

AMAZONIANA	XI	2	185 – 200	Kiel, Juli 1990
------------	----	---	-----------	-----------------

## Taxonomic Studies of the Rotifera from Shallow Waters on the Island of Maracá, Roraima, Brazil

by

Walter Koste and Barbara Robertson

Dr. Walter Koste, Ludwig-Brill-Str. 5, Quakenbrück, FRG.

M. Sc. Barbara Robertson, Instituto Nacional de Pesquisas da Amazônia, C.p. 478,  
69000 Manaus - Amazonas, Brazil.

(accepted for publication: June 1990)

### Abstract

Four samples collected in the periodically dry, shallow water ecosystems on the island of Maracá (Roraima, Brazil) were investigated for rotifers. This survey is the first in the area. 159 species were identified and the rotifer community is characteristic of small bodies of water with decomposing vegetation.

Most of the rotifer species are cosmopolitan. *Dicranophorus sebastus* (HARRING & MYERS 1928) and *Lecane clara* (BRYCE 1892) are new for the Neotropics. Three new species are described: *Lepadella christinei*, *L. tricostata* and *Testudinella robertsoni*.

**Keywords:** Rotifers, Roraima, Brazil, taxonomic studies, new species.

### Resumo

Apresentamos o resultado do primeiro levantamento da fauna de rotíferos dos ecossistemas aquáticos rasos e sazônicas na ilha de Maracá, Roraima, Brasil. As amostras foram coletadas durante a época de chuva, em junho de 1987. 159 espécies de rotíferos foram identificados: 13 são planctônicas e a grande maioria, 146, formas litoraneas, incluindo gêneros típicos de zonas de decomposição como *Cephalodella*, *Lepadella*, *Mytilina*, *Lecane*, *Testudinella* e as muitas espécies de Bdelloidea.

A maioria dos rotíferos são cosmopolitas. Apenas onze são endêmicos da América do Sul. *Dicranophorus sebastus* (HARRING & MYERS 1928) and *Lecane clara* (BRYCE 1892) são novos para os Neotrópicos, e *Lepadella christinei*, *Lepadella tricostata* e *Testudinella robertsoni* são descritas como espécies novas.

## Introduction

The present survey of the rotifers of shallow water ecosystems on the island of Maracá in Roraima, Brazil, was carried out under the auspices of the cooperation between the Royal Geographic Society (RGS), Brazil's late Secretaria Especial de Meio Ambiente (SEMA), and the Instituto Nacional de Pesquisas da Amazônia (INPA) called the Maracá Rainforest Project (1987 - 1988).

At present, most of the available information on Amazonian rotifers, taxonomical, biological and ecological, comes from rivers and floodplain lakes in the central Amazonian region. Little is known from the more peripheral areas of the basin. Thus the opportunity to collect material on Maracá island was very welcome.

## Study area

The large, fluvial island of Maracá, located at 3° 22' N, 61° 26' W, lies between two channels (Furo Maracá and Furo Santa Rosa) of the Rio Urariquera which drains the Territory of Roraima in northern Brazil (Figs. 1 and 2). The island was decreed an ecological reserve in 1978 and one of its unique features is that it lies on the boundary between the Amazon forest proper and large expanses of dry savanna located east and west on the mainland. The island itself, however, is basically forested with a few patches of dry and wet savanna. Two kinds of wet savanna, one of the few aquatic biotopes on the island, were described by the Vegetation Survey Team (MILLIKEN & RATTER 1989), however only one, the seasonally flooded campo, was sampled by us (Fig. 2). The seasonally flooded campo is basically treeless and although MILLIKEN & RATTER (1989) list approximately 130 species of plants, grasses of the Gramineae dominate. During the peak of the rainy season, May, June and July, most of the campo floods to a maximum depth of about 30 cm. During the rest of the year it tends to dry out although wet patches can remain. Our samples were collected in June at which time the water was warm, 30° C, and well oxygenated, 5.45 mg/l. The pH was nearly neutral, around 6.0, and the conductivity very low, 15  $\mu$ S.

Other aquatic biotopes on the island include small ponds located in the forest. We sampled the most accessible one called "grassy pond" (Fig. 2). Like the seasonally flooded campo, "grassy pond" is also seasonal, drying up during the dry season. However, during the rainy season it became over a meter deep and had an open water area of about 200 m<sup>2</sup>. The limnological data is not very different from that of the campo. The water was also warm, 29° C, and well saturated, 7.25 mg/l, a little more acidic, pH 5.1, and of low conductivity, 10  $\mu$ S.

## Material, methods and abbreviations

All the samples were collected in June, 1987, during the rainy season, with a 55  $\mu$ m plankton net, and are qualitative. All were immediately preserved with formalin (final concentration 7 %).

One sample was collected in the most accessible pond, referred to as "grassy pond", and the other three were collected in the seasonally flooded campo area between the river and the field station (Fig. 2).

Dates and stations sampled:

- 18. 06. 87 Ilha de Maracá "grassy pond"
- 19. 06. 87 Ilha de Maracá savanna 1
- 22. 06. 87 Ilha de Maracá savanna 2
- 22. 06. 87 Ilha de Maracá savanna 3

