. 12. 2005, coll. Sumita Sharma; 3 examples, Kololua, 29. 11. 2005, coll. Sumita Sharma; 4 examples, Baskandi, 19. 10. 2004, coll. B. K. Sharma.

*Characters* : Test broadly spherical, slightly narrow near oral aperture but widened at the base with the presence of 5-10 spines. Surface of test spines smooth, formed by quartz crystals. Oral aperture wide, about half the diameters of the test, crenulated; crenulations varying from 8-12, sometimes more.

*Distribution* : INDIA - Manipur and West Bengal.

*Elsewhere* : Pantropical.

### 13. *Diffflugia oblonga* Ehrenberg, 1838

(Fig. 497)

*Material examined* : 2 examples, Barundanga, 04. 12. 2002, coll. B. K. Sharma; 2 examples, Kamranga, 03. 11. 2004, coll. B. K. Sharma; 2 examples, Hiragota, 04. 11. 2004, coll. B. K. Sharma; 2 examples, Thekera, 05.11.2004, coll. B. K. Sharma; 2 examples, Kujibalipatty, 11. 01. 2005, coll. B. K. Sharma; 2 examples, Donga, 02. 12. 2005, coll. Sumita Sharma; 2 examples, Muijan, 29. 11. 2005, coll. Sumita Sharma; 2 examples, Hakoi, 29. 11. 2005, coll. Sumita Sharma; 2 examples, Sesa, 01. 12. 2005, coll. Sumita Sharma; 2 examples, Maghuri, 30. 11. 2005, coll. Sumita Sharma; 2 examples, Salchapra, 11. 12. 2004, coll. B. K. Sharma.

*Characters* : Test typically oblong, with smooth margins and rounded base; composed of big angular quartz crystals. Oral aperture circular and without any lobe.

*Distribution* : INDIA - Meghalaya, Manipur, West Bengal and Andhra Pradesh.

*Elsewhere* : Cosmopolitan.

### 14. *Diffflugia urceolata* Carter, 1864

(Fig. 498)

*Material examined* : 6 examples, Deepor, 12. 07. 2004, coll. B. K. Sharma; 4 examples, Ghorajan, 07. 05. 2004, coll. B. K. Sharma; 3 examples, Padma, 14. 07. 2004, coll. B. K. Sharma; 3 examples, Padmakhua, 01. 09. 2006, coll. Sumita Sharma; 4 examples, Amuri, 01. 09. 2006, coll. Sumita Sharma; 2 examples, Dubratoli, 03. 09. 2006, coll. Sumita Sharma; 3 examples, Patoni, 01. 09. 2006, coll. Sumita Sharma; 2 examples, Dholi, 05. 04. 2005, coll. Sumita Sharma; 2 examples, Moona, 06. 9. 2006, coll. Sumita Sharma; 2 examples, Samuajan, 11. 06. 2004, coll. B. K. Sharma; 2 examples, Salchapra, 08. 08. 2004, coll. B. K. Sharma; 2 examples, Baskandi, 19. 01. 2004, coll. B. K. Sharma.

*Characters* : Test spherical or ovoid-spherical, composed of angular quartz crystals and diatoms; quartz crystals on the rim smaller than those of the spherical part of the test. Oral aperture circular; margin of the collar around oral aperture recurved or rolled towards exterior.

*Distribution* : INDIA - Manipur and West Bengal.

*Elsewhere* : apparently Cosmopolitan.

### Family NEBELIDAE

*Characters* : Test with plates or scales secreted by cytoplasm; sometimes with foreign particles.

The samples collected from Assam include five genera belonging to this family.

Genus *Awerintzewia* Schouteden, 1906

*Characters* : Test colored, broadly ovoid and compressed; surface covered with quartz grains. Oral aperture oval; wall of the test around aperture considerably thickened and usually tapering gradually.

This genus is represented by one species in the material examined from Assam.

15. *Awerintzewia cyclostoma* (Penard, 1902)  
(Fig. 499)

*Material examined* : 4 examples, Muijan, 29. 11. 2005, coll. Sumita Sharma; 3 examples, Diang, 01. 12. 2005, coll. Sumita Sharma.

*Characters* : Test ovoid and compressed; covered with quartz platelets of various size. Several platelets large and scattered, small filling in between large ones. Oral aperture small, terminal and oval; bordered internally by a thickened wall of the test.

*Distribution* : INDIA - Mizoram and West Bengal.

*Elsewhere* : apparently Cosmopolitan.

Genus *Heleopera* Leidy, 1879

*Characters* : Test various colored, with a little foreign material at fundus. Oral aperture elliptical or linear with thin lip, elliptic notch visible near aperture in narrow lateral view.

Only one species belonging to this genus is documented in the present study.

16. *Heleopera rosea* Pennard, 1890  
(Fig. 500)

*Material examined* : 3 examples, Chatla, 04. 11. 2004, coll. B. K. Sharma; 3 examples, Kakerikhola, 10. 12. 2004, coll. B. K. Sharma; 2 examples, Japara, 01. 12. 2005, coll. Sumita Sharma.

*Characters* : Test ovoid-elongate and compressed; covered with siliceous platelets. Oral aperture with obtusely angular corners.

*Distribution* : INDIA Meghalaya, Manipur, Arunachal Pradesh, Sikkim and Himachal Pradesh.

*Elsewhere* : Cosmopolitan.

Genus *Lesquereusia* Schlumberger, 1845

*Characters* : Test compressed, semi-spiral in appearance, with interlacing curved or vermiform pellets; test with said grains.

Only one species belonging to this genus is recorded in the examined material.

17. *Lesquereusia spiralis* (Ehrenberg, 1830)  
(Fig. 501)

*Material examined* : 5 examples, Dhir, 11. 03. 2003, coll. B. K. Sharma; 6 examples, Hakama, 07. 02. 2005, coll. B. K. Sharma; 4 examples, Sagmara, 09. 01. 2003, coll. B. K. Sharma; 8 examples, Deepor, 08. 02. 2005, coll. B. K. Sharma; 4 examples, Kamranga, 08. 12. 2004, coll. B. K. Sharma; 3 examples, Thekera, 03. 12. 2005, coll. Sumita Sharma; 3 examples, Donga, 02. 12. 2005, coll. Sumita Sharma; 3 examples, Borbil-Tinsuki, 01. 12. 2005, coll. Sumita Sharma; 4 examples, Muijan, 29. 11. 2005, coll. Sumita Sharma.

*Characters* : Test transparent, semi-spiral and composed of closely arranged vermiform pellets; neck below the constriction with a slight elevation from which outline continued in a straight line down to mouth. Oral aperture circular; its margin plain and sharply defined.

*Distribution* : INDIA - Meghalaya, Manipur, West Bengal and Andhra Pradesh.

*Elsewhere* : Cosmopolitan.

Genus *Nebela* Leidy, 1879

*Characters* : Test usually transparent, colorless and more or less laterally compressed; ovate, pyriform or elongated in broad view. Test composed of round, oval or irregular platelets of uniform or mixed sizes, terminating with an aperture, sometimes with teeth around the opening.

Two species of this genus are examined in the samples collected from the floodplain lakes of Assam.

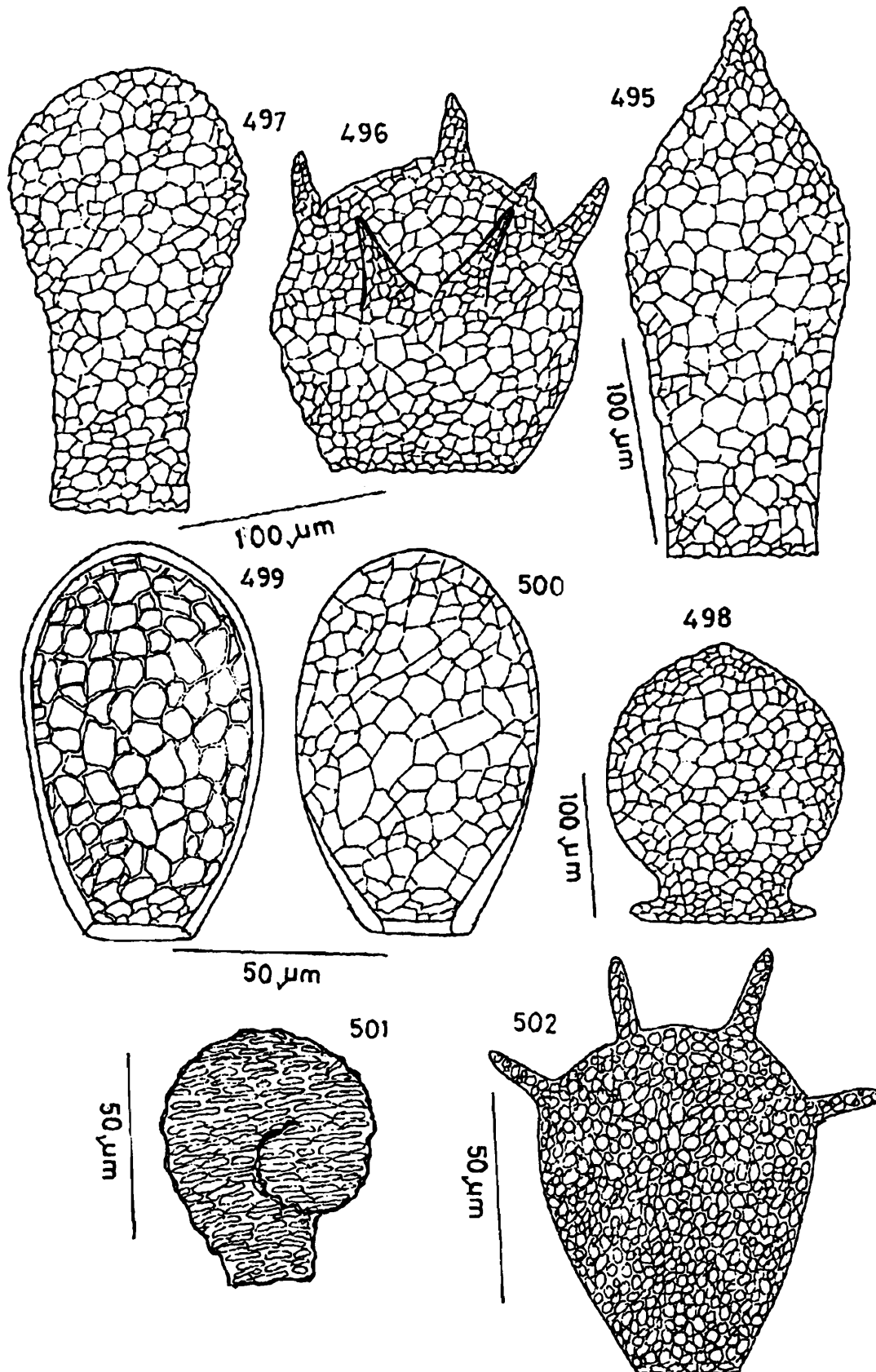
18. *Nebela caudata* Leidy, 1876  
(Fig. 502)

*Material examined* : 3 examples, Ghorajan, 09. 09. 2004, coll. B. K. Sharma; 3 examples, Hiragota, 10. 09. 2004, coll. B. K. Sharma; 2 examples, Daphlang, 05. 09. 2006, coll. Sumita Sharma.

*Characters* : Test transparent, colorless, ovoid and compressed; with rounded angular fundus and with 4-5 narrow blunt, conical processes projecting from lateral borders. Test covered with polygonal or circular platelets, usually joining and rarely overlapping. Oral aperture transversely oval.

*Distribution* : INDIA- Sikkim.

*Elsewhere* : Tropics and subtropics.



*Diffugia acuminata* Ehrenberg : Fig. 495, lateral view; *D. corona* Wallich : Fig. 496, lateral view; *D. oblonga* Ehrenberg : Fig. 497, lateral view; *D. urceolata* Carter: Fig. 498, lateral view; *Awerintzewia cyclostoma* (Penard) : Fig. 499, lateral view; *Heleopera rosea* Pennard : Fig. 500, lateral view; *Lesquereusia spiralis* (Ehrenberg) : Fig. 501, lateral view; *Nebela caudata* Leidy : Fig. 502, lateral view.

19. *Nebela dentistoma* Pennard, 1850  
(Fig. 503)

*Material examined* : 3 examples, Hakama, 11. 07. 2004, coll. B. K. Sharma; 3 examples, Horinchora, 08. 09. 2004, coll. B. K. Sharma; 2 examples, Karasing, 06. 09. 2006, coll. Sumita Sharma.

*Characters* : Test ovoid, without any neck and compressed; covered with small circular, polygonal or oval transparent platelets, usually of uniform size or mixed with angular platelets or short rods of chitinous or siliceous substance.

*Distribution* : INDIA - Meghalaya, Arunachal Pradesh, Sikkim and West Bengal.

*Elsewhere* : Cosmopolitan.

Genus *Quadrutella* Schulze, 1875

*Characters* : Test transparent, colorless and compressed; composed of siliceous quadrangular platelets, arranged in transverse and longitudinal oblique series in consecutive or alternating order. Test compressed laterally especially in the region of oral aperture, located terminally.

This genus is represented by only one species in the collections examined from the floodplain lakes of Assam.

20. *Quadrutella symmetrica* (Wallich, 1824)  
(Fig. 504)

*Material examined* : 3 examples, Sarain Hubbi, 29. 11. 2005, coll. Sumita Sharma; 3 examples, Bor beel, 01. 12. 2005, coll. Sumita Sharma.

*Characters* : Test colorless, transparent and comprised of square chitinous platelets arranged in more or less oblique transverse and longitudinal rows. Test pyriform in ventral view with sides (flanks) sloping to produce a neck of variable length. Oral aperture transverse oval and located terminally.

*Distribution* : INDIA - Mizoram, Himachal Pradesh and Uttaranchal.

*Elsewhere* : Cosmopolitan.

Class FILOSEA

Order GROMIIDA

Family CYPHODERIIDAE

*Characters* : Test formed of thin membrane, covered with discs or scales and devoid of any adherent external matter. Oral aperture terminal and oblique.

Only one genus belonging to this family is observed in the examined material.

**Genus *Cyphoderia* Schumberger, 1848**

*Characters* : Test retort shaped, curved and devoid of adherent extraneous matter; test formed of thin chitinous membrane covered with discs or scales. Oral aperture terminal, oblique, usually circular; neck generally recurved, never furnished with a disc-shaped collar.

Only one species belonging to this genus is reported in the present account.

**21. *Cyphoderia ampulla* (Ehrenberg. 1840)  
(Fig. 505)**

*Material examined* : 2 examples, Diang, 01. 12. 2005, coll. Sumita Sharma; 3 examples, Memdubi, 30. 11. 2005, coll. Sumita Sharma.

*Characters* : Test yellowish or brownish, translucent, covered with distinct circular or oval scales or plates located appreciably apart, Oral aperture circular, terminal, placed obliquely with a curved neck; fundus obtusely rounded.

*Distribution* : INDIA- Uttaranchal.

*Elsewhere* : apparently Cosmopolitan.

**Family EUGLEPHIDAE**

*Characters* : Test composed of siliceous scales or plates cemented together. Body hyaline, pseudopodia filiform, often branching, sometimes anatomizing.

This family is represented by three genera in the material examined from Assam.

**Genus *Euglypha* Dujardin, 1841**

*Characters* : Test hyaline, ovoid or elongated, circular or elliptical; formed of circular, oval or scutiform siliceous, imbricate platelets arranged in alternating longitudinal rows. Oral aperture terminally bordered by serrated or denticulate scales.

*Euglypha* is represented by three species in the samples collected from Assam.

**22. *Euglypha acanthophora* Dujardin, 1841  
(Fig. 506)**

*Material examined* : 3 examples, Hakama, 07. 02. 2005, coll. B. K. Sharma; 3 examples, Horinchora, 02. 11. 2004, coll. B. K. Sharma; 4 examples, Deepor, 08. 02. 2005, coll. B. K. Sharma; 2 examples, Kamranga, 10. 02. 2005, coll. B. K. Sharma; 4 examples, Muijan, 29. 11. 2005, coll. Sumita Sharma.

*Characters* : Test ovoid, slight elongated towards aperture; aperture circular, bordered by

one or two rows of finely serrated platelets. Test platelets elliptical, some of the posterior half and at the base of fundus prolonged into spines, spines usually 4-7 in number.

*Distribution* : INDIA - Mizoram, Meghalaya, Nagaland, West Bengal and Andhra Pradesh.

*Elsewhere* : Cosmopolitan.

23. *Euglypha laevis* (Ehrenberg, 1845)  
(Fig. 507)

*Material examined* : 4 examples, Bhoispuri, 07. 01. 2003, coll. B. K. Sharma; 4 examples, Horinchora, 07. 02. 2005, coll. B. K. Sharma; 3 examples, Fingua, 12. 03. 2003, coll. B. K. Sharma; 4 examples, Deepor, 08. 02. 2005, coll. B. K. Sharma; 3 examples, Chatla, 09. 12. 2004, coll. B. K. Sharma; 3 examples, Karasing, 02. 12. 2005, coll. Sumita Sharma; 3 examples, Itakhuli, 01. 12. 2005, coll. Sumita Sharma; 2 examples, Kololua, 29. 11. 2005, coll. Sumita Sharma.

*Characters* : Test oviform, glabrous and elliptical or sub-circular in transverse section; aperture elliptical or sub-circular, bordered by a single row of platelets pointed terminally, leaving wider gaps in between their terminal ends. Test platelets oval and slightly imbricate.

*Distribution* : INDIA - Meghalaya, Tripura, Sikkim, West Bengal and Andhra Pradesh.

*Elsewhere* : Cosmopolitan.

24. *Euglypha tuberculata* Dujardin, 1841  
(Fig. 508)

*Material examined* : 3 examples, Jogra, 10. 12. 2002, coll. B. K. Sharma; 4 examples, Goranga, 08.12. 2004, coll. B. K. Sharma; 2 examples, Daphlang, 02. 12. 2005, coll. Sumita Sharma.

*Characters* : Test elongate-oviform, not compressed and glabrous; test platelets round or oval, imbricating and forming a regular hexagonal pattern. Aperture circular, bordered by 8-12 finely serrated platelets, arranged in a single or double rows.

*Distribution* : INDIA - Arunachal Pradesh, Meghalaya, Mizoram, Nagaland, Tripura, Jammu and Kashmir, Himachal Pradesh, Sikkim, West Bengal and Andhra Pradesh.

*Elsewhere* : Cosmopolitan.

Genus *Tracheleuglypha* Deflandre, 1953

*Characters* : Test with distinct hyaline collar, denticulate or laciniate; aperture bordered by a dentate neck without scale.

Only one species belonging to this genus is recorded in the present study.

25. *Tracheleuglypha dentata* (Vejdowsky, 1882)  
(Fig. 509)

*Material examined* : 3 examples, Japara, 01. 12. 2005, coll. Sumita. Sharma; 3 examples, Hakoi, 29. 11. 2005, coll. Sumita Sharma; 2 examples, Sarain Hubbi, 29. 11. 2005, coll. Sumita Sharma.

*Characters* : Test hyaline, oval or circular in outline; formed of circular or sub-circular platelets, regularly overlapping and often presenting a hexagonal design. Aperture circular, terminal, surrounded by chitinous hyaline collar and denticulate or laciniate.

*Distribution* : INDIA-Manipur, Mizoram, Meghalaya, Arunachal Pradesh, Tripura, Himachal Pradesh, Uttaranchal, Sikkim and West Bengal.

*Elsewhere* : Cosmopolitan.

Genus *Trinema* Dujardin, 1841

*Characters* : Test small, hyaline, oviform or elongate and compressed anteriorly; covered with circular siliceous platelets. Oral aperture circular, sub-terminal and invaginated.

Two species belonging to this genus are examined in the sampled collected from the floodplain lakes of Assam.

26. *Trinema enchelys* (Ehrenberg, 1838)  
(Fig. 510)

*Material examined* : 3 examples, Bhoispuri, 08. 08. 2002, coll. B. K. Sharma; 3 examples, Hakama, 08. 09. 2004, coll. B. K. Sharma; 4 examples, Kamakhya, 11. 08. 2002, coll. B. K. Sharma; 4 examples, Deepor, 09. 09. 2004, coll. B. K. Sharma; 3 examples, Hiragota, 10. 09. 2006, coll. B. K. Sharma; 2 examples, Bandha, 03. 09. 2006, coll. Sumita Sharma; 2 examples, Daphlang, 05. 09. 2006, coll. Sumita Sharma.

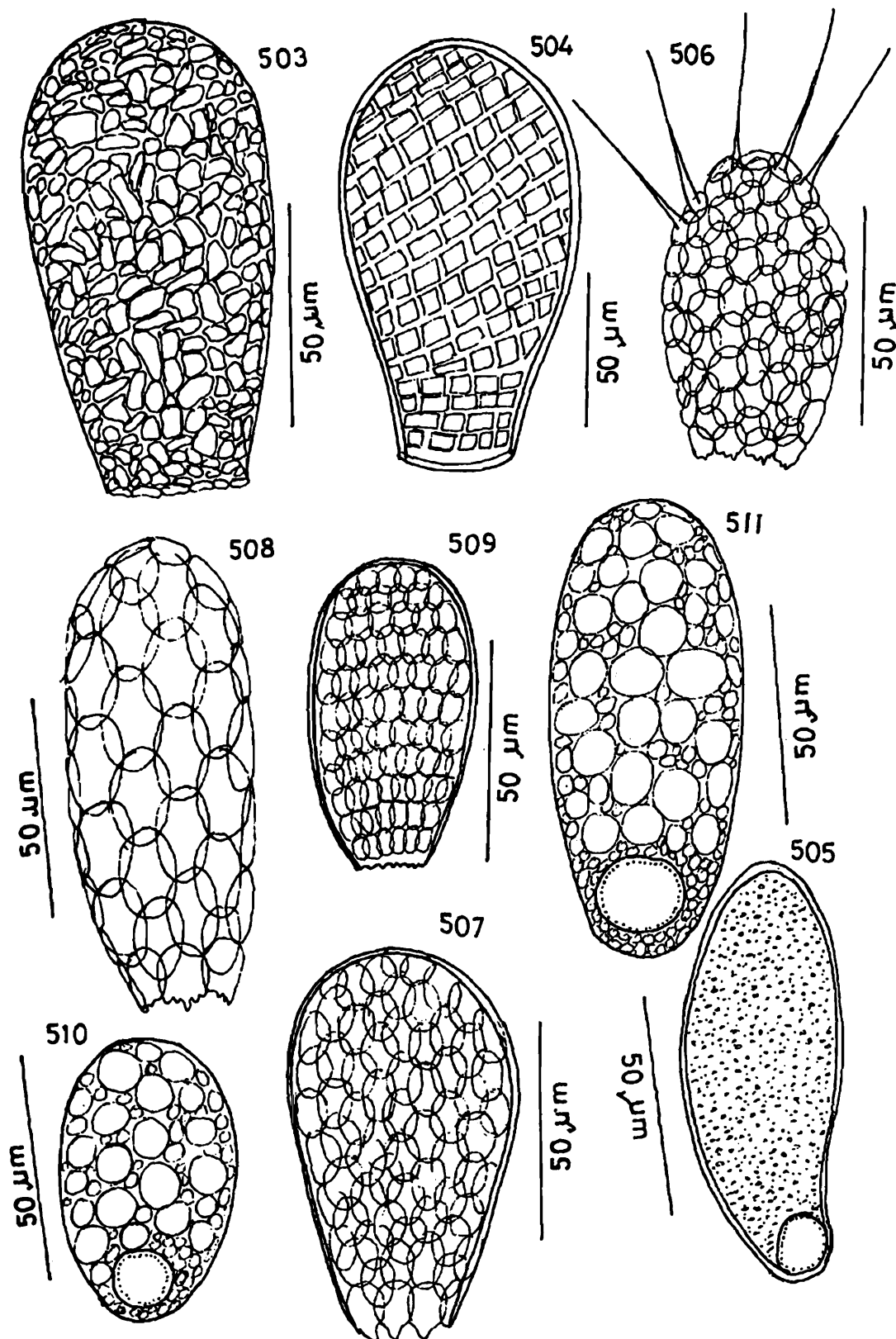
*Characters* : Test hyaline, elliptic, covered with siliceous circular large platelets, scarcely overlapping and smaller platelets in between large ones. Oral aperture circular, oblique, invaginated, bordered by toothed platelets.

*Distribution* : INDIA Manipur, Meghalaya, Arunachal Pradesh, Nagaland, Tripura, Himachal Pradesh, Sikkim, West Bengal and Andhra Pradesh.

*Elsewhere* : Cosmopolitan.

27. *Trinema lineare* Penard, 1840  
(Fig. 511)

*Material examined* : 3 examples, Horinchora, 06. 05. 2004, coll. B. K. Sharma; 2 examples, Fingua, 06. 05. 2002, coll. B. K. Sharma; 4 examples, Deepor, 12. 07. 2004, coll. B. K.



*Nebela dentistoma* Pennard : Fig. 503, lateral view; *Quadrutella symmetrica* (Wallich) : Fig. 504, lateral view; *Cyphoderia ampulla* (Ehrenberg) : Fig. 505, ventro-lateral view; *Euglypha acanthophora* Dujardin : Fig. 506, lateral view; *E. laevis* (Ehrenberg) : Fig. 507, lateral view; *E. tuberculata* Dujardin: Fig. 508, lateral view; *Tracheleuglypha dentata* (Vejdovsky) : Fig. 509, lateral view; *Trinema enchelys* (Ehrenberg) : Fig. 510, ventral view; *T. lineare* Penard: Fig. 511, ventral view.

Sharma; 3 examples, Kamranga, 07. 05. 2004, coll. B. K. Sharma; 3 examples, Ghorajan, 07. 05. 2004, coll. B. K. Sharma; 2 examples, Bamoni, 01. 09. 2006, coll. Sumita Sharma; 2 examples, Sitalmari, 05. 04. 2005, coll. Sumita Sharma.

*Characters* : Test small, hyaline, elongate, composed of small circular platelets distinguishable near the edges where they appear as minute undulations. Oral aperture circular, oblique, invaginated and bordered by toothed platelets.

*Distribution* : INDIA- Meghalaya, Mizoram, Nagaland, Arunachal Pradesh, Himachal Pradesh, Sikkim and West Bengal.

*Elsewhere* : Cosmopolitan.

## 5. GASTROTRICHA

### SYSTEMATIC LIST OF REPORTED SPECIES

Phylum GASTROTRICHA

Family CHAETONOTIDAE

*Chaetonotus anomalus* Brunson, 1950

*C. gastrocyaneus* Brunson, 1950

*C. similis* Zelinka, 1889

### SYSTEMATIC ACCOUNT

Family CHAETONOTIDAE

*Characters* : Body divided into head, neck and trunk. Unbranched caudal furca present as postero-lateral extensions of the body, usually with adhesive glands.

This family is represented by only one genus in the present account.

Genus *Chaetonotus* Ehrenberg, 1830

*Characters* : Body covered with scales or spines or both. Caudal furca unsegmented, shorter than body.

Three species belonging to *Chaetonotus* are observed in the samples collected from the floodplain lakes of Assam.

1. *Chaetonotus anomalus* Brunson, 1950

(Fig. 512)

*Material examined* : 4 examples, Hakama, 11. 07. 2004, coll. B. K. Sharma; 4 examples, Ghorajan, 09. 09. 2004, coll. B. K. Sharma; 3 examples, Kamranga, 12. 07. 2004, coll. B.

K. Sharma; 3 examples, Urmal, 10. 09. 2004, coll. B. K. Sharma; 3 examples, Solmari, 12. 07. 2004, coll. B. K. Sharma.

**Characters** : Head distinctly five-lobed. Body with 6-8 long rows of spines, increasing in size posteriorly; also with seven long, twice bifurcate spines arising behind the mid region of the trunk and projecting considerably beyond the other spines. Caudal furca relatively long, slight dilated at base and divergent.

**Distribution** : INDIA Meghalaya, West Bengal, Orissa and Andhra Pradesh.

**Elsewhere** : Cosmopolitan.

### 2. *Chaetonotus gastrocyaneus* Brunson, 1950

(Fig. 513)

**Material examined** : 3 examples, Ghorajan, 09. 09. 2004, coll. B. K. Sharma; 4 examples, Hiragota, 13. 07. 2004, coll. B. K. Sharma; 2 examples, Akhepeti, 11. 09. 2004, coll. B. K. Sharma; 2 examples, Bamoni, 01. 09. 2006, coll. Sumita Sharma.

**Characters** : Body elongated. Head irregular, rounded or flattened anteriorly; cephalic shield present, with two pairs of tactile ciliary tufts. Body with 10-16 rows of spines, spines in anterior part of body relatively small; each spine with three pronged base and bifurcate distally. Caudal furca relatively short and divergent.

**Distribution** : INDIA- Orissa.

**Elsewhere** : apparently Cosmopolitan.

### 3. *Chaetonotus similis* Zelinka, 1889

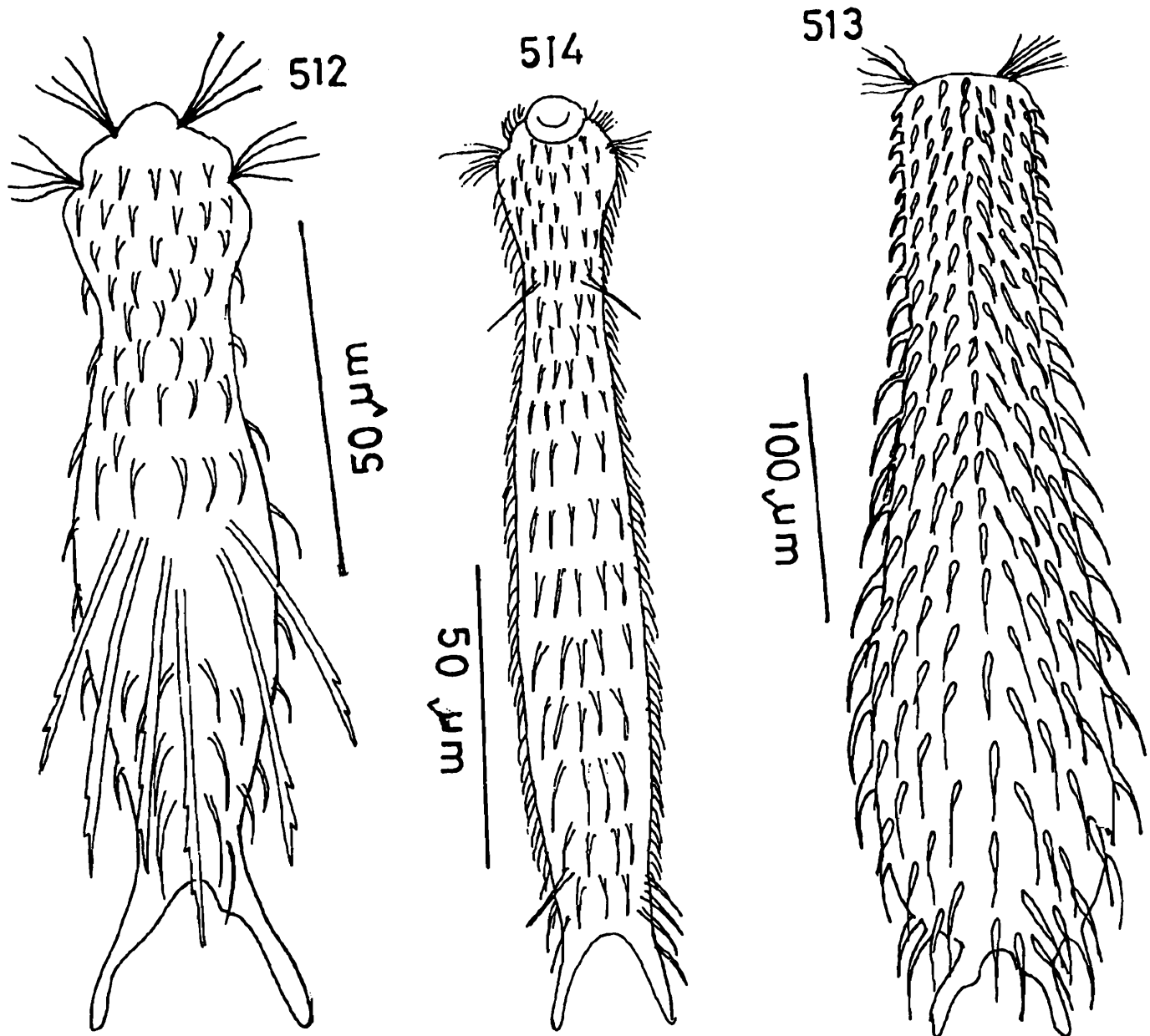
(Fig. 514)

**Material examined** : 3 examples, Barundanga, 07. 01. 2003, coll. B. K. Sharma; 4 examples, Deepor, 03. 11. 2004, coll. B. K. Sharma; 2 examples, Daphlang, 02. 12. 2005, coll. Sumita Sharma; 3 examples, Muijan, 29. 11. 2005, coll. Sumita Sharma; 3 examples, Maghuri, 30. 11. 2005, coll. Sumita Sharma.

**Characters** : Body slender and elongated. Head indistinctly five-lobed. Dorsal surface of body convex and with longitudinal rows of spines; spines increasing in size posteriorly, each spine bifurcated distally and arises on a broad base from a flat cuticular plate. Caudal furca small and divergent.

**Distribution** : INDIA - Meghalaya, West Bengal, Orissa and Andhra Pradesh.

**Elsewhere** : Cosmopolitan.



*Chaetonotus anomalus* Brunson: Fig. 512, dorsal view; *C. gastrocyaneus* Brunson: Fig. 513, dorsal view; *C. similis* Zelinka: Fig. 514, dorsal view.

## C. DIVERSITY OF ZOOPLANKTON

### 1. Zooplankton diversity in selected floodplain lakes

The seasonal plankton samples (collected during 2004-05) from fifteen floodplain lakes of the Brahmaputra river basin, Assam revealed 209 species of zooplankton, belonging to 75 genera and 35 families. The details of their species composition in different beels are included in Table 3. The richness varied between 102-156 ( $125 \pm 13$ ) species in individual beels; Ghorajan showed peak richness (156 species) while minimum number is noticed in Kakerikhola. Further, 130, 129, 126 and 120 species are recorded from Bamoni, Padma, Hakama and Daphlang respectively during the present survey while the richness varied between 105-118 species in rest of the beels.

Rotifera, the main qualitative group, are represented by 127 species belonging to 32 genera and 21 families with their richness varying between 69-93 ( $75 \pm 6$ ) species. The maximum richness is noticed in Ghorajan and lowest number (69 species) is recorded in Hiragota. In addition, 83, 82 and 80 rotifer species are observed in Padma, Urmal and Hakama respectively. The richness, however, ranged between 70-76 in the rest of the beels.

