

**Taxonomic studies and new distribution records of Rotifera  
(Phylum Aschelminthes) from Rio Jatapú and Uatumã, Amazonas, Brazil**

by

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**Abstract**

In 1983 six plankton samples were collected by Dr. J. A. Nunes de Mello from Jatapú and Uatumã Rivers and these were examined for rotifers. 39 taxa were identified among which, *Brachionus adisi* n. sp., is a new species, and *Microcodon clavus* EHRENBERG, 1830 and also *Monommata actices* MYERS, 1930, are new records for the Neotropical region.

**Keywords:** Rotifers, Amazonian Region, taxonomical studies, new records.

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## 1. Introduction

In spite of the increasing interest in the zooplankton of Amazonian waters there still are areas from where few or no samples have been taken, thus our knowledge of the rotifer fauna in these rivers and ria lakes are still poor. Only the lower Rio Nhámundá, typical of this landscape, has been studied by BRANDORFF et al. (1982). Therefore the samples from Rio Jatapú and Uatumã were examined with great interest.

## 2. Study area

The Jatapú and Uatumã rivers are tributaries of the Middle Amazon River. The sampling sites in these rivers were: 1, 5, 10, 20, and 30 (Map 1). The physico-chemical conditions of the water column (0.0 - 5.0 m) on the day of sampling are the following:

	RIO JATAPÚ	RIO UATUMÃ
Secchi disc (m)	0.60	0.60
Temp. (°C)	32.0 - 32.5	31.0 - 31.5
pH	5.1 - 5.8	4.9 - 5.0
O <sub>2</sub> (mg/l)	4.3 - 4.9	4.0 - 6.0
μS	30.0 - 31.4	8.4 - 11.2

## 3. Material and Methods

In October 1983 six plankton samples were collected by Dr. J. A. Nunes de Mello (Department of Zoology, INPA, Manaus) in the lower Rio Jatapú and Rio Uatumã (São Sebastião de Uatumã). At each station 20 liters of water were filtered through a 55 μm plankton net. The samples were fixed immediately with formalin.

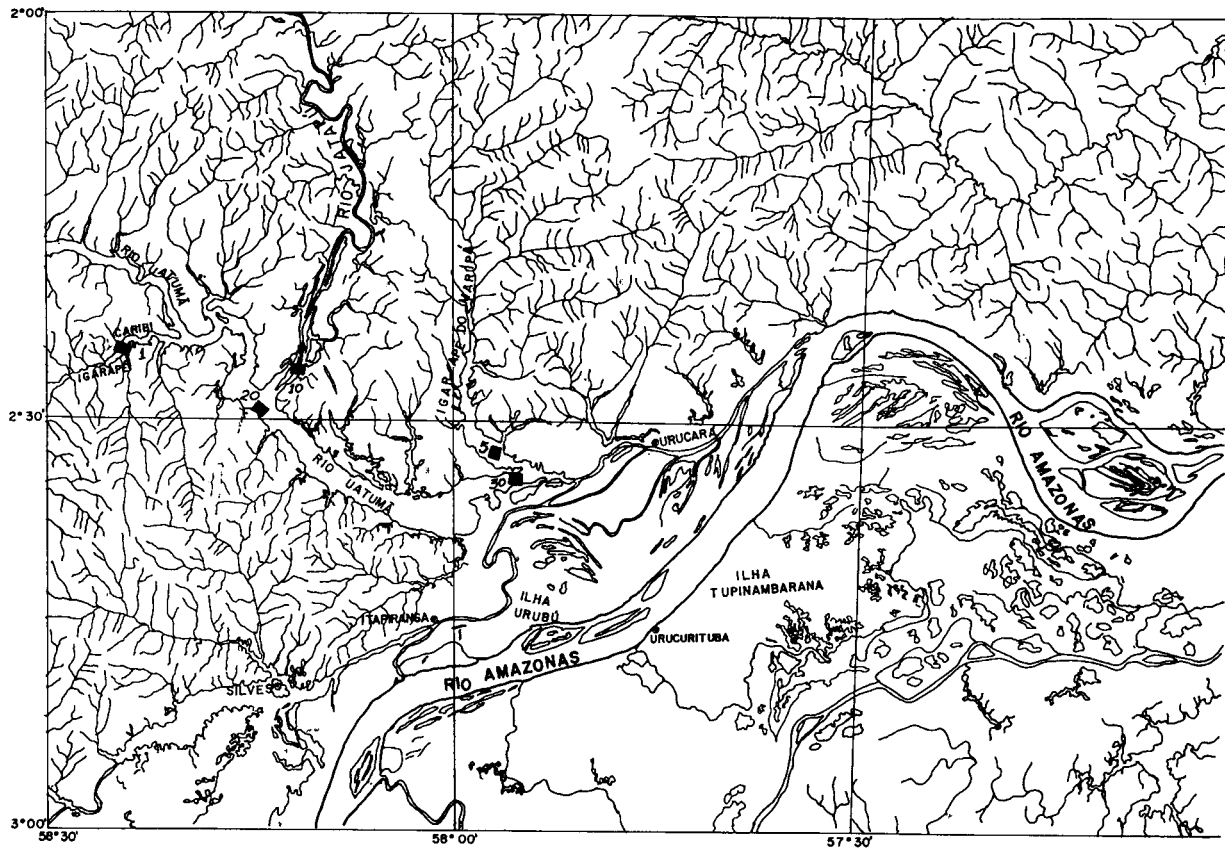
Dates and sampling stations:

- 1.) R. Jatapú, 18.10.83, 1.0 m
- 2.) R. Uatumã (Igarapé Caribu), 20.10.83, 1.0 m
- 3.) R. Uatumã (Station 20), 22.10.83, surface
- 4.) R. Uatumã (Igarapé Maripá), 18.10.83, surface
- 5.) R. Uatumã (Station 20), 22.10.83, 1.0 m
- 6.) R. Uatumã (Station 30), 22.10.83, 1.0 m

Trophi analysis of the rotifers were made with the use of Kaliumhypochlorid (5 %).

The holotype of the new species was deposited, in a permanent slide of glyceringelatine, in the INPA (Manaus, Amazonas) collection. Three paratypes are in the collection (of the genus *Brachionus*) of Koste, Quakenbrück, F.R.G.

Given the small number of samples we list only the relative abundances of the rotifers.



Map 1:  
From DNPM: Investigation area. Stations 1, 5, 10, 20, 30

#### 4. List of rotifers from Rio Jatapú and Rio Uatumã

Abbreviations: 1 = single specimen; r = rare (2 - 10); c = common (11 - 20); ab = abundant (more than 20); R.U. = Rio Uatumã; R.J. = Rio Jatapú

Taxa	R.J.	R.U.	R.U.	R.U.
	18.10.83	18.10.83	20.10.83	22.10.83
1. <i>Anuraeopsis navicula</i> ROUSSELET	r	r	—	r
2. <i>A. sioli</i> KOSTE	r	—	—	r
3. <i>Ascomorpha klementi</i> HAUER	—	—	—	c
4. <i>Asplanchnella sieboldi</i> (LEYDIG)	1	—	r	—
5. <i>Bdelloidea</i> , not ident.	ab	r	c	c
6. <i>Brachionus adisi</i> n. sp.	c	—	r	c
7. <i>B. caudatus</i> BARROIS & DADAY	—	—	1	—
8. <i>B. gessneri</i> HAUER	ab	c	ab	ab
9. <i>B. gillardi</i> HAUER	r	1	r	c
10. <i>B. mirus mirus</i> DADAY	r	—	—	r
11. <i>B. mirus</i> f. <i>voigti</i> (HAUER)	—	—	—	r
12. <i>B. urceolaris amazonica</i> KOSTE	r	—	—	—
13. <i>B. zahniseri reductus</i> AHLSTROM	—	—	—	r
14. <i>Collotheca tenuilobata</i> (ANDERSON)	r	—	—	—
15. <i>Dissotrocha macrostyla</i> (EHRENBERG)	—	—	—	1
16. <i>Filinia longiseta</i> (EHRENBERG)	—	—	—	c
17. <i>F. longiseta</i> (EHRB.) <i>limnetica</i> after ZACHARIAS, 1983	—	—	—	ab
18. <i>Hexarthra intermedia braziliensis</i> (HAUER)	—	—	—	c
19. <i>Keratella americana</i> CARLIN (incl. f. <i>pustulata</i> HAUER)	ab	r	c	ab
20. <i>K. cochlearis</i> (GOSSE)	r	r	c	ab
21. <i>Lecane melini</i> THOMASSON	—	—	r	r
22. <i>L. proiecta</i> HAUER	c	r	r	ab
23. <i>L. signifera</i> (JENNINGS) (f. <i>ploenensis</i> VOIGT 1902)	—	—	—	1
24. <i>Macrochaetus collinsi</i> (GOSSE)	—	—	—	1
25. <i>Microcodon clavus</i> EHRB.	—	—	—	r
26. <i>Monommata actices</i> MYERS	r	—	—	r
27. <i>Ploesoma lenticulare</i> HERRICK	r	—	—	ab
28. <i>Polyarthra remata</i> (SKORIKOV)	c	r	r	ab
29. <i>P. vulgaris</i> CARLIN	c	r	r	ab
30. <i>Sinantherina socialis</i> (LINNE)	r	r	—	—
31. <i>Synchaeta longipes</i> GOSSE	r	—	—	c
32. <i>Testudinella patina</i> (HERMANN)	—	—	—	1
33. <i>Trichocerca bicristata</i> (GOSSE)	r	r	r	ab
34. <i>Tr. braziliensis</i> (MURRAY)	r	—	r	ab
35. <i>Tr. capucina</i> (WIERZEJSKI & ZACHARIAS)	r	r	r	ab
36. <i>Tr. chattoni</i> (BEAUCHAMP)	r	r	r	c
37. <i>Tr. similis</i> (WIERZEJSKI)	r	r	r	c
38. <i>Tr. similis</i> (WIERZEJSKI) f. <i>grandis</i> (after HAUER, 1965)	r	—	r	r
39. <i>Tr. stylata</i> (GOSSE)	r	—	—	—
Total	26	14	18	33