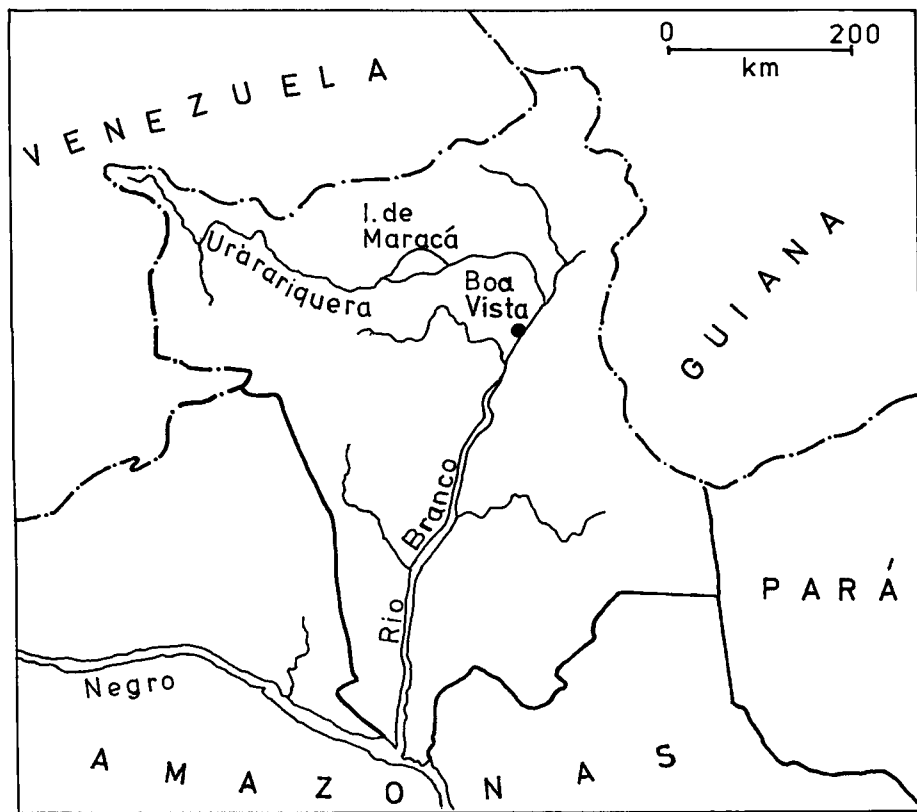


Fig. 1:  
Territory of Roraima, Brazil

For identification of the specimens, about 20 drops of every sample were mixed with glycerine (10 %) and spread on a slide. Specimens of interest were isolated and placed on another slide with a minute drop of distilled water and glycerine (9 : 1). Trophi mounts were prepared with 10 % sodium-hypochlorite, and permanent slides were prepared by the evaporation method described in KOSTE (1978).

The following abbreviations have been used:

lg = length, wi = width, lo = lorica, li = littoral, pl = planktonic, cosm = cosmopolitan, end = endemic, s = sessile, fig = figure.

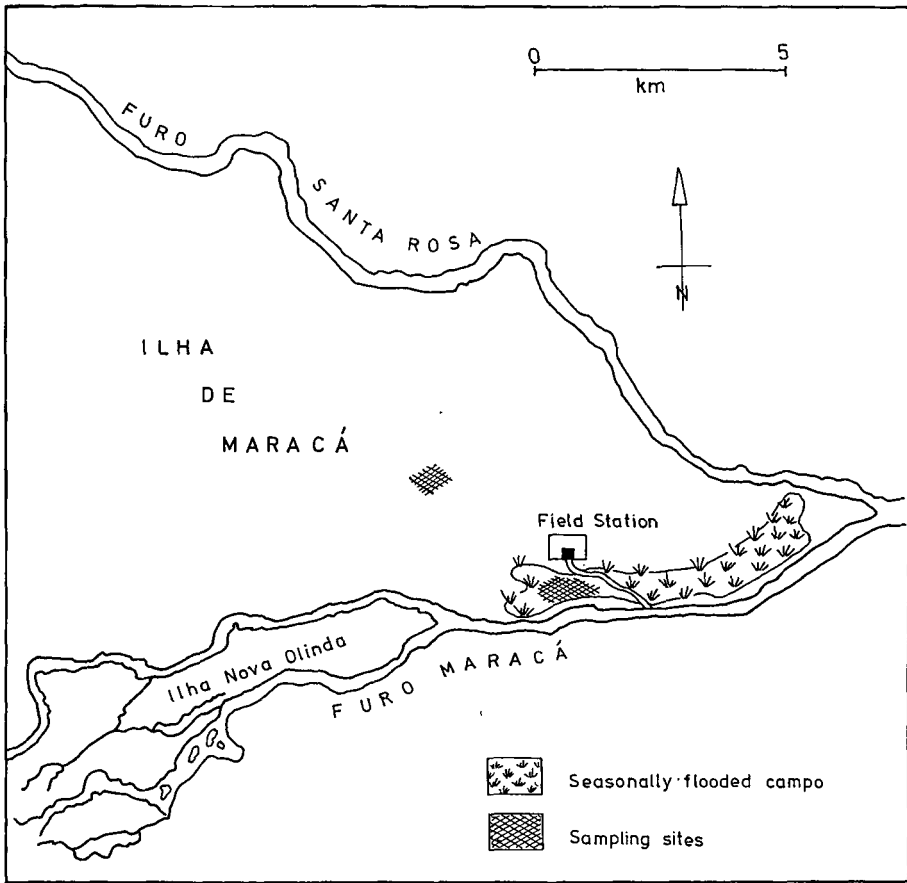


Fig. 2:  
 Eastern end of Maracá island with sampling sites: savanna and "grassy pond". Modified from MILLIKEN & RATTER (1989).

### List of rotifers

The given list of rotifers includes data on relative abundances: very rare animals (1 - 5) are given as numbers, rare animals (5 - 10) = r, common animals (11 - 20) = c, and abundant animals (> 20) = ab, and also includes the following information: littoral = li, planktonic = pl, sessile = s, tropical = trop, endemic of South America = end, cosmopolitan = cosm, grassy pond = g. p., savanna = sav, not identifiable = nid.