The rotifers included 125 species of the monogononts and only two species of Bdelloidea. Lecanidae (33 species) is followed by 21, 16 and 12 species of Colurellidae, Brachionidae and Trichocercidae; these four families of Ploimida formed important component of the documented. The examined collections showed 33 species of *Lecane* while *Lepadella*, *Trichocerca* and *Brachionus* are represented by 16, 12 and 11 species respectively; the stated four genera exhibited qualitative importance. Thirty-three species are noticed to be rare while 20 species showed common occurrence in the examined collections. The present observations indicated several acidophilus, warm-stenothermal, eurytopic and eutrophic species.

Cladocera are represented by 49 species belonging to 28 genera and seven families and their richness ranged between 21-39 ( $27 \pm 4$ ) species in different beels. Peak richness of this group is noticed in Ghorajan while their lowest species number is observed in Kakerikhola. Hakama and Padma recorded 31 species each of these micro-crustaceans while the richness varied between 21-28 species in the rest of the beels. Among the documented families, the Chydoridae (27 species and 15 genera) and Daphniidae (7 species 3 genera) showed qualitative importance.

Rhizopoda included 22 species spread over 9 genera and 5 families. The richness of these testate amoebae in the different floodplain lakes ranged between 7-16 ( $10 \pm 2$ ) species; peak richness is noted in Ghorajan, lowest richness is observed in Kakerikhola and the number varied between 8-12 species in the remaining beels. Centropyxidae included 6 species while Euglephidae, Nebelidae, Diffflugidae and Arcellidae recorded 5, 4, 4, 2 species respectively.

Table 3. Zooplankton diversity of Floodplain lakes of Assam

| Floodplain lakes                             | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 |
|--|---|---|---|---|---|---|---|---|---|----|----|----|----|----|----|
| <b>ROTIFERA</b>                              |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |
| Family BRACHIONIDAE                          |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |
| <i>Anuraeopsis fissa</i> Gosse               | + | - | + | + | - | + | + | - | + | -  | +  | +  | -  | +  | +  |
| <i>A. coelata</i> De Beauchamp               |   |   | - | - | + | - | - | + | - | +  | -  | -  | -  | -  | -  |
| <i>Brachionus angularis</i> Gosse            | + | + | + |   | + | + | + | + | + | +  | +  |    | +  | +  | +  |
| <i>B. bidentatus</i> Anderson                | + | + | + | + | + | + | + | - | + | -  | -  | +  | +  | +  | -  |
| <i>B. calyciflorus</i> Pallas                | + | + | + | + | - | + | + | + | + | +  | +  | +  | +  | -  | +  |
| <i>B. caudatus</i> Barrois & Daday           | + |   |   | + | + |   |   | + | - | +  | +  | +  | +  | -  | -  |
| <i>B. diversicornis</i> (Daday)              |   | + | + | + | + | + | + | - | + | +  | +  | -  | +  | +  | +  |
| <i>B. donneri</i> Brehm                      |   | + |   |   |   | - |   | - | - | -  | -  |    | +  | -  | -  |
| <i>B. falcatus</i> Zacharias                 | + | + | + | + | + | + | + | + | + | +  | +  | +  | +  | +  | +  |
| <i>B. forficula</i> Wierzejski               | + | + | - | + | + | + | + | - | - | +  | -  | +  | +  | +  | +  |
| <i>B. mirabilis</i> Daday                    | - | - | + | - | - |   |   | + | + | -  | -  | -  | -  | -  | -  |
| <i>B. quadridentatus</i> (Hermann)           | + | + | + | + | + | + | + | + | + | +  | +  | +  | +  | +  | +  |
| <i>B. rubens</i> Ehrenberg                   |   |   | + | + | - | + | + | + | + | -  | +  | +  | -  | -  | -  |
| <i>Keratella cochlearis</i> (Gosse)          | + | + | + | + | + | + | + | + | + | +  | +  | +  | +  | +  | +  |
| <i>K. tropica</i> (Apstein)                  | + | + | + | + | + | + | - | + | + | +  | +  | +  | +  | +  | +  |
| <i>K. lenzi</i> Hauer                        | - | + | + | - | + | + | + | + | - | +  | +  | -  | -  | -  | +  |
| <i>K. procurva</i> (Thorpe)                  |   | + | - | - | + | - | + | - | - | +  | -  | -  | -  | +  | -  |
| <i>Platytias quadricornis</i> (Ehrenberg)    | + | + | + | + | + | + | - | + | + | +  | +  | +  | +  | +  | +  |
| <i>Platyonus patulus</i> (Müller)            | + | + | + | + | + | + | + | + | + | +  | +  | +  | +  | +  | +  |
| <i>P. patulus macracanthus</i> (Daday)       | - |   | + | - | + | + | + | + | + | -  | +  | +  | +  | -  | +  |
| Family EPHIPHANIDAE                          |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |
| <i>Ephiphanes brachionus</i><br>(Ehrenberg)  | + | - | + | - | - | + |   | - | + | -  | -  | -  | +  | -  | -  |
| Family EUCHLANIDAE                           |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |
| <i>Euchlanis dilatata</i> Ehrenberg          | + | + |   | + | + | + | + |   | + | +  | +  | +  | +  | +  | +  |
| <i>E. incisa</i> Carlin                      | - | - | + | - | - | + | - | + | - |    | -  | -  | -  | +  | -  |
| <i>E. triquetra</i> Ehrenberg                | + | - | + |   | + | - |   | - | + | -  | +  | +  | -  | +  | +  |
| <i>Dipleuchlanis propatula</i> (Gosse)       | - | + | + | + | + | + | + | + | + | +  | +  | +  | +  | -  | +  |
| <i>Beauchampiella eudactylota</i><br>(Gosse) | + | + | - | + | + | + | + | + | - | +  | +  | -  | +  | +  | +  |

Table 3. Contd.

| Floodplain lakes                        | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 |
|---|---|---|---|---|---|---|---|---|---|----|----|----|----|----|----|
| <b>Family MYTILINIDAE</b>               |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |
| <i>Lophocharis salpina</i> (Ehrenberg)  | - | - | + |   | - |   |   | - | - | -  |    | +  |    |    |    |
| <i>Mytilina bisulcata</i> (Lucks)       | - | - | + |   | + | + |   | + | + |    |    |    | +  | +  | -  |
| <i>M. ventralis</i> (Ehrenberg)         | + | + | + | + | + | + | + | + | + | +  | +  | +  | +  | +  | +  |
| <b>Family TRICHOTRIIDAE</b>             |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |
| <i>Macrochaetus collinsi</i> (Gosse)    | - |   | + | - |   |   | + | - | - |    | +  | +  |    | +  | +  |
| <i>M. longipes</i> Myers                | + | - | + |   |   |   |   |   |   | +  |    |    |    |    |    |
| <i>M. sericus</i> (Thorpe)              |   | + | + | + | + | + | + | + | + | +  | +  | +  | +  | +  |    |
| <i>Trichotria tetractis</i> (Ehrenberg) | + | + | + | + | + | + | + | + | + | +  | +  | +  | +  | +  | +  |
| <b>Family COLURELLIDAE</b>              |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |
| <i>Colurella adriatica</i> Ehrenberg    | - | + | - | + | + | - | - | - | - | +  |    |    | -  | +  | -  |
| <i>C. obtusa</i> (Gosse)                | + | + | + | + | + | + | + | + | + | +  | +  | +  | +  | +  | +  |
| <i>C. sulcata</i> (Stenroos)            | + | - | + | - | - |   |   |   |   | -  | +  | +  |    | -  |    |
| <i>C. uncinata</i> (Müller)             | + | + |   | + | + | + | + | + | + | +  | +  | +  | +  | +  | +  |
| <i>Lepadella acuminata</i> (Ehrenberg)  | + | - | + | + | + | + |   | + | + | -  | -  | +  | +  | +  | +  |
| <i>L. apsidea</i> Harring               | + | + | + | - | + |   | - | - |   | -  |    | +  | +  | -  |    |
| <i>L. apsicora</i> Myers                | + | - | - | - | - | - | + | + |   | -  | +  | -  |    | +  |    |
| <i>L. biloba</i> Hauer                  | - |   | + | + |   |   | + | + |   |    | +  |    |    |    |    |
| <i>L. cristata</i> (Rousselet)          |   | + | - | - | - | - | + |   |   | +  | -  |    |    | -  |    |
| <i>L. discoidea</i> Segers              | + | - | - | - | + | - |   |   | + |    | -  | -  |    |    |    |
| <i>L. ehrenbergii</i> (Perty)           | + | + |   | + | + | + | + | + | + | +  | +  |    | +  | -  | +  |
| <i>L. eurysterna</i> Myers              | + |   | + | - |   |   | - | + | + |    |    |    |    | +  | +  |
| <i>L. heterostyla</i> (Murray)          | + | + | - | + | + | + | + |   | + | +  |    | +  | +  |    | +  |
| <i>L. lindau</i> Koste                  | - | + |   |   |   |   |   |   |   | -  | -  | -  |    | +  |    |
| <i>L. minuta</i> (Weber & Montet)       | - | - | + |   |   |   |   | + | + |    |    | -  |    | +  | +  |
| <i>L. ovalis</i> (Müller)               | + | + | + | + | + | + | + | + | + | +  | +  | +  | +  | +  | +  |
| <i>L. patella</i> (Müller)              | + | + | + | + | + | + | + | + | + | +  | +  | +  | +  | +  | +  |
| <i>L. rhomboides</i> (Gosse)            | + |   | + | + | + | + |   | + |   | +  | +  | +  | +  | +  | +  |
| <i>L. triba</i> Myers                   | - | + |   | - |   | - | + |   |   | -  |    | -  |    |    |    |
| <i>L. triptera</i> (Ehrenberg)          |   | - | + |   |   |   |   | + | + |    | +  | +  | +  | +  |    |
| <i>Squatinella mutica</i> (Ehrenberg)   | + | + | - | - | + | + |   | + | + | +  | +  |    |    |    |    |

Table 3. Contd.

| Floodplain lakes                    | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 |
|-------------------------------------|---|---|---|---|---|---|---|---|---|----|----|----|----|----|----|
| Family LECANIDAE                    |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |
| <i>Lecane aculeata</i> (Jakubski)   | + | + | + | + | + |   | + | + | + | +  | +  | +  | -  | -  | +  |
| <i>L. blachei</i> Berzins           | + |   |   |   |   | + | - | - | - | +  | -  | -  | -  | -  | -  |
| <i>L. bulla</i> Gosse)              | + | + | + | + | + | + | + | + | + | +  | +  | +  | +  | +  | +  |
| <i>L. closterocerca</i> (Schmarda)  | + | + | + | + | + | + | + | + | + | +  | +  | +  | +  | +  | +  |
| <i>L. crepida</i> Harring           | + | + | + |   |   | + |   | + | + | +  | +  |    | +  | +  | +  |
| <i>L. curvicornis</i> (Murray)      | + | + | + | + | + | + | + | + | + | +  | +  | +  | +  | +  | +  |
| <i>L. decipiens</i> (Murray)        | + |   | + |   |   |   | + |   |   | +  |    | +  | +  | +  | -  |
| <i>L. doryssa</i> Harring           |   | + |   |   |   |   |   |   |   | -  | +  | -  |    | -  | -  |
| <i>L. flexilis</i> (Gosse)          | + |   | + |   | + | - | - | + | + |    | -  | -  | +  | +  | +  |
| <i>L. hamata</i> (Stokes)           |   | + | + | + | + | + |   | + | + | +  | +  | +  | +  | +  | +  |
| <i>L. hastata</i> (Murray)          |   |   |   | + |   |   | - | + | + |    | -  | -  | +  | +  | +  |
| <i>L. hornemanni</i> (Ehrenberg)    | + |   | + | + | + | + | + | + | + | +  | +  | +  | +  | -  | +  |
| <i>L. inermis</i> (Bryce)           | + | + | + | + | + |   | + | + | + |    | +  | +  | +  | +  | -  |
| <i>L. inopinata</i> Harring & Myers | + | + |   | + |   | + |   |   | - | +  | +  | +  | +  | +  | -  |
| <i>L. lateralis</i> Sharma          |   |   |   | + |   | + |   |   |   |    | +  |    | -  | -  | -  |
| <i>L. leontina</i> (Turner)         | + | + | + | + | + | + | + | + | + | +  | +  | +  | +  | +  | +  |
| <i>L. ludwigii</i> (Eckstein)       | + |   | + | + | + |   | + | + | + | +  | -  |    | +  | +  | +  |
| <i>L. luna</i> (Müller)             | + | + | + | + | + | + | + | + | + | +  | +  | +  | +  | +  | +  |
| <i>L. lunaris</i> (Ehrenberg)       | + | + | + | + | + | + | + | + | + | +  | +  | +  | +  | +  | +  |
| <i>L. monostyla</i> (Daday)         |   | + | + |   |   |   |   |   |   | -  | -  | +  | -  | +  | -  |
| <i>L. nana</i> (Murray)             | + | + |   | + |   | + |   |   | + | -  | +  | +  | +  | +  | -  |
| <i>L. ohioensis</i> (Herrick)       |   | + | + |   |   | + |   | + |   |    |    | +  | +  | -  | +  |
| <i>L. papuana</i> (Murray)          | + | + | + | + | + | + | + | + | + | +  | +  | +  | +  | +  | +  |
| <i>L. pertica</i> Harring & Myers   | + |   | + | + |   | + | + | + | + |    | +  | +  | -  | +  | -  |
| <i>L. ploenensis</i> (Voigt)        | + | + |   | + | + | + |   | + | + |    | +  | +  |    | +  | -  |
| <i>L. pyriformis</i> (Daday)        | + | + |   | + | + |   | + | + | + | +  | +  | -  | +  | -  | +  |
| <i>L. quadridentata</i> (Ehrenberg) | + | + | + | + | + | + | + | + | + | +  | +  | +  | +  | +  | +  |
| <i>L. signifera</i> (Jennings)      | + | + |   | + |   |   |   | + | + | +  | +  |    | +  | +  | +  |
| <i>L. stenroosi</i> (Meissner)      |   |   | + |   |   |   | + | + | - | -  |    |    | +  | +  | +  |
| <i>L. sympoda</i> Hauer             | - |   | + |   |   |   |   | + | + | -  | -  | -  | -  | +  | +  |
| <i>L. thienemanni</i> (Hauer)       |   |   | + | + |   | + |   | + |   | +  |    | +  | -  | -  | -  |





Table 3. Contd.

| Floodplain lakes                              | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 |
|---|---|---|---|---|---|---|---|---|---|----|----|----|----|----|----|
| <i>Diaphanosoma volzi</i> Stingelin           | - | - | + | - | + | + |   | + | - |    |    |    |    | -  | +  |
| <i>Pseudosida bidentata</i> Herrick           | + | - | + | - | - | - | - | + |   | +  | -  | -  |    | +  | +  |
| <i>Sida crystallina</i> (O. F. Muller)        | + | + | + | + |   | + | + |   | + |    | +  | +  | -  | +  | -  |
| Family DAPHNIIDAE                             |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |
| <i>Ceriodaphnia cornuta</i> Sars              | + | + | - | + | + | - | + | + | + | +  | +  | -  | +  | +  | +  |
| <i>C. reticulata</i> (Jurine)                 | + | - | + | - |   | + | - | + | + |    | -  | +  | -  | -  | +  |
| <i>Scapholeberis kingi</i> Sars               | + | + | + |   | + | + | - | + | + | +  | +  |    | +  | +  | +  |
| <i>Simocephalus acutirostratus</i> (King)-    |   | - | + | + | - | - | + |   |   |    | -  |    | +  | -  | -  |
| <i>S. exspinosus</i> (De Geer)                | + | - | + | - | + | - | - |   | + | +  | -  | -  | -  | +  |    |
| <i>S. serrulatus</i> (Koch)                   | - | - | - | - | - | - | + | - | - | -  | -  | -  | -  |    | +  |
| <i>S. vetulus</i> (O.F.Müller)                | + | + | + | + | + | + |   | + | + | +  | +  | +  | +  | +  |    |
| Family BOSMINIDAE                             |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |
| <i>Bosmina longirostris</i><br>(O. F. Muller) | + | + | + | + | - |   | + | + | + | +  | -  | +  |    | +  | +  |
| <i>Bosminopsis deitersi</i> Richard           | + |   | + |   |   |   |   |   | + | +  | +  |    |    | -  | +  |
| Family MOINIDAE                               |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |
| <i>Moina micrura</i> Kurz                     | + | - | + | - |   | - | + | + | + |    |    | +  |    | -  | +  |
| <i>Moinodaphnia macleayi</i> (King)           | - | + | + | + |   | + |   |   | - |    |    | -  |    | +  | +  |
| Family MACROTHRICIDAE                         |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |
| <i>Macrothrix laticornis</i> (Fischer)        | + | + | + | + | + | + | + | + | + | +  | +  | +  | +  | +  |    |
| <i>M. odiosa</i> (Gurney)                     | - | - | + | - | - |   | + | + | - | -  | -  | -  |    |    | -  |
| <i>M. spinosa</i> King                        | + | + | - | - | - | + | - | - | - | -  | +  | +  | -  | +  | +  |
| <i>M. triselialis</i> (Brady)                 | + | - | + | + | + | - | - |   | + | +  | +  | +  | +  |    | +  |
| <i>Grimaldina brazzai</i> Richard             | - | - | - | - | - | - | - | - | - | -  | +  |    | -  | -  | -  |
| Family ILYCRYPTIDAE                           |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |
| <i>Ilyocryptus spinifer</i> Herrick           | - | + | + | - | - | - | - | - | + | -  | -  | -  | -  | +  | +  |
| Family CHYDORIDAE                             |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |
| <i>Acroperus harpae</i> (Baird)               | + | - | + | - | - | - | + | + | + | -  |    | +  | +  | -  | +  |
| <i>Alona affinis</i> (Leydig)                 | - | + | + | + | + | - | - | - | + | +  | +  | -  |    | +  | -  |
| <i>A. costata</i> Sars                        | + | - | + | + | + | + | + | + | - | +  | +  | +  | +  |    | +  |

Table 3. Contd.

| Floodplain lakes                               | 1         | 2         | 3         | 4         | 5         | 6         | 7         | 8         | 9         | 10        | 11        | 12        | 13        | 14        | 15        |
|--|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|
| <i>A. davidi</i> Richard                       | +         | +         |           | +         | +         |           |           |           | -         | -         | -         |           | -         | +         | -         |
| <i>A. globulosa</i> (Daday)                    | +         |           | +         |           |           | +         | +         | +         | -         | +         | +         | +         | +         | -         | +         |
| <i>A. guttata</i> Sars                         |           | +         | +         | +         | -         |           |           |           | +         | -         |           |           | -         | +         | -         |
| <i>A. quadrangularis</i> (O. F. Muller)        | +         | +         | +         | +         | +         | +         | +         | +         | +         | +         | +         | +         | +         | +         | +         |
| <i>A. rectangula</i> Sars                      | +         |           | +         | -         |           |           | +         | +         | +         | -         | +         |           | -         | -         | +         |
| <i>Alonella excisa</i> (Fischer)               | +         |           | +         | +         | +         | +         | +         |           | +         | +         | +         | +         | -         | -         | -         |
| <i>Camptocercus uncinatus</i> Smirnov          |           | +         | +         |           |           | +         | +         |           | -         | +         | +         |           | -         | +         | +         |
| <i>C. rectirostris</i> Schoedler               |           |           | +         |           |           | +         | +         | +         |           | +         |           | -         |           | +         | -         |
| <i>Chydorus faviformis</i> Birge               |           | +         |           |           |           | +         |           | +         | -         | +         | -         | -         | +         | +         | -         |
| <i>C. pubescens</i> Sars                       | +         |           |           |           | -         |           | -         | +         | -         | +         | -         |           | +         | -         | -         |
| <i>C. reticulatus</i> Daday                    |           | +         | +         |           |           | +         | -         |           | -         | -         | +         | -         | +         | +         | +         |
| <i>C. sphaericus</i> (O. F. Muller)            | +         | +         | +         | +         | +         | +         | +         | +         | +         | +         | +         | +         | +         | +         | +         |
| <i>Dadaya macrops</i> (Daday)                  |           | +         | +         | +         |           |           | +         | +         | -         | -         | +         | -         | +         | +         | -         |
| <i>Dunhevedia crassa</i> King                  | +         | +         |           |           | +         | +         | -         | -         | +         | -         | +         | +         | -         | +         | -         |
| <i>D. serrata</i> Daday                        | +         |           |           | +         |           |           | -         |           | -         | -         | +         | -         | -         | +         | -         |
| <i>Ephemeroporus barroisi</i> (Richard)        | +         | +         | +         | +         | +         | +         | -         | +         | +         | -         | +         | +         | -         | +         | +         |
| <i>Euryalona orientalis</i> (Daday)            |           | +         |           | +         | +         |           |           | -         | -         | +         | -         | +         | +         | -         | -         |
| <i>Graptoleberis testudinaria</i><br>(Fischer) |           | +         | +         |           | +         | +         | +         | +         | +         | +         | -         | +         | +         | +         | -         |
| <i>Karualona karua</i> (King)                  | +         | +         | +         | +         | +         | +         | +         | +         | +         | +         | +         | +         | +         | +         | -         |
| <i>Kurzia longirostris</i> (Daday)             |           |           | +         | -         | -         |           |           | -         | +         | -         | -         | -         | +         | +         | -         |
| <i>Leydigia acanthocercoides</i><br>(Fischer). | +         |           | +         | -         |           |           | +         | +         | +         | -         | +         | -         | -         | -         | +         |
| <i>Oxyurella singalensis</i> (Daday)           |           | +         | +         | +         | +         | +         | -         | +         | +         | -         | -         | +         | +         | +         | +         |
| <i>Picripleuroxus laevis</i> Sars              |           | +         | +         |           |           |           | +         |           | +         | +         | -         | -         | +         | -         | -         |
| <i>P. similis</i> Vavra                        | +         |           | +         | +         | +         | +         | -         | -         | +         | -         | +         | +         | -         | +         | +         |
| <b>No. of Cladocera Species</b>                | <b>31</b> | <b>26</b> | <b>39</b> | <b>25</b> | <b>21</b> | <b>22</b> | <b>25</b> | <b>27</b> | <b>31</b> | <b>24</b> | <b>26</b> | <b>25</b> | <b>23</b> | <b>28</b> | <b>31</b> |

## COPEPODA

## Family DIAPTOMIDAE

*Heliodiaptomus contortus*  
(Gurney)

+ - + + - - + + + + - - + + -

Table 3. Contd.

| Floodplain lakes                         | 1        | 2        | 3        | 4        | 5        | 6        | 7        | 8        | 9        | 10       | 11       | 12       | 13       | 14       | 15       |
|--|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|
| <i>H. viduus</i> (Gurney)                | +        | +        | +        |          | +        |          |          | +        | +        |          |          | +        | +        |          | +        |
| Family CYCLOPIDAE                        |          |          |          |          |          |          |          |          |          |          |          |          |          |          |          |
| <i>Tropocyclops confinis</i> Kiefer      | -        | +        | +        |          |          | +        |          | +        |          |          | +        |          |          | +        |          |
| <i>Microcyclops varicans</i> Sars        | +        | -        | -        |          | +        | -        | +        |          |          |          | +        | +        |          | -        | +        |
| <i>Mesocyclops leuckarti</i> (Claus)     | +        | +        | +        | +        | +        | +        | +        | +        | +        | +        | +        | +        | +        | +        | +        |
| <i>M. splendidus</i> Lindberg            | -        | +        | +        | +        |          | +        | -        | +        | +        | -        |          |          | +        | +        | -        |
| <i>Thermocyclops crassus</i> (Fischer)   | -        | -        | +        |          | -        | -        | -        | +        | -        |          |          |          | -        | -        | +        |
| <i>T. decipiens</i> Kiefer               |          |          |          |          |          |          |          |          |          |          |          |          |          |          |          |
| <b>No. of Copepoda Species</b>           | <b>4</b> | <b>4</b> | <b>7</b> | <b>3</b> | <b>3</b> | <b>3</b> | <b>3</b> | <b>6</b> | <b>4</b> | <b>2</b> | <b>3</b> | <b>3</b> | <b>4</b> | <b>4</b> | <b>4</b> |
| <b>RHIZOPODA</b>                         |          |          |          |          |          |          |          |          |          |          |          |          |          |          |          |
| Family ARCELLIDAE                        |          |          |          |          |          |          |          |          |          |          |          |          |          |          |          |
| <i>Arcella discoides</i> Ehrenberg       | +        | +        | +        | +        | +        | +        | +        | +        | +        | +        | -        | +        |          |          | +        |
| <i>A. hemispherica</i> Perty             | -        | -        | +        |          |          | -        | -        | -        |          | -        | +        | -        | -        | +        | -        |
| <i>A. vulgaris</i> Ehrenberg             | +        | -        | +        |          | -        | -        | -        |          |          | +        | +        | +        | +        | -        | +        |
| Family CENTROPYXIDAE                     |          |          |          |          |          |          |          |          |          |          |          |          |          |          |          |
| <i>Centropyxis aculeata</i> (Ehrenberg)  | -        | +        | +        | +        | +        | -        | -        | -        |          | +        |          | -        |          | +        | +        |
| <i>C. cassis</i> (Wallich)               | +        | -        |          | -        | -        | -        |          | +        | +        |          | -        |          | +        |          |          |
| <i>C. ecornis</i> (Ehrenberg)            | +        | -        | +        | -        | -        | -        | +        | +        | +        | +        |          |          | +        | +        | -        |
| <i>C. minuta</i> Deflandre               | -        | +        | +        | +        | -        | +        | +        | +        | +        | -        | +        | +        |          |          | +        |
| <i>C. oblonga</i> (Deflandre)            | -        | -        | +        | -        | +        | +        | +        | +        | +        | -        | +        | +        | +        |          |          |
| <i>Cyclopyxis eurysterna</i> (Deflandre) | -        | -        | -        | -        | -        | -        | -        | -        | -        |          | -        | -        | +        | -        |          |
| Family DIFFLUGIDAE                       |          |          |          |          |          |          |          |          |          |          |          |          |          |          |          |
| <i>Diffugia acuminata</i> Ehrenberg      | +        | +        | +        | -        | -        | -        | -        | +        | +        | +        | +        |          | -        | +        | +        |
| <i>D. corona</i> Wallich                 | -        | -        | -        | +        | +        | -        | +        | -        | -        | -        |          | +        | +        |          | +        |
| <i>D. oblonga</i> Ehrenberg              | -        | +        | +        | +        | -        | +        | +        | +        | +        | +        | +        | -        | +        | +        | -        |
| <i>D. urceolata</i> Carter               | +        | -        | +        | -        | +        | -        | +        | +        | +        | +        | -        | +        | +        | +        | -        |
| Family NEBELIDAE                         |          |          |          |          |          |          |          |          |          |          |          |          |          |          |          |
| <i>Heleopera rosea</i> Pennard           | -        | -        | -        | -        | -        | +        | +        | -        | -        | -        | -        | -        | -        | -        |          |
| <i>Lesquereusia spiralis</i> (Ehrenberg) | +        | -        | +        | +        | -        | -        | -        | +        | +        | +        | -        | +        |          | +        | +        |

Table 3. Contd.

| Floodplain lakes                      | 1         | 2        | 3         | 4        | 5        | 6        | 7         | 8         | 9         | 10        | 11       | 12        | 13        | 14       | 15        |
|---------------------------------------|-----------|----------|-----------|----------|----------|----------|-----------|-----------|-----------|-----------|----------|-----------|-----------|----------|-----------|
| <i>Nebela caudata</i> Leidy           |           |          | +         |          |          | +        | +         |           | -         | -         | +        | -         | -         | -        | +         |
| <i>N. dentistoma</i> Pennard          | +         | +        | -         |          |          |          |           | -         | -         | -         | -        | -         | +         | -        | -         |
| Family EUGLEPHIDAE                    |           |          |           |          |          |          |           |           |           |           |          |           |           |          |           |
| <i>Euglypha acanthophora</i> Dujardin | +         | +        | +         | +        | -        | -        | -         | +         | +         | -         | -        | +         | +         | -        | +         |
| <i>E. laevis</i> (Ehrenberg)          | -         | +        | +         | -        | +        | +        | +         | +         | +         | +         | +        | -         | -         | +        | -         |
| <i>E. tuberculata</i> Dujardin        |           |          | -         | -        | -        | +        | -         | -         | -         | -         | -        | +         | +         | -        | +         |
| <i>Trinema enchelys</i> (Ehrenberg)   | +         |          | +         | -        | +        |          | -         | +         | +         | -         | +        | +         | -         | +        | +         |
| <i>T. lineare</i> Penard              |           | +        | +         | +        |          |          | +         | -         | -         | +         | -        | -         | +         | -        | +         |
| <b>No. of Rhizopoda Species</b>       | <b>10</b> | <b>9</b> | <b>16</b> | <b>8</b> | <b>7</b> | <b>8</b> | <b>11</b> | <b>12</b> | <b>12</b> | <b>10</b> | <b>9</b> | <b>10</b> | <b>11</b> | <b>9</b> | <b>12</b> |

## GASTROTRICHA

## Family CHAETONOTIDAE

|                                     |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
|-------------------------------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| <i>Chaetonotus anomalus</i> Brunson | + | - | + | + | - | - | - | + | - | - | - | - | - | + | - |
| <i>C. gastrocyaneus</i> Brunson     |   | - | + |   | - | - | + | + | - | + | - | - | - | - | - |
| <i>C. similis</i> Zelinka           | - |   | - | - | + | - | - | - | - | - | + | - | + | - | + |

|                                  |            |            |            |            |            |            |            |            |            |            |            |            |            |            |            |
|----------------------------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|
| <b>Total Zooplankton Species</b> | <b>126</b> | <b>109</b> | <b>156</b> | <b>108</b> | <b>102</b> | <b>105</b> | <b>109</b> | <b>129</b> | <b>130</b> | <b>107</b> | <b>110</b> | <b>110</b> | <b>116</b> | <b>118</b> | <b>120</b> |
|----------------------------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|

1. Hakama ; 2. Horinchora; 3. Ghorajan; 4. Kamranga; 5. Kakerikhola; 6. Chatla; 7. Hiragota; 8. Urmal; 9. Padma; 10. Bamoni; 11. Basana; 12. Goranga; 13. Sitalmari; 14. Solmari; 15. Daphlang; = absent; + = present.

Copepoda included 8 species belonging to five genera and two species with only species of Calanoida while Cyclopoida showed 6 species. The richness of this group in the individual lakes varied between 2-7 species; lowest and peak diversity is noticed in Bamoni and Ghorajan respectively. Gastrotricha included only three species of Chaetonotidae and showed occasional occurrence in the different sampled beels.

The community similarity between zooplankton taxocoenosis of the different floodplain lakes (Table 4) ranged between 57.3-78.6%. Peak similarity is noticed between Ghorajan and Urmal while its lowest value is observed between Hiragota and Solmari. Total richness of zooplankton in the different lakes (Table 5) ranged between 107-156 species, their mean richness varied between  $59 \pm 5$  -  $83 \pm 5$  species while seasonal richness in individual beels varied between 50-90 species. In addition, zooplankton richness during autumn, winter, summer and monsoon ranged between 62-82, 64-80, 50-85 and 53-75 species respectively.

**Table 4.** Percentage similarities between Zooplankton communities (Sorensen's index)

| Floodplain lakes | 1 | 2    | 3    | 4    | 5    | 6    | 7    | 8    | 9    | 10   | 11   | 12   | 13   | 14   | 15   |
|------------------|---|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| Hakama           | - | 58.7 | 64.5 | 69.2 | 65.8 | 69.1 | 61.2 | 71.1 | 75.8 | 68.7 | 68.6 | 71.2 | 65.3 | 64.7 | 65.8 |
| Horinchora       |   | -    | 58.9 | 69.1 | 68.2 | 67.3 | 63.3 | 62.2 | 64.4 | 66.7 | 69.1 | 61.2 | 63.8 | 65.8 | 62.9 |
| Ghorajan         |   |      |      | 64.4 | 62.0 | 67.4 | 67.9 | 78.6 | 77.6 | 63.9 | 67.7 | 67.7 | 64.0 | 70.1 | 68.8 |
| Kamranga         |   |      |      | -    | 69.5 | 70.4 | 64.5 | 67.5 | 69.7 | 70.7 | 68.8 | 68.8 | 65.2 | 68.1 | 60.5 |
| Kakerikhola      |   |      |      |      | -    | 68.5 | 59.9 | 67.5 | 72.4 | 68.9 | 70.4 | 61.3 | 66.1 | 66.4 | 64.9 |
| Chatla           |   |      |      |      |      | -    | 68.2 | 71.8 | 69.8 | 69.8 | 75.3 | 71.6 | 63.3 | 66.4 | 62.2 |
| Hiragota         |   |      |      |      |      |      | -    | 69.7 | 65.3 | 68.5 | 69.4 | 63.0 | 62.2 | 57.3 | 61.1 |
| Urmal            |   |      |      |      |      |      |      | -    | 78.0 | 71.2 | 67.8 | 65.3 | 65.3 | 68.8 | 63.4 |
| Padma            |   |      |      |      |      |      |      |      | -    | 67.5 | 71.7 | 67.5 | 68.3 | 69.3 | 68.0 |
| Bamoni           |   |      |      |      |      |      |      |      |      | -    | 66.3 | 62.6 | 66.4 | 64.9 | 59.9 |
| Basana           |   |      |      |      |      |      |      |      |      |      | -    | 68.2 | 60.2 | 66.7 | 63.5 |
| Goranga          |   |      |      |      |      |      |      |      |      |      |      | -    | 63.7 | 57.9 | 61.7 |
| Sitalmari        |   |      |      |      |      |      |      |      |      |      |      |      | -    | 63.2 | 63.6 |
| Solmari          |   |      |      |      |      |      |      |      |      |      |      |      |      | -    | 59.7 |
| Daphlang         |   |      |      |      |      |      |      |      |      |      |      |      |      |      | -    |

1. Hakama ; 2. Horinchora; 3. Ghorajan; 4. Kamranga; 5. Kakerikhola; 6. Chatla; 7. Hiragota; 8. Urmal; 9. Padma; 10. Bamoni; 11. Basana; 12. Goranga; 13. Sitalmari; 14. Solmari; 15. Daphlang

**Table 5.** Seasonal variations in Zooplankton richness

| Floodplain lakes | Autumn | Winter | Summer | Monsoon | Range   | Total Richness | Mean $\pm$ SD |
|------------------|--------|--------|--------|---------|---------|----------------|---------------|
| Hakama           | 74     | 80     | 68     | 62      | 62 - 78 | 126            | 71 $\pm$ 7    |
| Horinchora       | 63     | 66     | 69     | 53      | 53 - 69 | 109            | 63 $\pm$ 6    |
| Ghorajan         | 82     | 90     | 85     | 75      | 75 - 90 | 156            | 83 $\pm$ 5    |
| Kamranga         | 63     | 69     | 60     | 52      | 52 - 69 | 108            | 61 $\pm$ 6    |
| Kakerikhola      | 62     | 64     | 50     | 60      | 50 - 64 | 102            | 59 $\pm$ 5    |
| Chatla           | 68     | 66     | 50     | 59      | 50 - 68 | 105            | 61 $\pm$ 7    |
| Hiragota         | 62     | 60     | 70     | 55      | 55 - 67 | 109            | 62 $\pm$ 5    |
| Urmal            | 72     | 82     | 69     | 64      | 64 - 82 | 129            | 72 $\pm$ 7    |
| Padma            | 77     | 72     | 82     | 65      | 65 - 82 | 130            | 74 $\pm$ 6    |
| Bamoni           | 67     | 70     | 60     | 53      | 53 - 67 | 107            | 62 $\pm$ 7    |
| Basana           | 62     | 65     | 70     | 58      | 58 - 70 | 110            | 64 $\pm$ 4    |
| Goranga          | 66     | 72     | 64     | 59      | 59 - 72 | 110            | 65 $\pm$ 5    |
| Sitalmari        | 70     | 64     | 75     | 60      | 60 - 75 | 116            | 67 $\pm$ 6    |
| Solmari          | 66     | 76     | 70     | 65      | 55 - 76 | 118            | 69 $\pm$ 4    |
| Daphlang         | 72     | 70     | 80     | 56      | 56 - 80 | 120            | 69 $\pm$ 9    |

Total rotifer richness in the different lakes (Table 6) varied between 69-93 species, mean richness fluctuated between  $38 \pm 5$  (Hiragota)  $58 \pm 5$  species (Ghorajan) while the number of species in individual beels during different seasons varied between 30-64 species. In addition, their richness ranged between 40-57, 36-64, 37-62, 30-51 species during autumn, winter, summer and monsoon respectively in the sampled beels.