#### 4.1. Interpretation of the list

The great majority (29) of the species are planktonic rotifers and these usually occurred with high abundances. Members of the littoral fauna are: *Bdelloidea*, *Dissotrocha macrostyla*, *Lecane melini*, *L. proiecta*, *L. signifera*, *Macrochaetus collinsi*, *Monommata actices*, *Testudinella patina*, *Trichocerca bicristata*, *Tr. chattoni*, and *Tr. similis* (f. *grandis*).

Endemics for the Neotropical region are: *Ascomorpha klementi*, *Brachionus adisi*, *B. gessneri*, *B. gillardi*, *B. mirus*, *B. urceolaris amazonica*, *B. zahniseri reductus*, *Hexarthra intermedia braziliensis*, *Lecane melini*, *L. Proiecta*, *Trichocerca braziliensis*. *Brachionus adisi* n. sp., which in our opinion is a new rotifer, is common in the Rio Jatapú and Uatumã. *Microcodon clavus* and *Monommata actices*, up to now, were unknown for this zoogeographical region. In references to these three species descriptions and distribution remarks follow.

### 5. New species and distribution records

#### 5.1. *Brachionus adisi* KOSTE & HARDY nov. spec. (Fig. 1a - e, 3a)

Type material: 23 loricate females in samples Nr. 1 (12), Nr. 5 (4), Nr. 6 (7).

Holotype: Loricated female from sample Nr. 1 collected by Dr. J. A. Nunes de Mello in R. Jatapú (18.10.83), deposited in the permanent slide collection of INPA, Manaus, Brazil.

Paratypes: 5 specimens in the Koste collection (genus *Brachionus*), permanent slides.

Type locality: Rio Jatapú, Amazonas, Brazil (2° 26' 15" S; 58° 18' 20" W).

Description: Lorica in ventral and dorsal view nearly rectangular, but strongly indented at the base of the caudal spines. Ventral plate flat, dorsal plate bulging (Fig. 1d). Dorsal apical rim with two median, short spines and divided by rhomboid aperture (Fig. 1a - c). Anterior lateral spines long and curved inwards, particularly at the pointed ends. Ventral apical rim with only a shallow median indentation. Posterior spines slightly asymmetrical, long and spread out. On the inner side of these spines, near the base, there is a pair of very pointed, needle-shaped prickles. The oval-foot opening is located at the narrowest portion of the caudal ventral plate (Fig. 3a). Lateral antenna with nearly cylindrical tubes (Fig. 3a: Lt). The integument is soft, without structures. Only between the ventral and dorsal lorica is there a stronger border (Fig. 1d).

