

**A taxonomical and environmental study of the genus
Brachionus
(Rotifera: Monogononta) (Pallas, 1776) in
Al-Hammer marsh, south of Iraq**

Huda K. Ahmed and Abdulhusein H. Ghazi

Dept. of Marine Biology, Marine Science Center, Univ. of Basrah, Iraq.

Abstract

Samples of Rotifera genus *Brachionus* were collected from Al-Barka and Al-Nagara region in Al-Hammer Marsh, South of Iraq. Remarks on the taxonomy were notes on 6 species of the genus and a monthly density of each species were recorded during the study period from Feb-2006 to Jan-2007. The highest value of total density was 2.78 ind /l recorded in May -2006, whereas the lowest value was 0.01 ind /l and reported in March-2006.

Introduction

The Studies of the Iraq's Rotifera is limited with little ecological information, especially in the southern marshes. Between 1921 and 2007, most of researches include species list and abundances. Gurney (1921) reported on three species of Rotifera in the Iraqi marshes. Al- Saboonchi *et al.* (1986) reported on 19 species and seasonal density of Rotifera in Garma Marsh, South of Iraq. Ahmed and Mohamed (2006) studied the Rotifera community in three marshes (Basrah, Amara and Nasiria).

Generally Rotifera includes common but unnoticed metazoans (size range between 50-2000 μm) inhabiting every type of habitat. Phylum Rotifera is divided into two classes, the Digononta and the Monogononta. The members of the class Monogononta constitute 90 % of the Known species; they have a species-specific trophus, Rotifer body possess three main features: a ciliated anterior end, called the corona; Jaws, called trophi; and a thicken body wall, called the lorica (Wallace *et al.*, 2006); hence the identification of rotifers depends on the characteristics of the lorica, corona, and mastax (trophi) for plankton specimens.

Remarks in this paper are confined particularly to brief notes on the species of genus *Brachionus* and the monthly changes of density of these species in at Al-Hammer marshes south of Iraq.

Material and methods

Sampling were carried out monthly from Feb-2006 to Jan-2007, from Al-Barka and Al-Nagara region in Al-Hammar Marsh by standard towing plankton net of a mesh size 53μ , the net was towed for 20 meters distance. The specimens were fixed by 4% formalin solution. Compound microscope was used for examination of the Rotifera. To identify the trophi of the species, it must be extracted from the surrounding soft tissues. This is accomplished using a small volume of household bleach to dissolve the tissues (Taylor, 2005). Description and identification of the species are based on (Edmonson, 1959 and Pennak, 1989). The monthly and total densities of the species were calculated.

Remarks

Genus *Brachionus* is thermophile and euryhaline inhabits mainly shallow waters and pools. All species feed on algae and partly- on bacteria, food species lists have not been reported. Members of the genus are easy to cultivate, and consequently more is known about their life span, propagation and reproduction than most species of other genera of Rotifera (Ruttner-Kolisko, 1974). Six species of genus *Brachionus* were found in the southern marshes of Iraq, they appeared in different times of the year with different densities. In the present study the six species were described morphologically and anatomically by extracted trophus from surrounding tissues for each species. Fig.1 shows a diagram of the trophus which have seven parts: a fulcrum (unpaired), paired rami (singular ramus), paired *uncil* (singular *uncus*) and paired manubria (singular manubrium) and each part was changed depending on the feeding habit of the species.