Species	samples: g.p.	sav 1	sav 2	sav 3	remarks	fig.
<b>MONOGONONTA</b>						
1. <i>Asplanchna girodi</i>	—	—	—	r	pl, cosm	
2. <i>Beauchampia crucigera</i>	r	r	—	—	li, s, cosm	
3. <i>Brachionus calyciflorus</i> (f. <i>amphiceros</i> )	4	—	—	—	pl, cosm	
4. <i>B. falcatus falcatus</i>	—	r	—	—	pl, trop	
5. <i>B. quadridentatus melhemi</i>	—	r	—	c	pl, trop	
6. <i>B. patulus patulus</i>	c	c	—	c	li, cosm	
7. <i>B. patulus macracanthus</i>	r	—	—	r	li, trop	
8. <i>Cephalodella forficula</i>	—	2	1	—	li, cosm	
9. <i>C. gibba</i>	r	r	4	1	li, cosm	
10. <i>C. gigantea</i>	1	2	—	—	li, cosm	
11. <i>C. mucronata</i>	r	1	—	r	li, trop	
12. <i>C. nana</i>	—	1	—	—	li, cosm	
13. <i>C. panarista</i>	r	r	r	—	li, trop	
14. <i>C. tenuiseta</i>	—	2	—	—	li, cosm	
15. <i>C. nid.</i>	r	r	r	r	li, ?	
16. <i>Collotheca campanulata</i>	2	3	—	—	li, cosm, s	
17. <i>C. edentata</i>	—	1	—	—	li, cosm, s	
18. <i>C. ornata</i>	4	r	—	—	li, cosm, s	
19. <i>C. tenuilobata</i>	c	c	r	r	li, trop, s	
20. <i>C. nid.</i>	r	r	r	r	li, ? , s	
21. <i>Colurella uncinata</i>	5	1	r	r	li, cosm	
22. <i>Conochilus unicornis</i>	—	r	—	—	pl, cosm	
23. <i>Cupelopagis vorax</i>	2	—	—	—	li, trop, s	
24. <i>Dicranophorus caudatus</i>	r	r	r	—	li, cosm	
25. <i>D. forcipatus</i>	r	r	r	r	li, cosm	
26. <i>D. luetkeni</i>	2	—	—	—	li, cosm	
27. <i>D. sebastus</i>	c	—	—	—	li, end ?	fig. 3
28. <i>Dipleuchlanis propatula</i>	c	c	r	1	li, cosm	
29. <i>Enteroplea lacustris</i>	2	—	2	—	li, cosm	
30. <i>Euchlanis incisa</i>	1	r	1	2	li, cosm	
31. <i>Euchlanis meneta</i>	—	—	1	—	li, cosm	
32. <i>Filinia longiseta</i>	—	—	ab	—	pl, cosm	
33. <i>Floscularia conifera</i>	3	r	r	r	li, cosm, s	
34. <i>F. decora</i>	4	1	1	1	li, end, s	
35. <i>F. janus</i>	—	r	—	1	li, cosm, s	
36. <i>F. melicerta</i>	c	—	—	—	li, cosm, s	
37. <i>F. ringens</i>	ab	c	c	c	li, cosm, s	
38. <i>Itura aurita</i>	r	—	—	—	li, cosm	
39. <i>Keratella americana</i>	r	—	—	—	pl, end, trop	
40. <i>K. lenzi</i>	r	—	—	ab	pl, trop	

List of rotifers cont.

Species	samples: g.p.	sav 1	sav 2	sav 3	remarks	fig.
41. <i>K. procurva</i>	—	—	c	—	pl, trop	
42. <i>Lecane acus</i>	—	—	r	r	li, cosm	
43. <i>L. amazonica</i>	—	r	2	1	li, end, trop	
44. <i>L. arcuata</i>	—	—	r	—	li, cosm	
45. <i>L. astia</i>	r	—	—	—	li, end	
46. <i>L. bulla</i>	ab	ab	c	c	li, cosm	
47. <i>L. clara</i>	ab	1	1	ab	li, cosm	fig. 4
48. <i>L. closteroerca</i>	—	—	r	—	li, cosm	
49. <i>L. cornuta</i>	c	c	r	c	li, cosm	
50. <i>L. curvicornis curvicornis</i>	ab	ab	c	c	li, cosm, trop	
51. <i>L. curvicornis nitida</i>	r	r	r	—	li, trop	
52. <i>L. crenata</i>	c	ab	ab	c	li, trop	
53. <i>L. crepida</i>	—	r	r	r	li, trop	
54. <i>L. doryssa</i>	c	r	r	r	li, trop	
55. <i>L. elongata</i>	1	—	r	c	li, trop	
56. <i>L. flexilis</i>	—	—	2	—	li, cosm	
57. <i>L. hamata</i>	—	—	c	3	li, cosm	
58. <i>L. haliclysta</i>	—	1	1	2	li, trop	
59. <i>L. hornemanni</i>	1	1	2	1	li, cosm	
60. <i>L. leontina</i>	c	c	c	c	li, trop	
61. <i>L. ludwigi ludwigi</i>	r	2	c	c	li, trop	
62. <i>L. ludwigi ercodes</i>	—	—	2	—	li, trop	
63. <i>L. kutikova</i>	—	1	—	—	li, trop, end	
64. <i>L. methoria</i>	—	1	—	—	li, trop	
65. <i>L. murrayi</i>	1	—	—	—	li, trop	
66. <i>L. monostyla</i>	r	r	2	r	li, trop	
67. <i>L. elsa</i>	2	—	—	—	li, cosm	
68. <i>L. obtusa</i>	1	3	1	1	li, cosm	
69. <i>L. ohioensis</i>	—	—	2	—	li, cosm	
70. <i>L. papuana</i>	—	—	1	1	li, trop	
71. <i>L. pertica</i>	r	1	3	—	li, trop	
72. <i>L. ploenensis</i>	r	—	2	—	li, trop	
73. <i>L. quadridentata</i>	r	r	r	r	li, cosm	
74. <i>L. rhytida</i>	—	—	4	—	li, trop	
75. <i>L. scutata</i>	—	—	—	3	li, cosm	
76. <i>L. signifera</i>	2	r	r	r	li, trop	
77. <i>L. stichaea amazonica</i>	—	—	1	—	li, trop, end	
78. <i>L. styrax</i>	—	—	2	1	li, trop	
79. <i>L. sympoda</i>	—	1	1	—	li, trop	
80. <i>L. subulata</i>	r	—	4	2	li, cosm	

List of rotifers cont.