Measurements of lorica (lgth. = length; sp. = spines):

Total length	216 - 283 $\mu\text{m}$
Greatest width	80 - 86 $\mu\text{m}$
Greatest high	50 - 68 $\mu\text{m}$
Median sp.	5 - 8 $\mu\text{m}$
Lgth. of anterior lateral sp.	54 - 90 $\mu\text{m}$
Lgth. of posterior sp.	65/72 - 76/86 $\mu\text{m}$
Lgth. of prickles at the posterior sp.	10 - 15 $\mu\text{m}$
Lgth. and width of foot opening	25/18 $\mu\text{m}$
Subitaneous egg	54/72 $\mu\text{m}$

Discussion: The new species resembles *Brachionus mirus* DADAY, 1905 (f. *voighti* HAUER, 1961) (Fig. 2a - c), which is common in Amazonian waters (KOSTE 1972: 372; HAUER 1961: 67 - 68, 1965: 348 - 349). The variability of *B. mirus* has been demonstrated by PAGGI (1973) and KOSTE (1978), particularly the size and shape of the anterior lateral and posterior caudal spines. The dorsal position, the features of the foot opening and the form of the lateral antenna aperture are constant taxonomic characters.

All *B. mirus*, including the variable forms (Fig. 2a - d, 3b), have, at the caudal end of the dorsal plate, a trapezoid dome over the foot opening which terminates in paired knob-shaped projections, directed dorsally (Fig. 3b: Pr). Only the subspecies *B. mirus reductus* KOSTE, 1972 (Pl. 10: a - e) lacks these projections.

The new species, *B. adisi* (Fig. 1a - d, 3a) different from *B. mirus* s. l., has a ventrally situated foot opening (Fig. 3a: Fo), no dome covering this aperture, and no projections. Rather than the knob-shaped,

blunt structures, on the inside of the base of the caudal spines there are needle-shaped prickles (Fig. 3a: Pri). Finally, the remarkable narrowing of the lorica at the caudal spine insertion has never been observed in the *B. mirus* group.

All these morphological characteristics separate *B. adisi* from similar members of the genus *Brachionus*. We consider *B. adisi* to be a valid species, belonging to the endemic *Brachionus* species group of the Neotropics, which includes: *B. gessneri* HAUER, 1956, *B. gillardi* HAUER, 1966, *B. kultrum* PAGGI, 1981, *B. mirus* DADAY, 1905, *B. mirus reductus* KOSTE, 1972, *B. urceolaris amazonica* KOSTE & ROBERTSON, 1983, *B. incertus* HAUER, 1953. *B. variegatus* KRAU, 1962, listed by PEJLER (1977) in our opinion is a critical taxon which resembles *B. quadridentatus mirabilis* (DADAY 1897).

Etymology: *B. adisi* is dedicated to Dr. Joachim Adis, Max-Planck-Institute for Limnology, Tropical Ecology Working group, Plön, F.R.G., in gratitude for a successful cooperation.

### 5.2. *Microcodon clavus* EHRENBERG, 1830 (Fig. 4a - b)

Up to now this species has only been recorded from Europe, North America, New Zealand (KOSTE 1978) and Australia (SHIEL & KOSTE 1979). RIDDER & POURRIOT (in press) also recorded it from West Africa, Ivory Coast.

In the 22.10.83 sample from R. Uatumã there were 5 slightly contracted but well preserved females. The long foot, half of the total length, with a single toe, and the strongly arched dorsal plate are characteristic. The corona is indined ventrally. The internal organs are peculiarly coloured. The eye is red, the mastax clear yellow, the epipharynx, anterior to the mastax, is purple and the stomach is brown tending to blue green. The vitellarium has only four nuclei. *M. clavus* seems to prefer acid waters, tends to be littoral, but can also be found in the plankton.

Measurements: Total length: 125 - 155  $\mu\text{m}$ ; foot: 48 - 50  $\mu\text{m}$ ; toe: 25 - 28  $\mu\text{m}$ ; trophi = 45  $\mu\text{m}$ .

### 5.3. *Monommata actices* MYERS, 1930 (Fig. 5a - g)

This species is new for the Neotropical region. See KOSTE & PAGGI (1982). Similar specimens were found in Lago Camaleão (KOSTE et al. 1984) and designated as *M. cf. actices*. Prior to this, however, the species was only recorded by HAUER (1958), WULFERT (1951, 1960), KOSTE (1968), and DONNER (1978) from Middle Europe and BERZINS (pers. comm.) from Sweden. It occurs mostly in waters with a pH of 4.5 - 6.8, often in *Sphagnum* pools (Fig. 5a - b).

8 contracted specimens were found in Rio Uatumã and 3 in Rio Jatapú (Fig. 5f - g).

The trophi analysis showed the characteristic thin fulcrum, curved manubria with typical small hook, sickle-shaped rami and delicate unci (Fig. 5c - e). The longitudinal folds of the integument described by MYERS (1930) and WULFERT (1960a) were not observed in the preserved material. The stomach was filled with green and brown granules, but no zoochlorella. The brain and retrocerebralorgan presented large, dark granules. The cerebraleye was carmin.