**Table 6.** Seasonal variations in Rotifera richness

| Floodplain Lakes | Autumn | Winter | Summer | Monsoon | Range  | Total Richness | Mean $\pm$ SD |
|------------------|--------|--------|--------|---------|--------|----------------|---------------|
| Hakama           | 44     | 54     | 42     | 40      | 40-54  | 80             | $45 \pm 5$    |
| Horinchora       | 40     | 46     | 42     | 30      | 30-49  | 70             | $39 \pm 6$    |
| Ghorajan         | 57     | 64     | 59     | 51      | 51-64  | 93             | $58 \pm 5$    |
| Kamranga         | 40     | 46     | 39     | 31      | 31-46  | 71             | $39 \pm 5$    |
| Kakerikhola      | 41     | 46     | 36     | 30      | 30-46  | 70             | $38 \pm 6$    |
| Chatla           | 47     | 38     | 32     | 40      | 32 -47 | 71             | $39 \pm 5$    |
| Hiragota         | 40     | 36     | 45     | 30      | 38-45  | 69             | $38 \pm 5$    |
| Urmal            | 46     | 60     | 51     | 42      | 42-60  | 82             | $49 \pm 7$    |
| Padma            | 50     | 42     | 62     | 42      | 42 -62 | 83             | $49 \pm 8$    |
| Bamoni           | 40     | 44     | 40     | 32      | 30-44  | 70             | $39 \pm 4$    |
| Basana           | 41     | 47     | 41     | 33      | 33-47  | 71             | $40 \pm 5$    |
| Goranga          | 42     | 50     | 40     | 32      | 32 -50 | 72             | $41 \pm 6$    |
| Sitalmari        | 50     | 40     | 52     | 36      | 36 -52 | 77             | $44 \pm 7$    |
| Solmari          | 40     | 52     | 46     | 35      | 35 -52 | 76             | $43 \pm 6$    |
| Daphlang         | 45     | 42     | 50     | 32      | 32 -50 | 72             | $42 \pm 7$    |

**Table 7.** Percentage similarities between Rotifera communities (Sorensen's index)

| Floodplain lakes | 1 | 2    | 3    | 4    | 5    | 6    | 7    | 8    | 9    | 10   | 11   | 12   | 13   | 14   | 15   |
|------------------|---|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| Hakama           |   | 61.6 | 66.3 | 75.5 | 72.0 | 78.1 | 71.1 | 60.3 | 81.0 | 76.0 | 72.8 | 73.7 | 72.6 | 70.5 | 72.4 |
| Horinchora       |   | -    | 56.8 | 69.5 | 75.7 | 68.1 | 70.5 | 64.5 | 65.3 | 70.0 | 69.5 | 66.2 | 72.1 | 63.0 | 67.6 |
| Ghorajan         |   |      |      | 67.5 | 67.9 | 71.2 | 70.8 | 80.4 | 78.9 | 61.7 | 69.9 | 74.4 | 68.6 | 70.2 | 73.2 |
| Kamranga         |   |      |      |      | 75.2 | 80.3 | 71.4 | 75.8 | 76.6 | 78.0 | 77.5 | 74.1 | 70.3 | 70.7 | 69.9 |
| Kakerikhola      |   |      |      |      |      | 75.2 | 70.5 | 76.3 | 78.4 | 75.7 | 78.0 | 59.1 | 70.7 | 68.5 | 74.6 |
| Chatla           |   |      |      |      |      |      | 74.3 | 77.1 | 77.9 | 79.4 | 78.9 | 76.9 | 71.6 | 68.0 | 74.1 |
| Hiragota         |   |      |      |      |      |      |      | 72.8 | 71.0 | 71.9 | 75.7 | 69.5 | 68.5 | 63.4 | 73.7 |
| Urmal            |   |      |      |      |      |      |      |      | 83.6 | 78.0 | 77.1 | 70.1 | 69.2 | 72.1 | 72.7 |
| Padma            |   |      |      |      |      |      |      |      |      | 73.2 | 76.6 | 69.7 | 73.7 | 70.4 | 78.7 |
| Bamoni           |   |      |      |      |      |      |      |      |      |      | 73.7 | 69.0 | 68.0 | 64.4 | 71.8 |
| Basana           |   |      |      |      |      |      |      |      |      |      |      | 72.7 | 66.2 | 69.4 | 69.9 |

**Table 7. Contd.**

| Floodplain lakes | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13   | 14   | 15   |
|------------------|---|---|---|---|---|---|---|---|---|----|----|----|------|------|------|
| Goranga          |   |   |   |   |   |   |   |   |   |    |    |    | 68.4 | 64.9 | 65.3 |
| Sitalmari        |   |   |   |   |   |   |   |   |   |    |    |    | -    | 75.5 | 76.5 |
| Solmari          |   |   |   |   |   |   |   |   |   |    |    |    |      | -    | 70.3 |
| Daphlang         |   |   |   |   |   |   |   |   |   |    |    |    |      |      | -    |

1. Hakama ; 2. Horinchora; 3. Ghorajan; 4. Kamranga; 5. Kakerikhola; 6. Chatla; 7. Hiragota; 8. Urmal; 9. Padma; 10. Bamoni; 11. Basana; 12. Goranga; 13. Sitalmari; 14. Solmari; 15. Daphlang

The rotifer communities indicated similarity values (Table 7) ranging between 56.8-83.6%. Peak similarity is recorded between Urmal and Padma and minimum community similarity is observed between Horinchora and Ghorajan.

Overall species richness of Cladocera (Table 8) in the different floodplain lakes varied between 21-30 species and their mean richness ranged between  $13 \pm 2$  (Kakerikhola) -  $23 \pm 2$  species (Ghorajan) while seasonal richness in individual beels varied between 11-26 species. In addition, the cladoceran communities indicated richness ranging between 14-22, 14-26, 12-25 and 11-20 species during autumn, winter, summer and monsoon in various sampled beels.

**Table 8. Seasonal variations in Cladocera richness**

| Lakes       | Autumn | Winter | Summer | Monsoon | Range   | Total Richness | Mean $\pm$ SD |
|-------------|--------|--------|--------|---------|---------|----------------|---------------|
| Hakama      | 20     | 24     | 19     | 16      | 16 - 24 | 31             | $20 \pm 3$    |
| Horinchora  | 16     | 18     | 20     | 15      | 15 - 20 | 26             | $17 \pm 2$    |
| Ghorajan    | 21     | 26     | 24     | 20      | 20 - 26 | 39             | $23 \pm 2$    |
| Kamranga    | 16     | 16     | 18     | 14      | 14 - 18 | 25             | $16 \pm 1$    |
| Kakerikhola | 12     | 15     | 14     | 11      | 11 - 15 | 21             | $13 \pm 2$    |
| Chatla      | 17     | 15     | 12     | 14      | 12 - 17 | 22             | $14 \pm 2$    |
| Hiragota    | 18     | 16     | 20     | 13      | 13 - 20 | 25             | $17 \pm 3$    |
| Urmal       | 16     | 19     | 13     | 15      | 13 - 19 | 27             | $16 \pm 2$    |
| Padma       | 20     | 19     | 23     | 17      | 17 - 23 | 31             | $20 \pm 2$    |
| Bamoni      | 17     | 19     | 14     | 13      | 13 - 19 | 24             | $16 \pm 2$    |
| Basana      | 15     | 18     | 22     | 14      | 14 - 22 | 26             | $17 \pm 3$    |
| Goranga     | 14     | 21     | 19     | 15      | 14 - 21 | 25             | $17 \pm 3$    |
| Sitalmari   | 18     | 14     | 19     | 14      | 14 - 19 | 23             | $16 \pm 2$    |
| Solmari     | 16     | 20     | 18     | 17      | 16 - 20 | 28             | $18 \pm 1$    |
| Daphlang    | 22     | 18     | 25     | 16      | 16 - 25 | 31             | $20 \pm 3$    |

Cladocera recorded community similarities (Table 9) ranging between 37.0-92.6% during the present observations. Peak similarity is noticed between Horinchora and Solmari while lowest value is observed between Solmari and Daphlang.

Seasonal quantitative abundance of zooplankton (Table 10) ranged between 188-411 n/l while their mean abundance varied between  $227 \pm 21$  -  $301 \pm 66$  n/l in the different lakes; lowest and peak mean densities are observed in Hakama and Chatla respectively. In addition, zooplankton abundance ranged between 188-401, 208-419, 198-364 and 210-307 during autumn, winter, summer and monsoon in the individual lakes.

The rotifer communities exhibited seasonal abundance (Table 11) in the different floodplain lakes ranging between 98-214 n/l and their mean abundance varied between  $109 \pm 8$  -  $169 \pm 45$  n/l; peak and lowest mean densities are observed in Chatla and Hakama. Then rotifers comprised between  $47.9 \pm 4.4$  -  $55.8 \pm 3.0$  % of zooplankton abundance.. In addition, the Rotifera abundance varied between 95-246, 91-214, 110-188, 98-151 n/l during autumn, winter, summer and monsoon respectively in the individual beels.

The species diversity of Rotifera (Table 12) exhibited seasonal variations ranging between 1.899-3.124 and its mean value in the sampled beels varied between  $2.087 \pm 0.110$  (Urmal) -  $2.698 \pm 0.372$  (Sitalmari) during the study period. The diversity ranged between 1.987-2.885, 2.114-3.120, 2.159-3.214 and 1.899-2.123 during autumn, winter, summer and monsoon seasons respectively in individual lakes.

**Table 9.** Percentage similarities between Cladoceran communities (Sorensen's index)

| Floodplain lakes | 1 | 2    | 3    | 4    | 5    | 6    | 7    | 8    | 9    | 10   | 11   | 12   | 13   | 14   | 15   |
|------------------|---|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| Hakama           | - | 49.1 | 62.8 | 60.7 | 57.7 | 62.4 | 50.0 | 65.5 | 71.0 | 69.1 | 73.7 | 67.8 | 48.1 | 54.2 | 54.8 |
| Horinchora       |   | -    | 64.6 | 70.6 | 59.6 | 45.0 | 54.9 | 56.6 | 67.9 | 64.0 | 73.1 | 58.8 | 65.3 | 92.6 | 52.6 |
| Ghorajan         |   |      | -    | 62.5 | 56.7 | 68.8 | 65.6 | 69.7 | 77.1 | 66.7 | 67.7 | 59.4 | 58.1 | 71.6 | 62.9 |
| Kamranga         |   |      |      | -    | 60.9 | 55.3 | 52.0 | 52.0 | 57.6 | 57.1 | 66.7 | 64.0 | 58.3 | 67.9 | 41.5 |
| Kakerikhola      |   |      |      |      | -    | 65.1 | 39.1 | 54.2 | 65.4 | 71.1 | 63.8 | 65.2 | 63.6 | 68.4 | 42.3 |
| Chatla           |   |      |      |      |      | -    | 55.3 | 69.4 | 56.6 | 60.9 | 75.0 | 76.6 | 57.8 | 76.0 | 49.1 |
| Hiragota         |   |      |      |      |      |      | -    | 69.2 | 53.6 | 61.2 | 62.7 | 56.0 | 54.1 | 49.1 | 39.3 |
| Urmal            |   |      |      |      |      |      |      |      | -    | 58.2 | 66.7 | 56.6 | 61.5 | 60.0 | 61.8 |
| Padma            |   |      |      |      |      |      |      |      |      | -    | 58.2 | 70.2 | 64.3 | 51.8 | 67.8 |
| Bamoni           |   |      |      |      |      |      |      |      |      |      | -    | 64.0 | 57.1 | 72.3 | 65.4 |
| Basana           |   |      |      |      |      |      |      |      |      |      |      | -    | 66.7 | 57.1 | 72.3 |
| 40.0             |   |      |      |      |      |      |      |      |      |      |      |      |      | 54.2 | 51.8 |
| Sitalmari        |   |      |      |      |      |      |      |      |      |      |      |      |      |      | 54.9 |
| Solmari          |   |      |      |      |      |      |      |      |      |      |      |      |      |      | -    |
| Daphlang         |   |      |      |      |      |      |      |      |      |      |      |      |      |      | -    |

1. Hakama ; 2. Horinchora; 3. Ghorajan; 4. Kamranga; 5. Kakerikhola; 6. Chatla; 7. Hiragota; 8. Urmal; 9. Padma; 10. Bamoni; 11. Basana; 12. Goranga; 13. Sitalmari; 14. Solmari; 15. Daphlang

**Table 10.** Seasonal variations in Zooplankton abundance

| Lakes       | Autumn | Winter | Summer | Monsoon | Range   | Mean $\pm$ SD |
|-------------|--------|--------|--------|---------|---------|---------------|
| Hakama      | 251    | 242    | 198    | 218     | 198-251 | 227 $\pm$ 21  |
| Horinchora  | 240    | 261    | 301    | 317     | 240-317 | 280 $\pm$ 31  |
| Ghorajan    | 261    | 227    | 330    | 210     | 210-330 | 232 $\pm$ 18  |
| Kamranga    | 224    | 318    | 397    | 223     | 223-318 | 276 $\pm$ 38  |
| Kakerikhola | 207    | 251    | 234    | 259     | 207-259 | 238 $\pm$ 20  |
| Chatla      | 401    | 294    | 246    | 252     | 246-411 | 301 $\pm$ 66  |
| Hiragota    | 219    | 233    | 308    | 225     | 219-308 | 246 $\pm$ 36  |
| Urmal       | 237    | 211    | 340    | 278     | 211-340 | 266 $\pm$ 49  |
| Padma       | 200    | 263    | 329    | 262     | 200-329 | 263 $\pm$ 46  |
| Bamoni      | 231    | 419    | 248    | 229     | 229-419 | 282 $\pm$ 79  |
| Basana      | 235    | 208    | 327    | 200     | 200-327 | 242 $\pm$ 50  |
| Goranga     | 267    | 313    | 246    | 211     | 211-313 | 259 $\pm$ 37  |
| Sitalmari   | 188    | 238    | 350    | 214     | 188-350 | 247 $\pm$ 62  |
| Solmari     | 219    | 269    | 301    | 234     | 219-301 | 256 $\pm$ 32  |
| Daphlang    | 221    | 265    | 364    | 278     | 221-364 | 282 $\pm$ 52  |

Rotifera registered evenness (Table 13) ranging between 0.781-0.991 and mean seasonal values between  $0.828 \pm 0.043$  (Bamoni) -  $0.970 \pm 0.022$  (Chatla) in the different floodplain lakes. In addition, evenness varied between 0.781-0.912, 0.819-0.933, 0.834-0.971 and 0.824-0.956 during autumn, winter, summer and monsoon seasons in individual beels.

**Table 11.** Seasonal variations in Rotifera abundance

| Lakes       | Autumn | Winter | Summer | Monsoon | Range   | Mean $\pm$ SD | Percentage     |
|-------------|--------|--------|--------|---------|---------|---------------|----------------|
| Hakama      | 108    | 121    | 110    | 98      | 98-121  | 109 $\pm$ 8   | 48.4 $\pm$ 4.9 |
| Horinchora  | 110    | 152    | 146    | 138     | 110-152 | 136 $\pm$ 16  | 49.0 $\pm$ 5.6 |
| Ghorajan    | 136    | 107    | 138    | 109     | 107-138 | 122 $\pm$ 14  | 48.2 $\pm$ 4.2 |
| Kamranga    | 112    | 136    | 132    | 102     | 102-142 | 123 $\pm$ 16  | 48.9 $\pm$ 2.7 |
| Kakerikhola | 102    | 128    | 110    | 141     | 102-141 | 120 $\pm$ 15  | 50.4 $\pm$ 2.7 |
| Chatla      | 246    | 157    | 129    | 145     | 129-245 | 169 $\pm$ 45  | 55.8 $\pm$ 3.0 |
| Hiragota    | 105    | 121    | 169    | 106     | 105-169 | 125 $\pm$ 26  | 50.4 $\pm$ 3.1 |
| Urmal       | 110    | 97     | 188    | 122     | 97-188  | 129 $\pm$ 35  | 47.9 $\pm$ 4.4 |
| Padma       | 108    | 142    | 168    | 149     | 108-168 | 142 $\pm$ 22  | 53.7 $\pm$ 2.1 |
| Bamoni      | 102    | 214    | 137    | 119     | 102-214 | 142 $\pm$ 46  | 49.7 $\pm$ 4.5 |
| Basana      | 120    | 115    | 178    | 108     | 108-178 | 130 $\pm$ 28  | 53.7 $\pm$ 1.5 |
| Goranga     | 131    | 174    | 140    | 101     | 101-174 | 137 $\pm$ 26  | 52.4 $\pm$ 3.9 |
| Sitalmari   | 95     | 127    | 183    | 112     | 95-183  | 125 $\pm$ 33  | 51.9 $\pm$ 1.1 |
| Solmari     | 118    | 122    | 168    | 140     | 118-168 | 137 $\pm$ 20  | 53.4 $\pm$ 5.0 |
| Daphlang    | 117    | 133    | 183    | 151     | 117-183 | 146 $\pm$ 24  | 51.9 $\pm$ 1.7 |

**Table 12.** Seasonal variations in Species diversity of Rotifera

| Lakes       | Autumn | Winter | Summer | Monsoon | Range       | Mean $\pm$ SD     |
|-------------|--------|--------|--------|---------|-------------|-------------------|
| Hakama      | 2.112  | 2.328  | 2.249  | 1.910   | 1.910-2.328 | 2.150 $\pm$ 0.158 |
| Horinchora  | 2.561  | 3.011  | 2.990  | 2.123   | 2.123-3.011 | 2.671 $\pm$ 0.363 |
| Ghorajan    | 2.578  | 2.894  | 2.778  | 2.108   | 2.108-2.894 | 2.589 $\pm$ 0.300 |
| Kamranga    | 2.885  | 2.979  | 2.689  | 2.094   | 2.094-2.979 | 2.662 $\pm$ 0.344 |
| Kakerikhola | 2.194  | 3.080  | 2.786  | 2.005   | 2.005-3.080 | 2.516 $\pm$ 0.435 |
| Chatla      | 2.534  | 2.991  | 2.971  | 1.986   | 1.986-2.991 | 2.620 $\pm$ 0.409 |
| Hiragota    | 2.018  | 2.242  | 2.145  | 2.110   | 2.018-2.242 | 2.151 $\pm$ 0.054 |
| Urmal       | 1.987  | 2.114  | 2.257  | 1.990   | 1.987-2.257 | 2.087 $\pm$ 0.110 |
| Padma       | 1.989  | 2.432  | 2.153  | 2.010   | 1.989-2.432 | 2.146 $\pm$ 0.177 |
| Bamoni      | 2.015  | 2.567  | 2.414  | 1.981   | 1.981-2.567 | 2.244 $\pm$ 0.252 |
| Basana      | 2.014  | 2.897  | 2.563  | 1.899   | 1.899-2.897 | 2.343 $\pm$ 0.406 |
| Goranga     | 2.356  | 3.120  | 2.769  | 1.966   | 1.966-3.120 | 2.552 $\pm$ 0.433 |
| Sitalmari   | 2.664  | 3.029  | 2.995  | 2.102   | 2.102-3.029 | 2.698 $\pm$ 0.372 |
| Solmari     | 2.319  | 2.987  | 3.214  | 2.023   | 2.023-3.124 | 2.636 $\pm$ 0.483 |
| Daphlang    | 2.106  | 2.775  | 3.010  | 2.003   | 2.003-3.010 | 2.473 $\pm$ 0.429 |

The rotifer communities of the floodplain lakes, sampled during 2004-05, exhibited dominance (Table 14) ranging between 0.066-0.110 and its mean seasonal valued ranged between  $0.091 \pm 0.009$  -  $0.157 \pm 0.069$ . Further, the dominance varied between 0.096-0.261, 0.076-0.210, 0.065-0.164 and 0.087-0.187 during autumn, winter, summer and monsoon seasons in individual beels.

**Table 13.** Seasonal variations in Evenness of Rotifera

| Lakes       | Autumn | Winter | Summer | Monsoon | Range       | Mean $\pm$ SD     |
|-------------|--------|--------|--------|---------|-------------|-------------------|
| Hakama      | 0.868  | 0.910  | 0.922  | 0.875   | 0.868-0.922 | 0.899 $\pm$ 0.020 |
| Horinchora  | 0.912  | 0.933  | 0.899  | 0.901   | 0.899-0.933 | 0.911 $\pm$ 0.013 |
| Ghorajan    | 0.902  | 0.877  | 0.923  | 0.897   | 0.877-0.923 | 0.899 $\pm$ 0.016 |
| Kamranga    | 0.867  | 0.819  | 0.872  | 0.916   | 0.819-0.916 | 0.868 $\pm$ 0.034 |
| Kakerikhola | 0.889  | 0.923  | 0.895  | 0.956   | 0.889-0.956 | 0.916 $\pm$ 0.027 |
| Chatla      | 0.934  | 0.991  | 0.971  | 0.986   | 0.934-0.991 | 0.970 $\pm$ 0.022 |
| Hiragota    | 0.899  | 0.834  | 0.901  | 0.824   | 0.824-0.901 | 0.864 $\pm$ 0.037 |
| Urmal       | 0.824  | 0.915  | 0.897  | 0.902   | 0.824-0.915 | 0.884 $\pm$ 0.036 |
| Padma       | 0.911  | 0.897  | 0.901  | 0.954   | 0.897-0.954 | 0.916 $\pm$ 0.023 |
| Bamoni      | 0.781  | 0.803  | 0.834  | 0.895   | 0.781-0.895 | 0.828 $\pm$ 0.043 |
| Basana      | 0.867  | 0.834  | 0.901  | 0.880   | 0.834-0.901 | 0.870 $\pm$ 0.024 |
| Goranga     | 0.902  | 0.900  | 0.894  | 0.901   | 0.894-0.902 | 0.899 $\pm$ 0.003 |
| Sitalmari   | 0.911  | 0.899  | 0.934  | 0.909   | 0.899-0.934 | 0.913 $\pm$ 0.013 |
| Solmari     | 0.911  | 0.903  | 0.896  | 0.914   | 0.896-0.914 | 0.906 $\pm$ 0.007 |
| Daphlang    | 0.887  | 0.873  | 0.902  | 0.897   | 0.873-0.903 | 0.890 $\pm$ 0.011 |

**Table 14.** Seasonal variations in Dominance of Rotifera

| Lakes       | Autumn | Winter | Summer | Monsoon | Range       | Mean $\pm$ SD     |
|-------------|--------|--------|--------|---------|-------------|-------------------|
| Hakama      | 0.115  | 0.097  | 0.065  | 0.123   | 0.065-0.123 | 0.100 $\pm$ 0.022 |
| Horinchora  | 0.099  | 0.101  | 0.121  | 0.113   | 0.099-0.121 | 0.108 $\pm$ 0.009 |
| Ghorajan    | 0.126  | 0.142  | 0.095  | 0.132   | 0.095-0.142 | 0.124 $\pm$ 0.176 |
| Kamranga    | 0.157  | 0.201  | 0.152  | 0.099   | 0.099-0.201 | 0.152 $\pm$ 0.036 |
| Kakerikhola | 0.157  | 0.112  | 0.164  | 0.101   | 0.101-0.164 | 0.133 $\pm$ 0.027 |
| Chatla      | 0.098  | 0.076  | 0.091  | 0.098   | 0.076-0.098 | 0.091 $\pm$ 0.009 |
| Hiragota    | 0.159  | 0.176  | 0.135  | 0.092   | 0.092-0.159 | 0.140 $\pm$ 0.032 |
| Urmal       | 0.201  | 0.097  | 0.126  | 0.112   | 0.097-0.201 | 0.134 $\pm$ 0.040 |
| Padma       | 0.101  | 0.143  | 0.121  | 0.093   | 0.093-0.143 | 0.114 $\pm$ 0.019 |
| Bamoni      | 0.261  | 0.177  | 0.102  | 0.087   | 0.087-0.261 | 0.157 $\pm$ 0.069 |
| Basana      | 0.147  | 0.175  | 0.113  | 0.178   | 0.113-0.175 | 0.153 $\pm$ 0.026 |
| Goranga     | 0.141  | 0.129  | 0.167  | 0.103   | 0.103-0.167 | 0.135 $\pm$ 0.023 |
| Sitalmari   | 0.096  | 0.101  | 0.099  | 0.121   | 0.096-0.121 | 0.104 $\pm$ 0.010 |
| Solmari     | 0.113  | 0.124  | 0.152  | 0.090   | 0.090-0.152 | 0.120 $\pm$ 0.022 |
| Daphlang    | 0.135  | 0.140  | 0.110  | 0.187   | 0.110-0.187 | 0.143 $\pm$ 0.028 |

Cladocera indicated abundance (Table 15) ranging between 63-121 n/l and mean seasonal abundance between  $80 \pm 11$  -  $101 \pm 12$  n/l. Lowest and peak mean densities are recorded in Hakama and Chatla respectively. They comprised between  $30.6 \pm 3.7$  -  $36.7 \pm 1.4$  % of quantitative variations of zooplankton. The density of Cladocera varied between 61-120 during autumn and it varied between 71-121, 63-114 and 63-103 during winter, summer and monsoon seasons in individual lakes sampled presently.

**Table 15.** Seasonal variations in Cladocera abundance

| Lakes       | Autumn | Winter | Summer | Monsoon | Range  | Mean $\pm$ SD | Percentage     |
|-------------|--------|--------|--------|---------|--------|---------------|----------------|
| Hakama      | 91     | 78     | 63     | 89      | 63-91  | 80 $\pm$ 11   | 35.4 $\pm$ 3.7 |
| Horinchora  | 88     | 74     | 81     | 97      | 74-97  | 85 $\pm$ 8    | 30.6 $\pm$ 3.7 |
| Ghorajan    | 91     | 85     | 101    | 78      | 78-191 | 89 $\pm$ 8    | 35.1 $\pm$ 2.8 |
| Kamranga    | 84     | 106    | 97     | 88      | 84-106 | 94 $\pm$ 9    | 35.9 $\pm$ 3.7 |
| Kakerikhola | 71     | 80     | 79     | 97      | 71-97  | 82 $\pm$ 9    | 34.2 $\pm$ 2.0 |
| Chatla      | 120    | 105    | 91     | 89      | 89-120 | 101 $\pm$ 12  | 34.3 $\pm$ 3.0 |
| Hiragota    | 78     | 90     | 100    | 80      | 78-100 | 87 $\pm$ 9    | 35.6 $\pm$ 2.1 |
| Urmal       | 94     | 71     | 114    | 103     | 71-114 | 95 $\pm$ 16   | 35.9 $\pm$ 2.6 |
| Padma       | 69     | 97     | 104    | 99      | 69-104 | 92 $\pm$ 13   | 35.2 $\pm$ 2.4 |

**Table 15.** Seasonal variations in Cladocera abundance

| Lakes     | Autumn | Winter | Summer | Monsoon | Range  | Mean $\pm$ SD | Percentage     |
|-----------|--------|--------|--------|---------|--------|---------------|----------------|
| Bamoni    | 81     | 112    | 99     | 84      | 81-112 | 94 $\pm$ 12   | 34.6 $\pm$ 4.9 |
| Basana    | 90     | 74     | 107    | 63      | 63-107 | 84 $\pm$ 17   | 34.7 $\pm$ 2.9 |
| Goranga   | 97     | 121    | 86     | 78      | 78-121 | 95 $\pm$ 16   | 36.7 $\pm$ 1.4 |
| Sitalmari | 61     | 89     | 105    | 85      | 61-105 | 85 $\pm$ 16   | 34.9 $\pm$ 3.8 |
| Solmari   | 71     | 100    | 98     | 79      | 79-100 | 87 $\pm$ 12   | 34.0 $\pm$ 1.9 |
| Daphlang  | 70     | 101    | 117    | 89      | 89-117 | 94 $\pm$ 17   | 33.5 $\pm$ 2.7 |

**Table 16.** Seasonal variations in Species diversity of Cladocera

| Lakes       | Autumn | Winter | Summer | Monsoon | Range       | Mean $\pm$ SD     |
|-------------|--------|--------|--------|---------|-------------|-------------------|
| Hakama      | 1.897  | 2.103  | 2.413  | 1.911   | 1.897-2.103 | 2.081 $\pm$ 0.208 |
| Horinchora  | 1.943  | 2.011  | 1.910  | 1.948   | 1.943-2.011 | 1.959 $\pm$ 0.040 |
| Ghorajan    | 2.178  | 2.498  | 2.670  | 1.967   | 1.967-2.670 | 2.328 $\pm$ 0.273 |
| Kamranga    | 2.085  | 2.379  | 2.612  | 1.949   | 1.949-2.612 | 2.256 $\pm$ 0.257 |
| Kakerikhola | 2.394  | 2.680  | 2.996  | 2.100   | 2.100-2.996 | 2.542 $\pm$ 0.332 |
| Chatla      | 2.779  | 2.899  | 3.001  | 2.023   | 2.023-3.001 | 2.675 $\pm$ 0.385 |
| Hiragota    | 2.010  | 2.742  | 2.945  | 2.002   | 2.002-2.945 | 2.425 $\pm$ 0.425 |
| Urmal       | 1.970  | 2.946  | 2.879  | 1.962   | 1.962-2.946 | 2.439 $\pm$ 0.474 |
| Padma       | 2.115  | 2.782  | 2.901  | 2.012   | 2.012-2.901 | 2.453 $\pm$ 0.393 |
| Bamoni      | 2.216  | 2.967  | 2.759  | 1.983   | 1.983-2.967 | 2.244 $\pm$ 0.252 |
| Basana      | 2.214  | 2.793  | 2.864  | 1.901   | 1.901-2.864 | 2.443 $\pm$ 0.402 |
| Goranga     | 2.231  | 2.997  | 3.001  | 2.101   | 2.101-3.001 | 2.582 $\pm$ 0.419 |
| Sitalmari   | 2.549  | 2.789  | 2.987  | 2.462   | 2.462-2.987 | 2.697 $\pm$ 0.206 |
| Solmari     | 2.517  | 3.121  | 2.969  | 2.120   | 2.120-3.121 | 2.682 $\pm$ 0.393 |
| Daphlang    | 1.989  | 2.870  | 2.716  | 1.907   | 1.907-2.870 | 2.370 $\pm$ 0.427 |

The species diversity of Cladocera (Table 16) recorded variations 1.897-3.121 and its mean seasonal values ranged between 1.959  $\pm$  0.040 (Horinchora) - 2.697  $\pm$  0.206 (Sitalmari) in different floodplain lakes. Further, the values of species diversity in individual beels ranged 1.879-2.770, 2.011-3.121, 1.910-3.001 and 1.901-3.462 during autumn, winter, summer and monsoon seasons respectively.

Cladocera indicated evenness (Table 17) ranging between 0.824-0.942 and mean seasonal values between 0.864  $\pm$  0.036 (Hiragota) - 0.970  $\pm$  0.022 (Chatla) in the different floodplain lakes sampled presently. The evenness, however, ranged between 0.824-0.932, 0.834-0.170, 0.880-0.971 and 0.824-0.942 in individual beels respectively.