Species	samples: g.p.	sav 1	sav 2	sav 3	remarks	fig.
81. <i>L. tenuiseta</i>	—	—	—	3	li, cosm	
82. <i>L. ungulata</i>	r	1	1	4	li, cosm	
83. <i>L. wulferti</i>	r	r	r	r	li, trop, end	
84. <i>Lacinularia flosculosa</i>	—	c	—	—	pl, cosm	
85. <i>Lepadella benjamini</i>	r	1	r	1	li, trop	
86. <i>L. christinei</i> nov. spec.	—	—	r	3	li, trop	fig. 5
87. <i>L. cristata</i>	c	c	c	c	li, trop	
88. <i>L. donneri</i>	r	r	r	1	li, trop, end	
89. <i>L. latusinus</i>	r	—	c	—	li, trop	
90. <i>L. monodactyla</i>	r	r	2	—	li, trop	
91. <i>L. patella</i>	—	—	r	—	li, cosm	
92. <i>L. quadricarinata</i>	r	—	r	3	li, cosm	
93. <i>L. quinquecosta</i>	2	—	3	2	li, cosm	
94. <i>L. rhomboides</i>	r	r	r	—	li, cosm	
95. <i>L. tricostata</i> nov. spec.	—	—	—	r	li, end ?	fig. 6
96. <i>L. triptera</i>	—	1	3	—	li, cosm	
97. <i>Lindia truncata</i>	—	—	2	—	li, cosm	
98. <i>Limnias ceratophylli</i>	r	—	r	—	li, cosm, s	
99. <i>Limnias melicerta</i>	r	r	r	—	li, cosm, s	
100. <i>Macrochaetus collinsi</i>	r	ab	c	—	li, cosm	
101. <i>Manfredium eudactylum</i>	r	—	2	—	li, cosm	
102. <i>Monommata grandis</i>	r	c	c	c	li, cosm	
103. <i>M. maculata</i>	c	c	c	r	li, trop	
104. <i>M. nid.</i>	r	2	1	3	li, trop ?	
105. <i>Mytilina bisulcata</i>	—	—	1	—	li, cosm	
106. <i>M. macrocera</i>	r	—	—	—	li, trop	
107. <i>M. trigona</i>	1	—	—	1	li, cosm	
108. <i>M. ventralis ventralis</i>	r	—	r	r	li, cosm	
109. <i>M. ventralis macracantha</i>	rr	r	r	c	li, cosm	
110. <i>M. ventralis michelangellii</i>	1	—	—	1	li, trop, end	
111. <i>Notommata copeus</i>	rr	r	r	r	li, cosm	
112. <i>N. glyphura</i>	r	r	r	—	li, cosm	
113. <i>N. pachyura</i>	—	1	—	—	li, cosm	
114. <i>N. tripus</i>	r	—	—	—	li, cosm	
115. <i>N. nid.</i>	r	—	—	—	li	
116. <i>Octotrocha speciosa</i>	3	—	—	1	li, trop, s	
117. <i>Platylas leloupi leloupi</i>	rr	r	3	—	li, trop	
118. <i>P. leloupi latiscapularis</i>	2	r	5	c	li, trop, end	
119. <i>Polyarthra</i> nid.	r	—	c	—	pl, cosm	
120. <i>Ptygura barbata</i>	r	—	—	—	li, trop, s	

## List of rotifers cont.

Species	samples: g.p.	sav 1	sav 2	sav 3	remarks	fig.
121. <i>P. longicornis</i>	r	1	—	—	li, cosm, s	
122. <i>P. linguata</i>	c	r	r	r	li, trop, s	fig. 7
123. <i>P. mucicola</i>	r	—	—	—	li, cosm, s	
124. <i>P. tacita</i>	r	r	2	—	li, trop, s	
125. <i>Resticula melandocous</i>	r	r	r	r	li, cosm	
126. <i>Scaridium longicaudum</i>	2	—	4	1	li, cosm	
127. <i>Sinantherina spinosa</i>	r	—	—	c	pl, trop	
128. <i>Taphrocampa selenura</i>	3	—	5	r	li, cosm	
129. <i>Tetrasiphon hydrocora</i>	c	—	2	—	li, cosm	
130. <i>Testudinella ahlstromi</i>	c	—	c	—	li, trop	fig. 9
131. <i>T. mucronata</i>	2	1	2	1	li, cosm	
132. <i>T. ohlei</i>	c	—	—	—	li, trop, end	
133. <i>T. parva</i>	2	c	c	4	li, cosm	fig. 10
134. <i>T. robertsoni</i> nov. spec.	c	—	—	—	li, trop	fig. 8
135. <i>T. patina</i>	c	c	r	c	li, cosm	
136. <i>Trichocerca bidens</i>	2	—	—	1	li, cosm	
137. <i>T. bicristata</i>	2	r	1	r	li, cosm	
138. <i>T. brasiliensis</i>	1	1	3	4	li, trop	
139. <i>T. collaris</i>	c	—	c	1	li, cosm	
140. <i>T. elongata</i>	—	—	—	1	li, cosm	
141. <i>T. flagellata</i>	—	4	r	1	li, trop	
142. <i>T. iernis</i>	2	—	4	—	li, cosm	
143. <i>T. rosea</i>	c	—	c	1	li, cosm	
144. <i>T. scipio</i>	—	3	3	1	li, cosm	
145. <i>T. tenuior</i>	1	—	1	—	li, cosm	
146. <i>T. tigris</i>	—	r	1	2	li, cosm	
147. <i>T. insignis</i>	r	1	c	—	li, cosm	
148. <i>T. similis</i>	r	r	r	r	pl, cosm	
149. <i>Trichotria tetractis</i>	r	—	c	—	li, cosm	

**BDELLOIDEA**

150. <i>Dissotrocha aculeata</i>	r	—	—	—	li, cosm	
151. <i>D. macrostyla</i>	—	—	—	r	li, cosm	
152. <i>Habrotrocha angusticollis</i>	c	—	c	c	li, cosm	
153. <i>Habrotrocha</i> nid.	r	—	—	—	li, cosm	
154. <i>Macrotrachela</i> nid.	r	—	1	—	li, cosm	
155. <i>Philodina</i> nid.	r	r	r	r	li, cosm	
156. <i>Mnjobia</i> nid.	1	—	—	—	li, cosm	
157. <i>Rotaria neptunia</i>	c	—	—	—	li, cosm	



List of rotifers cont.