Measurements: Trophi: total length: 24  $\mu\text{m}$ , fulcrum: 16  $\mu\text{m}$ , rami: 14  $\mu\text{m}$ , unci: 6 - 8  $\mu\text{m}$ , small toe: 90 - 150  $\mu\text{m}$ , large toe: 104 - 200  $\mu\text{m}$ .

## 6. Summary

Despite the increasing interest in the zooplankton of the Amazon, little is known of the rotifer fauna of the northern tributaries. Thus, the plankton samples collected by Dr. J.A. Nunes de Mello from the lower Rio Jatapú and Uatumã were a welcome contribution to our studies. 39 species of rotifers were identified. Some are characteristic for the acidic and weak acidic Amazonian waters: *Brachionus gessneri*, *B. gillardi*, *B. mirus*, *Lecane proiecta*, *L. meljani*.

14 taxa are Neotropical endemics. 25 are cosmopolitans. New for this zoogeographical region are *Monommata actices* (MYERS) and *Microcodon clavus* EHRENBERG, the latter now known from all continents. One new rotifer, *Brachionus adisi*, was described, and it apparently is also an endemic for the Amazon region.

## 7. Resumo

Foram investigados seis (6) amostras de plancton provenientes dos rios Jatapú e Uatumã (ambos afluentes do rio Amazonas), coletados por o Dr. Nunes de Mello. 39 taxa foram encontrados; um novo rotífera *Brachionus adisi* n. sp. é descrita e novas registros para a região Neotropical incluem *Microcodon clavus* EHRENBERG, 1830 e *Monommata actices* MYERS, 1930.

## 8. Acknowledgments

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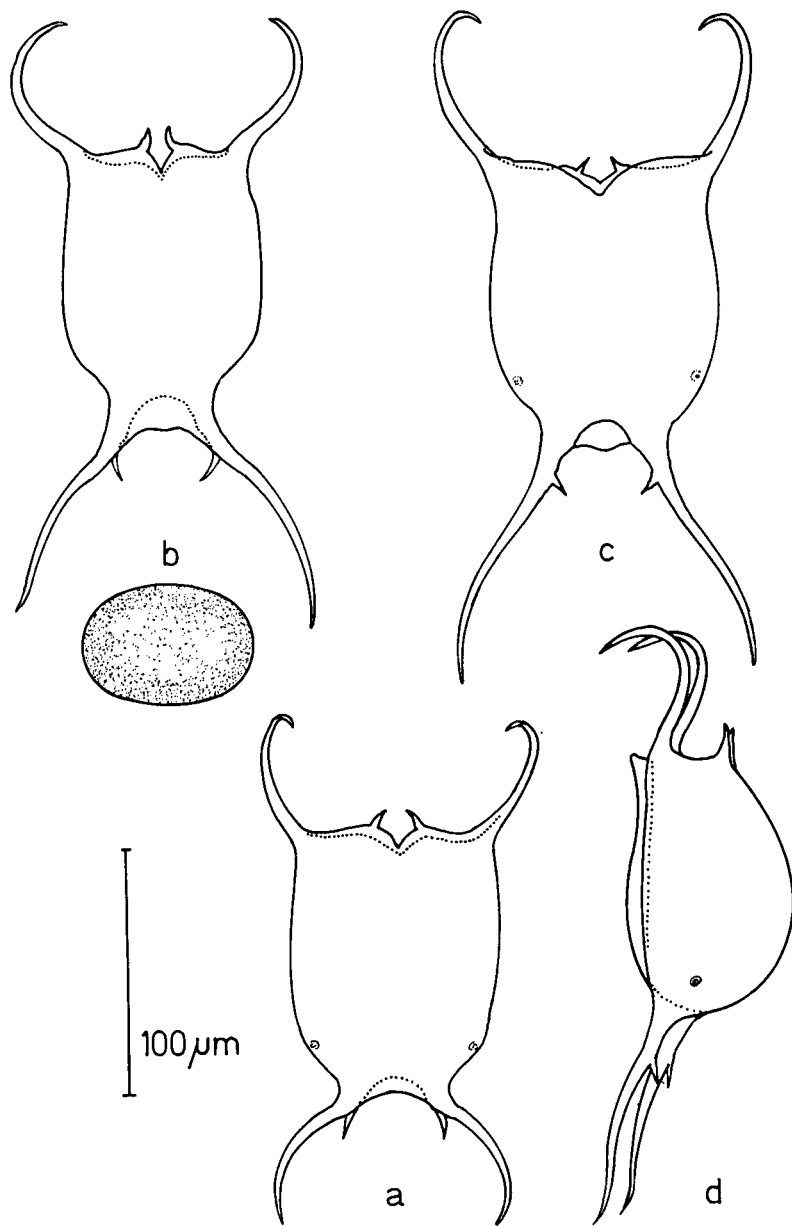