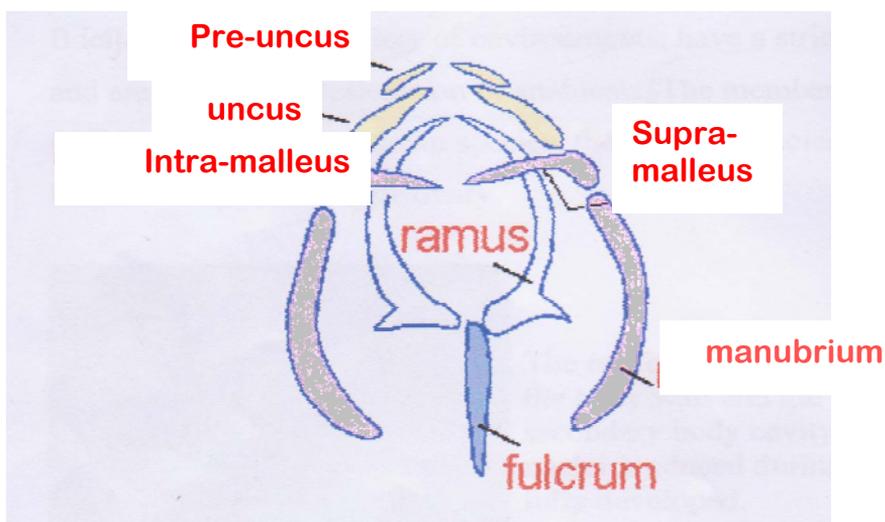


Fig. 1: Diagram of Rotifera trophi. (Excerpt from Ruttner - Kolisko, 1974)

The descriptions of *Brachionus* species are as follows :

Brachionus plicatilis (MÜLLER, 1786).

Lorica soft; dorsal and ventral plate not distinguishable. Size 150-300µm ; males larger than with that of *B. urceolaris*, resting eggs granulated, in brackish and inland salt water, polythermal, feeds on unicellular algae. (Plate 1).

B. angularis (Gosse, 1851).

Lorica strong, stippled and with facets, lentiform; all spines, except the small median ones, reduced with small lateral anterior spines); foot opening smooth; highly polymorphous species. Common in plankton of ponds, eurythermous. Size 100-200µm. (Plate 2).

B. rubens (Ehrenberg, 1838).

Lorica like that of *B. urceolaris* . Size 150-200 µm, males and resting egg as in *B. urceolaris* with similar habitat. (Plate 3).

B. calyciflorus (Pallas,1766).

Spines on anterior margin long, pointed, emerging from a broad, soft base; dorsal and ventral plate can not be distinguished on the sacciform body. Size 200-500 µm, Polymorphous species; soft, spine-like processes on the posterior margin and the foot opening may, but need not, be present. (Plate 4).

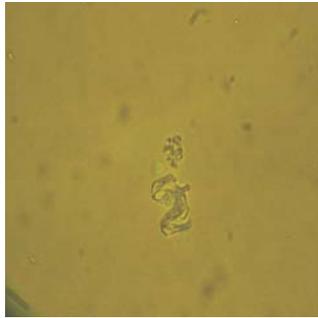
B. quadridentatus (Hermann,1783).

Lorica smooth or faintly stripped, body very flat pedal tube strongly protruding median spines on anterior margin long, more or less curved, lateral spines bent outwards. Size 200-400 µm. Spines on the posterior corners of the body varying in length shape of foot opening and spines equally variable .The species is highly polymorphous.

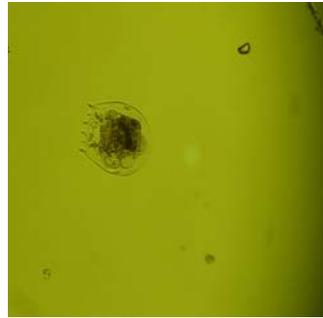
B. urceolaris (MÜLLER, 1773).

Lorica thin, but with distinct dorsal and ventral plate. Size 200-300µm; resting egg smooth, males illoricate; mainly benthic, often attached; in fresh water, in warm, shallow lakes and pools; feeds on unicellular green algae.

The mastax vary widely from species to species, for genus *Brachionus* species, trophies are particularly adapted for grinding particulate detritus (malleate or ramate trophus) (Ruttner - Kolisko, 1974).

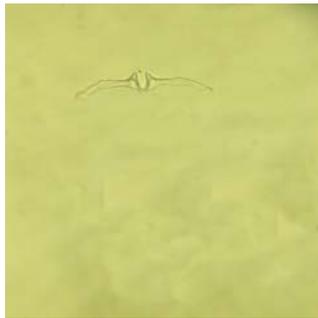


B

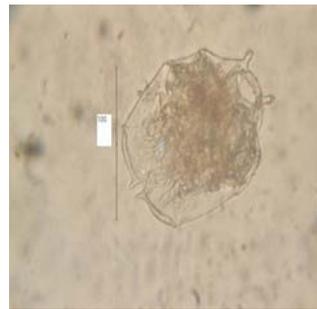


A

Plate 1- A: *Brachionus plicatilis*; B: trophy.