Species	samples: g.p.	sav 1	sav 2	sav 3	remarks	fig.
158. <i>Rotaria rotatoria</i>	r	r	r	r	li, cosm	
159. <i>Bdelloidea</i> nid.	c	r	c	r	li, cosm	
<b>Bdelloidea:</b>	9	3	5	5	10 li 0 pl	
<b>Monogononta:</b>	106	82	102	79	136 li 13 pl	
<b>Total:</b>	115	85	107	84	146 li 13 pl	

(endemic: 11; tropical (warm-stenothermal): 27; sessile: 14)

### Interpretation of species list

The total number of rotifers identified was 159. Except for a few specimens of the genera *Cephalodella*, *Collotheca*, *Motommata*, *Notommata* and *Polyarthra* which suffered preservation artefacts, most of the rotifers were identified to species level. Only a few are planktonic, 13. The great majority, 146, are littoral forms, and the assemblage is typical for Amazonian small ponds, lagoons and temporary pools.

The *Mytilina*-, *Lepadella*- and *Testudinella* species complex and the many *Bdelloidea* species represent a characteristic "rotten mud" community (KOSTE & ROBERTSON 1983), associated with decomposing vegetation.

The taxocoenosis is composed basically of cosmopolitan forms. 27 species are known only from warm waters, that is they are sub-tropical and tropical warm stenotherms. Eleven (11) species are endemic to South America: *Dicranophorus sebastus*, *Floscularia decora*, *Keratella americana*, *Lecane amazonica*, *Lecane astia*, *Lecane stichaea amazonica*, *Lecane wulferti*, *Lepadella donneri*, *Lepadella tricostata*, *Platyias leloupi laticapularis* and *Testudinella ohlei*.

Three new species were found: *Lepadella christinei*, *Lepadella tricostata*, and *Testudinella robertsoni*. These are described in the next part where some other rare and interesting species are discussed.

### New species and species of special interest

#### *Dicranophorus sebastus* (HARRING & MYERS 1928) (Fig. 3)

This tiny carnivore was found in the "grassy pond" sample. Prey rotifers such as *Lecane* and *Lepadella rhomboides* were visible. The trophi analyses with sodiumhypochlorite allowed us to observe not only the minute trophi (Fig. 3), but also several prey trophi and lorica fragments. Since HARRING & MYERS' original description in 1928 there has been no further report on this species which appears to be known only from acidic waters of the Nearctics.

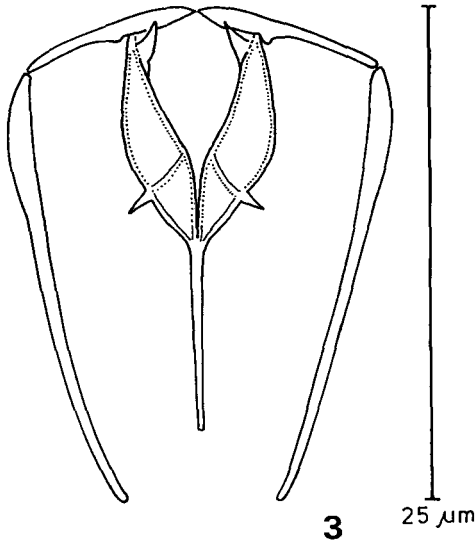


Fig. 3:  
*Dicranophorus sebastus*  
(HARRING & MYERS 1928).  
Trophi lg 23  $\mu\text{m}$ .

Measurements: Total lg 160 - 200  $\mu\text{m}$ , toe lg 26  $\mu\text{m}$ , trophi lg 23  $\mu\text{m}$ .  
Lit.: HARRING & MYERS (1928): 738 - 739, Table 35, Fig. 1 - 2.

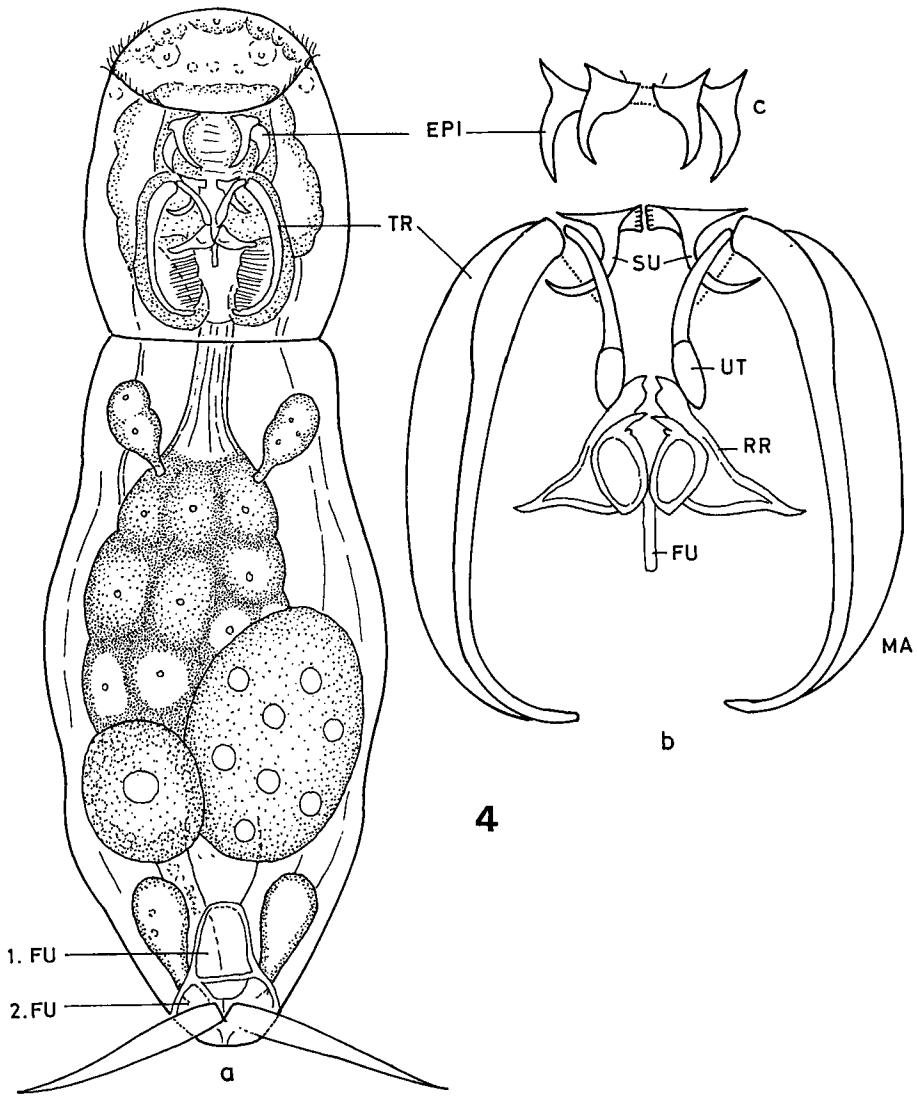
*Lecane* (s. str.) *clara* (BRYCE 1892) (Figs. 4a - c)