Fig. 1:

*Brachionus adisi* KOSTE & HARDY nov. spec.

a) Lorica, dorsal, total lgth. 209  $\mu\text{m}$ , greatest width 86  $\mu\text{m}$ . b) Lorica and subitaneous egg (72/54  $\mu\text{m}$ ), total lgth. 252  $\mu\text{m}$ . c) Ventral lorica, total lgth. 270  $\mu\text{m}$ . d) Lateral lorica, total lgth. 234  $\mu\text{m}$ , greatest highth of lorica 68  $\mu\text{m}$ .

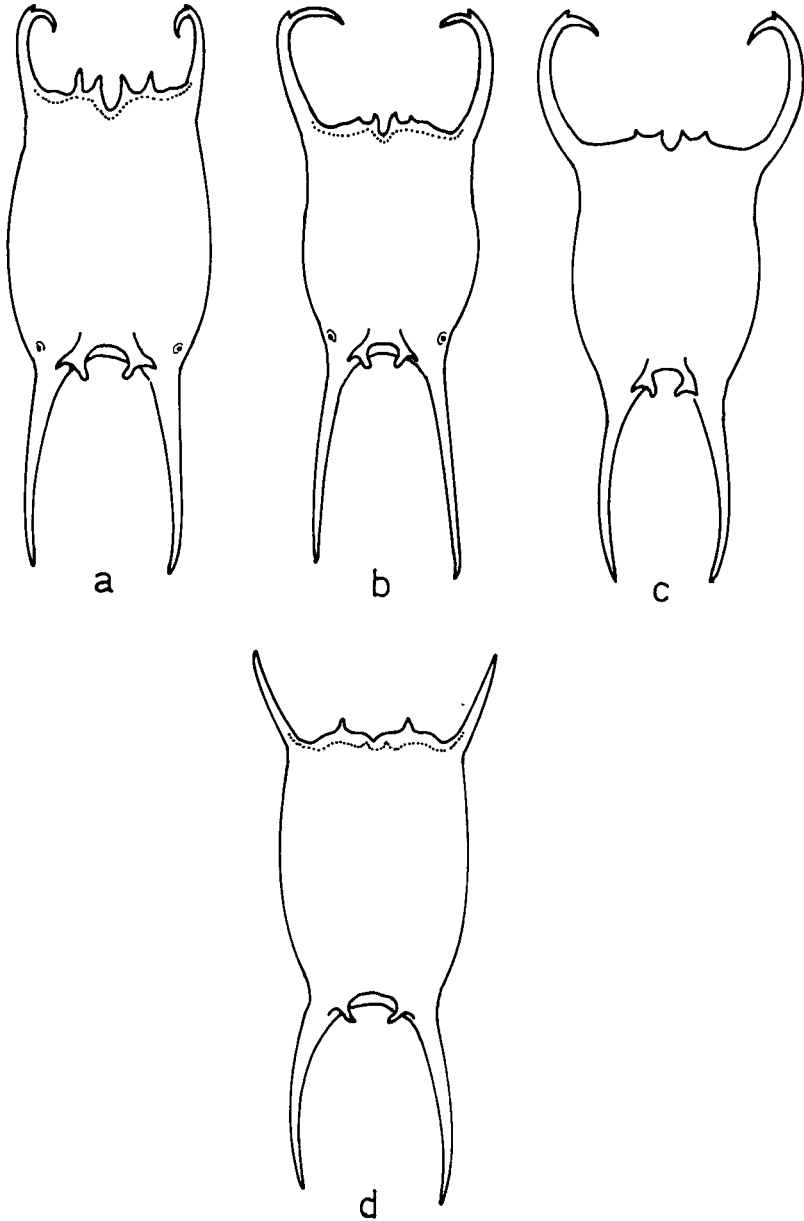


Fig. 2:

*Brachionus mirus* DADAY, 1905 and variations.

a - c) Different loricas of *Brachionus mirus* DADAY f. *voighti*, total lgth. 210 - 216  $\mu\text{m}$ .

d) Lorica of *Brachionus mirus* DADAY f. *typica*, total, dorsal lgth. 242  $\mu\text{m}$ .