**Table 17.** Seasonal variations in Evenness of Cladocera

| Lakes       | Autumn | Winter | Summer | Monsoon | Range       | Mean $\pm$ SD     |
|-------------|--------|--------|--------|---------|-------------|-------------------|
| Hakama      | 0.910  | 0.898  | 0.912  | 0.899   | 0.898-0.912 | 0.905 $\pm$ 0.006 |
| Horinchora  | 0.912  | 0.932  | 0.880  | 0.923   | 0.880-0.932 | 0.912 $\pm$ 0.020 |
| Ghorajan    | 0.899  | 0.901  | 0.933  | 0.897   | 0.897-0.933 | 0.907 $\pm$ 0.015 |
| Kamranga    | 0.904  | 0.911  | 0.902  | 0.936   | 0.902-0.911 | 0.913 $\pm$ 0.013 |
| Kakerikhola | 0.889  | 0.923  | 0.895  | 0.956   | 0.889-0.923 | 0.916 $\pm$ 0.027 |
| Chatla      | 0.934  | 0.991  | 0.971  | 0.986   | 0.934-0.991 | 0.970 $\pm$ 0.022 |
| Hiragota    | 0.899  | 0.834  | 0.901  | 0.824   | 0.824-0.901 | 0.864 $\pm$ 0.036 |
| Urmal       | 0.824  | 0.915  | 0.897  | 0.902   | 0.824-0.915 | 0.884 $\pm$ 0.036 |
| Padma       | 0.914  | 0.890  | 0.931  | 0.927   | 0.890-0.931 | 0.916 $\pm$ 0.016 |
| Bamoni      | 0.882  | 0.903  | 0.934  | 0.905   | 0.882-0.934 | 0.906 $\pm$ 0.018 |
| Basana      | 0.914  | 0.843  | 0.910  | 0.892   | 0.843-0.914 | 0.890 $\pm$ 0.028 |
| Goranga     | 0.912  | 0.901  | 0.898  | 0.931   | 0.898-0.931 | 0.910 $\pm$ 0.012 |
| Sitalmari   | 0.932  | 0.901  | 0.940  | 0.912   | 0.901-0.942 | 0.921 $\pm$ 0.016 |
| Solmari     | 0.920  | 0.923  | 0.901  | 0.926   | 0.901-0.926 | 0.917 $\pm$ 0.010 |
| Daphlang    | 0.898  | 0.890  | 0.908  | 0.907   | 0.898-0.908 | 0.901 $\pm$ 0.007 |

**Table 18.** Seasonal variations in Dominance of Cladocera

| Lakes       | Autumn | Winter | Summer | Monsoon | Range       | Mean $\pm$ SD     |
|-------------|--------|--------|--------|---------|-------------|-------------------|
| Hakama      | 0.118  | 0.127  | 0.098  | 0.134   | 0.098-0.134 | 0.119 $\pm$ 0.013 |
| Horinchora  | 0.101  | 0.139  | 0.152  | 0.098   | 0.098-0.152 | 0.122 $\pm$ 0.023 |
| Ghorajan    | 0.146  | 0.121  | 0.090  | 0.128   | 0.090-0.146 | 0.121 $\pm$ 0.020 |
| Kamranga    | 0.112  | 0.109  | 0.152  | 0.099   | 0.099-0.152 | 0.118 $\pm$ 0.020 |
| Kakerikhola | 0.144  | 0.118  | 0.164  | 0.101   | 0.101-0.164 | 0.132 $\pm$ 0.024 |
| Chatla      | 0.102  | 0.097  | 0.110  | 0.098   | 0.097-0.110 | 0.096 $\pm$ 0.009 |
| Hiragota    | 0.137  | 0.167  | 0.123  | 0.099   | 0.099-0.167 | 0.131 $\pm$ 0.026 |
| Urmal       | 0.198  | 0.101  | 0.142  | 0.113   | 0.101-0.198 | 0.138 $\pm$ 0.037 |
| Padma       | 0.101  | 0.143  | 0.121  | 0.093   | 0.093-0.143 | 0.114 $\pm$ 0.019 |
| Bamoni      | 0.178  | 0.164  | 0.106  | 0.097   | 0.097-0.178 | 0.136 $\pm$ 0.035 |
| Basana      | 0.134  | 0.170  | 0.102  | 0.142   | 0.102-0.170 | 0.137 $\pm$ 0.024 |
| Goranga     | 0.130  | 0.118  | 0.156  | 0.100   | 0.100-0.156 | 0.126 $\pm$ 0.020 |
| Sitalmari   | 0.099  | 0.115  | 0.101  | 0.128   | 0.099-0.128 | 0.111 $\pm$ 0.012 |
| Solmari     | 0.109  | 0.130  | 0.162  | 0.101   | 0.101-0.162 | 0.125 $\pm$ 0.023 |
| Daphlang    | 0.142  | 0.155  | 0.123  | 0.110   | 0.110-0.155 | 0.132 $\pm$ 0.017 |

The dominance of Cladocera (Table 18) varied between 0.090-0.198 and mean seasonal dominance ranged between  $0.096 \pm 0.009$  -  $0.138 \pm 0.037$  in the different beels. It, however, fluctuated between 0.099-0.198, 0.097-0.170, 0.090-0.104 and 0.093-9.142 during autumn, winter, summer and winter respectively in individual floodplain lakes.

## 2. Rotifer diversity in selected floodplain lakes

In addition to the above mentioned observations on zooplankton communities and their dominant qualitative and quantitative components, investigations are undertaken, during 2002-03 exclusively on the rotifer communities of fifteen floodplain lakes of lower Assam. The results of the latter investigations are published earlier by Sharma (2005) and their salient features are indicated in this account.

One hundred sixty-four species of Rotifera, belonging to 39 genera and 20 families are identified and the details of their species composition are indicated in Table 19. The richness in individual beels varied between 67-103 ( $79 \pm 11$ ) species. Peak rotifer richness is observed in Dhir beel and is followed by occurrence of 97 and 95 species in Deepor and Dighali respectively. On the other hand, lowest diversity is noticed in Sagmara while the number ranged between 71-89 in rest of the sampled beels.

The rotifer communities included 161 species of Ploimida and only three species of Bdelloidea. Lecanidae are represented by 45 species while Brachionidae, Colurellidae and Trichocercidae recorded 25, 22 and 13 species respectively. Among the reported genera, *Lecane* is the most important genus. *Lepadella*, *Brachionus* and *Trichocerca* included 16, 13 and 13 species respectively. The stated feature are also observed in the rotifer faunas of individual lakes.

**Table 19.** Rotifera in Floodplain lakes of Lower Assam (after Sharma, 2005)

| Floodplain lakes                            | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 |
|---|---|---|---|---|---|---|---|---|---|----|----|----|----|----|----|
| Family BRACHIONIDAE                         |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |
| <i>Anuraeopsis fissa</i> Gosse              | + | - | + | + | + | + | + | + | + | -  | +  | +  | -  | +  | +  |
| <i>A. navicula</i> Rousselet                |   |   |   |   | + |   |   | + | - | +  | +  | -  | +  | -  | +  |
| <i>Brachionus angularis</i> Gosse           | + | + | + | + | + | + | + | + | + | +  | +  | +  | +  | +  | +  |
| <i>B. bidentatus</i> Anderson               | + | + | + | + | + | + | + | + | + | +  | -  | +  | +  | +  | -  |
| <i>B. budapestinensis</i> Daday             | + | + |   | - |   |   |   |   | - | -  |    | -  | -  | -  | +  |
| <i>B. calyciflorus</i> Pallas               | + | + | + | + |   | + | + | + | + | +  | +  | +  | -  | -  | +  |
| <i>B. caudatus</i> Barrois & Daday          | + |   |   | + | + |   |   | + |   | -  | +  | +  | +  | -  | -  |
| <i>B. dichotomus reductus</i> Koste & Shiel | + |   |   | - |   | - |   |   | - | +  | -  |    | -  | +  | -  |
| <i>B. diversicornis</i> (Daday)             |   | + | + | + | + | + | + | + | + | +  | +  |    | +  | +  | +  |
| <i>B. donneri</i> Brehm                     |   | + |   |   |   |   |   | - | + | -  |    | -  | +  | -  | -  |







Table 19. Contd.

| Floodplain lakes                                    | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 |
|---|---|---|---|---|---|---|---|---|---|----|----|----|----|----|----|
| <i>Lecane (M.) closterocerca</i><br>(Schmarda)      | + | + | + | + | + | + | + | + | + | +  | +  | +  | +  | +  | +  |
| <i>L. (M.) decipiens</i> (Murray)                   | + |   |   |   |   | - | + | - | - | +  | -  | -  | -  | -  | -  |
| <i>L. (M.) hamata</i> (Stokes)                      | - | + | + | + | + | + | - | + | + | +  | +  | +  | +  | +  | +  |
| <i>L. (M.) lunaris</i> (Ehrenberg)                  | + | + | + | + | + | + | + | + | + | +  | +  | +  | +  | +  | +  |
| <i>L. (M.) monostyla</i> (Daday)                    |   | + |   | - |   |   |   | - | - |    | -  | +  | -  | -  | -  |
| <i>L. (M.) pyriformis</i> (Daday)                   | + | + | + | + | + | + | + | + | + | +  | +  | -  | +  | +  | +  |
| <i>L. (M.) quadridentata</i> (Ehrenberg)            | + | + | + | + | + | + | + | + | + | +  | +  | +  | +  | +  | +  |
| <i>L. (M.) rugosa</i> (Harring)                     | - | - | - | - |   | - | - | + | - | -  | -  | -  |    | -  | -  |
| <i>L. (M.) scutata</i> (Harring & Myers)            | + |   | + | - | - | - | + | + | + | -  | -  | +  | -  | -  | -  |
| <i>L. (M.) solfatara</i> (Hauer)                    | - |   | - | - |   | - | - | - | - | +  | -  | -  | -  | -  | -  |
| <i>L. (M.) stenroosi</i> (Meissner)                 | - |   | + | - | - | - | - | - | - | -  | -  | -  | +  | +  | +  |
| <i>L. (M.) thienemanni</i> (Hauer)                  | - |   | + | + |   | + | + | + | + | +  | +  | +  | -  | -  | -  |
| <i>L. (M.) unguitata</i> (Fadeev)                   | + | + | + | + | + | + | + | + | + | +  | +  | +  | +  | +  | +  |
| Family NOTOMMATIDAE                                 |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |
| <i>Cephalodella forficula</i> (Ehrenberg)           | + | - | + | + | + | + | + | + | + | +  | +  | -  | -  | +  | +  |
| <i>C. gibba</i> (Ehrenberg)                         | - | + | + | + | + | - | + | + | + | +  | +  | +  | -  | -  | -  |
| <i>C. mucronata</i> Myers                           | - |   |   |   |   | - | - | - | - | -  | -  | -  | +  | +  | -  |
| <i>Monommata longiseta</i> (Müller)                 | + | - | + | + |   | + | + | + | + | +  | -  | +  | +  | -  | +  |
| <i>M. maculata</i> (Harring & Myers)                | - |   |   | + |   |   | - | - | - | -  | -  | -  |    | -  | -  |
| <i>Notommata pachyura</i> (Gosse)                   | - | - | - |   | + |   |   | - | - | -  | -  | -  | -  | -  | -  |
| <i>N. spinata</i> Koste & Shiel                     | + | - |   | - |   |   | - | - | - | -  | -  | -  |    | -  | -  |
| <i>Scaridium longicaudum</i> (Müller)               | + | + | - | + | + | + | + | + | + | +  | +  | +  | -  | +  | -  |
| <i>Taphrocampa selenura</i> (Gosse)                 |   |   | - | - |   |   | - | - | - | +  | -  | -  | -  | -  | -  |
| Family GASTROPODIDAE                                |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |
| <i>Ascomorpha saltans</i> Bartsch                   | + |   | - | - |   | - |   | - |   | -  | -  | -  | +  | -  | -  |
| <i>A. ovalis</i> (Bergendal)                        |   |   | + | + |   | - |   | - | + | -  | -  | -  | +  | +  | -  |
| Family TRICHOCERCIDAE                               |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |
| <i>Trichocerca bicristata</i> (Gosse)               |   | + |   | - | - |   | - | - | - | -  | -  | -  | +  | -  | +  |
| <i>Trichocerca capucina</i><br>(Wierzejski & Zach.) | + | - | + | + | + | + | + | + | + | +  | +  | +  | +  | -  | -  |
| <i>T. cylindrica</i> (Imhof)                        | + | + | + | + | + | + | - | + | + | +  | -  | +  | -  | -  | +  |
| <i>T. elongata</i> (Gosse)                          | + |   | + | + | + | - | + | + | + | +  | +  | -  | +  | +  | -  |

Table 19. Contd.

| Floodplain lakes                                | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 |
|---|---|---|---|---|---|---|---|---|---|----|----|----|----|----|----|
| <i>Trichocerca flagellata</i> Hauer             | - | - |   | + |   |   |   |   |   |    |    |    |    |    | +  |
| <i>T. jenningsi</i> Voigt                       |   | - | + |   |   |   |   |   |   |    |    | +  |    |    |    |
| <i>T. iernis</i> (Gosse)                        | - |   |   |   |   |   | + |   |   |    |    |    |    |    | -  |
| <i>T. longiseta</i> (Schrank)                   | + | + | + | + | + | + |   |   | + |    |    |    |    |    |    |
| <i>T. porcellus</i> (Gosse)                     | + | + | + |   |   | + | + | + | + | +  | +  |    | +  |    | +  |
| <i>T. rattus</i> (Müller)                       | + | - | - | - | - |   |   |   |   |    |    |    | +  | +  |    |
| <i>T. similis</i> (Wierzejski)                  | + | + | + | - | + | + | + | + | + | +  | +  | +  |    | +  | +  |
| <i>T. tropis</i> (Hauer)                        | - | - | - |   |   |   |   |   |   |    |    |    | +  |    |    |
| <i>T. weberi</i> (Jennings)                     | - | + |   | - |   |   | - |   | - |    |    |    |    | +  | +  |
| Family ASPLANCHNIDAE                            |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |
| <i>Asplanchna brightwelli</i> Gosse             | - | - | + | - | - | - | - |   | - | -  |    | -  | +  | +  |    |
| <i>A. priodonta</i> Gosse                       | + | + | + | + | + | + | + | + | + | +  | +  | +  | -  |    | +  |
| Family SYNCHAETIDAE                             |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |
| <i>Synchaeta oblonga</i> Ehrenberg              | - | - |   |   |   |   |   | - | - | -  |    | +  |    |    |    |
| <i>Pleosoma lenticulare</i> Herrick             | - | - | + |   |   |   |   |   | + |    | -  |    |    |    | +  |
| <i>Polyarthra vulgaris</i> Carlin               | + | + | + | + | + | + | + | + | + | +  | +  | +  | +  | +  | +  |
| Family DICRANOPHORIDAE                          |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |
| <i>Dicranophoroides caudatus</i><br>(Ehrenberg) | + |   |   | - |   |   |   |   | - |    |    | -  | +  | +  |    |
| <i>Dicranophorus forcipatus</i> (Müller)        | - |   | + | + | + | + | + | + | + | +  | +  | +  |    |    |    |
| Family FLOSCULARIDAE                            |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |
| <i>Sinantherina spinosa</i> (Thorpe)            | + |   | + |   | + | + | + | + | + | +  |    | +  |    |    | +  |
| <i>S. socialis</i> (Linné)                      |   | + | + | + | + | + | + | + | + | -  | +  |    | +  | +  |    |
| Family CONOCHILIDAE                             |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |
| <i>Conochilus unicornis</i> Rousselet           | + | - | + | + |   | + | + | + | + | +  |    | +  |    |    | +  |
| Family HEXARTHRIIDAE                            |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |
| <i>Hexarthra intermedia</i> Wiszniewski         | - | - | - | + | - | - | - |   | - |    |    |    |    |    | +  |
| <i>H. mira</i> (Hudson)                         | + | - | + |   | + | + | + | + | + |    |    |    |    | +  | +  |
| Family FILINIIDAE                               |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |
| <i>Filinia brachiata</i> (Rousselet)            | - |   | + | - |   | - | - | - |   |    | -  | -  |    |    |    |
| <i>F. camasecla</i> Myers                       | + | + | + | + |   |   | + | + | + | +  |    | +  |    |    |    |
| <i>F. longiseta</i> (Ehrenberg)                 | + | + | + | + | + | + | + | + | + | +  | +  | +  | +  | +  | +  |
| <i>Filinia terminalis</i> (Plate)               | - | - | + |   |   | + |   | + | + |    |    |    |    |    | +  |

Table 19. Contd.

| Floodplain lakes                     | 1         | 2         | 3          | 4         | 5         | 6         | 7         | 8         | 9         | 10        | 11        | 12        | 13        | 14        | 15        |
|--------------------------------------|-----------|-----------|------------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|
| <i>F. opoliensis</i> (Zacharias)     | +         |           | +          | +         | +         | +         | +         | +         | +         | +         | +         | -         | -         | +         | +         |
| <i>F. pejeri</i> Hutchinson          | +         | +         |            | +         | +         |           | +         | +         | -         | +         | -         | +         | +         | +         | -         |
| <i>F. saltator</i> (Gosse)           |           | +         |            |           | -         | -         | -         | -         | -         | -         | -         | -         | +         | -         | +         |
| Family TESTUDINELLIDAE               |           |           |            |           |           |           |           |           |           |           |           |           |           |           |           |
| <i>Testudinella brevicaudata</i>     |           |           |            |           |           |           |           |           |           |           |           |           |           |           |           |
| Yamamoto                             | -         |           |            | +         | -         | -         |           | +         | -         | -         | -         | -         | -         | -         | -         |
| <i>Testudinella emarginula</i>       |           |           |            |           |           |           |           |           |           |           |           |           |           |           |           |
| (Stenroos)                           | +         | +         | +          |           |           |           |           | -         | -         | +         | -         | -         | -         | +         | +         |
| <i>T. greeni</i> Koste               | +         | -         | +          | +         | +         | -         | +         | +         | +         | -         | +         | +         | -         | -         | +         |
| <i>T. parva</i> (Ternetz)            |           | +         | -          |           |           |           |           |           |           | -         | -         | -         | +         | -         | -         |
| <i>T. patina</i> (Hermann)           | +         | +         | +          | +         | +         | +         | +         | +         | +         | +         | +         | +         | +         | +         | +         |
| <i>T. tridentata</i> Smirnov         | -         | -         | +          | -         |           | -         | -         | -         | -         | -         | +         | -         | -         | +         | -         |
| <i>Pompholyx sulcata</i> Hudson      | -         | -         | +          | -         |           | -         | -         | -         | +         | +         | -         | -         | -         | -         | +         |
| Family TROCHOSPHAERIDAE              |           |           |            |           |           |           |           |           |           |           |           |           |           |           |           |
| <i>Horaella brehmi</i> Donner        |           |           |            |           |           |           |           |           |           |           |           |           |           |           |           |
| Semper                               | +         |           | +          | -         | -         | -         | +         | +         | +         | +         | -         | -         | -         | -         | -         |
| Family PHILODINIDAE                  |           |           |            |           |           |           |           |           |           |           |           |           |           |           |           |
| <i>Philodina citrina</i> (Ehrenberg) |           |           |            |           |           |           |           |           |           |           |           |           |           |           |           |
| Semper                               |           | -         | +          | +         | -         |           |           | +         | -         | -         | -         | +         | -         | -         | +         |
| <i>Rotaria neptunia</i> (Ehrenberg)  | +         |           | +          | -         | +         | +         | -         | +         | +         | +         | +         | +         | -         | +         | -         |
| <i>R. rotatoria</i> (Pallas)         | -         | +         |            |           |           |           |           | -         | -         | -         | -         | -         | +         | -         | +         |
| <b>Total No. of Species</b>          | <b>89</b> | <b>81</b> | <b>103</b> | <b>73</b> | <b>67</b> | <b>72</b> | <b>75</b> | <b>97</b> | <b>95</b> | <b>77</b> | <b>67</b> | <b>71</b> | <b>71</b> | <b>74</b> | <b>75</b> |

1. Bhoispuri ; 2. Barundanga; 3. Dhir; 4. Fingua; 5. Sagmara; 6. Kamakhya; 7. Rowmari; 8. Deepar; 9. Dighali; 10. Borbila; 11. Siligurijan; 12. Mori; 13. Kujibalipatty; 14. Thekera; 15. Bandha; - = absent; + = present.

The rotifer richness (Table 20) in different floodplain lakes ranged between 34-59, 35-68, 42-68 and 30-55 during autumn, winter, summer and monsoon seasons respectively. The number of species in the four seasons ranged between 32-68 species in individual beels. Mean seasonal richness varied between  $38 \pm 6$  -  $61 \pm 6$  species; peak and lowest richness was observed in Thekera and Dhir respectively while Deepor ( $60 \pm 9$  species) also exhibited higher mean value.

The rotifer communities of different beels registered 54.4 - 86.5 % similarity (Table 21). The peak similarity is observed between Deepor and Dighali while lowest similarity is recorded between the rotifer faunas of Rowmari and Kujibalipatty.

The population density of Rotifera (Table 22) ranged between 68-329 n/l and mean seasonal abundance varied between  $87 \pm 20$  -  $256 \pm 44$  n/l; lowest and peak values are recorded Kujibalipatty and Kamakhya respectively. The rotifers comprised between  $41.4 \pm 3.2$  -  $65.9 \pm 5.4$  % of quantitative abundance of zooplankton; maximum and minimum percentage contributions are noticed in Thekera and Sagmara respectively. The rotifer density in individual beels varied between 81-272, 68-235, 69-252 and 85-318 n/l in autumn, winter, summer and monsoon seasons respectively.

**Table 20.** Seasonal variations in Rotifer species richness (after Sharma, 2005)

| Lakes         | Autumn | Winter | Summer | Monsoon | Range | Mean $\pm$ SD | Total Richness |
|---------------|--------|--------|--------|---------|-------|---------------|----------------|
| Bhoispuri     | 48     | 60     | 63     | 55      | 48-55 | $56 \pm 6$    | 89             |
| Barundanga    | 42     | 58     | 61     | 46      | 42-61 | $51 \pm 8$    | 81             |
| Dhir          | 58     | 65     | 68     | 52      | 53-68 | $61 \pm 6$    | 103            |
| Fingua        | 38     | 45     | 57     | 44      | 38-57 | $46 \pm 6$    | 73             |
| Sagmara       | 38     | 42     | 48     | 50      | 38-50 | $44 \pm 5$    | 67             |
| Kamakhya      | 45     | 56     | 45     | 41      | 41-56 | $47 \pm 6$    | 72             |
| Rowmari       | 42     | 45     | 48     | 54      | 41-54 | $47 \pm 4$    | 75             |
| Deepor        | 59     | 68     | 67     | 45      | 45-68 | $60 \pm 9$    | 97             |
| Dighali       | 46     | 59     | 65     | 42      | 42-65 | $53 \pm 9$    | 95             |
| Borbila       | 40     | 46     | 54     | 49      | 40-54 | $47 \pm 6$    | 77             |
| Siligurijan   | 34     | 52     | 45     | 42      | 34-52 | $43 \pm 6$    | 67             |
| Mori          | 40     | 48     | 44     | 38      | 38-51 | $42 \pm 6$    | 71             |
| Kujibalipatty | 49     | 54     | 42     | 30      | 30-54 | $44 \pm 9$    | 71             |
| Thekera       | 34     | 35     | 48     | 32      | 32-48 | $38 \pm 6$    | 74             |
| Bandha        | 37     | 39     | 50     | 35      | 35-50 | $40 \pm 6$    | 75             |

**Table 21.** Percentage similarities between Rotifer communities (Sorensen's index) (after Sharma, 2005)

| Floodplain lakes | 1 | 2    | 3    | 4    | 5    | 6    | 7    | 8    | 9    | 10   | 11   | 12   | 13   | 14   | 15   |      |
|------------------|---|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| Bhoispuri        | - | 60.0 | 62.5 | 71.7 | 70.5 | 70.8 | 69.5 | 74.2 | 77.2 | 73.5 | 64.1 | 68.7 | 65.0 | 65.0 | 65.8 |      |
| Barundanga       |   | -    | 56.5 | 62.3 | 66.2 | 67.8 | 64.1 | 62.9 | 64.8 | 67.1 | 60.8 | 65.8 | 64.5 | 58.1 | 61.5 |      |
| Dhir             |   |      | -    | 65.9 | 68.2 | 70.9 | 71.9 | 83.0 | 63.6 | 71.1 | 67.0 | 66.7 | 57.5 | 62.1 | 69.7 |      |
| Fingua           |   |      |      | -    | 75.7 | 78.6 | 74.3 | 77.6 | 73.8 | 73.3 | 74.3 | 75.0 | 59.7 | 61.2 | 69.7 |      |
| Sagmara          |   |      |      |      |      | 80.6 | 76.1 | 76.8 | 74.1 | 80.6 | 79.1 | 72.5 | 57.9 | 65.2 | 61.9 |      |
| Kamakhya         |   |      |      |      |      |      | -    | 80.2 | 60.4 | 82.6 | 80.5 | 77.7 | 75.5 | 60.1 | 67.1 | 72.1 |
| Rowmari          |   |      |      |      |      |      |      | -    | 81.4 | 76.5 | 81.6 | 77.5 | 74.9 | 53.4 | 60.4 | 64.0 |

**Table 21. Contd.**

| Floodplain lakes | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9    | 10   | 11   | 12   | 13   | 14   | 15   |
|------------------|---|---|---|---|---|---|---|---|------|------|------|------|------|------|------|
| Deepor           |   |   |   |   |   |   |   |   | 86.5 | 77.0 | 74.4 | 75.0 | 57.1 | 65.5 | 69.8 |
| Dighali          |   |   |   |   |   |   |   |   |      | 76.7 | 71.6 | 69.9 | 71.1 | 66.3 | 74.1 |
| Borbila          |   |   |   |   |   |   |   |   |      | -    | 73.6 | 74.3 | 59.4 | 63.6 | 61.8 |
| Siligurijan      |   |   |   |   |   |   |   |   |      |      |      | 71.0 | 58.0 | 61.0 | 59.1 |
| Mori             |   |   |   |   |   |   |   |   |      |      |      | -    | 53.5 | 55.2 | 63.2 |
| Kujibalipatty    |   |   |   |   |   |   |   |   |      |      |      |      |      | 67.6 | 61.4 |
| Thekera          |   |   |   |   |   |   |   |   |      |      |      |      |      |      | 60.4 |
| Bandha           |   |   |   |   |   |   |   |   |      |      |      |      |      |      | -    |

1. Bhoispuri ; 2. Barundanga; 3. Dhir; 4. Fingua; 5. Sagmara; 6. Kamakhya; 7. Rowmari; 8. Deepor; 9. Dighali; 10. Borbila; 11. Siligurijan; 12. Mori; 13. Kujibalipatty; 14. Thekera; 15. Bandha

The species diversity of Rotifera (Table 23) varied between 1.817-3.001 in different floodplain lakes and its mean values ranged between  $2.036 \pm 0.049$  (Borbila)  $2.642 \pm 0.368$  (Deepor). The dominance mean values ranged between 0.109-0.216 while mean evenness varied between 0.840-0.925 in the sampled beels.

**Table 22. Seasonal variations in Rotifer abundance (n/l) and Percentage composition (after Sharma, 2005)**

| Lakes         | Autumn | Winter | Summer | Monsoon | Mean $\pm$ SD | Percentage      |
|---------------|--------|--------|--------|---------|---------------|-----------------|
| Bhoispuri     | 94     | 132    | 74     | 109     | $102 \pm 21$  | $49.0 \pm 7.6$  |
| Barundanga    | 115    | 99     | 81     | 102     | $99 \pm 12$   | $51.8 \pm 6.8$  |
| Dhir          | 187    | 129    | 158    | 122     | $149 \pm 26$  | $55.9 \pm 12.7$ |
| Fingua        | 161    | 195    | 182    | 250     | $197 \pm 33$  | $64.1 \pm 4.5$  |
| Sagmara       | 191    | 210    | 242    | 318     | $240 \pm 48$  | $65.9 \pm 5.4$  |
| Kamakhya      | 210    | 235    | 252    | 329     | $256 \pm 44$  | $63.7 \pm 4.4$  |
| Rowmari       | 272    | 182    | 153    | 210     | $192 \pm 29$  | $57.3 \pm 6.6$  |
| Deepor        | 210    | 239    | 175    | 224     | $212 \pm 24$  | $52.1 \pm 5.9$  |
| Dighali       | 131    | 145    | 120    | 192     | $147 \pm 27$  | $47.1 \pm 6.5$  |
| Borbila       | 142    | 163    | 105    | 138     | $137 \pm 21$  | $49.4 \pm 4.0$  |
| Siligurijan   | 109    | 87     | 158    | 172     | $132 \pm 35$  | $55.9 \pm 9.9$  |
| Mori          | 89     | 123    | 79     | 108     | $100 \pm 17$  | $41.9 \pm 4.5$  |
| Kujibalipatty | 121    | 73     | 69     | 85      | $87 \pm 20$   | $42.4 \pm 7.0$  |
| Thekera       | 81     | 68     | 137    | 110     | $99 \pm 27$   | $41.4 \pm 3.2$  |
| Bandha        | 108    | 122    | 198    | 135     | $141 \pm 34$  | $48.3 \pm 8.7$  |

**Table 23.** Seasonal variations in Rotifer Species diversity (after Sharma, 2005)

| Lakes         | Autumn | Winter | Summer | Monsoon | Mean          | Mean $\pm$ SD     |
|---------------|--------|--------|--------|---------|---------------|-------------------|
| Bhoispuri     | 1.910  | 2.238  | 1.817  | 2.249   | 1.817 - 2.249 | 2.053 $\pm$ 0.193 |
| Barundanga    | 2.506  | 3.001  | 1.992  | 2.102   | 1.992 - 3.001 | 2.250 $\pm$ 0.254 |
| Dhir          | 2.622  | 2.314  | 2.280  | 2.018   | 2.018 - 2.622 | 2.309 $\pm$ 0.214 |
| Fingua        | 2.110  | 1.994  | 1.987  | 2.547   | 1.987 - 2.547 | 2.159 $\pm$ 0.229 |
| Sagmara       | 2.585  | 2.008  | 2.672  | 2.876   | 2.008 - 2.876 | 2.535 $\pm$ 0.322 |
| Kamakhya      | 2.851  | 2.972  | 2.030  | 2.087   | 2.030 - 2.932 | 2.485 $\pm$ 0.429 |
| Rowmari       | 2.194  | 2.647  | 2.857  | 1.914   | 1.914 - 2.857 | 2.403 $\pm$ 0.370 |
| Deepor        | 2.885  | 2.989  | 2.653  | 2.040   | 2.040 - 2.989 | 2.642 $\pm$ 0.368 |
| Dighali       | 2.242  | 2.018  | 2.110  | 2.145   | 2.018 - 2.242 | 2.151 $\pm$ 0.054 |
| Borbila       | 1.982  | 2.110  | 1.998  | 2.015   | 1.982 - 2.015 | 2.036 $\pm$ 0.049 |
| Siligurijan   | 2.128  | 2.543  | 2.672  | 2.782   | 2.128 - 2.782 | 2.531 $\pm$ 0.495 |
| Mori          | 2.082  | 2.432  | 1.987  | 2.102   | 1.987 - 2.432 | 2.152 $\pm$ 0.168 |
| Kujibalipatty | 1.987  | 2.114  | 2.257  | 1.990   | 1.987 - 2.257 | 2.087 $\pm$ 0.110 |
| Thekera       | 2.010  | 1.989  | 2.153  | 2.432   | 1.989 - 2.432 | 2.146 $\pm$ 0.177 |
| Bandha        | 2.414  | 2.567  | 1.981  | 2.015   | 1.981 - 2.567 | 2.244 $\pm$ 0.252 |

## DISCUSSION

### A. Biodiversity of Zooplankton

#### Zooplankton

Plankton samples collected from the floodplain lakes of Assam reveal 273 species of Zooplankton belonging to 95 genera and 37 families and, hence, represent their highest biodiversity known so far from the floodplain environs of the Indian subcontinent. The rich species, generic and family diversity of zooplankton, in turn, indicates greater environmental heterogeneity as well as micro-habitat diversity of the sampled beels.

The documented richness significantly outnumbers the earlier reports of 76 species (Khan, 2002) and 89 species (Khan, 2003) from these ecosystems of Southeastern West Bengal and registers nearly three-fold increase than an unpublished report of 93 species (Sarma, 2000), including various doubtful reports, from the beels of Assam. The striking differences within the stated works are apparently due to lack of exhaustive sampling or incomplete determination of various species rather than the general paucity of zooplankton richness in the floodplain lakes (Sharma, 2005).

Rotifera > Cladocera > Rhizopoda > Copepoda > Gastrotricha contribute to Zooplankton richness in the present observations. The distinct qualitative dominance of Rotifera, however, concurs with the earlier remarks of Sharma (1991a, 1998a, 2005) and Sharma and Sharma (2005a). The zooplankton communities of the sampled beels of Assam are characterized by occurrence of cosmopolitan > cosmotropical and pantropical species and depict broadly a 'tropical character' following the generalizations of Fernando (1980, 2002), and Dussart *et al.* (1984). The stated conclusions are primarily based on the general nature and composition of the examined zooplankton diversity while more specific remarks are made, hereunder, on composition of the constituent groups and on Rotifera and Cladocera in particular.

### Rotifera

One hundred and seventy-six species (185 taxa) of Rotifera documented in the present study indicate the highest diversity of this Phylum known till date from the floodplain lakes of the Indian subcontinent. The examined species incidentally represent the richest biodiversity of the group recorded so far from any particular state and aquatic ecosystem of India and, in turn, comprise about 48.0% of the Indian Rotifera and 88.0% of the species of the group known from Northeastern India. Interestingly, the rotifer communities exhibit the highest generic (40 genera) diversity reported till date from the floodplain lakes or any state of this country; this feature assumes special significance in view of 43 genera of Rotifera so far reported from N. E. India and 64 genera represented in the Indian inland waters (Sharma and Sharma, 2005a). These salient aspects are further endorsed by occurrence of 21 families of Eurotatoria as against the reports of 22 and 26 families from N. E. region and India respectively. The present results, hence, reflect the richest species and higher diversity (genera and families) of Rotifera in the floodplain lakes of Assam. Further, all the documented taxa (176 species, 40 genera and 21 families) are noticed in extensive collections examined from the Brahmaputra river basin while relatively limited samples from the Barrak river basin indicate 90 species belonging to 31 genera and 18 families.

Highly rich and diversified composition of the rotifer taxocoenosis certainly reflects greater ecosystem heterogeneity, and, consequently, higher microhabitat diversity of the sampled floodplain lakes. This important generalization endorses the findings of Jose de Paggi (1993), Bonecker *et al.* (1998) and Shiel *et al.* (1998) on the composition of the rotifer communities from the floodplains of Argentina, South America and Australia. In addition, the present results affirm the hypothesis of Segers *et al.* (1993) indicating tropical and subtropical floodplains to be the world's richest habitats for the rotifers. The qualitative predominance of Rotifera in all the floodplain lakes concurs with the studies of Sharma and Sharma (2001) and Sharma (2005).

The overall rotifer richness (176 species) observed presently is reasonably comparable with the report of 207 species (Segers *et al.* 1993) from the floodplain lakes of Africa but it is still lower than 218 and 252 species recorded, respectively from South America (Bonecker

*et al.* 1998) and Australia (Shiel *et al.* 1998). Interestingly, Deepor beel, a Ramsar site of India, exhibits the highest Rotifera richness (110 species) known till date from any individual aquatic ecosystem of the Indian subcontinent in general and the floodplain lake in particular (Sharma and Sharma, 2005b). The richness in this biodiversity 'hot-spot' is comparable with 111 species (Jose de Paggi, 1993) and 114 species (Jose de Paggi, 2001) examined from certain floodplains of Argentina. Besides, the rotifer richness from Deepor reasonably compares with the report of 124 species from Oguta lake in the Niger delta (Segers *et al.* 1993). On the other hand, the diversity in the stated beel is yet marginally lower than the reports of 136 species from Iyi-Efi lake in the Niger delta (Segers *et al.* loc cit ) and 130 species from Lake Guarana, Brazil (Bonecker *et al.* 1994).

A comparison with the Indian works indicates that total rotifer richness observed during this study is greater than earlier records of 116 species (Sharma and Sharma, 2001) and 164 species (Sharma, 2005) from the floodplains of the Brahmaputra river basin. The present report, however, indicates a distinct contrast to the record of 64 species (Sharma, 2000b) as well as unpublished reports of 29 species (Goswami, 1997) and 48 species (Sarma, 2000) from the beels of Assam. In addition, the richness is significantly higher than 37 species (Khan, 2002) and 43 species (Khan, 2003) examined from the floodplain lakes and other wetlands of Southeastern West Bengal. The rotifer richness from the floodplains of the Brahmaputra river basin is, however, notably higher than the report of 110 species (Arora and Mehra, 2003) from the backwaters of the river Yamuna at Delhi.