This *Lecane* species has a weak and flexible lorica without any lateral furrows. A narrow ventral plate is visible only occasionally. The foot segments (1 and 2 FU) are also not always distinct. The trophi (TR), which had not previously been observed, are remarkably large and strong. Our analyses also show manubria with a broad lamella (MA) and triangular rami (RR). The unci teeth (UT) are located above the subunci (SU) which have pointed curved hooks. The epipharynx (EPI), with four teeth, resembles the radula of molluscs. Trophi elements of this kind are unknown in other *Lecane* species.

*Lecane clara* is cosmopolitan, and lives in shallow waters and in the wet interstitial of shore zones. It is a new species for South America (KUTIKOVA 1970; KOSTE & PAGGI 1982).

Measurements: Total lg 150 - 200  $\mu\text{m}$ , toe lg 25 - 42  $\mu\text{m}$ , lorica wi 40 - 60  $\mu\text{m}$ , trophi lg 27  $\mu\text{m}$ .

Lit.: HARRING (1913); HARRING & MYERS (1926): 378, Table 17, Fig. 3 - 4; HAUER (1931): 10, Fig. 4; WIESZNIIEWSKI (1934): 381, Table 63, Fig. 74 - 75; KOSTE (1978): 206, Table 68, Fig. 4a - 2.



**Fig. 4:**  
*Lecane clara* (BRYCE 1892)  
 a: ventral, creeping (1. FU first foot segment, 2. FU second foot segment);  
 b: trophi (FU fulcrum, MA manubrium, RR rami, SU subunci, TR trophi, UT unci tooth);  
 c: epipharynx (EPI).

*Lepadella* (s. str.) *christinei* KOSTE nov. spec. (Figs. 5a - c)

Eleven (11) *Lepadella* specimens resembling *Lepadella quinquecostata* (LUCKS 1928) were found in the savanna samples. However, on closer observation some significant morphological differences were recognized. The median rib of the dorsal lorica is visible only posteriorly. Below the dotted collar around the head aperture there is a crossed line. The bellshaped foot aperture is extended, particularly on one side, by asymmetrical and variable spines (compare Figs. 5a - c with KOSTE (1978), Table 64, Figs. 2a - d and 10a).

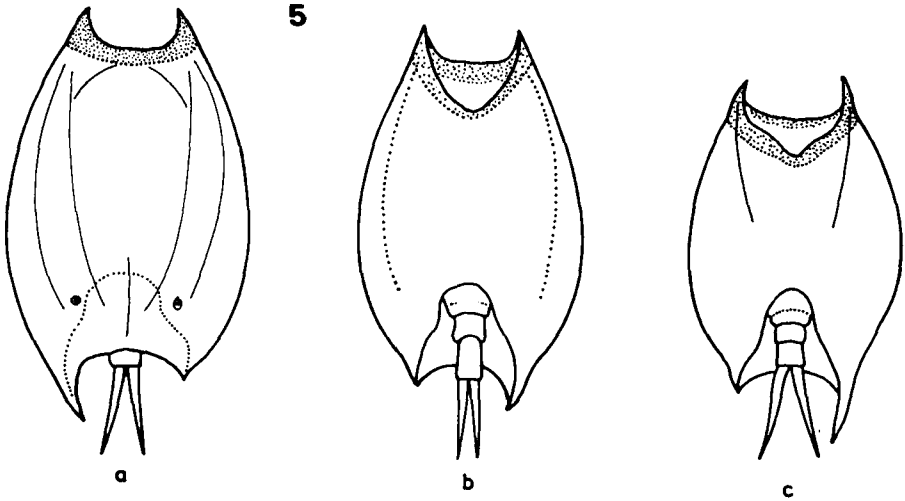


Fig. 5:  
*Lepadella christinei* nov. spec.  
a: lorica dorsal; b and c: different morphs, ventral.

Measurements: Lorica lag 108 - 115  $\mu\text{m}$ , lorica wi 65 - 69  $\mu\text{m}$ , toe lg 24  $\mu\text{m}$ .  
Preserved slides are deposited in the collection of the Forschungsinstitut Senckenberg Museum, Frankfurt/Main, FRG.

Holotype: female, coll. B. ROBERTSON, savanna 2, Ilha de Maracá, 18.06.1987, register number 7390 Rot; Paratype: same data, in collection of INPA, Manaus, Brazil - Am.

Etymology: Dedicated to my biological-technical assistant Mrs. Christine Leutbecher, Quakenbrück, in gratitude for her collaborating help in my laboratory.

*Lepadella tricostata* KOSTE nov. spec. (Figs. 6a - b)

In one of savanna samples seven (7) *Lepadella* specimens were conspicuous because of their small loricas. Three ribs can be observed on the dorsal lorica. The median one extends from the collar of the head aperture to the caudal end. The lateral ones reach from the anterior end to the lateral antenna papilla. The other furrows present in *Lepadella costata* (WULFERT 1940) are lacking. Also, the new species is less flat and in cross section the diameter is wider (compare with *L. costata* in KOSTE (1978), Table 65, Figs. 3a - e).