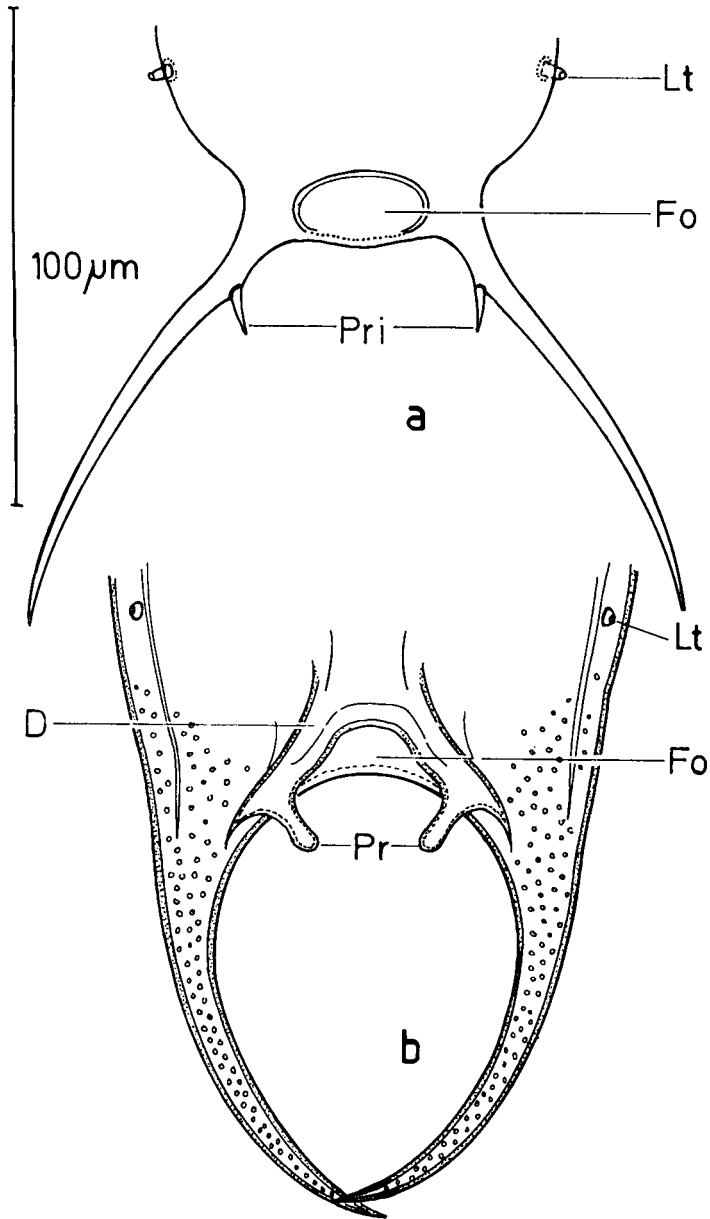


Fig. 3:

a) Foot opening and caudal spines of *Brachionus adisi* n. sp., ventral. (Fo = foot opening, Lt = lateral antenna, Pri = prickles at the insideside of caudal spines).

b) *Brachionus mirus* DADAY, caudal part, dorsal. (D = dome of the dorsal foot opening, Lt = lateral antenna, Pr = projections at the foot opening).