The Rotifera examined from the floodplain lakes of Assam are characterized by several new records. These include three new reports from the Indian subcontinent (Sharma, 2004) namely *Brachionus kostei*, *Macrochaetus danneeli* and *Lecane superaculeata*. Sharma (2005) added nine new records to the Indian Rotifera, i.e., *Dipleuchlanis ornata*, *Macrochaetus longipes*, *Colurella sanoamuangae*, *Lepadella heterodactyla*, *Lecane glypta*, *L. rugosa*, *L. solfatara*, *Monommata maculata* and *Notommata spinata*. Sharma and Sharma (2001) listed three new records from India namely *Lepadella lindau*, *L. minoruoides* and *Filinia camasecla* while *Keratella edmondsoni*, *Lecane blachei*, *Sinanotherina spinosa* and *Filinia saltator* comprised new records from N. E. region. In addition, Sharma (2006) recently added three new records from northeastern India. In all fifteen species of Rotifera are added as new records from India, seven new records from Northeastern region and more than 100 new records from Assam by the authors in the mentioned publications. Further, a notable number of species, reported from India, are identified only from Assam and appear to be restricted to the floodplains of this region.

The present study shows twenty biogeographically interesting elements which comprise a notable fraction (11.4%) of the documented richness. These taxa belong to the following categories :

1. Australasian elements : *Brachionus dichotomus reductus*, *Macrochaetus danneeli* and *Lecane batillifer*;

2. Oriental species : *Keratella edmondsoni*, *Colurella sanoamuangae*, *Lecane acanthinula*, *L. blachei*, *L. superaculeata* and *L. solfatara*;
3. Palaeotropical species : *Keratella javana*, *Dipleuchlanis ornata*, *Lecane braumi*, *L. lateralis*, *L. unguitata*, *Lepadella discoidea*, *L. minoruoides*, *Trichocerca cylindrica*, *Testudinella greeni* and *T. brevicaudata*;
4. Arctic-Temperate : *Lecane scutata*.

The occurrence of the Australasian elements in the floodplains lakes of Assam represents an interesting link between the rotifer fauna of the North-Eastern India with that of Southeast Asia and Australia. This generalization affirms the remarks by Shiel and Koste (1986), Shiel and Williams (1990), Shiel and Green (1996), Sanoamuang (1998b), Segers (2001), Sharma (2005) and Sharma and Sharma (2005a). Besides, such a salient feature imparts a unique character to the examined rotifer communities that makes them distinctive from other regions or states of India.

Among the Australasian taxa, *Lecane batillifer* is known in India only from Tripura (Sharma and Sharma 1997) and is now reported (Sharma, 2004, 2005) from certain floodplain lakes of Assam. *Brachionus dichotomus reductus*, an interesting brachionid, is examined from Meghalaya (Sharma and Sharma 1999a), Tripura (Sharma and Sharma 2000) and its distributional is further extended to Assam (Sharma, 2005). Both these taxa are, hence, exclusively restricted to N. E. India. Segers (2001) commented on occurrence of *reductus* vicariant of *B. dichotomus* outside Australia, hypothesized recent expansion of these populations to Southeast Asia and hinted at a possible Australian origin of this taxon. The disjunct distribution and restricted occurrence of populations of *reductus* vicariant in N. E. region lends support to Segers's hypothesis. *Macrochaetus danneeli*, third member of the Australasian category, is reported from Australia and Thailand. Segers and Sarma (1993) mentioned its occurrence in South India (based on an unpublished report) while its recent report from the floodplains of Assam (Sharma, 2005) indicates the second confirmed report of this species from Asia. Further, all the stated three rotifers are classified (*vide* Segers, 2001) as Northern Australian taxa and representatives of tropical faunal elements.

The occurrence of six Oriental endemics is another salient feature of the faunal diversity of Rotifera of the sampled floodplain lakes. Of these, *Colurella sanoamuangae* and *Lecane superaculeata* have originally been described from Thailand by Chittapun *et al.* (1999), and Sanoamuang and Segers (1997) respectively. The former species is recently recorded from the beels of Assam (Sharma, 2005) while the later is reported by Sharma (2004); these two rotifers are, therefore, now known to occur outside their type-localities and their distributional range is extended to the Indian subcontinent. *Lecane solfatara*, described from Indonesia, is an interesting addition to the Indian Rotifera. *Keratella edmondsoni*, a close relative of cosmopolitan *K. procurva*, is reported from South India, Rajasthan, Northeast India and Northeast Thailand. *Lecane blachei* is known Cambodia and Thailand while its Indian reports

are limited to Assam (Sharma, 2004) and West Bengal. On the other hand, *L. acanthinula*, a possible vicariant of the cosmopolitan *L. furcata* (Segers, 1996), shows disjunct distribution in India with reports from its Southern and North-Eastern regions.

Among the palaeotropical elements, *Keratella javana* is recorded from Meghalaya and now its distribution is extended to Assam, and *Dipleuchlanis ornata* and *Lepadella discoidea* are recent additions to the Indian Rotifera (Sharma, 2005). *K. javana*, *D. ornata*, *Testudinella brevicaudata* and *T. greeni* are so far known only from N. E. India; *Lecane lateralis*, described originally by Sharma (1978) from West Bengal, is now a widely known palaeotropical species while *Lecane unguitata* and *Trichocerca cylindrica* are examined from various parts of this country. *Lecane scutata*, the sole Arctic-temperate element is so far known from Assam, Meghalaya and Tripura from the Northeastern region as well as West Bengal from Eastern India.

Besides the members of the four stated categories, a number of species namely *Anuraeopsis navicula*, *Brachionus donneri*, *Lophocharis salpina*, *Mytilina acanthophora*, *M. bisulcata*, *Lepadella costatoides*, *L. dactyliseta*, *L. heterodactyla*, *L. lindau*, *L. bifurca*, *L. doryssa*, *L. glypta*, *L. haliclysta*, *L. rugosa*, *Taphrocampa annulosa*, *Trichocerca bicristata*, *T. flagellata*, *Pleosoma lenticulare*, *Filinia brachiata*, *F. camasecla*, *F. pejleri*, *F. saltator*, *Testudinella parva* and *Horaella brehmi* indicate examples of regional or local distributional importance.

The cosmopolitan species form a major qualitative component (61.9%) of the rotifer communities of the sampled beels of Assam. Pantropical (15.9%) > Tropicopolitan or cosmopolitan (11.4%) species are well represented in the examined collections. The observed trend re-affirms the earlier remarks of Sharma and Sharma (2001) and Sharma (2005) and is also in general conformity with the general composition of the rotifer fauna of Northeastern India (Sharma and Sharma, 2005a) except for marginal variations in their percentage compositions.

Four families of Eurotatoria namely Lecanidae (49 species) > Brachionidae (27 species) > Lepadellidae (26 species) > Trichocercidae (11 species) constitute a dominant fraction (64.2%) of the rotifer diversity. The qualitative importance of these families broadly concurs with the reports from the floodplains of South America (Jose de Paggi, 1993, 2001; Bonecker *et al.* 1994, 1998; Lansac-Toha *et al.* 1997; Rossa, 1997; Serafim, 1997; Segers *et al.* 1998), Africa (Segers *et al.* 1993), Thailand (Sanoamuang, 1998b) and India (Sharma and Sharma, 2001; Sharma, 2005). In addition, this salient feature agrees with general composition of the Indian Rotifera (Sharma, 1998a) as well as with the rotifer fauna of the Oriental region. Besides, five other monogonont families namely Notommatidae > Testudinellidae = Euchlanidae > Filiniidae > Trichotriidae, together, form a valuable sub-dominant qualitative component (33 species, 18.7%). Interestingly, majority of the mentioned families, except Brachionidae and Filiniidae, include predominantly littoral-periphytic taxa (Segers, 2001). On the contrary, the analysed rotifer communities are characterized by paucity of planktonic elements; these features are attributed to the lack of definite pelagic habitats (De Manuel, 1994) in the floodplain lakes, their shallow nature and the growth of aquatic macrophytes.

Latitudinal variations in the distribution, directly or indirectly induced by climatological factors are well documented in Rotifera (Green, 1972; De Ridder, 1981; Dumont, 1983; Segers, 1996). Segers (2001) stressed the role of thermophiles in the rotifer fauna of Southeast Asia and indicated the qualitative significance of *Lecane* and to a lesser degree of *Brachionus*. The role of these two 'tropic-centered' genera is well evident in the faunal diversity of Rotifera in the floodplain lakes of Assam in general and individual beels in particular. This fact is authenticated by higher speciose nature of *Lecane* (49 species) which represents 27.8% of the total richness. In general, the lecanid dominance compares well with the floodplain rotifer faunas studied by Segers *et al.* (1993, 1998), Sanoamuang (1998b, Jose de Paggi (2001) are well as with the authors observations (Sharma and Sharma, 2001; Sharma, 2005). The qualitative diversity of *Lecane* also broadly corresponds with its richness in the rotifer fauna of Northeastern India (Sharma and Sharma, 2005a).

Among about 22 species of *Brachionus* known to occur in the Indian waters (Sharma, 1998), only 14 species are observed in this study; their richness corresponds with the earlier report of 13 species (Sharma, 2005) while Sharma and Sharma (2001) listed only 8 species. It is important to note that the reported species number may be misleading as the examined collections show only fewer common eurytopic *Brachionus* spp. while the rest show limited occurrence. The relative paucity of species of this brachionid genus in particular is attributed to slightly acidic-circumneutral character and soft-waters of the sampled beels. On the other hand, such waters are known for diverse rotifer assemblages and harbor greater *Lecane* richness (Segers, 2001); both the characteristic features are confirmed in the present observations.

The rotifer communities also show qualitative importance of *Lepadella* (20 species, 11.4%) and *Trichocerca* (11 species, 6.2%). Thus, the four monogonont genera namely *Lecane* > *Lepadella* > *Brachionus* > *Trichocerca*, in the stated order, comprise the bulk of the reported richness (94 species, 53.4%); this salient feature corresponds with the composition of the rotifer fauna of N. E. India (Sharma and Sharma, 2005a). In addition, *Keratella*, *Testudinella*, *Filinia*, *Cephalodella*, *Euchlanis* and *Macrochaetus*, together include 31 species (17.6%). In general the most diverse genera, except *Brachionus* and to lesser degree *Keratella* and *Filinia*, are predominantly the littoral-periphytonic taxa. The stated features confirm the important fact that the floodplain lakes are inhabited by a diverse rotifer taxocoenosis (Segers and De Meester, 1994; Sanoamuang *et al.* 1995; Segers, 2001) resulting from the higher habitat heterogeneity and consequently reflecting higher micro-habitat diversity of these ecotones.

The qualitative significance of 'tropic-centered' *Lecane* and *Brachionus* as well as wider representation and distribution of several Pantropical and cosmopolitan species impart a general 'tropical character' to the examined rotifer taxocoenosis of the floodplain lakes of Assam. This generalization concurs with the composition of the tropical faunas from different parts of the globe (Green, 1972; Pejler, 1977; Fernando, 1980; Dussart *et al.* 1984; Segers, 1996, 2001). The stated remarks are also supported by the occurrence of fewer species of 'temperate-centered' *Keratella* (6 species) and relative scarcity of representatives of speciose

'cold-water' genera like *Cephalodella* (4 species) and *Synchaeta* (1 species). In addition, the lack of any member of 'temperate-centered' *Notholca* is noteworthy although species of this genus are known to drift with the Himalayan rivers to lower latitudes of N. W. India (Arora and Mehra, 2003).

Based on the present observations as well as our earlier findings (Sharma and Sharma, 2001; Sharma, 2005), 20 species (11.4%) are characterized as acidophilus elements; these include *Plationus patulus macracanthus*, *Dipleuchlanis propatula*, *Euchlanis triquetra*, *Mytilina bisulcata*, *Colurella sanoamuangae*, *C. sulcata*, *Lepadella acuminata*, *L. cristata*, *L. discoidea*, *L. triptera*, *Lecane doryssa*, *L. glypta*, *L. pertica*, *L. scutata*, *L. signifera*, *Monommata longiseta*, *M. maculata*, *Testudinella emarginula*, *T. parva* and *T. tridentata*. On the other hand, *Anuraeopsis fissa*, *Brachionus angularis*, *B. budapestinensis*, *B. falcatus*, *B. rubens*, *Filinia longiseta*, *F. opoliensis*, *Polyarthra vulgaris*, *Pompholyx sulcata* and *Rotaria neptunia* indicate preference for alkaline-eutrophic waters. Further observations are required to authenticate the status of some of the listed indicator species. In addition, *Anuraeopsis fissa*, *Brachionus bidentatus*, *B. forficula*, *Dipleuchlanis propatula*, *Beauchampiella eudactylota*, *Macrochaetus collinsi*, *M. sericus*, *Colurella sulcata*, *Lepadella cristata*, *Lecane ludwigi* and *L. stenroosi* are termed as warm-stenothermal species (vide Koste, 1978).

A number of rotifer genera namely *Ascomorpha*, *Epiphanes*, *Horaella*, *Lophocharis*, *Pleosoma*, *Squatinella*, *Synchaeta*, *Taphrocampa*, *Trochosphaera* and *Notommata* exhibit rare occurrence in the present study while *Pompholyx* shows rare occurrence in the beels of upper Assam. Thirty-three species (13.1%) namely *Brachionus dichotomus reductus*, *B. kostei*, *Keratella edmondsoni*, *K. javana*, *Dipleuchlanis ornata*, *Macrochaetus danneeli*, *Colurella sanoamuangae*, *Lepadella heterodactyla*, *L. lindau*, *L. minoruoides*, *L. minuta*, *L. triba*, *L. bifurca*, *L. braumi*, *L. glypta*, *L. rugosa*, *L. rutneri*, *L. scutata*, *L. solfatara*, *L. sola*, *L. superaculeata*, *Pleosoma lenticulare*, *Taphrocampa annulosa*, *Trichocerca bicristata*, *T. kostei*, *T. insignis*, *Filinia brachiata*, *F. saltator*, *Testudinella brevicaudata*, *T. greeni*, *T. tridentata*, *Horaella brehmi* and *Trochosphaera aequatorialis* are rare elements. On the other hand, only 20 species (11.4%) i.e., *Brachionus angularis*, *B. quadridentatus*, *Keratella cochlearis*, *K. tropica*, *Plationus patulus*, *Mytilina ventralis*, *Trichotria tetractis*, *L. ovalis*, *L. bulla*, *L. closterocerca*, *L. curvicornis*, *L. leontina*, *L. papuana*, *L. lunaris*, *L. ungulata*, *Trichocerca similis*, *T. rattus*, *Asplanchna priodonta*, *Polyarthra vulgaris* and *Testudinella patina* exhibit common occurrence in various beels.

Interestingly, the rotifer communities are characterized by the occurrence of a high number of small taxa although species up to the size class of about 600  $\mu\text{m}$  are also frequently noticed. The former feature may be assigned to conditions of low concentrations of food, and predation by fish and invertebrates as suggested by Papinski (1990) and Baumgartner *et al.* (1997) respectively. However, the detailed observations are required to confirm these findings. Besides, the present results demonstrate a frequent occurrence of non-planktonic taxa in open waters of several sampled lakes. The establishment of both planktonic and non-planktonic taxa in the lakes with marginal vegetation suggests the occupation of different niches (Bonecker *et al.* 1998).

## Cladocera

Fifty-six species recorded in this study exhibit rich and diversified Cladocera taxocoenosis of the floodplain lakes of Assam. The present results indicate the highest richness of the group known till date from the floodplains or other aquatic ecosystems of the Indian subcontinent. These salient remarks reiterate features of greater environmental heterogeneity of the sampled beels, which, in turn, can be attributed to their general ecotone character and habitat diversity imparted by diverse associations of aquatic macrophytes. Further, the stated generalizations confirm our earlier remarks based on the zooplankton and Rotifera biodiversity examined during this study. The documented richness of Cladocera assumes special significance in light of a conservative estimate (Fernando and Kanduru, 1984; Sharma and Michael, 1987) of occurrence of up to 60 - 65 species of this group from tropical and subtropical parts of India while it comprises nearly 50.0% of the known species of the Indian Cladocera. The stated characteristics provide an indicator of the taxonomic diversity of the cladoceran in the floodplain lakes of Assam.

Interestingly, the cladoceran communities reflect greater higher diversity (33 genera) as compared with 36 genera so far known from India (Sharma, 1991b). The generic richness is even higher than the reports of 29 genera each in the cladoceran faunas of the states of Meghalaya (Sharma and Sharma, 1999b) and Tripura (Venkataraman and Das, 2000). Besides, all the seven families of freshwater Cladocera known to occur in the Indian inland aquatic biotopes are represented in the examined collections. These facts re-affirm greater cladoceran diversity of the floodplain lakes. The reported families represent two phylogenetic stems of Cladocera (Smirnov and Timms, 1983) namely the Ctenopoda and the Anomopoda; the former order includes only the family Sididae while members of six families of the latter (Macrothricidae-Ilyocryptidae-Chydoridae-Bosminidae-Moinidae-Daphniidae) are reported in this study.

One species represents an interesting new record from Asia, four species are new records from Northeastern India and thirty-five species are new records from Assam. In addition, this study includes one Australasian element. The Cladocera richness compares well with 58 species reported from Meghalaya (Sharma and Sharma, 1999b; Sharma 2008), corresponds with 56 species known from West Bengal (Venkataraman, 1999) while it is higher than 49 species examined from Tripura (Venkataraman and Das, 2000) from N. E. India. The recorded species register 76.4 and 73.3% similarities with the cladoceran faunas of the states of Meghalaya and Tripura respectively; while higher similarity values apparently result from common occurrence of several species, the extent of dissimilarity indicates some taxa restricted to the floodplain lakes.

The cladoceran richness observed in the present study is distinctly higher than the record of 14 species from 37 floodplain lakes (Sarma, 2000) of Assam, 9 species from 65 wetlands of 24-Parganas district (Nandi *et al.* 1993) of West Bengal as well as 36 species from 20 wetlands, including 25 species from four ox-bow lakes of Southeastern West Bengal (Khan,

2003); 39 species from 30 wetlands of the Keoladeo National Park, Rajasthan (Venkataraman, 1992) and 29 species from 25 water bodies of Melaghat Tiger reserve, Maharashtra (Rane, 2005). The peak diversity of 44 species recorded from Deepor beel, a Ramsar site of India, is highest known so far from any individual floodplain lake of India. The richness, however, differs prominently than only 9 species listed earlier by Shyamananda Singh (1991) from Loktak lake, Manipur (another Ramsar site) and, including dubious reports of three *Daphnia* spp and certain unidentified species. Interestingly, total richness observed during this study as well as number of species occurring in individual lakes presents a distinct contrast to the reports of five species from a wetland (Yousuf *et al.* 1986) and eleven species from two floodplain lakes (Khan, 1987) of Kashmir; one (Baruah *et al.* 1993), four (Sinha *et al.* 1994) and twelve species (Sanger and Sharma, 1995) from a floodplain lake of Bihar and three species from Mori beel (Goswami and Goswami, 2001) from Assam.

The Cladocera are invariably considered as a group showing cosmopolitan distribution. The recent bio-geographical considerations, on the other hand, question cosmopolitan nature of various species and focus attention on recognition and occurrence of geographical vicariants or equivalents of different taxa. The current opinions on definite extent of distributional ranges of various taxa render the task of assigning them to correct categories more difficult. In view of the stated limitations, the documented species exhibit broadly equal occurrence of Cosmopolitan (16.1%) and Pantropical species (16.1%) while cosmotropical species (17.9%) marginally exceed. In addition, two species are Palaeartic elements, one species is designated as an Australasian element, six species show restricted distribution while the rest (19 species) are set aside due to uncertainty about their exact distributional ranges. The occurrence of several cosmopolitan, cosmotropical and pantropical species along with typical cosmotropical and pantropical genera imparts a general 'tropical character' to the cladoceran fauna of the floodplain lakes of Assam. These remarks are in conformity with the general composition of cladoceran communities from other tropical regions (Fernando, 1980; Fernando and Kanduru, 1984; Dussart *et al.* 1984; Sharma and Michael, 1987; Michael and Sharma, 1988; Sharma, 1991b; Sharma and Sharma, 1999b).

Chydoridae, the largest family of Cladocera, form a dominant component (31 species, 55.4%) of the reported richness of these micro-crustaceans; these, in turn, include 14 species of Chydorinae and 17 species of Aloninae. Among 19 genera of each of the two sub-families, 8 and 10 genera respectively are represented in this account. The chydorid dominance broadly concurs with the results of Khan (2003). Daphniidae (8 species) > Sididae (6 species) = Macrothricidae (6 species), together, comprise yet another important component (35.7%) of the cladoceran diversity of the floodplain lakes of Assam.

*Leydigiopsis*, a rare genus of the chydorid Cladocera, was described from Brazil by Sars (1901) and has since believed to be restricted to South America (Smirnov, 1971). Interestingly, this genus was recently reported from north-east Thailand (Sanoamuang, 1998a) after a time lag of nearly one century. The present report assumes biogeographical importance (Sharma

and Sharma, 2007) as it extends the distributional range of *Leydigiopsis* to the Indian subcontinent and also comprises its second record from the Oriental region. The occurrence of this rare genus of Cladocera in India may, however, represent an example of its introduction by man and thus deserved further study. This statement endorses the comments on the Thai material (Sanoamuang, *loc. cit.*) and re-affirms remarks of Dumont (1997) regarding emphasis on human introductions of several cladoceran taxa in different parts of the globe.

The genus *Leydigiopsis* includes only four species namely *L. curvirostris*, *L. brevirostris*, *L. megalops* and *L. ornata*; the first three species were known to be restricted to South America while the last occurred in Neotropical region (Smirnov, 1971). Of these, a single specimen of *Leydigiopsis* was recently collected (Sanoamuang, 1998a) from a swamp (Bung Bung) in Kalasin province of north-east Thailand; it resembled with *L. megalops* in certain aspects but the status of the Thai taxon was not ascertained because of insufficient material. On the other hand, the specimens examined from Deepor beel, a Ramsar site and an important floodplain lake of the Brahmaputra river basin of lower Assam (N. E. India), belong distinctly to *L. curvirostris* Sars, 1901 which represents a new record from Asia. Further, the present report of this rare and interesting chydorid species results in significant extension of its distributional range.

*Disperalona caudata*, another globally interesting species, was described (Smirnov, 1996a) from Mudginberri Lagoon, Kakadu National Park, N. Territory, Australia and was believed to be an Australian endemic (Smirnov, 1996b). This chydorid was, however, recently examined from north-east Thailand by Sanoamuang (1998a) as incidentally its first record from Asia. The present report of occurrence of *D. caudata* in two floodplain lakes of the Brahmaputra river basin further extends its distributional range to the Indian subcontinent. In view of the current bio-geographical limit, *D. caudata* is currently designated as an Australasian element (Sharma and Sharma, 2007). Further, this interesting species depicts an important link between the Cladocera faunas of N. E. India, South-East Asia and Australia. The presence of this species holds parallel to the reports of several Australasian species of Rotifera from N. E. India (Sharma, 2004, 2005; Sharma and Sharma 2001, 2005) and thus endorses our earlier remarks on the affinities of zooplankton communities of Northeastern India with those of Southeast Asia as well as Australia. A careful future examination of Zooplankton collections from this region is likely to add more such interesting micro-faunal elements.

Among other members of the Chydoridae, *Picripleuroxus laevis* and *Alona davidi* deserve special mention as new records from Northeastern India. *Alonella nana*, *Chydorus reticulatus*, *Daday macrops*, *Pseudochydorus globosus*, *Camptocercus uncinatus*, and *Graptoleberis testudinaria* represent second records from this region; these species are known from the neighboring state of Meghalaya (Sharma and Sharma, 1999b; Sharma 2008). In addition, *Alonella excisa*, *Chydorus faviformis*, *Dunhevedia crassa*, *D. serrata*, *Ephemeroporus barroisi*, *Pleuroxus similis*, *Alona costata*, *A. globulosa*, *A. guttata*, *A. rectangula*, *Euryalona orientalis*, *C. rectirostris*, *Karualona karua* and *Oxyurella singalensis* are new records from Assam.

The present study includes several interesting examples of restricted global distribution. The members of this category include *Diaphanosoma senegal*, *Simocephalus acutirostratus*, *Macrothrix odiosa*, *Chydorus reticulatus*, *Dunhevedia serrata*, *Alona davidi*, *Disperalona caudata* and *Leydigiopsis curvirostris*; the remarks on the distribution of last two species are made earlier in this account. Among the stated species, *D. senegal* is so far known from Africa, India and Bangladesh; *Simocephalus acutirostratus* is recorded from Australia and S. E. Asia; *Macrothrix odiosa* is known from Sri Lanka, Africa, Sunda islands, Madagascar and S. Europe; *Chydorus reticulatus* is examined from Sri Lanka, India, Malaysia and Thailand; *D. serrata* is reported from Sri Lanka, Africa, Indonesia, Thailand, Philippines and New Guinea while *A. davidi* is reported from Ethiopian region and Haiti.

The examined collections reveal several examples of disjunct occurrence and or of regional distributional interest. Among the members of the Sidiidae, *Diaphanosoma senegal* is reported from Meghalaya, Gujarat and Maharashtra; *D. volzi* from Meghalaya and Kerala and *Sida crystallina* is recorded from Meghalaya, Assam and Kashmir. Of the daphniids, *Ceriodaphnia reticulata* is known from Meghalaya, Rajasthan, Bihar and Gujarat; *Simocephalus acutirostratus* appears to occur in Central India and southwards (Sharma, 1991b); and *S. serrulatus* is known from S. India, Assam and Meghalaya. The Bosminidae depict restricted occurrence of both *Bosmina longirostris* and *Bosminopsis deitersi*.

Among other interesting species, *Moinodaphnia macleayi* is examined from West Bengal, Bihar, Kerala; *Macrothrix spinosa* from Tripura, Manipur, Rajasthan, Tamil Nadu, and Andaman & Nicobar islands; *M. odiosa* from Bihar and Rajasthan; *Guernella raphaelis* exhibits disjunct distribution in this country (Sharma and Sharma, 2001), with reports from West Bengal, Bihar and Rajasthan while *Grimaldina brazzai* is examined from West Bengal and Rajasthan.

Of the documented species of Chydoridae, *Alonella nana* is so far reported from Meghalaya and Kashmir; *Dadaya macrops* from Tripura, Rajasthan and Tamil Nadu; *C. faviformis* from Jammu & Kashmir and Meghalaya; *C. pubescens* is known from Bihar, West Bengal, Assam and Tripura; *Dunhevedia serrata* from Tripura, West Bengal, Gujarat, Rajasthan, Tamil Nadu, and Andhra Pradesh; *Picripleuroxus laevis* only from Kashmir; *Alona davidi* from West Bengal; *Camptocercus uncinatus* from Meghalaya and Madhya Pradesh while *Kurzia longirostris* is observed from West Bengal, Kerala, Tamil Nadu and Rajasthan.

The examined collections are characterized by prominence of littoral or periphytic cladocerans particularly in view of the explained common occurrence of the Chydoridae and littoral taxa of Macrothricidae, Ilyocryptidae, *Pseudosida*, *Sida* and *Simocephalus*. On the other hand, various planktonic species include *Diaphanosoma sarsi*, *D. excisum*, *Ceriodaphnia cornuta*, *Bosmina longirostris*, *Bosminopsis deitersi*, *Moina micrura* and *Moinodaphnia macleayi* and even these exhibit restricted occurrence. Notable among these is much restricted occurrence of *B. longirostris* which otherwise (Sharma, personal communication) is the most common species of Cladocera noticed in aquatic ecosystems of N. E. India.

The majority of the species are identified by their parthenogenetic females while the males of only three species *Daphnia lumholtzi*, *Karualona karua* and *Camptocercus uncinatus* are examined in the present study. Among these, the male of the last species represents a new record from Asia. *Diaphanosoma excisum*, *Ceriodaphnia cornuta*, *Macrothrix triserialis*, *Chydorus sphaericus*, *Ephemeroporus barroisi*, *Alona costata*, *Karualona karua* and *Notalona globulosa* show relatively common occurrence. On the other hand, *Diaphanosoma senegal*, *Ceriodaphnia reticulata*, *Moina micrura*, *Bosmina longirostris*, *Moinodaphnia macleayi*, *Guernella raphaelis*, *Chydorus pavus*, *Chydorus pubescens* and *Alona verrucosa pseudoverrucosa* are rare elements.

### Copepoda

Copepoda are represented by eleven species, belonging to seven genera and two families, and include one new record from India while seven species are new records from Northeastern India. The present report assumes special taxonomic importance because of nearly complete lack of investigations on faunal diversity of copepods in N. E. India (Battish, 1992) while the works of Brehm (1950, 1953), Reddiah (1964, 1965) and Radhakrishna and Ranga Reddy (1977) provide only limited reference to the specimens examined from this region. In addition, this study indicates one Indian endemic. The analyzed collections include five species each of Calanoida and Cyclopoida and, in general, exhibit reasonably good qualitative diversity of Copepoda even within the limited extent of the documented species.

The most common diaptomid genera in the plankton of tropical India (Ranga Reddy, 2001) are *Heliodiaptomus*, *Neodiaptomus* and *Phyllodiaptomus*; all these members of Diaptominae are known in the examined collections and are represented by three, one and one species respectively. Among species of the first genus, *H. contortus* is an Indian endemic. Described from the Indian Museum tank, Calcutta (Gurney, 1907), it is now believed to be a eurytopic species which though not common is yet widely distributed in India (Ranga Reddy, 1994). *H. cinctus*, described by Gurney (1907) from Chakradharpur (Bihar), is yet another eurytopic species (Ranga Reddy and Radhakrishna, 1981) which is fairly widely distributed in India except subtropical Kashmir. It is apparently a S. E. Asian element with reports from India, Sri Lanka and Myanmar. *H. viduus*, third member of this genus, is reported to be most abundant in Southern India that decreases gradually in North (Hossain, 1985). The distribution range of *H. contortus* is presently extended to N. E. India while other two species are known earlier from Assam.

Of the rest two member of Diaptominae, *Phyllodiaptomus annae*, described originally from Sri Lanka, deserves special comments on its distribution. This species is currently known from Sri Lanka, India and Thailand. Ranga Reddy (1994) remarked on its occurrence only in S. India (Tamil Nadu) and hence considered its reports from Thailand (Lai and Fernando, 1981; Boonsom, 1984) as puzzling. On the other hand, Battish (1992) indicated its presence in West Bengal, Andhra Pradesh, Madhya Pradesh and Tamil Nadu; certain

records, however, may require confirmation in view of the remarks of Ranga Reddy (*loc. cit.*). The present report of *P. annae* from certain floodplain lakes of the Brahmaputra river basin, Assam extends its distributional range to Northeastern India and provides support for its earlier reports from Thailand.

Free living Cyclopoida reported presently belong exclusively to the family Cyclopidae which, in turn, includes more than 40 genera in surface freshwaters, about half occurring in tropics while only four of them comprise truly planktonic species (Alekseev, 2002). Further, out of four subfamilies of Cyclopidae, two namely *Eucyclopinae* and *Cyclopinae* include truly freshwater species; the two are also represented in the examined collections by one and four species respectively. Among seven genera of Eucyclopinae known from the tropics, only *Tropocyclops* has planktonic species. This genus includes *T. prasinus* in the present study which is a new record from N. E. region; it so far exhibits disjunct distribution in India.

Cyclopinae, another sub-family of Cyclopidae, includes 16 genera in tropics. Of these, *Mesocyclops* and *Thermocyclops* contain typical planktonic species widely represented in the tropics while *Microcyclops* occurs mainly in shallow water (Alekseev, 2002). These three genera are represented by two, two and one species in the examined collections. The genus *Mesocyclops* has been under intensive taxonomic revision following the seminal paper of Kiefer (1981). The formerly cosmopolitan *M. leuckarti* is now a Palaearctic species and all its records from other zoogeographical regions are considered as invalid (Van der Velde, 1984). *M. splendidus*, another recorded species of the genus, represents a new record from Northeastern India; described originally from Malabar coast, it now appears to be a S. E. Asian element with reports from Sri Lanka, India, Bangladesh and Thailand.

*Thermocyclops* consists of more than 50 species found mainly in low latitudes (Alekseev, 2002). This genus is presently represented by cosmopolitan *T. crassus* which is a new record from India while Pantropical *T. decipiens* is known only from Ladak and its distributional range is now extended to eastern Himalayas.

Total richness of Copepoda (11 species, 7 genera, 2 families) observed in the beels of Assam broadly concurs with the report 10 species (7 genera, 2 families) from the floodplain lakes and wetlands of Southeastern West Bengal (Khan, 2003). The two lists, however, register only 57.1% community similarity (*vide* Sorenson's index) thereby indicating considerable divergence in their species composition. This is in spite of the fact that Calanoida and Cyclopoida include five species each in the later report. The species number is marginally higher than eight species reported by Khan (2002) from two ox-bow lakes of West Bengal.

### **Rhizopoda**

The Rhizopoda are often observed in bottom ooze of aquatic ecosystems and invariably occur as facultative plankton in shallow water bodies and also those with aquatic vegetation. The latter aspect is endorsed presently as plankton samples collected from the floodplain lakes of Assam indicate 27 species of the testate amoebae belonging to six families and

fourteen genera. The listed species indicate the rich and diverse taxocoenosis of the group and again affirm diverse nature of individual groups of zooplankton communities of the sampled beels. One species represents a new record from Northeastern India while 24 species are new records from Assam. Total qualitative richness is higher than 20, 12, 7 and 19 species of the rhizopods reported from freshwater biotopes of Meghalaya (Das *et al.* 1995), Tripura (Das *et al.* 2000), Sikkim (Das *et al.* 2003) and Manipur (Das *et al.* 2004) respectively.