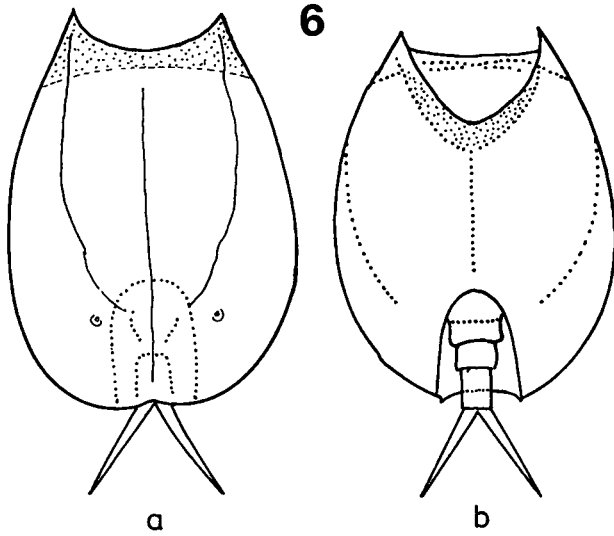


Fig. 6:  
*Lepadella tricostata* nov. spec.  
 a: lorica dorsal;  
 b: ventral.

Measurements: Lorica lg 74 - 77  $\mu\text{m}$ , lorica wi 55 - 57  $\mu\text{m}$ , toe lg 18 - 21  $\mu\text{m}$ . It was not possible to prepare permanent slides.

*Ptygura linguata* (EDMONDSON 1939) (Figs. 7a - b)

This rare, originally North American *Ptygura* was found in the "grassy pond" and savanna 1 samples. The tube was attached to plant fragments of *Utricularia* spec. and some unidentified algae clusters. The head of each specimen was contracted at the tube opening, resembling *Ptygura pedunculata* (EDMONDSON 1939), *Ptygura tacita* (EDMONDSON 1940) and *Ptygura brachiata* (HUDSON 1886). *Ptygura linguata* presents some special characteristics such as a very long lateral antenna, a pair of curved hooks visible in the neck (this is a strict taxonomic criterion for the genus *Floscularia* (CUVIER 1798)), a minute trophi (Fig. 7b) and a long peduncle. The tube is often unusually transparent.

*Ptygura linguata* was first described from New Jersey, USA, but the first author rediscovered it in lagoons near Rio Nhamundá, a tributary of the Amazon River (BRANDORFF et al. 1982).

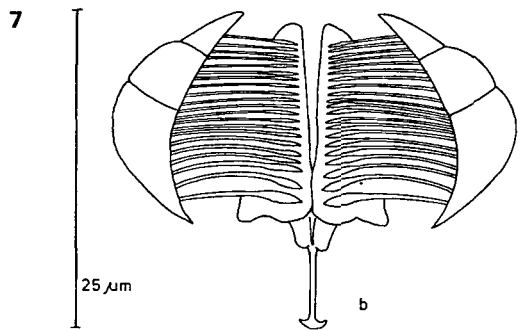
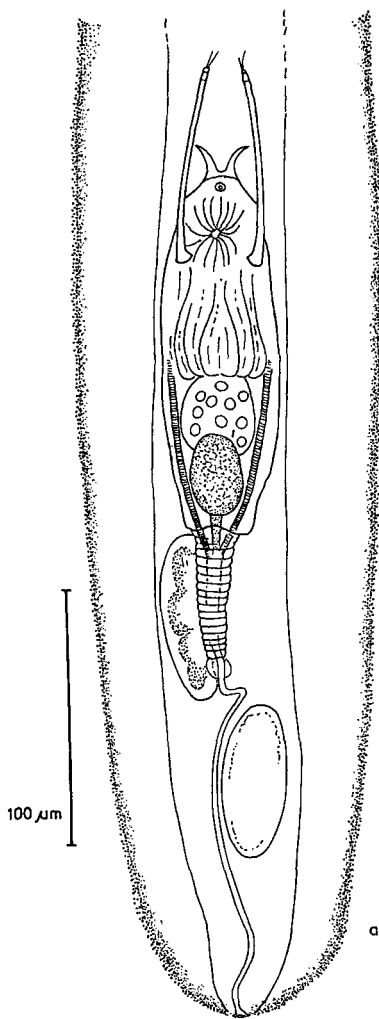


Fig. 7:  
*Ptygura linguata* (EDMONDSON 1939)  
 a: contracted female in its tube, ventral;  
 b: trophi apical, lg 25  $\mu\text{m}$ .

Measurements: Tube lg 720 - 1200  $\mu\text{m}$ , peduncle 240 - 300  $\mu\text{m}$ , lg of lateral antenna 100 - 160  $\mu\text{m}$ .

Lit.: EDMONDSON (1939): 462 - 463, Fig. 13 - 17; (1949): 132, Fig. 12;  
 KOSTE in BRANDORFF et al. (1982): 89, Fig. 44 - 47; KOSTE & PAGGI (1982): 95.

*Testudinella robertsoni* KOSTE nov. spec. (Figs. 8a - b)

Many populations of different *Testudinella* species were found in all the samples, and they represent a taxocoenosis typical of the decomposition zone of seasonal pools. The following species were found: *Testudinella ahlstromi* (HAUER 1956) (Synonym *T. incisa ahlstromi* according to KOSTE (1978), Fig. 9), *Testudinella mucronata* (GOSSE 1886), *T. ohlei* (KOSTE 1972), *T. parva* (TERNETZ 1892) (different morphs as shown in Fig. 10), *T. patina* (HERMANN 1783) and a new species, *Testudinella robertsoni* (Fig. 8). This rotifer was observed in the "grassy pond" sample. At the apical end of the dorsal lorica the new species resembles that of *Testudinella discoidea* (AHLSTROM 1938) (see KOSTE 1978, Table 197, Fig. 2). The foot aperture of the new species, however, is smaller and does not extend to the caudal end of the ventral lorica. It is also similar to *Testudinella brevicaudata* (YAMAMOTO 1951), but has a head aperture which presents tiny, laterally pointed corners.