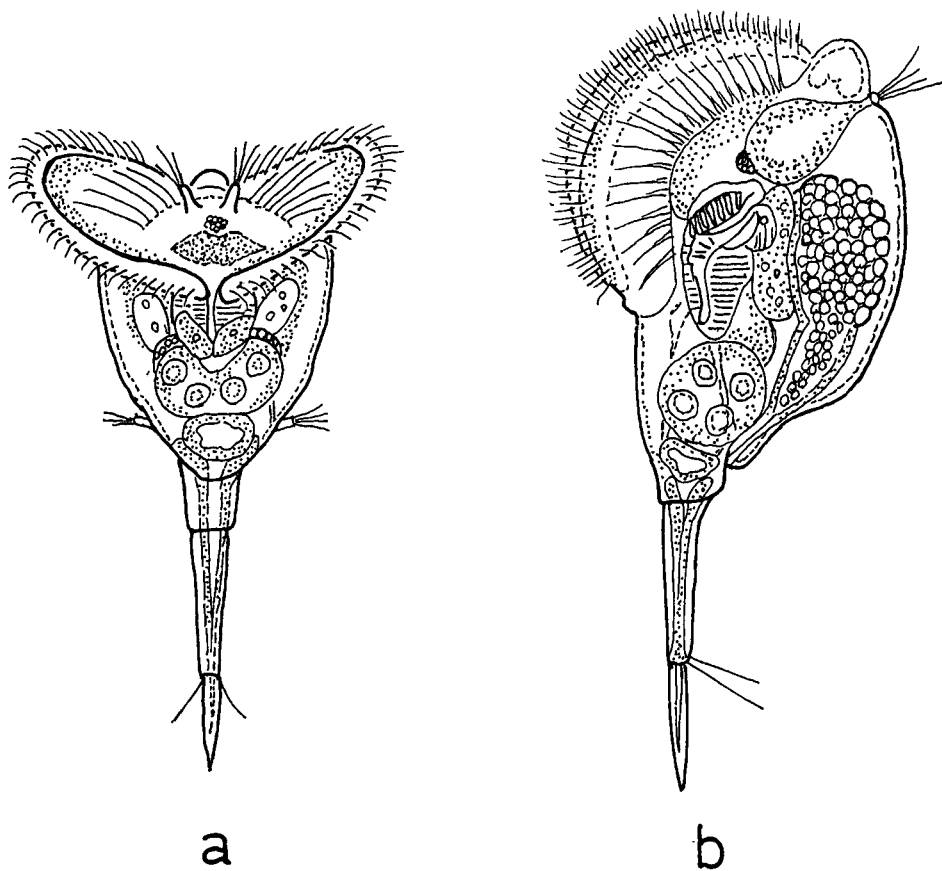


Fig. 4:  
*Microcodon clavus* EHRENBERG, 1830, female, after KOSTE 1968.  
a) ventral, b) lateral views.

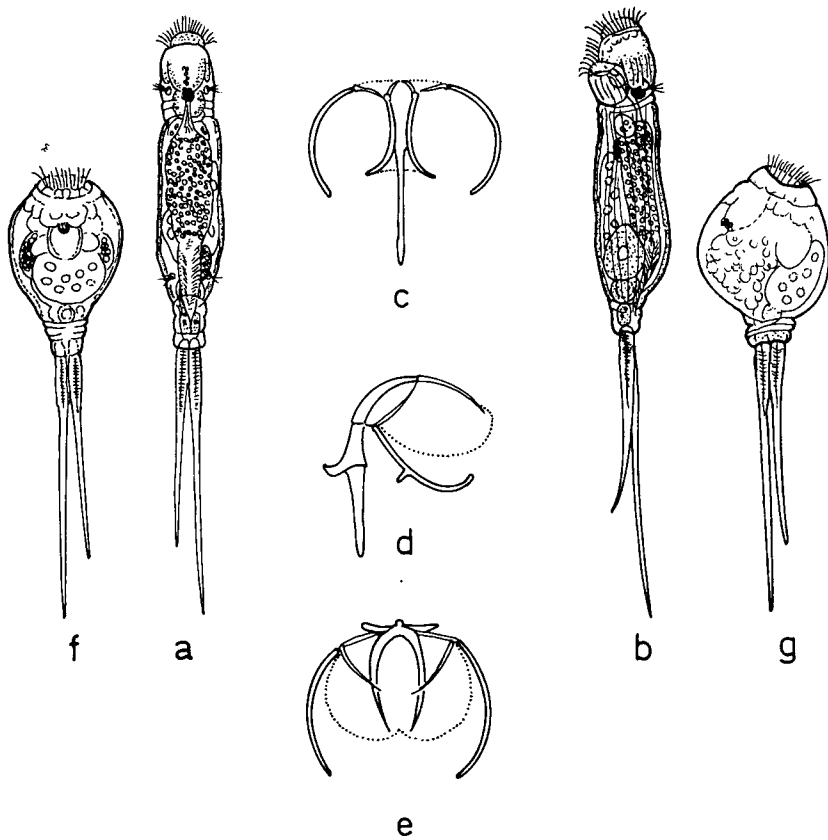


Fig. 5:

*Monommata actices* MYERS 1930

- a) Female, swimming, dorsal (from Hahlener Moor, NW-Germany). b) Lateral view (total lgth. 234  $\mu$ m).  
 c) Trophi, apical (22  $\mu$ m). d) Lateral. e) Dorsal view. f) *M. actices* from Rio Jatapú, with contracted body, ventral. g) Lateral view.