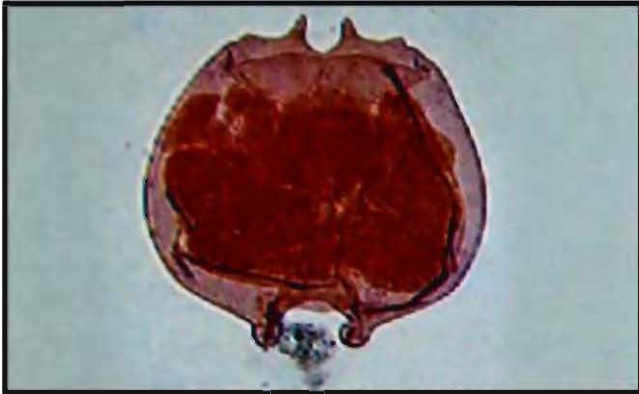
The examined collections are represented by 20 species of Lobosea and 7 species of Filosea, and register L / F quotient = 2.8 as against its values ranging between 0.5-1.4 reported (Chattopadhyay and Das, 2003) for moss-dwelling rhizopods. *Centropyxis* and *Diffflugia* appear to be relatively more speciose in the present study. Centropyxidae > Nebelidae = Euglephidae comprise the dominant fraction (19 species, 70.4% of the reported species). Cyphoderiidae, the least speciose family, includes only one species i.e., *Cyphoderia ampulla* which represents an interesting element with biogeographical and ecological importance. This moss dwelling species (Chattopadhyay and Das, *loc. cit*) is known only from Uttaranchal; it is, however, now reported from the freshwater environs and its distributional range is currently extended to Northeastern India. Interestingly, four other species of moss-dwelling Rhizopoda namely *Awrintzewia cyclostoma*, *Nebela caudata*, *N. dentistoma* and *Quadrutella symmetrica* are reported from freshwaters in this study. These species may have accidentally drifted in water bodies from surrounding patches of mosses; their occurrence in aquatic environs requires further confirmation.

*Arcella hemispherica*, *Centropyxis cassis*, *Trignopyxis arcula*, *Diffflugia urceolata*, *Cyclopyxis eurysterna*, *Awerintzewia cyclostoma*, *Nebela caudata*, *N. dentistoma*, *Quadrutella symmetrica* and *Euglypha laevis* comprise examples of local or regional distributional interest. Further, these species exhibit rare occurrence in the studied collections. On the other hand, *Arcella discoides*, *A. vulgaris*, *Centropyxis aculeata*, *C. ecornis*, *C. minuta*, *Diffflugia acuminata*, *D. oblonga*, *Euglypha acanthophora*, *E. tuberculata* and *Trinema enchelys* exhibit relatively common occurrence.

### Gastrotricha

The gastrotrichs invariably occur in plankton collections but are often over-looked because of difficulty of their identification from the preserved materials (Fernando, 2002). The limited information on Indian freshwater Gastrotricha is attributed to the works of Vanamala Naidu (1962), Visvesvara (1963, 1964), Dhanapathi (1976), Rao and Mohan (1977) and Sharma (1980, 1987b) while the sole contribution from N. E. India is by Sharma and Sharma (1990).

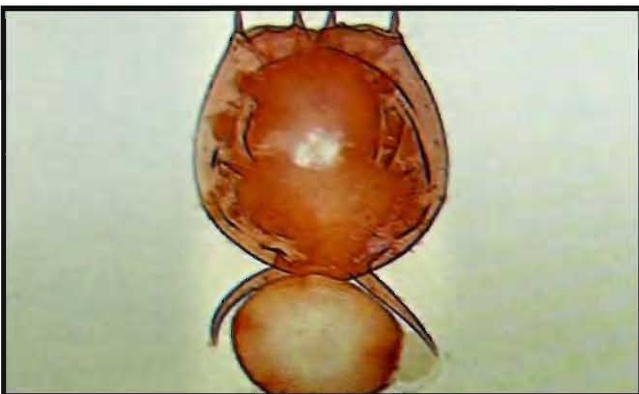
Three species of Gastrotricha belonging to the genus *Chaetonotus* (Family : Chaetonotidae) are reported in the present account. Among these, *C. gastrocyaneus* is a new record from Northeastern India while the other two species represent new records from Assam. Further, all these species are cosmopolitan elements.



**Fig. 515 :** *Brachionus angularis* Gosse



**Fig. 516.** *B. bidentatus* Anderson



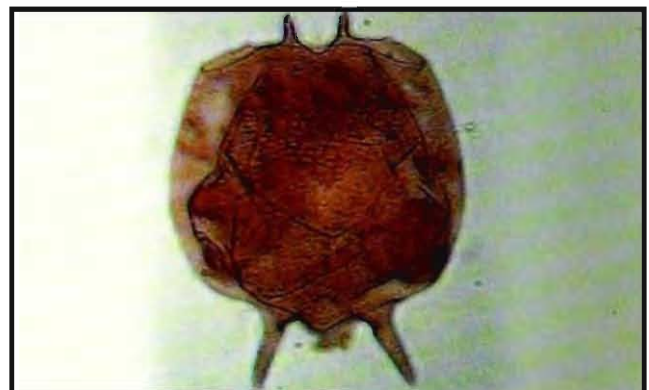
**Fig. 517 :** *B. caudatus personatus* (Ahlstrom)



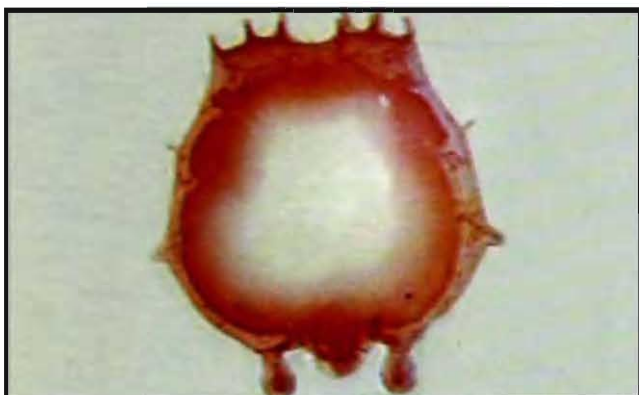
**Fig. 518 :** *B. caudatus personatus* (Ahlstrom)



**Fig. 519 :** *B. calyciflorus* Pallas



**Fig. 520 :** *B. dichotomus reductus* Koste & Shiel



**Fig. 521 :** *B. donneri* Brehm



**Fig. 522 :** *B. falcatus* Zacharias

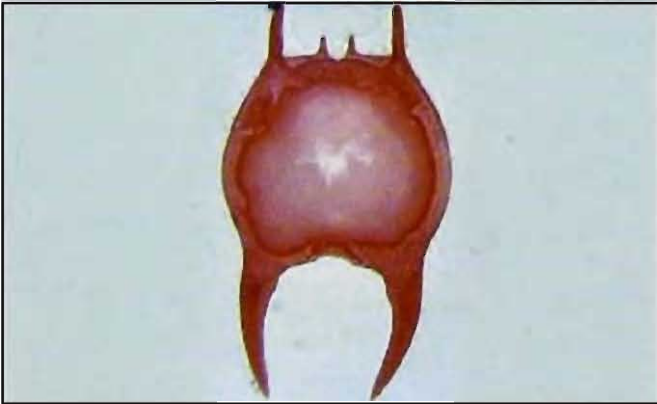


Fig. 523 : *Brachionus forficula* Wierzejski



Fig. 524 : *B. quadridentatus* Hermann

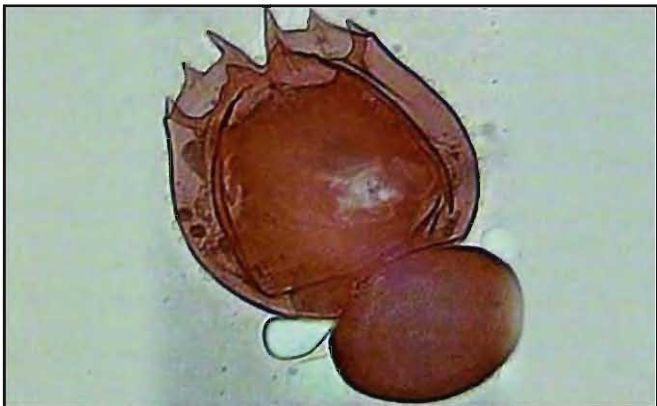


Fig. 525 : *B. rubens* Ehrenberg



Fig. 526 : *B. mirabilis* Daday

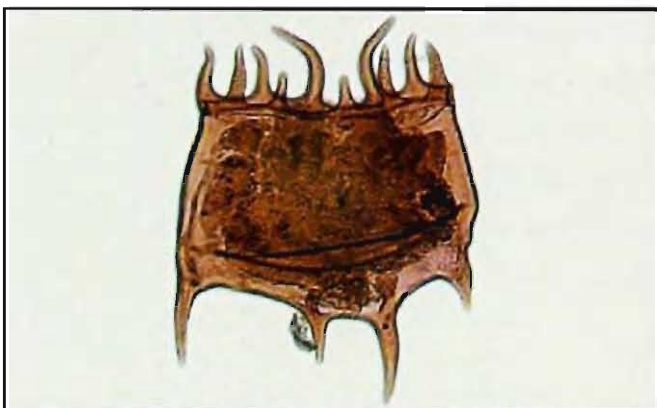


Fig. 527 : *Platyonus patulus* (O.F. Müller)

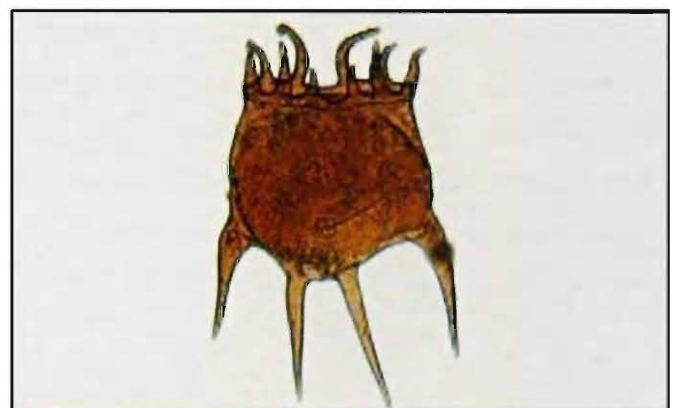


Fig. 528 : *P. patulus macracanthus* (Daday)



Fig. 529 : *Keratella cochlearis* Gosse



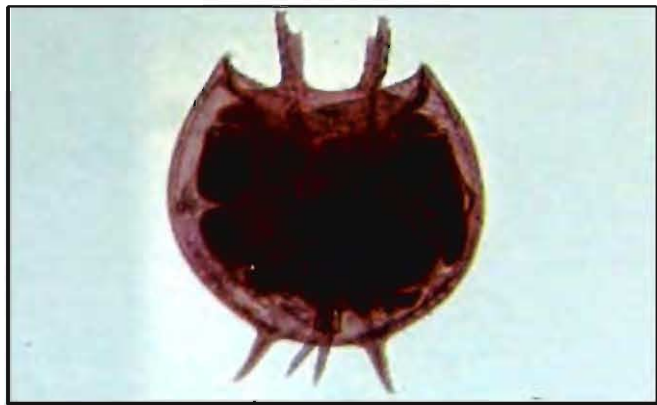
Fig. 530 : *K. lenzi* Hauer



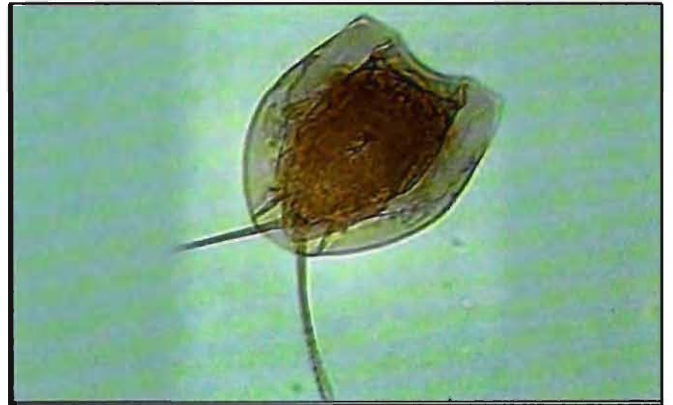
**Fig. 531 :** *Keratella tropica* (Apstein)



**Fig. 532 :** *Anuraeopsis fissa* Gosse



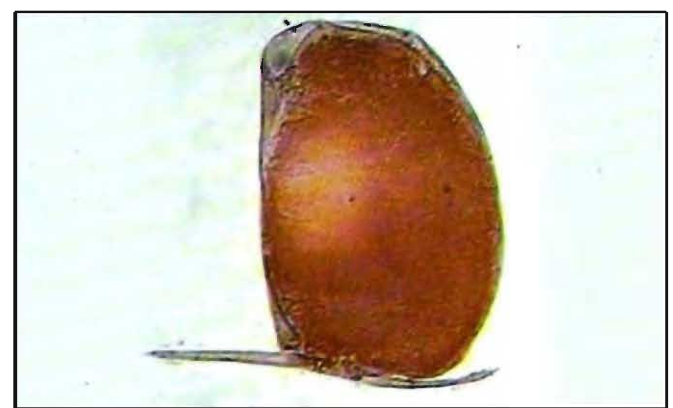
**Fig. 533 :** *Platyas quadricornis* (Ehrenberg)



**Fig. 534 :** *Dipleuchlanis propatula* (Gosse)



**Fig. 535 :** *Beauchampiella eudactylota* (Gosse)



**Fig. 536 :** *Mytilina bisulcata* (Lucks)



**Fig. 537 :** *M. ventralis* (Ehrenberg)



**Fig. 538 :** *M. ventralis longidactyla* Wulfert

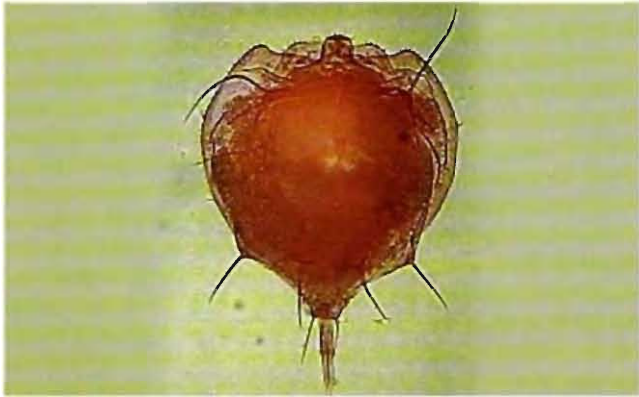


Fig. 539 : *Macrochaetus sericus* (Thorpe)

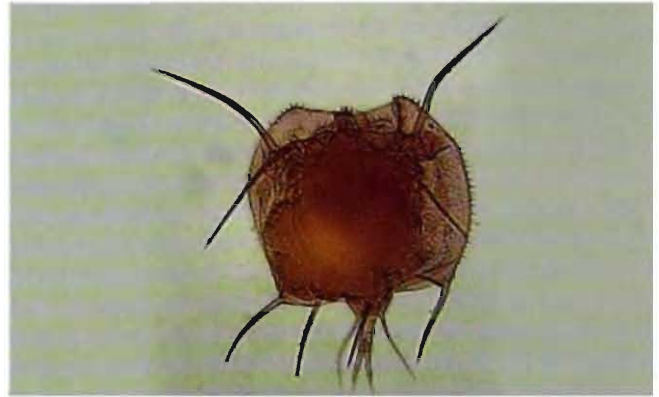


Fig. 540 : *M. longipes* Myers



Fig. 541 : *Trichotria tetractis* (Ehrenberg)



Fig. 542 : *Colurella uncinata* (O.F. Müller)

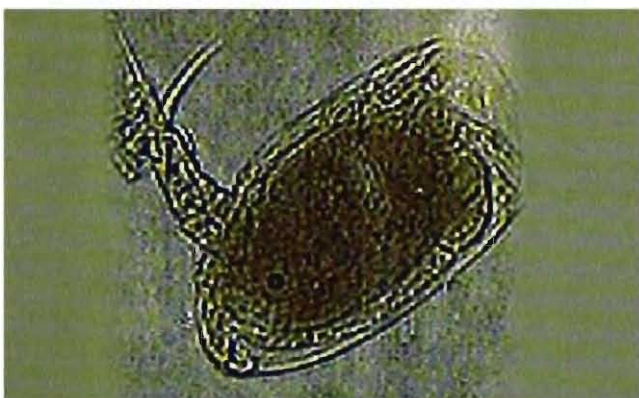


Fig. 543 : *C. sulcata* (Stenroos)



Fig. 544 : *Lepadella acuminata* (Ehrenberg)



Fig. 545 : *Lepadella apsicora* Myers

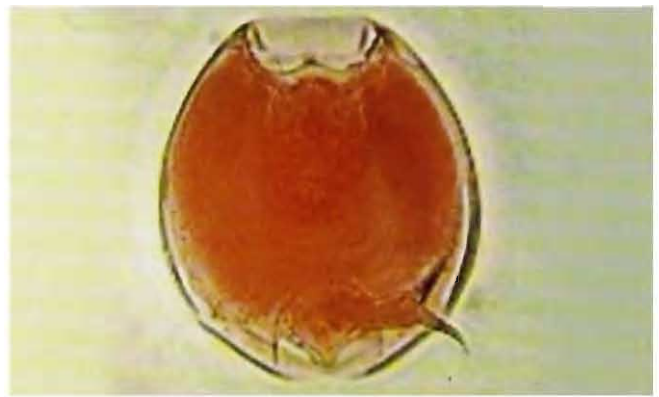


Fig. 546 : *L. apside* Haring



**Fig. 547** : *Lepadella discoidea* Segers



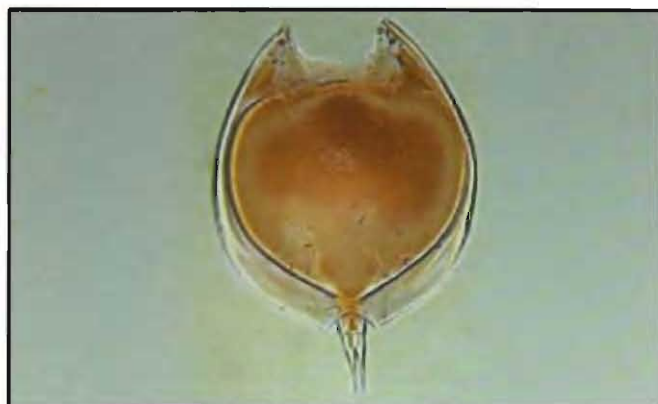
**Fig. 548** : *L. heterodactyla* Fadeew



**Fig. 549** : *L. heterostyla* (Murray)



**Fig. 550** : *L. patella* (O.F. Müller)



**Fig. 551** : *Lepadella ovalis* (O. F. Müller)



**Fig. 552** : *L. rhomboides* (Gosse)



**Fig. 553** : *Lecane aculeata* (Jakubski)



**Fig. 554** : *L. crepida* Haring



Fig. 555 : *Lecane curvicornis* (Murray)

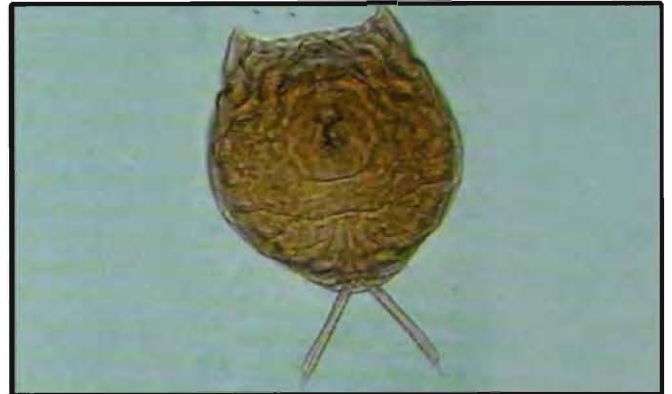


Fig. 556 : *L. curvicornis nitida* (Hauer)

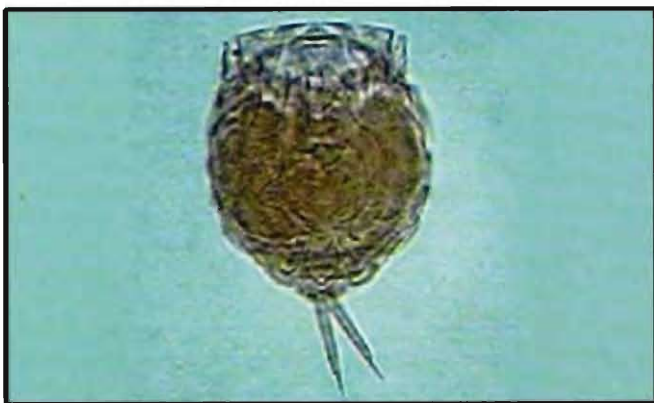


Fig. 557 : *L. doryssa* Harring



Fig. 558 : *L. hornemanni* (Ehrenberg)



Fig. 559 : *L. haliclysta* Harring & Myers

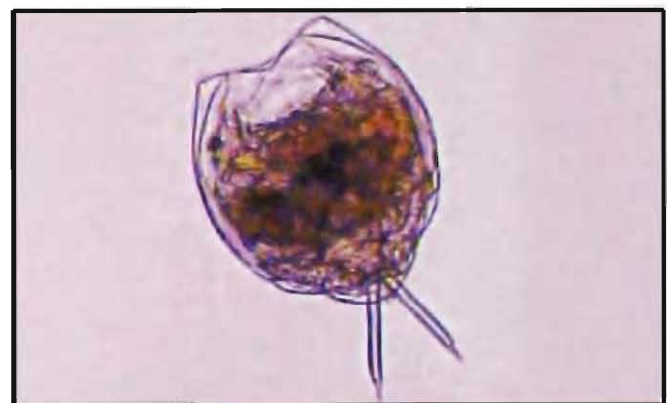


Fig. 560 : *L. lateralis* Sharma



Fig. 561 : *L. leontina* (Turner)



Fig. 562 : *L. ludwigii* (Eckstein)



Fig. 563 : *Lecane ohioensis* (Herrick)

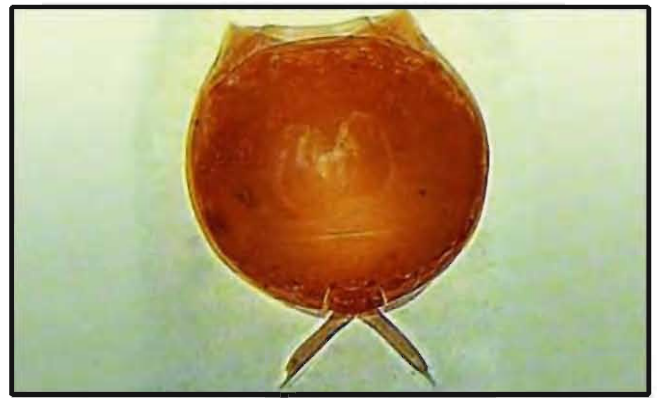


Fig. 564 : *L. luna* (O.F. Müller)

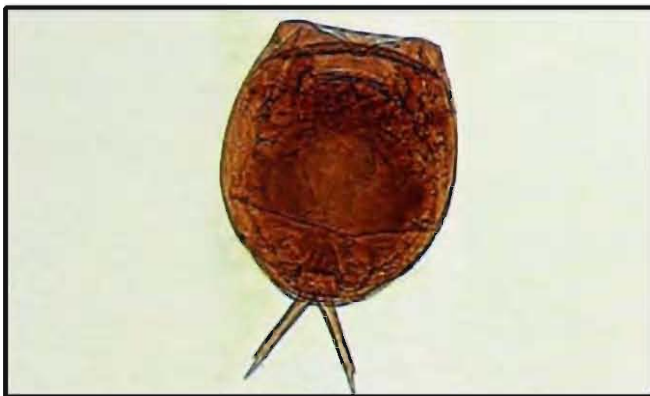


Fig. 565 : *L. papuana* (Murray)



Fig. 566 : *L. pertica* Harring & Myers



Fig. 567 : *L. ploenensis* (Voigt)

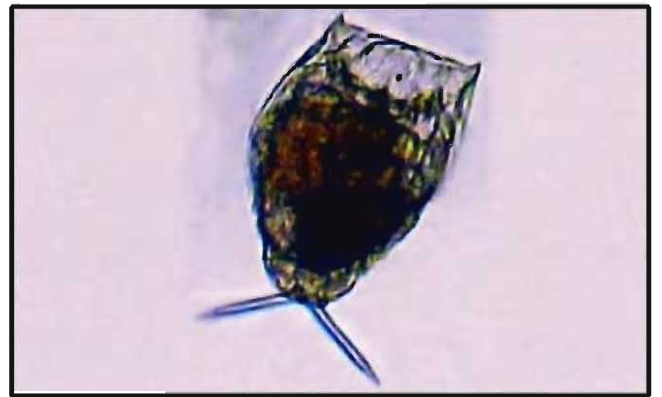


Fig. 568 : *L. signifera* (Jennings)



Fig. 569 : *L. ungulata* (Gosse)

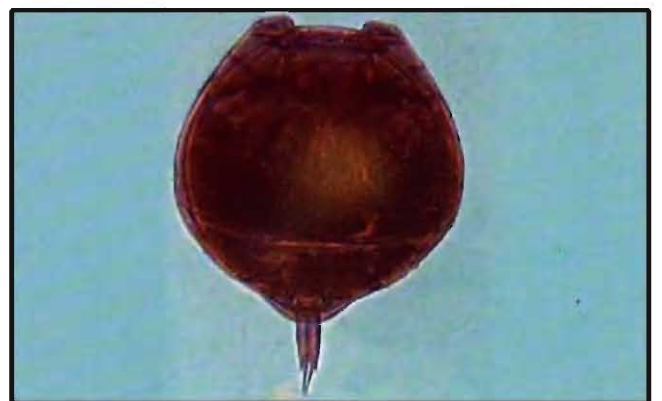


Fig. 570 : *L. (Hemimonostyla) blachei* Berzins



Fig. 571 : *Lecane (Hm.) sympoda* Hauer



Fig. 572 : *L. (Monostyla) batillifer* (Murray)

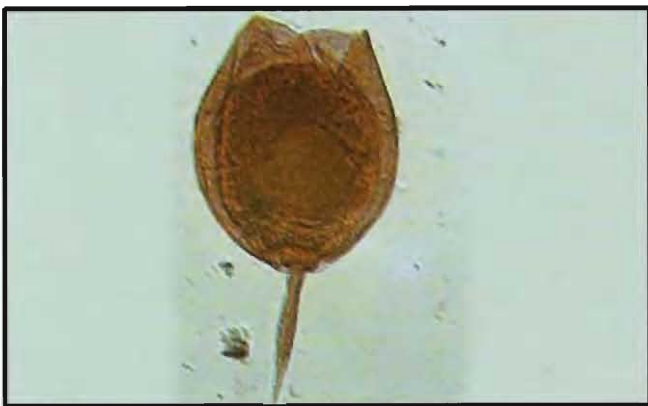


Fig. 573 : *L. (M.) bulla* (Gosse)



Fig. 574 : *L. (M.) closterocerca* (Schmarda)



Fig. 575 : *L. (M.) furcata* (Murray)



Fig. 576 : *L. (M.) hamata* (Stokes)



Fig. 577 : *L. (M.) decipiens* (Murray)



Fig. 578 : *L. (M.) lunaris* (Ehrenberg)



Fig. 579 : *Lecane (Monostyla) obtusa* (Murray)



Fig. 580 : *L. (M.) pyriformis* (Daday)

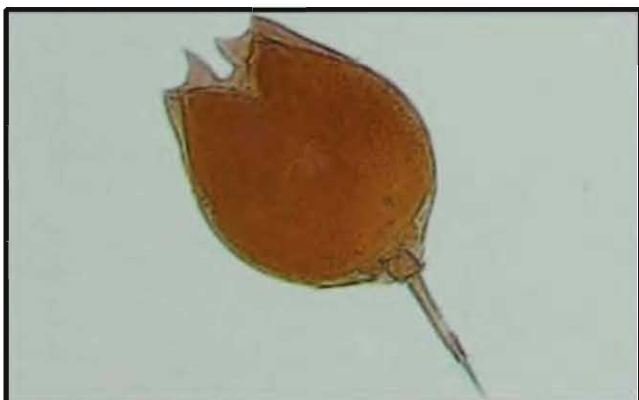


Fig. 581 : *L. (M.) quadridentata* (Ehrenberg)

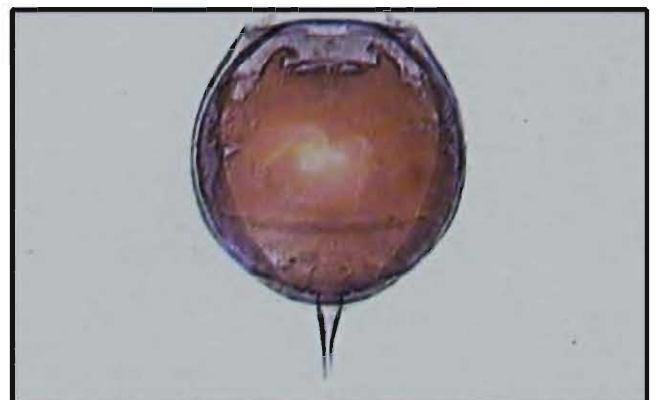


Fig. 582 : *L. (M.) stenroosi* (Meissner)



Fig. 583 : *L. (M.) unguitata* (Fadeev)



Fig. 584 : *Scardium longicaudum* (O.F. Müller)



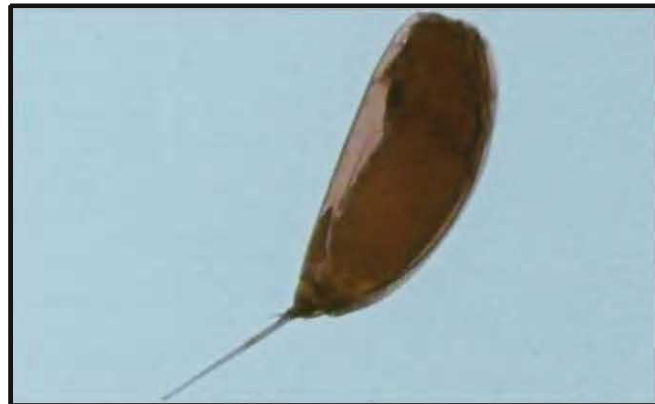
Fig. 585 : *Cephalodella forficula* (Ehrenberg)



Fig. 586 : *Ascomorpha saltans* Bartsch



**Fig. 587** : *Trichocerca flagellata* Hauer



**Fig. 588** : *T. jenningsi* Voigt



**Fig. 589** : *T. longiseta* (Schrank)



**Fig. 590** : *T. rattus* (O.F. Müller)



**Fig. 591** : *Asplanchna brightwelli* Gosse



**Fig. 592** : *Pleosoma lenticulare* Herrick



**Fig. 593** : *Dicranophorus forcipatus* (O.F. Müller)



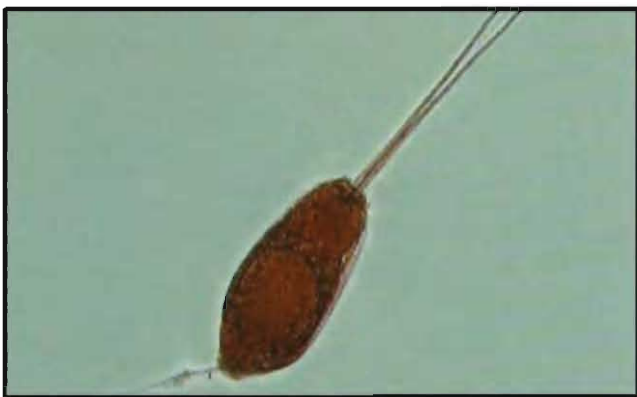
**Fig. 594** : *Sinantherina spinosa* (Thorpe)



**Fig. 595 :** *Hexarthra mira* (Hudson)



**Fig. 596 :** *Filinia camasecla* Myers



**Fig. 597 :** *F. longiseta* (Ehrenberg)



**Fig. 598 :** *F. opoliensis* (Zacharias)



**Fig. 599 :** *F. saltator* (Gosse)



**Fig. 600 :** *Testudinella brevicaudata* Yamamoto



**Fig. 601 :** *T. emarginula* (Stenroos)



**Fig. 602 :** *T. parva bidentata* (Ternetz)



Fig. 603 : *Testudinella tridentata* Smirnov



Fig. 604 : *T. patina* (Hermann)

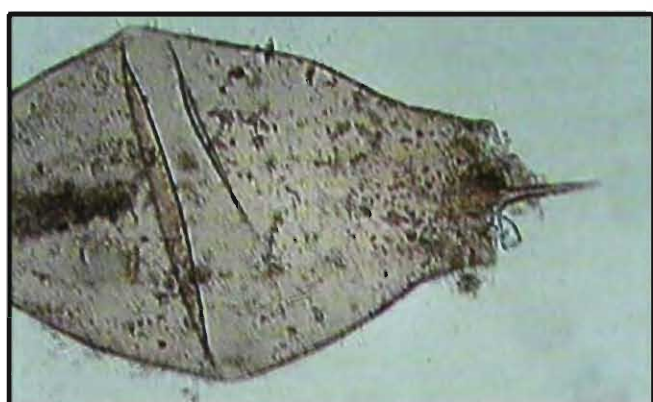


Fig. 605 : *T. greeni* Koste



Fig. 606 : *Diaphanosoma excisum* Sars



Fig. 607 : *Psudosida bidentata* Herrick



Fig. 608 : *Ceriodaphnia cornuta* Sars



Fig. 609 : *C. reticulata* (Jurine)



Fig. 610 : *Scapholeberis kingi* Sars

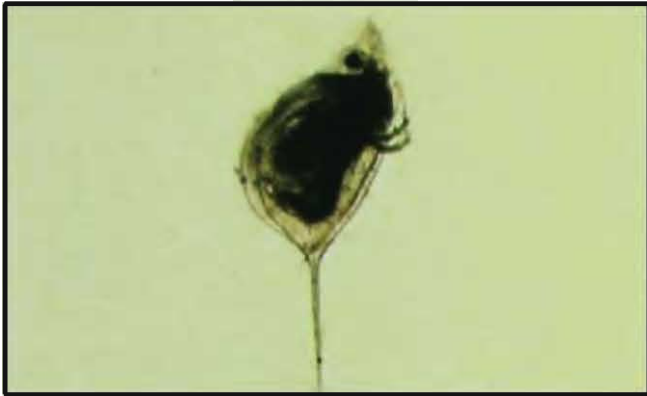


Fig. 611 : *Daphnia lumholtzi* Sars



Fig. 612 : *Simocephalus vetulus* (O.F. Müller), head



Fig. 613 : *S. vetulus* (O.F. Müller), postabdomen

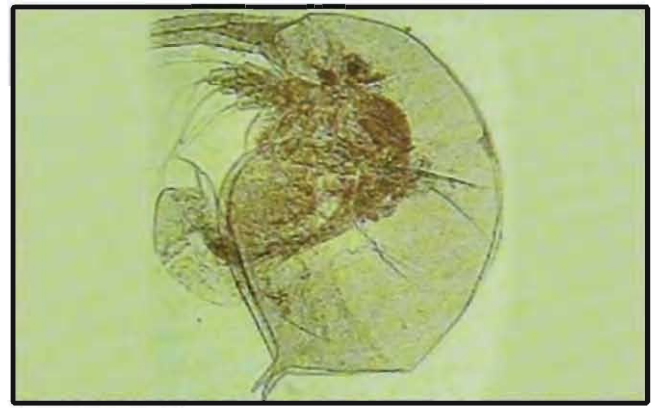


Fig. 614 : *Bosmina longirostris* (O.F. Müller)