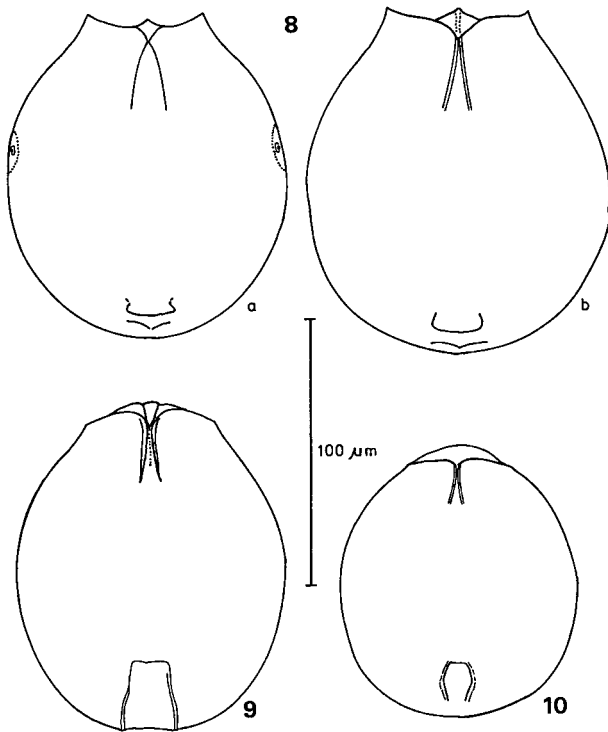


Fig. 8:  
*Testudinella robertsoni* nov. spec.  
a and b: different loricas.

Fig. 9:  
*Testudinella ahlstromi* (HAUER 1956),  
broad morph, lorica lg 127  $\mu\text{m}$ .

Fig. 10:  
*Testudinella parva* (TERNETZ 1892),  
lorica ventral, lg 101  $\mu\text{m}$ .

Measurements: Lorica lg 122 - 132  $\mu\text{m}$ , lorica wi 98 - 105  $\mu\text{m}$ , wi of head aperture 48 - 58  $\mu\text{m}$ .

Lit.: AHLSTROM (1938), Table 6, Fig. 3; KOSTE (1978): 535. It was not possible to prepare permanent slides.

Etymology: Dedicated to the second author of this paper, MSc Barbara Robertson, INPA, Manaus, Brazil, for her long and most valuable collaboration.

### Summary

This is the result of the first survey of the rotifer fauna in the periodically dry, shallow water ecosystems on the island of Maracá, in Roraima, Brazil. The samples were collected during the rainy season, in June, 1987. 159 species of rotifers were identified; 13 are planktonic while the great majority, 146, are littoral forms, including genera typical of decomposition zones such as *Cephalodella*, *Lepadella*, *Mytilina*, *Lecane*, *Testudinella* and the many Bdelloidea species.

The majority of the rotifers are cosmopolitan. Only eleven are South American endemics. *Dicranophorus sebastus* (HARRING & MYERS 1928) and *Lecane clara* (BRYCE 1892) are new for the Neotropics, and *Lepadella christinei*, *Lepadella tricostata* and *Testudinella robertsoni* are described as new species.

## Acknowledgments

The authors would like to thank Edinaldo Nelson dos Santos Silva for his indispensable help in collecting samples and Pedro A. Suarez for the limnological data.

The first author is also grateful for the longterm loan of microscope facilities by the Deutsche Forschungsgemeinschaft, Bonn-Bad Godesberg, FRG.

## References

- AHLSTROM, E. H. (1938): Plankton Rotatoria from North Carolina.- J. Elisha Mitchal Sc. Soc. **54** (1): 88 - 110.
- BRANDORFF, G. O., KOSTE, W. & N. N. SMIRNOV (1982): The Composition and Structure of Rotifera and Crustacean Communities of the Lower Rio Nhamundá, Amazonas, Brazil.- Stud. Neotrop. Fauna Environ. **17**: 69 - 121.
- EDMONDSON, W. T. (1939): New Species of Rotatoria, with Notes on Heterogenic Growth.- Trans. Am. Micr. Soc. **58**: 459 - 472.
- EDMONDSON, W. T. (1949): A formula key to the Rotatorian genus *Ptygura*.- Trans. Am. Micr. Soc. **68** (2): 127 - 135.
- HARRING, H. K. (1913): Synopsis of the Rotatoria.- Bull. U. S. Nat. Mus. Washington **81**: 7 - 226.
- HARRING, H. K. & F. J. MYERS (1926): The Rotifer Fauna of Wisconsin. III. A Revision of the Genera *Lecane* and *Monostyla*.- Trans. Wisconsin Acad. Sci., Arts and Letters **22**: 315 - 423.
- HARRING, H. K. & F. J. MYERS (1928): The Rotifer Fauna of Wisconsin. IV. The Dicranophoridae.- Trans. Wisconsin Acad. Sci., Arts and Letters **23**: 667 - 808.
- HAUER, J. (1931): Zur Rotatorienfauna Deutschlands (II).- Zool. Anz. **93**: 7 - 13.
- KOSTE, W. (1978): Die Rädertiere Mitteleuropas (Überordnung Monogononta).- Begr. v. M. Voigt, 2 Vols., Gebr. Borntraeger, Stuttgart.
- KOSTE, W. & S. JOSE DE PAGGI (1982): Rotifera of the Superorder Monogononta recorded from Neotropis.- Gew. und Abwässer **68/69**: 71 - 102.
- KOSTE, W. & B. ROBERTSON (1983): Taxonomic Studies of the Rotifera (Phylum Aschelminthes) from a Central Amazonian Varzea Lake, Lago Camaleão (Ilha de Marchantaria, Rio Solimões, Amazonas, Brazil).- Amazoniana **8** (2): 225 - 254.
- KUTIKOVA, L. A. (1970): Rädertierfauna der USSR.- Fauna USSR **104**: 1 - 744. Adad. Nauk SSSR, Leningrad (russ.).
- MILLIKEN, W. & J. RATTER (1989): The Vegetation of the Ilha de Maracá. First Report of the Vegetation Survey of the Maracá Rainforest Project (INPA/RGS/SEMA).- Royal Botanic Garden United Kingdom: 1 - 277.
- WIESZNIEWSKI, J. (1934): Les Rotifères psammiques.- Ann. mus. zool. Polon. **10** (19): 339 - 399.