Fig. 615 : *B. longirostris* (O.F. Müller), postabdomen



Fig. 616 : *Bosminopsis deitersi* (Richard)



Fig. 617 : *B. deitersi* Richard, postabdomen



Fig. 618 : *Moina micrura* (Kurz)



Fig. 619 : *Moinodaphnia macleayi* (King)



Fig. 620 : *Macrothrix laticornis* (Fischer)



Fig. 621 : *M. triselialis* (Brady)



Fig. 622 : *M. spinosa* King



Fig. 623 : *M. odiosa* (Gurney)



Fig. 624 : *Grimaldina brazzai* Richard



Fig. 625 : *G. brazzai* Richard, postabdomen

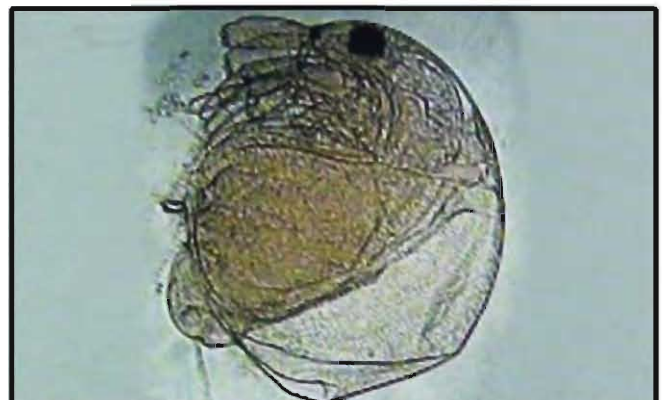
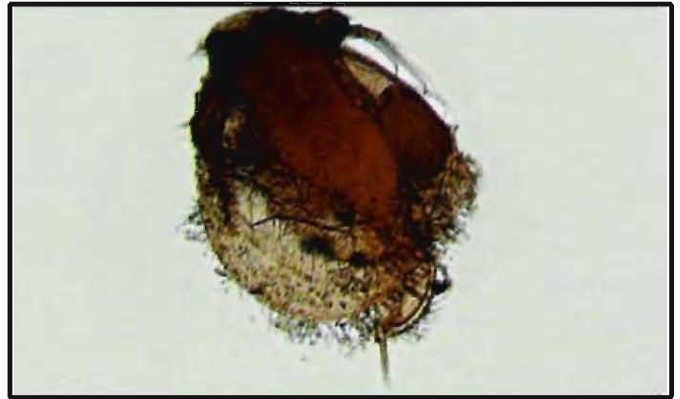


Fig. 626 : *Guernella raphaelis* Richard



**Fig. 627** : *Guernella raphaelis* (Richard), postabdomen



**Fig. 628** : *Ilyocryptus spinifer* Herrick



**Fig. 629** : *I. spinifer* Herrick, postabdomen



**Fig. 630** : *Alonella excisa* (Fischer)



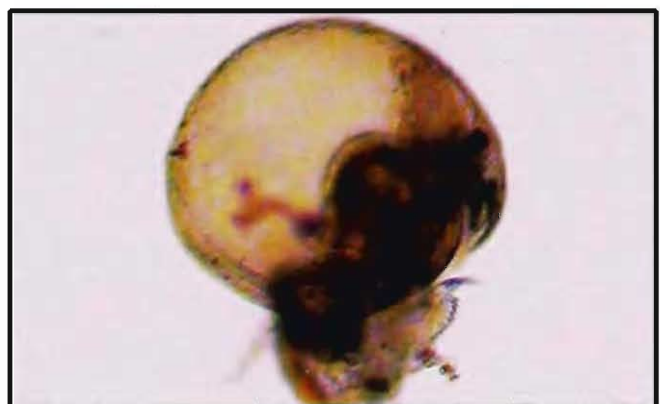
**Fig. 631** : *A. excisa* (Fischer), postabdomen



**Fig. 632** : *Chydorus faviformis* Birge



**Fig. 633** : *C. faviformis* Birge, postabdomen



**Fig. 634** : *Chydorus sphaericus* (O. F. Muller)



Fig. 635 : *Dadaea macrops* (Daday)

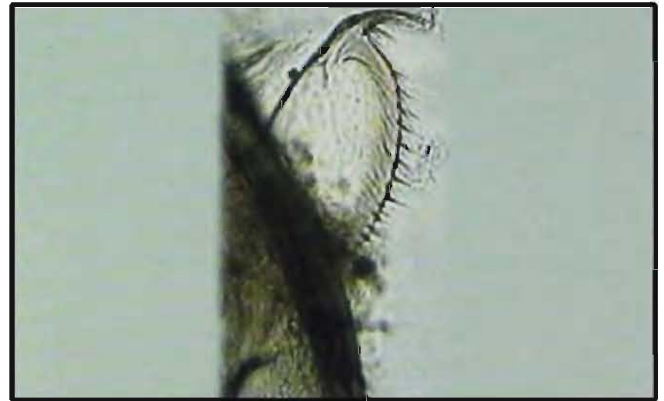


Fig. 636 : *D. macrops* (Daday), postabdomen

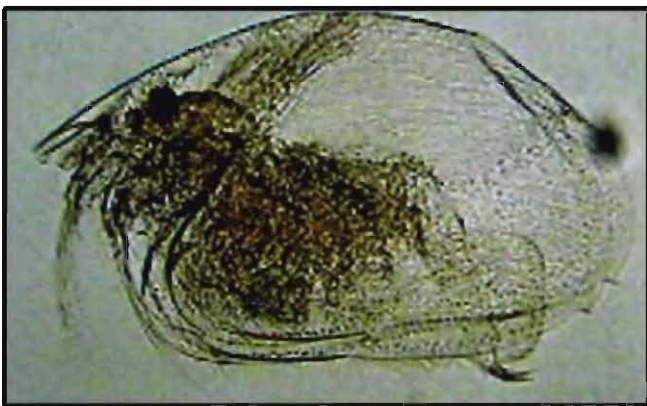


Fig. 637 : *Dunhevedia serrata* Daday

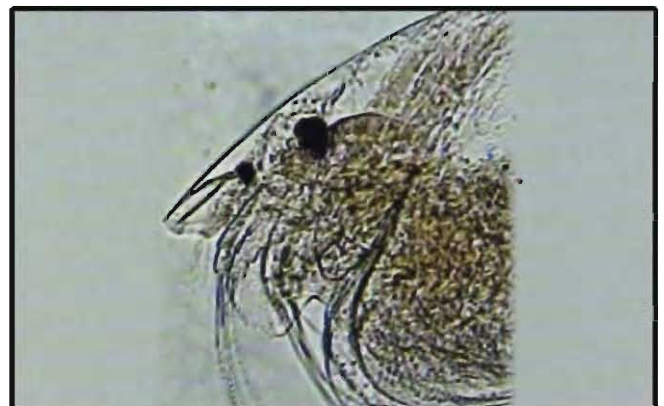


Fig. 638 : *Dunhevedia serrata* Daday, head

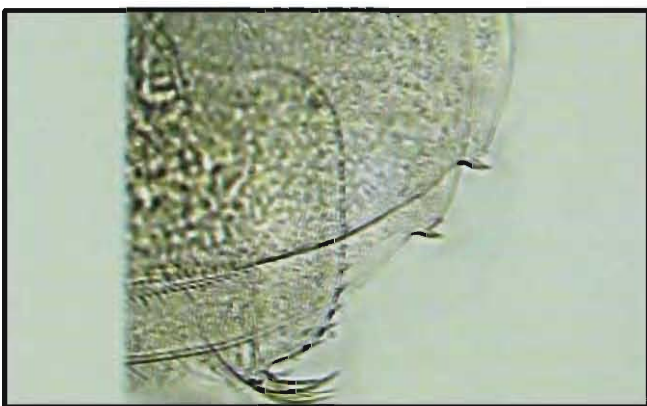


Fig. 639 : *D. serrata* Daday, postabdomen



Fig. 640 : *Ephemeroporus barroisi* (Richard)



Fig. 641 : *Ephemeroporus barroisi* (Richard), postabdomen

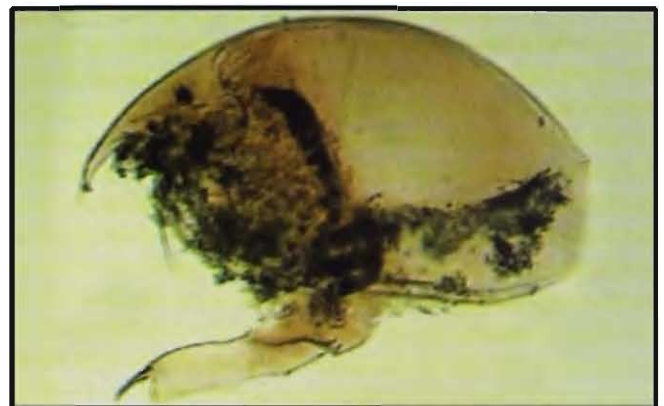


Fig. 642 : *Disperalona caudata* Smirnov



Fig. 643 : *Disperalona caudata* Smirnov, postabdomen

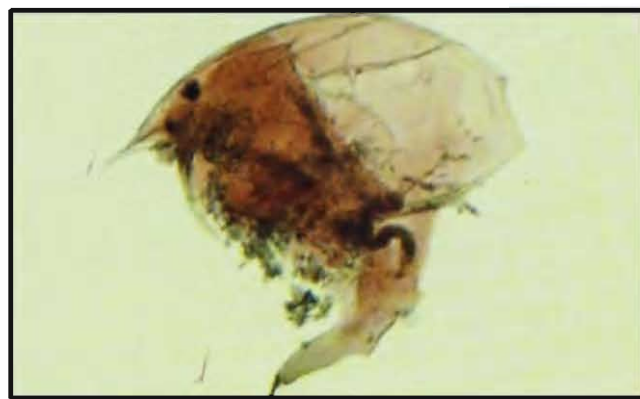


Fig. 644 : *Picripleuroxus laevis* Sars



Fig. 645, *P. laevis* Sars, postabdomen



Fig. 646 : *P. similis* Vavra



Fig. 647 : *P. similis* Vavra, postabdomen

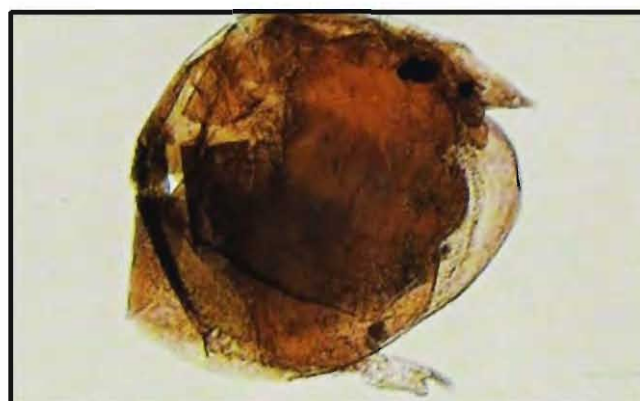


Fig. 648 : *Pseudochydorus globosus* (Baird)



Fig. 649 : *P. globosus* (Baird), postabdomen



Fig. 650 : *Acroperus harpae* (Baird)



Fig. 651 : *Acroperus harpae* (Baird), postabdomen

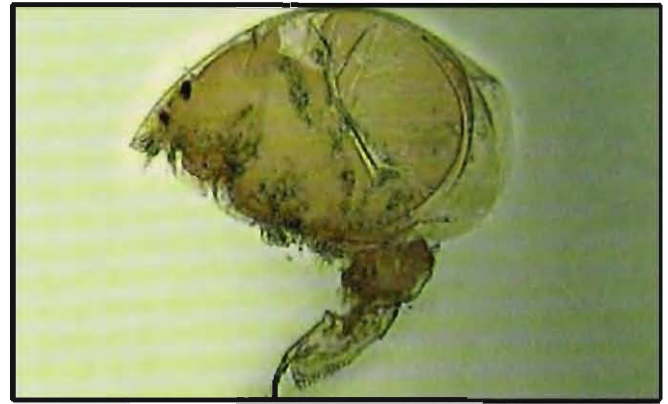


Fig. 652 : *Alona costata* Sars

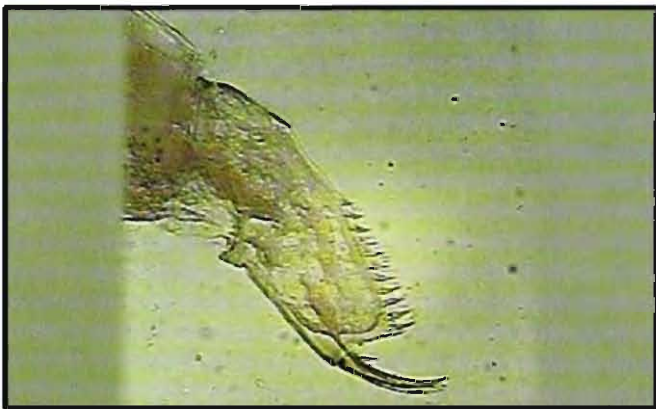


Fig. 653 : *A. costata* Sars, postabdomen

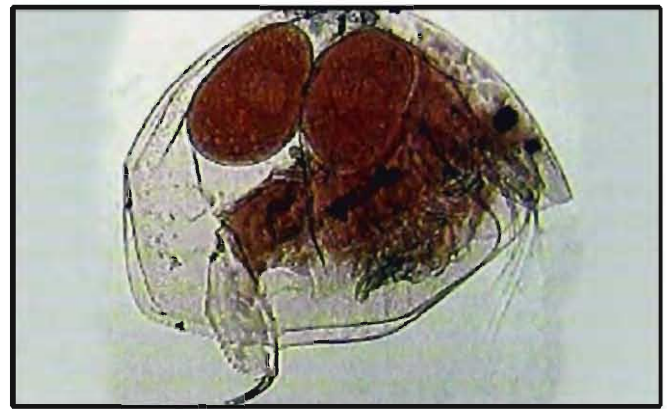


Fig. 654 : *A. davidi* Richard

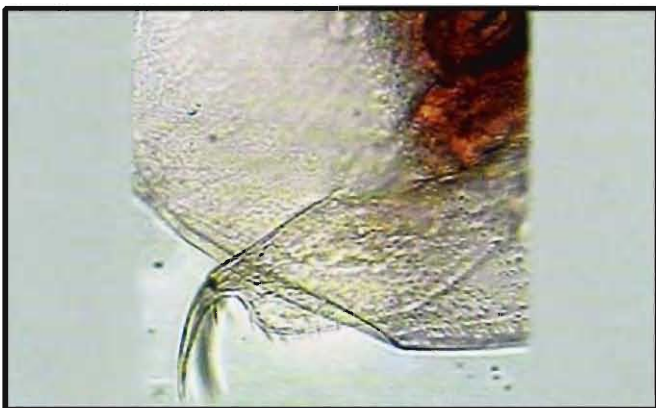


Fig. 655 : *A. davidi* Richard, postabdomen



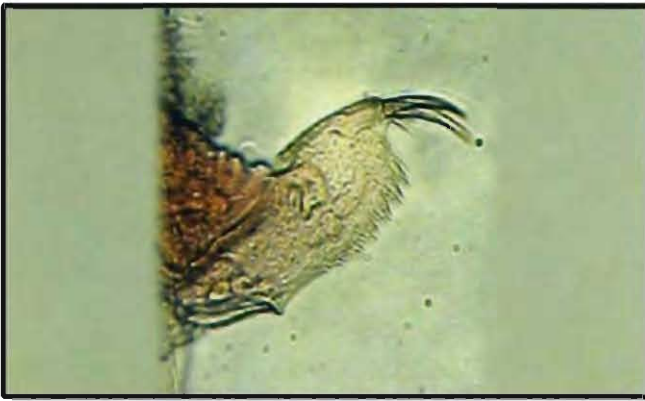
Fig. 656 : *A. globulosa* (Daday)



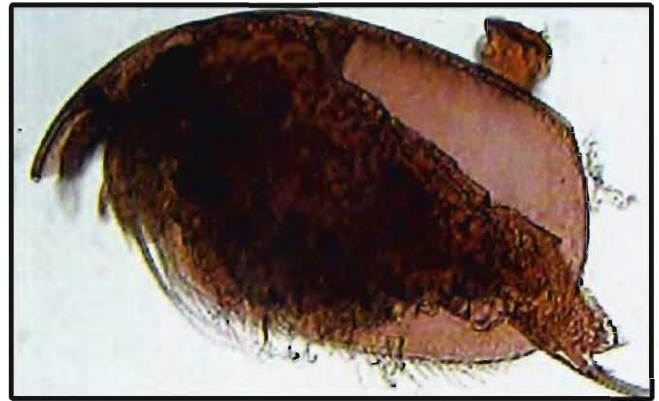
Fig. 657 : *A. globulosa* (Daday), postabdomen



Fig. 658 : *A. rectangula* Sars



**Fig. 659** : *Alona rectangularis* Sars, postabdomen



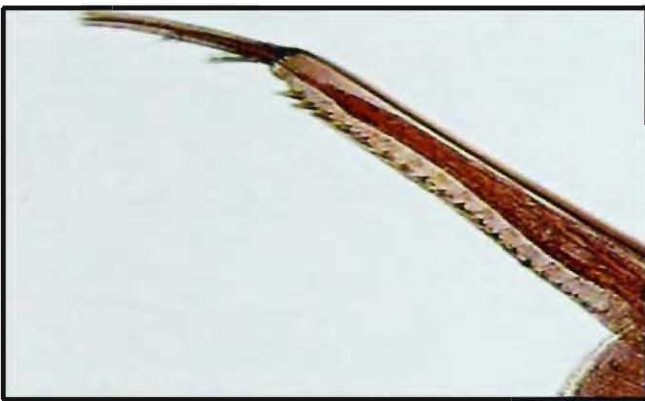
**Fig. 660** : *A. guttata* Sars



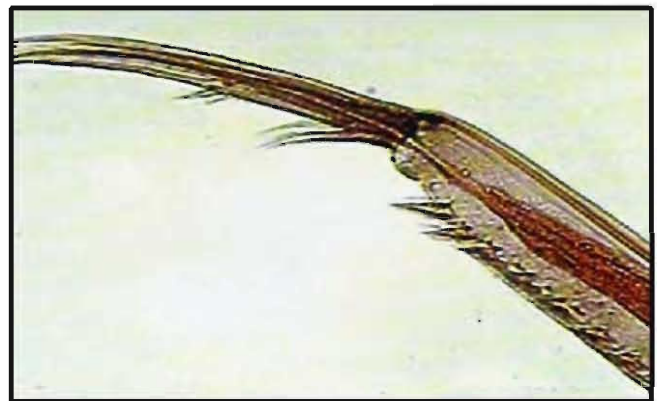
**Fig. 661** : *A. guttata* Sars, postabdomen



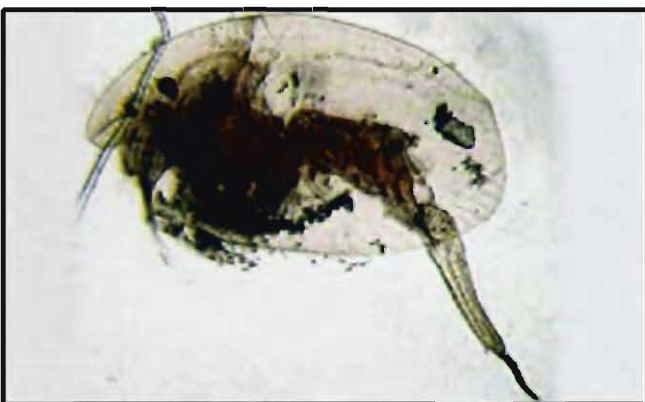
**Fig. 662** : *Camptocercus uncinatus* Smirnov



**Fig. 663** : *C. uncinatus* Smirnov, postabdomen



**Fig. 664** : *C. uncinatus* Smirnov, postabdomen (enlarged)



**Fig. 665** : *C. uncinatus* Smirnov, male



**Fig. 666** : *C. uncinatus* Smirnov, postabdomen (male)



Fig. 667 : *Euryalona orientalis* (Daday)



Fig. 668 : *E. orientalis* (Daday), postabdomen



Fig. 669 : *Graptoleberis testudinaria* (Fischer)

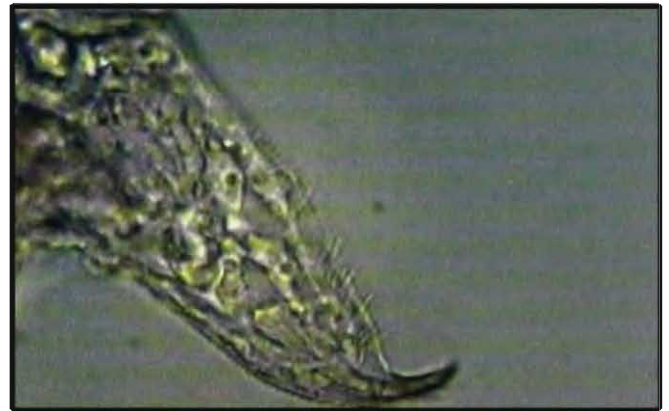


Fig. 670 : *G. testudinaria* (Fischer), postabdomen



Fig. 671 : *Kurzia longirostris* (Daday)



Fig. 672 : *K. longirostris* (Daday), postabdomen

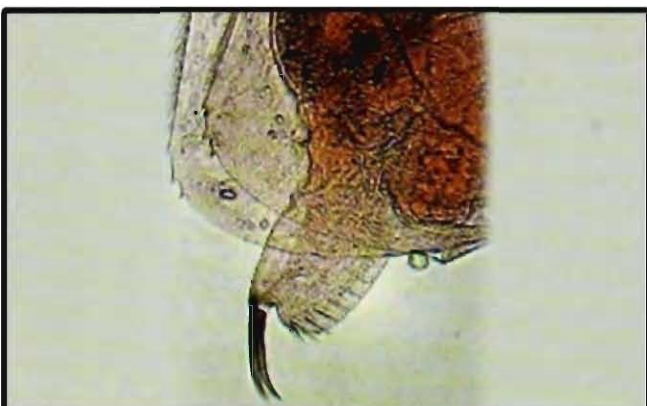


Fig. 673 : *Karualona karua* (King), postabdomen



Fig. 674 : *Leydigiopsis curvirostris* Sars



Fig. 675 : *Leydigiopsis curvirostris* Sars, postabdomen



Fig. 676 : *Leydigia acanthocercoides* (Fischer)



Fig. 676 : *L. acanthocercoides* (Fischer), postabdomen



Fig. 678 : *Oxyurella singalensis* (Daday), postabdomen



Fig. 679 : *Arcella discoides* Ehrenberg



Fig. 680 : *A. hemispherica* Perty

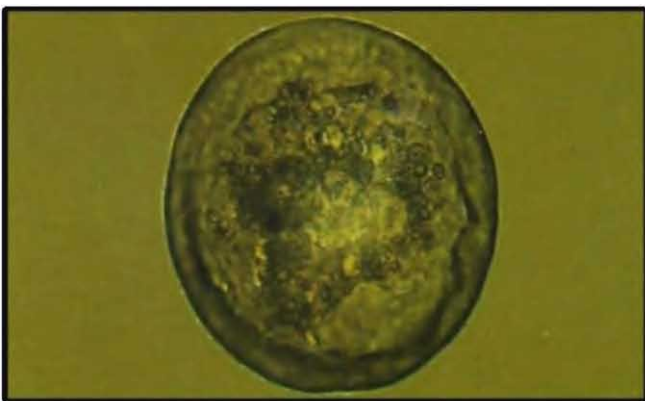


Fig. 681 : *A. vulgaris* Ehrenberg



Fig. 682 : *Centropyxis aculeata* (Ehrenberg)



Fig. 683 : *Centropyxis ecornis*



Fig. 684 : *C. cassis* (Wallich)



Fig. 685 : *Diffugia acuminata* Ehrenberg

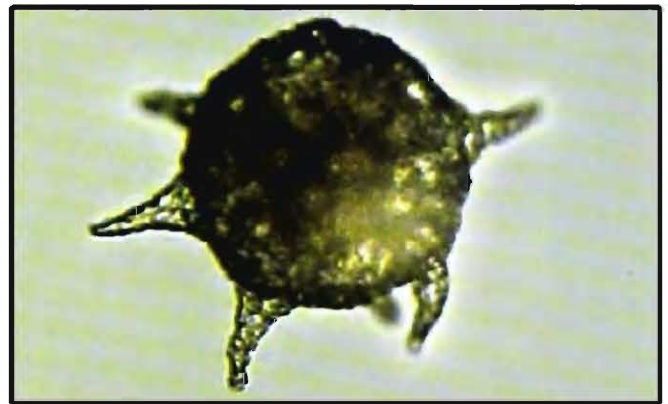


Fig. 686 : *D. corona* Wallich



Fig. 687 : *D. oblonga* Ehrenberg

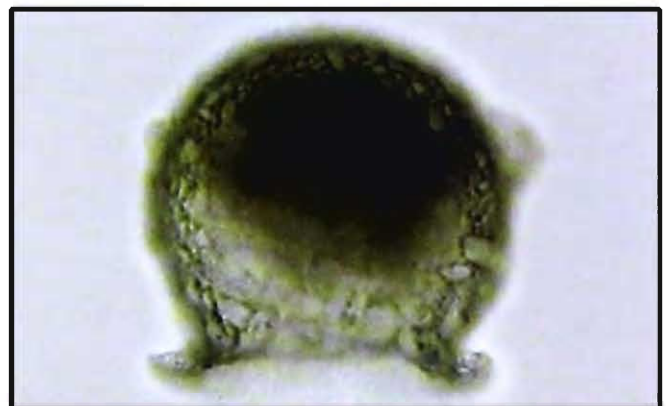


Fig. 688 : *D. urceolata* Carter



Fig. 689 : *Euglypha acanthophora* Dujardin



Fig. 690 : *Lesquereusia spiralis* (Ehrenberg)

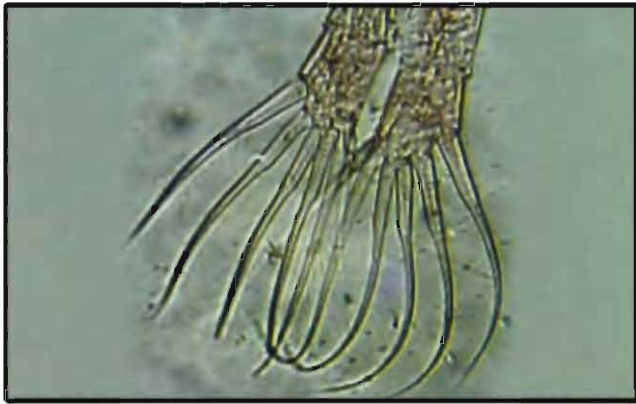


Fig. 691 : *Heliodiaptomus viduus* (Gurney), female-caudal rami

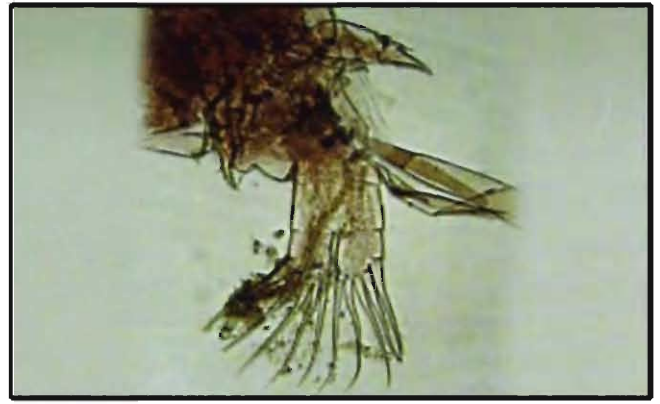


Fig. 692 : *H. viduus* (Gurney), male posterior part



Fig. 693 : *H. viduus* (Gurney), leg V



Fig. 694 : *H. viduus* (Gurney), male-caudal rami



Fig. 695 : *H. contortus* (Gurney), male-urosome and caudal

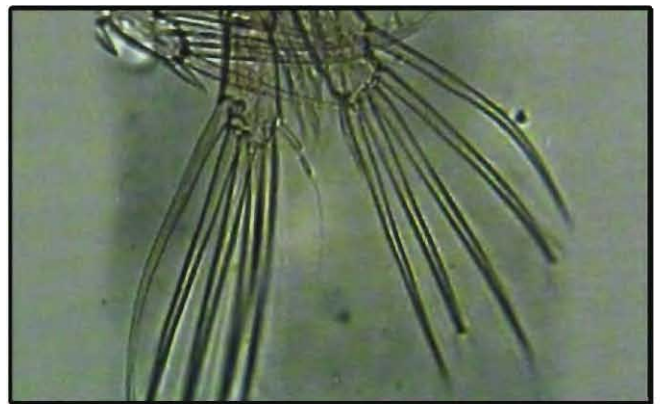


Fig. 696 : *H. contortus* (Gurney), female-caudal rami and setae



Fig. 697 : *Mesocyclops leuckarti* (Claus), female-cephalothorax



Fig. 698 : *M. leuckarti* (Claus), genital double somite

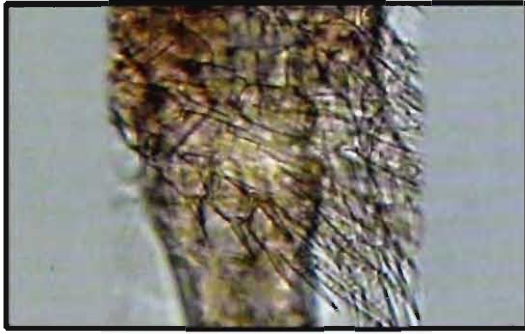


Fig. 699 : *Mesocyclops leuckarti* (Claus), thoracic legs

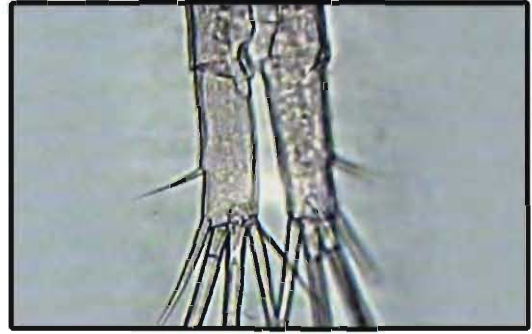


Fig. 700 : *M. leuckarti* (Claus), caudal rami



Fig. 701 : *M. leuckarti* (Claus), caudal rami and setae



Fig. 702 : *Microcyclops varicans* Sars, female



Fig. 703 : *M. varicans* Sars, pediger and genital double somite

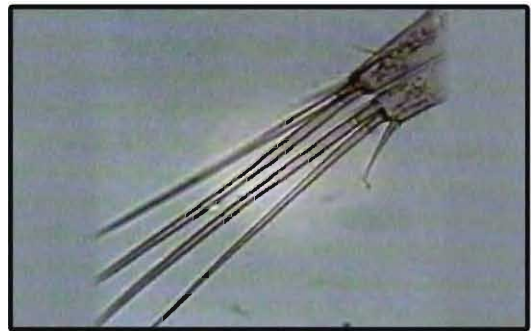


Fig. 704 : *M. varicans* Sars, caudal setae



Fig. 705 : *M. varicans* Sars, leg V

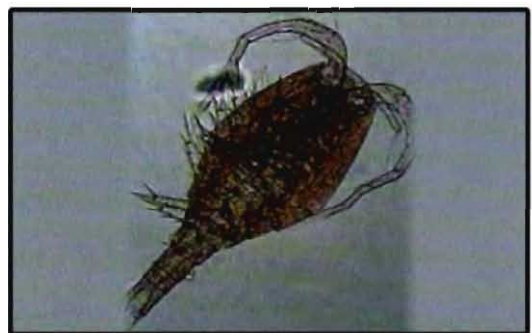


Fig. 706 : *Thermocyclops decipiens* Kiefer, female

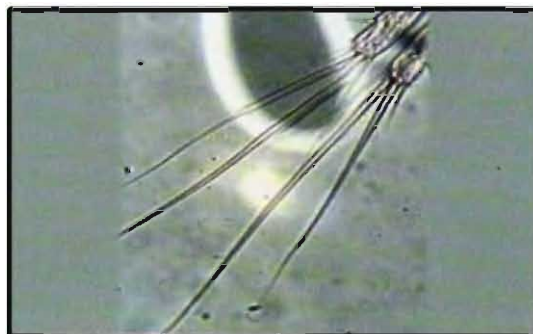


Fig. 707 : *T. decipiens* Kiefer, caudal setae

## B. Diversity of Zooplankton in selected floodplain lakes

The floodplain lakes sampled seasonally, during 2004-05, for ecosystem diversity of zooplankton are characterized by low ionic concentrations with notable variations in their specific conductivity (28.0-193.0  $\mu\text{S} / \text{cm}$ ); the lowest and peak values are noticed in Horinchora and Ghorajan respectively. The mean conductivity varies between 33.2-145.7  $\mu\text{S} / \text{cm}$  with  $> 100 \mu\text{S} / \text{cm}$  conductivity in ten beels. The observed range broadly concurs with earlier seasonal observations in fifteen floodplain lakes of Assam (Sharma, 2005) while mean values are relatively lower than the latter. All the beels, however, can be assigned to 'Class I' category of trophic classification *vide* Talling and Talling (1965).

Water temperature ranges between 16.4 - 33.2°C during the study period. Hydrogen ion concentration (6.0-8.4) indicates slightly acidic, circum-neutral and slightly alkaline nature of nine, four and two beels respectively as against five, one and nine lakes of the stated categories sampled in the previous investigations (Sharma, 2005). Dissolved oxygen (range 4.0 - 11.4, mean: 5.5 - 8.5 mg/l) shows well oxygenated waters of various floodplain lakes. Alkalinity (22.0 - 132.0 mg/l) and hardness (15.8 - 80.0 mg/l) indicate soft water nature of nine beels, only three of them show slightly alkaline / hard-water while the rest three record marginal conditions. Our results broadly correspond with earlier results of Sharma and Hussain (1999), Sharma (2000a, 2001a, 2005), and Sharma and Sharma (2001) except for marginal variations in certain abiotic factors.

### Zooplankton

Zooplankton communities of the seasonally sampled beels reveal a total of 209 species belonging to 75 genera and 34 families which, in turn, comprise 76.5%, 79.8% and 97.1% of overall richness respectively recorded in this study. The documented taxa re-affirm our earlier remarks on environmental heterogeneity and microhabitat diversity of the floodplain lakes of Assam. Total richness in different beels varies between 102-156 ( $125 \pm 13$ ) species; Ghorajan records peak (156 species) while lowest richness is noticed in Kakerikhola. Bamoni, Padma, Hakama and Daphlang indicate 130, 129, 126 and 120 species respectively while the richness varies between 105-118 species in the rest. The recorded qualitative differences reflect habitat variations of individual beels. Further, our results reflect distinctly higher zooplankton micro-faunal diversity as compared with the reports from the floodplains of Kashmir (Khan, 1987), Assam (Goswami, 1985, 1997; Sarma, 2000; Sharma *et al.* 2000), Manipur (Shyamananda Singh, 1991), West Bengal (Khan, 2002, 2003) and Bihar (Sanjer and Sharma, 1995; Siddiqui and Ramakrishna, 2002).

The present observations depict significant temporal variations of zooplankton richness in different beels ( $F_{14,59} = 6.202$ ,  $P < 0.005$ ) as well as between seasons ( $F_{3,59} = 13.756$ ,  $P < 0.005$ ). The richness varies between 62 - 82 ( $68 \pm 6$ ), 64 - 80 ( $71 \pm 8$ ), 50 - 85 ( $69 \pm 10$ ) and 53 - 75 ( $60 \pm 6$ ) species during autumn, winter, summer and monsoon seasons respectively and thus exhibits lowest richness in 13 beels during the rainy season. On the other hand, other

seasons show no distinct mean variations of maximum richness although peak is recorded in eight beels during winter while six beels exhibit summer maxima. Mean seasonal richness in different beels varies between  $59 \pm 5$  species (Kakerikhola) -  $83 \pm 5$  species (Ghorajan).

Zooplankton communities of the different beels record 57.3 - 78.6% similarity (*vide* Sorenson's index); peak value is noticed between Ghorajan and Urmal while lowest similarity is recorded between Urmal and Solmari. The recorded range fails to depict true extent of similarity as in a majority of instances (79.0 %) included in the matrix, the similarity actually ranges between 60 - 70%. The higher similarity apparently results from occurrence of 55 species in all lakes and nearly common occurrence of various other cosmopolitan species. Further, zooplankton communities of Horinchora record the lowest range of similarity (58.7 - 69.1%) while Kamranga exhibits the highest range (64.0 - 78.6%) with the other lakes of Assam. In general, the observed similarity exhibits a broad indication of habitat diversity of the sampled lakes.

Individual abiotic factors hardly exert any noticeable influence on zooplankton richness in general. This is ascertained by the fact that amongst the recorded factors, total and mean seasonal zooplankton richness depict significant inverse correlations only with dissolved oxygen ( $r = -0.705$ ,  $r = -0.714$ ). On the other hand, multiple regression registers moderately higher cumulative effect of six abiotic factors (water temperature, pH, specific conductivity, dissolved oxygen, alkalinity and hardness) on their total ( $R^2 = 0.626$ ) as well as mean richness ( $R^2 = 0.610$ ). The stepwise regression, however, reiterates distinct significance of dissolved oxygen in both the instances and also indicates certain extent of importance of pH and specific conductivity.

Zooplankton abundance records significant seasonal variations ( $F_{3,59} = 4.854$ ,  $P < 0.005$ ) but indicates insignificant variations in different beels ( $F_{14,59} = 3.659$ ); their density ranges between 188 - 411 n/l. Mean zooplankton density, however, varies between  $227 \pm 21$  (Hakama) -  $301 \pm 66$  n/l (Chatla) in the different lakes. The density ranges between 188-411, 208-419, 198-364 and 210-317 n/l during autumn, winter, summer and monsoon seasons respectively. Peak mean density ( $301 \pm 54$  n/l) is observed during summer while mean abundance shows no significant variations in the sampled beels during other seasons. The quantitative abundance noticed in this study is higher than the results of Sharma and Hussain (2001) while it is lower than the findings of Khan (2003). The present results show no significant influence of any individual abiotic parameter on seasonal variations in abundance of zooplankton. On the other hand, multiple regression exhibits higher cumulative of six factors ( $R^2 = 0.7708$ ) while stepwise regression records significant influence of hardness and alkalinity and to a less degree of pH on density of zooplankton.

### Rotifera

The rotifers are represented by 127 species belonging to 32 genera and 21 families and thus comprise a qualitatively dominant group of zooplankton in all the floodplain lakes; this

feature concurs with the results Sharma (2000a, 2005), Sharma and Sharma (2001, 2005a) and Khan (2002, 2003). The rotifer communities are characterized by higher richness of Lecanidae > Colurellidae > Brachionidae > Trichocercidae in the stated order of dominance. These four families together constitute about 64.6% of the recorded species. Amongst the significant genera, *Lecane* > *Lepadella* > *Trichocerca* > *Brachionus* deserve special mention for their qualitative contributions (72 species, 56.7%). Cosmopolitan elements (87 species) predominate the rotifer richness while Pantropical > Tropicopolitan species are well represented (25.0%). Further, seven biogeographically interesting species are examined presently. The stated salient features broadly confirm with earlier results of Sharma (2005) except for lower rotifer richness than the former report of 164 species belonging to 39 genera and 20 families. Besides, our results show relative paucity of *Brachionus* spp. and lack of any Australasian element; the former aspect is attributed to slightly acidic to circumneutral nature of majority of the sampled beels as against alkaline characters of certain number of beels sampled earlier (Sharma *loc. cit*). The present conclusions on composition of the rotifer communities of the seasonally sampled lakes endorse our general remarks on overall faunal diversity of Rotifera in the floodplain lakes of Assam documented in this study.

The present observations reveal that the rotifer richness in different beels ranges between 69 - 93 ( $75 \pm 6$  species) which, in turn, broadly concurs (67 - 103,  $79 \pm 11$  species) with the earlier results in other fifteen floodplain lakes of Assam (Sharma, 2005). The qualitative diversity documented in both the investigations is, however, significantly higher than the records of 24 - 35 ( $30 \pm 4$ ) species from five floodplain lakes of upper Assam (Sharma, 2000b) and 54 - 65 ( $56 \pm 3$ ) species from seven beels of upper and lower Assam (Sharma and Sharma 2001) as well as than the findings of Khan (2002, 2003) from Southeastern West Bengal. Any comparison with other Indian literature is handicapped due to insufficient analysis of the rotifer communities. These salient differences are clearly endorsed by incomplete inventories reporting merely 29 species from four beels (Goswami, 1997), 48 species from thirty-seven beels (Sarma, 2000), and 9 species from one beel (Goswami and Goswami, 2001) of Assam state. In addition, this disparity is confirmed by the reports of only 27 species from two floodplain lakes of Kashmir (Khan, 1987) while the lists by Sanjer and Sharma (1995) and Baruah and Das (2001) are incomplete to ascertain correct extent of the examined taxa.

The Rotifera richness shows significant variations in different seasons ( $F_{3,59} = 12.827$ ,  $P < 0.005$ ) and in different beels ( $F_{14,59} = 5.863$ ,  $P < 0.005$ ). The rotifers significantly influence qualitatively richness of zooplankton in the sampled lakes ( $r = 0.964$ ). The number of species ranges between 30-64 in individual beels in different seasons with occurrence of 40 - 57 ( $44 \pm 5$ ), 36 - 64 ( $47 \pm 7$ ), 37 - 62 ( $47 \pm 8$ ) and 30 - 51 ( $36 \pm 6$ ) species during autumn, winter, summer and monsoon respectively. The minimum richness is noticed during the rainy season while mean values show no definite periodicity during the remaining seasons. The peak richness is recorded in eleven and four beels during winter and summer respectively while minima are recorded in thirteen beels during monsoon and one beel each during winter and summer. Further, maximum mean richness is noticed in Ghorajan ( $58 \pm 5$  species) while its

minimum value is recorded in Hiragota ( $38 \pm 5$  species). The significance of temporal variations concurs with the results of Sharma (2005).

The rotifer communities indicate similarity values ranging between 56.8 - 83.6 % (*vide* Sorenson's index). The peak similarity is recorded between Urmal and Padma and minimum similarity is observed between Horinchora and Ghorajan. Only 2 and 4 instances indicate a similarity < 60% and > 80% respectively while in majority of instances (61.9%), the similarity varies between 70 - 80 %; higher similarity can be attributed to common occurrence of nearly one-third of the recorded rotifer species in all the sampled beels. The last aspect is in contrast to the results of Sharma (2005) indicating similarity between 60 -70 % in majority of the cases. In general, the community similarity corresponds with earlier report of 54.4 - 86.5 % similarity reported by Sharma (*loc cit*) while the present range is higher than that of 42.9 - 80.4 % (Sharma and Sharma, 2001) and 37.3 - 68.8 % (Sharma, 2000 b) reported earlier from the beels of upper Assam.

Amongst the recorded abiotic factors, total rotifer richness and mean seasonal richness in different beels registers significant inverse correlations only with dissolved oxygen ( $r = -0.642, -0.695$ ). Multiple regression indicates relatively moderate cumulative influences on total ( $R^2 = 0.548$ ) and mean richness ( $R^2 = 0.631$ ). The stepwise regression again exhibits the significant influence of dissolved oxygen on the richness of rotifer communities in the sampled floodplain lakes and while this study also shows importance of pH. On the other hand, earlier observations (Sharma, 2005) indicated an inverse correlation with pH and relatively corresponding cumulative influence ( $R^2 = 0.579$ ).

The rotifer abundance ranges between 98 - 245 n/l in the different beels as against marginally wider range (68 - 329 n/l) noticed earlier (Sharma, 2005). The abundance exhibits significant temporal variations between seasons ( $F_{3,59} = 3.785, P < 0.01$ ) and insignificant variations between beels ( $F_{14,59} = 0.986$ ). Hakama (98-121 n/l), Sitalmari (95-183 n/l), and Urmal (97-188 n/l) record lower abundance while Chatla (129-245 n/l) indicates highest abundance. The recorded density is higher than the reports of Yadava *et al.* (1987), Baruah *et al.* (1993), Sinha *et al.* (1994) and Goswami and Goswami (2001) and Sharma and Hussain (2001) while the abundance is lower than the results of Khan (1987) and Sanjer and Sharma (1995). Mean seasonal abundance varies between  $109 \pm 8$  n/l (Hakama) -  $169 \pm 45$  n/l (Chatla).

Our observations indicate rotifer densities varying between 95 - 246 ( $121 \pm 35$ ), 97 - 214 ( $136 \pm 28$ ), 110 - 188 ( $152 \pm 25$ ) and 98 - 151 ( $123 \pm 18$ ) n/l during autumn, winter, summer and monsoon seasons respectively thus indicating summer abundance of the rotifer communities. Further, eight beels exhibit summer maxima while five beels show maximum rotifer abundance during winter.

The rotifers form a dominant quantitative component (mean: 47.9 - 55.8%) of zooplankton in all the sampled beels; this feature concurs with the earlier results (41.1-65.9%) of Sharma (2005). A distinct quantitative significance of Rotifera noticed in this study also confirms with the findings of Khan (1987), Sanjer and Sharma (1995) and Sharma and Sharma (2001).

On the contrary, this feature differs from their sub-dominant role reported by Yadava *et al.* (1987), Baruah *et al.* (1993), Sharma (2000a) and Khan (2002). The lowest and peak percentage contributions are noticed in Urmal and Chatla respectively. In general, the present results indicate the peak density during summer in eight beels and during winter in five beels while lowest abundance is noticed during autumn in eight beels and during monsoon in five beels.

The present results show no significant influence of any individual abiotic parameter on seasonal variations in abundance of Rotifera. On the other hand, multiple regression exhibits higher cumulative impact of six factors ( $R^2 = 0.777$ ) while stepwise regression records significant influence of hardness and alkalinity and to a less degree of pH on variations of the rotifer densities. The cumulative influence broadly concurs with earlier results ( $R^2 = 0.798$ ) of Sharma (2005) while the rotifer density showed significant direct relationships with water temperature, specific conductivity, dissolved oxygen and alkalinity.

The species diversity of Rotifera ranges between 1.899 - 3.124 and registers significant temporal variations between the sampled beels ( $F_{14,59} = 5.175$ ,  $P < 0.005$ ) as well as between seasons ( $F_{3,59} = 44.427$ ,  $P < 0.005$ ). The mean seasonal values of species diversity vary between 2.087 (Urmal) - 2.698 (Sitalmari); the range broadly concurs with earlier report (Sharma, 2005) of mean values of 2.036 - 2.642. Further, the rotifer diversity ranges between  $2.289 \pm 0.203$ ,  $2.763 \pm 0.324$ ,  $2.666 \pm 0.338$  and  $2.020 \pm 0.069$  during autumn, winter, summer and monsoon seasons respectively. It shows peak during winter and minima during the rainy season; this generalization is supported by the fact twelve beels exhibit maximum species during winter and twelve beels record their minima during monsoon.

Our results are characterized by higher evenness of the rotifer communities (0.781 - 0.991) and its mean seasonal values range between  $0.828 \pm 0.043$  (Bamoni) -  $0.970 \pm 0.022$  (Chatla) in the sampled lakes. ANOVA indicates significant variations of evenness in the different beels ( $F_{14,59} = 5.469$ ,  $P < 0.005$ ) while it shows insignificant seasonal variations ( $F_{3,59} = 2.564$ ). Further, it records significant direct correlation with species diversity ( $r = 0.415$ ). Mean evenness shows peak during monsoon season ( $0.907 \pm 0.036$ ), records marginal decline during summer ( $0.900 \pm 0.028$ ) while it records little differences during autumn ( $0.883 \pm 0.037$ ) and winter ( $0.887 \pm 0.047$ ).

The present study exhibits low dominance of Rotifera (0.066 - 0.110) and its mean seasonal values range between  $0.091 \pm 0.009$  -  $0.157 \pm 0.069$ . Further, the dominance varies between 0.096 - 0.261, 0.076 - 0.210, 0.065 - 0.164 and 0.087 - 0.187 during autumn, winter, summer and monsoon and thus records very little seasonal variations. ANOVA registers its insignificant variations between seasons as well as the different lakes. The dominance exhibits a significant inverse correlation with evenness ( $r = -0.832$ ).

The features of higher evenness and lower dominance of Rotifera in the sampled beels confirm with earlier reports of mean values of 0.840 - 0.925 and 0.109 - 0.216 of evenness and dominance respectively recorded by Sharma (2005).

## Cladocera

Cladocera comprise the second important qualitative group of zooplankton in all the sampled lakes and contribute significantly to the richness of the latter ( $r = 0.917$ ). These micro-crustaceans are represented by 49 species belonging to 30 genera and seven families and, hence, exhibit rich and diverse taxocoenosis. The reported species represent 87.5% of overall cladoceran richness examined by the authors from the floodplain lakes of Assam. The rich diversity of Cladocera, in turn, provides yet another indicator of greater environmental heterogeneity and habitat diversity of the sampled beels. These remarks in particular re-endorse our results of this study based on qualitative diversity of zooplankton as well as Rotifera.

The cladoceran richness documented in this study is distinctly higher than the record of 14 species from 37 floodplain lakes (Sarma, 2000) of Assam, 9 species from 65 wetlands of 24-Parganas district (Nandi *et al.* 1993) of West Bengal as well as 36 species from 20 wetlands, including 25 species from four ox-bow lakes Southeastern West Bengal Khan, 2003); 39 species from 30 wetlands of the Keoladeo National Park, Rajasthan (Venkataraman, 1992) and 29 species from 25 water bodies of Melaghat Tiger reserve, Maharashtra (Rane, 2005). Even the peak diversity of 31 species recorded presently from Ghorajan differs prominently than only 9 species listed earlier by Shyamananda Singh (1991 a) from Loktak lake, Manipur as well as 11 species from two floodplain lakes (Khan, 1987) of Kashmir; one (Baruah *et al.* 1993), four (Sinha *et al.* 1994) and twelve species (Sanger and Sharma, 1995) from a floodplain lake Bihar, three species from Mori beel (Goswami and Goswami, 2001) from Assam.

The cladoceran richness in the different beels varies between 21-39 ( $27 \pm 4$ ) species and registers significant temporal variations between seasons ( $F_{3, 59} = 9.303$ ,  $P < 0.005$ ) and lakes ( $F_{14, 59} = 5.013$ ,  $P < 0.005$ ). The seasonal richness of this group varies between 11 - 26 species in individual beels while their mean richness ranges between  $13 \pm 2$  (Kakerikhola) -  $23 \pm 2$  species (Ghorajan). Further the number of reported species vary between 14 - 22 ( $17 \pm 3$ ), 14 - 26 ( $19 \pm 4$ ), 12 - 25 ( $19 \pm 4$ ) and 11 - 20 ( $15 \pm 3$ ) species during autumn, winter, summer and monsoon seasons respectively in various beels. Peak richness is noticed in seven beels each during winter and summer, thereby, indicating no definite seasonal periodicity. On the other hand, the cladoceran minima are recorded in eleven beels during the rainy season.

Family Chydoridae (27 species) distinctly predominate total cladoceran richness reported presently as well as that of individual lakes (11 - 20,  $15 \pm 2$  species). Peak chydorid richness is observed in Ghorajan, the minima is noticed in Daphlang while the number of species varies between 9 - 11 in the remaining beels. This family, in turn, includes members of only two sub-families i.e., Aloninae (17 species) > Chydorinae (10). The greater qualitative richness of the chydorids confirms with the general composition of the Indian Cladocera (Sharma, 1991b) and also with the studied cladoceran faunas of only two states of N. E. India namely Meghalaya (Sharma and Sharma, 1999b) and Tripura (Venkataraman and Das, 2000). Among other families of this group, only Daphniidae (6 species) merits attention.

Amongst the recorded abiotic factors, total and mean seasonal richness of Cladocera shows significant inverse correlations with dissolved oxygen ( $r = -0.642$ ,  $r = -0.623$ ). In addition, multiple regression indicates relatively lower cumulative influence of six factors on their total ( $R^2 = 0.499$ ) and mean richness ( $R^2 = 0.462$ ) while stepwise regression reasserts significance of dissolved oxygen.

The present observations reflect wider variations in species composition of Cladocera; this fact is endorsed by reasonably wider range (37.0 - 92.6%) of their community similarity (*vide* Sorenson's index). Peak similarity is noticed between Horinchora and Solmari while lowest value is observed between Solmari and Daphlang. The similarity is > 50% in 13 instances (14.3%) included in the matrix while its value < 70% is noticed in 12 instances. On the other hand, it varies between 50-60% in 36 instances (34.3%) and between 70 - 80% in 40 instances (39.0%). Horinchora records the highest range of community similarity (52.6 - 92.6%) while Daphlang exhibits the lowest range (37.0 - 62.9%).

Cladocera indicate abundance ranging between 63 - 121 n/l in different lakes and their mean seasonal abundance between  $80 \pm 11$  -  $101 \pm 12$  n/l; lowest and peak mean densities are recorded in Hakama and Chatla respectively. The abundance record significant seasonal differences ( $F_{3,59} = 2.91$   $P < 0.05$ ) while its exhibits insignificant differences between lakes ( $F_{14,59} = 0.721$ ). The cladocerans comprise between  $30.6 \pm 3.7$  -  $36.7 \pm 1.4$  % of quantitative variations of zooplankton and contribute significantly to abundance of later ( $r = 0.917$ ). Besides, the density varies between 61 - 120 ( $84 \pm 14$  n/l) during autumn and it ranges between 71 - 121 ( $92 \pm 15$ ), 63 - 114 ( $96 \pm 14$ ) and 63 - 103 ( $87 \pm 10$ ) n/l during winter, summer and monsoon seasons in individual lakes sampled presently. The peak abundance is recorded in seven and four beels during summer and winter respectively while lowest densities are noticed during autumn and monsoon in eight and four beels respectively.

The present results indicate no significant influence of any individual abiotic parameter on abundance of Cladocera. On the other contrary, multiple regression exhibits higher cumulative impact of six factors ( $R^2 = 0.740$ ) while stepwise regression records significant influence of hardness and alkalinity and to a less degree of pH on the density variations.

The species diversity of Cladocera records variations between 1.897 - 3.121; lowest and peak values are observed in Hakama and Sitalmari respectively. In addition, the mean seasonal values range between  $1.959 \pm 0.040$  (Horinchora) -  $2.697 \pm 0.206$  (Sitalmari) in different floodplain lakes. The diversity registers significant temporal differences between seasons ( $F_{3,59} = 63.489$ ,  $P < 0.005$  and between beels ( $F_{14,59} = 5.547$ ,  $p < 0.005$ ). Further, the species diversity in individual beels ranges between 1.879 - 2.770 ( $2.181 \pm 0.236$ ), 2.011 - 3.121 ( $2.705 \pm 0.313$ ), 1.910 - 3.001 ( $2.775 \pm 0.285$ ) and 1.901 - 2.462 ( $2.023 \pm 0.135$ ) during autumn, winter, summer and monsoon seasons respectively.

The cladoceran communities are characterized by higher evenness which, in turn, ranges between 0.824 - 0.942 while its mean seasonal values range between  $0.864 \pm 0.036$  (Hiragota)

-  $0.970 \pm 0.022$  (Chatla). ANOVA indicates significant variations of evenness in the different beels ( $F_{14,59} = 3.857$ ,  $P < 0.005$ ) while it shows insignificant seasonal variations ( $F_{3,59} = 1.101$ ). The evenness, however, varies between 0.824 - 0.932, 0.834 - 0.170, 0.880 - 0.971 and 0.824 - 0.942 in individual beels respectively.

The dominance of Cladocera varies between 0.090 - 0.198 and mean seasonal dominance ranges between  $0.096 \pm 0.009$  (Chatla) -  $0.138 \pm 0.037$  (Urmal) in the different beels. It, however, ranges between 0.099 - 0.198, 0.097 - 0.170, 0.090 - 0.104 and 0.093 - 0.142 during autumn, winter, summer and winter respectively in individual floodplain lakes. ANOVA registers its insignificant variations between seasons as well as the different lakes. The dominance registers a significant inverse correlation ( $r = -0.800$ ) with evenness.

### Other Groups

Rhizopoda include 22 species spread over 9 genera and 5 families. Their richness in the different lakes ranges between 7 - 16 ( $10 \pm 2$ ) species; peak richness is noted in Ghorajan, lowest richness is observed in Kakerikhola. Centropyxidae > Euglephidae > Nebelidae = Diffflugidae > Arcellidae, in the stated order contribute to their richness.

Copepoda are represented by eight species belonging to five genera and two families with only two species of Calanoida while Cyclopoida include six species. The richness of this group in the individual lakes varies between 2 - 7 species; lowest and peak diversity is noticed in Bamoni and Ghorajan respectively.

Gastrotricha are represented by only three species of Chaetonotidae and they exhibit only occasional occurrence in the different beels.

To conclude, Zooplankton communities of the floodplain lakes of Assam are characterized by their richest biodiversity. Rotifera, the main qualitative constituent, exhibit highly rich and speciose nature. Cladocera, another important group, depict highly diverse character of their faunal diversity. Rhizopoda and Copepoda also show diverse and interesting species composition. Occurrence of several biogeographically interesting species particularly the presence of Australasian elements is a noteworthy feature. The seasonally sampled selected beels show great heterogeneity of their zooplankton taxocoenosis, coupled with seasonal differences in their richness, abundance, species diversity, dominance and evenness. Individual variations in their community structure may be attributed to their habitat diversity resulting from differences in their macrophytes. The associations of zooplankton taxa as well as of their constituent groups in relation to the diversity of macrophytes merit special attention for the future investigations. The relatively lower abundance of zooplankton is attributed to special features of water quality of the different beels particularly their remarkably low ionic concentrations as well as slightly acidic to nearly circum-neutral waters. Rotifera and Cladocera depict moderately high species diversity but are characterized by higher equitability and lower dominance. Individual abiotic factors exert limited influence but exert moderate to higher cumulative impact on richness and abundance of zooplankton.

## SUMMARY

### Biodiversity of Zooplankton

Two hundred seventy three species of zooplankton belonging to 37 families and 95 genera, recorded in the present study, exhibit the richest biodiversity known till date from the floodplains or other freshwater biotopes of the Indian subcontinent.

Rotifera indicate the highest richness (176 species) of this Phylum known till date from the floodplain lakes of the Indian subcontinent as well as their richest biodiversity known so far from any particular state and / or aquatic ecosystem of India. In addition, they show the richest higher diversity (40 genera and 21 families). Biogeographically interesting rotifers (20 species, 11.4%) include three Australasian elements, six Oriental species, ten palaeotropical and one arctic-temperate species. The Australasian elements depict an interesting link between the rotifer faunas of the North-Eastern India with that of Southeast Asia and Australia.

Rotifera taxocoenosis depicts a general 'tropical character' with dominance of Cosmopolitan species (61.9%) while Pantropical > cosmotropical elements are also well represented (26.3%). Lecane (49 species) and *Brachionus* (13 species), two 'tropic-centered' genera, deserve special mention. Lecanidae (43 species) > Brachionidae (27 species) > Lepadellidae (22 species) > Trichocercidae (11 species) form a dominant fraction (64.2%) of Rotifera in the floodplain lakes of Assam. Twenty species (11.4%) occur in all the beels, 23 species (13.1%) exhibit rare occurrence, 20 species (11.4%) are characterized as acidophilus elements. The study also exhibits several alkaline-eutrophic indicators as well as warm-stenothermal species.

Cladocera reveal 56 species belonging 33 genera and 7 families and indicate the highest richness known till date from the floodplains or other aquatic ecosystems of the Indian subcontinent. *Leydigiopsis curvirostris* is an interesting new record from Asia, *Disperalona caudata* is designated as an Australasian element, four species are new records from Northeastern India and thirty-five species are new records from Assam. Chydoridae show qualitative dominance while Daphniidae (8 species) > Sididae (6 species) = Macrothricidae (6 species), together, form an important component (35.7%). Cladoceran fauna exhibits a general tropical character, records broadly equal occurrence of Cosmopolitan (16.1%) and Pantropical species (16.1%) while cosmotropical species (17.9%) marginally exceed.

Copepoda are represented by 11 species, belonging to 7 genera and 2 families and, include one new record from India while seven species are new records from N. E. India. The distribution range of *Heliodiaptomus contortus* and *Phyllodiaptomus amae* are extended to Northeastern India. *Tropocyclops prasinus* and *Mesocyclops splendidus* are new records from N. E. region; *Thermocyclops crassus* is a new record from India while the distributional range of *T. decipiens* is now extended to eastern Himalayas.

Rhizopoda indicate 27 species belonging to 6 families and 14 genera. One species represents a new record from Northeastern India while 24 species are new records from Assam. Lobosea

(20 species) and Filosea (7 species) register L / F quotient = 2.8. Centropyxidae > Nebelidae = Euglephidae form the dominant fraction (19 species, 70.4% of the reported species). Interestingly, five moss-dwelling species namely *Cyphoderia ampulla*, *Awerintzewia cyclostoma*, *Nebela caudata*, *N. dentistoma* and *Quadrutella bymmetrica* are reported from freshwaters in this study.

Gastrotricha include only three species belonging to the genus *Chaetonotus* (Family Chaetonotidae). *C. gastrocyaneus* is a new record from N. E. India while the other two species represent new records from Assam.

## B. Diversity of Zooplankton

The floodplain lakes sampled seasonally, during 2004-05, are characterized by low ionic contents. Water temperature ranges between 16.4 - 33.2°C. pH indicates slightly acidic, circumneutral and slightly alkaline nature of 9, 4 and 2 beels respectively. Dissolved oxygen shows well oxygenated waters of various lakes. Alkalinity and hardness indicate soft water nature of 9 beels, only 3 of them show slightly alkaline / hard-water while the rest record marginal conditions.

Zooplankton reveal 209 species, 75 genera and 34 families; their richness in the individual beels varies between 102 - 156 ( $125 \pm 13$ ) species and exhibits significant differences between beels as well as between seasons. Further, the richness varies between 62 - 82 ( $68 \pm 6$ ), 64 - 80 ( $71 \pm 8$ ), 50 - 85 ( $69 \pm 10$ ) and 53 - 75 ( $60 \pm 6$ ) species during autumn, winter, summer and monsoon respectively. Zooplankton communities of the different beels record 57.3 - 78.6% similarity (*vide* Sorenson's index). Total and mean seasonal richness depict significant inverse correlations only with dissolved oxygen. Multiple regression registers moderately higher cumulative effect of six abiotic factors on their total ( $R^2 = 0.626$ ) as well as mean richness ( $R^2 = 0.610$ ).

Zooplankton abundance indicates significant seasonal variations but shows insignificant variations between different lakes; the density ranges between 188 - 411 n/l while mean seasonal abundance varies between  $227 \pm 21$  -  $301 \pm 66$  n/l. Peak mean density is observed during summer. The present results show no significant influence of any individual abiotic parameter on seasonal variations in abundance of zooplankton, multiple regression exhibits higher cumulative of six factors ( $R^2 = 0.7708$ ).

Rotifera include 127 species (32 genera and 21 families) and show higher richness (64.6%) of Lecanidae > Colurellidae > Brachionidae > Trichocercidae. *Lecane* > *Lepadella* > *Trichocerca* > *Brachionus* are important genera (72 species, 56.7%). Cosmopolitan elements (87 species) predominate the richness while Pantropical > Tropicopolitan species are well represented (25.0%). Besides, seven biogeographically interesting species are examined presently.

Total rotifer richness in different beels ranges between 69 - 93 ( $75 \pm 6$  species); it shows significant variations in different seasons and in different beels. The richness ranges between

30 - 64 species in individual beels in different seasons with occurrence of 40 - 57 ( $44 \pm 5$ ), 36 - 64 ( $47 \pm 7$ ), 37 - 62 ( $47 \pm 8$ ) and 30 - 51 ( $36 \pm 6$ ) species during autumn, winter, summer and monsoon respectively. The rotifers indicate 56.8 - 83.6% (*vide* Sorenson's index) community similarity. Total richness and mean seasonal richness in different beels registers significant inverse correlations only with dissolved oxygen. Multiple regression indicates relatively moderate cumulative influences of six abiotic factors on total ( $R^2 = 0.548$ ) and mean rotifer richness ( $R^2 = 0.631$ ).

The rotifer abundance ranges between 98-245 n/l in the different beels and exhibits significant temporal variations between seasons and insignificant variations between beels. Mean seasonal abundance varies between 109 - 169 n/l. The rotifer densities vary between 95-246 ( $121 \pm 35$ ), 97-214 ( $136 \pm 28$ ), 110-188 ( $152 \pm 25$ ) and 98-151 ( $123 \pm 18$ ) n/l during autumn, winter, summer and monsoon seasons respectively. The rotifers form a dominant quantitative component (mean: 47.9-55.8%) of zooplankton in all the sampled beels. Our results show no significant influence of any abiotic parameter on seasonal variations in abundance of Rotifera. Multiple regression exhibits higher cumulative impact of six factors ( $R^2 = 0.777$ ).

The species diversity of Rotifera ranges between 1.899 - 3.124 and registers significant temporal variations between lakes as well as between seasons. The mean seasonal species diversity varies between  $2.289 \pm 0.203$ ,  $2.763 \pm 0.324$ ,  $2.666 \pm 0.338$  and  $2.020 \pm 0.069$  during autumn, winter, summer and monsoon seasons respectively. The rotifers exhibit higher evenness (0.781 - 0.991) while its mean seasonal values range between  $0.828 \pm 0.043$  -  $0.970 \pm 0.022$ . It indicates significant variations in the different beels and shows significant seasonal variations. Further, it records significant direct correlation with species diversity. Mean evenness shows peak during monsoon season ( $0.907 \pm 0.036$ ). The present results record low dominance of Rotifera (0.066-0.110); it varies between 0.096 - 0.261, 0.076 - 0.210, 0.065 - 0.164 and 0.087 - 0.187 during autumn, winter, summer and monsoon. The dominance registers insignificant variations between seasons as well as the different lakes and it exhibits significant inverse correlation with evenness.

Cladocera include 49 species belonging to 30 genera and seven families, their richness in the different beels varies between 21 - 39 ( $27 \pm 4$ ) species and registers significant temporal variations between seasons and lakes. The seasonal richness varies between 11 - 26 species in individual beels. The number of species vary between 14 - 22 ( $17 \pm 3$ ), 14 - 26 ( $19 \pm 4$ ), 12 - 25 ( $19 \pm 4$ ) and 11 - 20 ( $15 \pm 3$ ) species during autumn, winter, summer and monsoon seasons respectively in various beels. Peak richness is noticed in seven beels each during winter and summer. Family Chydoridae (27 species) distinctly predominates total cladoceran richness as well as that of individual lakes (11 - 20,  $15 \pm 2$  species). Total and mean seasonal richness of Cladocera show significant inverse correlations with dissolved oxygen. Multiple regression shows relatively lower cumulative influence of six factors on their total ( $R^2 = 0.499$ ) and mean richness ( $R^2 = 0.462$ ). The cladocerans exhibit 37.0 - 92.6% community similarity (*vide* Sorenson's index).

Cladocera abundance ranges between 63 - 121 n/l in different lakes and their mean seasonal abundance varies between  $80 \pm 11$ - $101 \pm 12$  n/l. The abundance records significant seasonal differences while it exhibits insignificant differences between lakes. They comprise between  $30.6 \pm 3.7$  -  $36.7 \pm 1.4\%$  of zooplankton. Besides, their density varies between 61-120 ( $84 \pm 14$  n/l) during autumn and it ranges between 71 - 121 ( $92 \pm 15$ ), 63 - 114 ( $96 \pm 14$ ) and 63 - 103 ( $87 \pm 10$ ) n/l during winter, summer and monsoon seasons in individual lakes. The peak cladoceran abundance is recorded in seven and four beels during summer and winter respectively. The present observations indicate no significant influence of any individual abiotic parameter on abundance of Cladocera. Multiple regression exhibits higher cumulative impact of six factors ( $R^2 = 0.740$ ).

The species diversity of Cladocera varies between 1.897 - 3.121 and registers significant temporal differences between seasons and between beels. Further, the species diversity ranges between 1.879 - 2.770 ( $2.181 \pm 0.236$ ), 2.011 - 3.121 ( $2.705 \pm 0.313$ ), 1.910 - 3.001 ( $2.775 \pm 0.285$ ) and 1.901 - 2.462 ( $2.023 \pm 0.135$ ) during autumn, winter, summer and monsoon seasons respectively. The cladoceran communities are characterized by higher evenness ranging between 0.824-0.942; it indicates significant variations of evenness in the different beels. The dominance varies between 0.090-0.198 and mean seasonal dominance ranged between  $0.096 \pm 0.009$  -  $0.138 \pm 0.037$  in the different beels. It registers insignificant variations between seasons as well as the different lakes and records a significant inverse correlation ( $r = -0.800$ ) with evenness.

Rhizopoda exhibit 22 species belonging to 9 genera and 5 families. Their richness in the different lakes ranges between 7-16 ( $10 \pm 2$ ) species. Centropyxidae > Euglephidae > Nebelidae = Diffflugidae > Arcellidae, in the stated order contribute to the richness of these testate amoebae. Copepoda include 8 species belonging to 5 genera and 2 families with only two species of Calanoida while Cyclopoida include six species. The richness in the individual lakes varies between 2-7 species. Gastrotricha are represented by only three species of Chaetonotidae and they exhibit only occasional occurrence in the different beels.

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