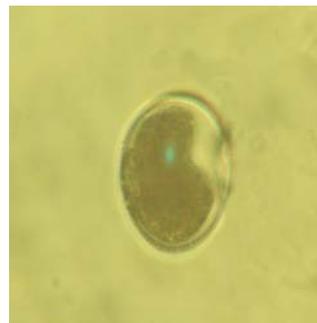
B



A

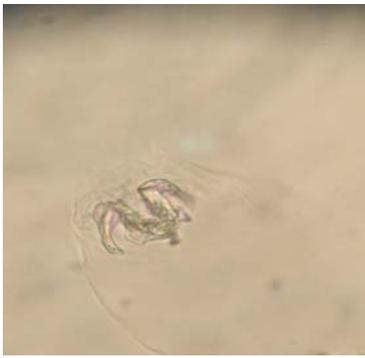
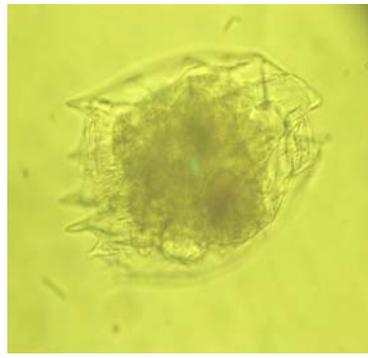
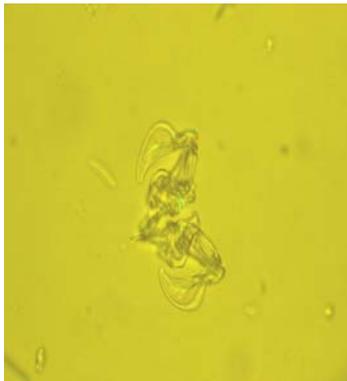
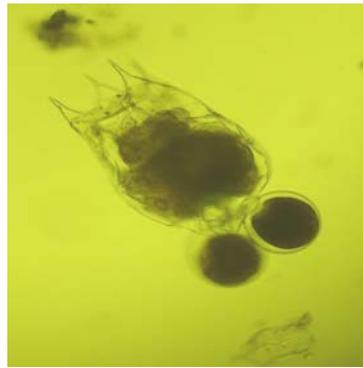
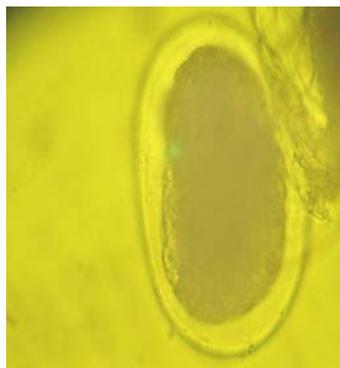


C



D

Plate 2 – A: *Brachionus angularis*, B: anterior dorsal of lorica, C: trophy and D: resting egg.

**B****A**Plate (3)- A: *Brachionus rubens*; B: trophi**B****A**Plate (4)- A: *Brachionas calyciflorus*; B: trophy and C: resting egg.**C**

Table(1) :Monthly and total density (ind./ l) of *Brachionus* species in Al- Hammar marsh during period from Feb. 2006 to Jan. 2007

Species	Month density (ind./ l)											
	Feb.	Mar	Apr.	May	Jun.	Jul.	Aug.	Sept	Oct.	Nov.	Dec.	Jan.
<i>Brachionus angularis</i>	--	--	0.34	--	--	0.52	0.58	--	--	--	--	--
<i>B.calyciflorus</i>	--	0.01	--	0.96	0.55	1.04	0.35	--	--	0.98	0.62	--
<i>B.quadridentatus</i>	--	--	0.04	1.00	0.34	0.22	0.7	0.07	--	--	--	2.24
<i>B.rubens</i>	--	--	--	--	--	--	--	0.70	0.04	--	--	--
<i>B.urceolaris</i>	--	--	--	0.18	--	--	--	--	--	--	--	--
<i>B. plicatilis</i>	--	--	0.28	0.64	0.50	0.62	0.90	0.66	0.61	0.28	0.14	0.22
Total	--	0.01	0.66	2.78	1.39	2.40	2.55	1.43	0.65	1.26	0.76	2.46

The changes in density of Rotifera genus *Brachionus* at months from Feb-2006 to Jan-2007 were shown in Fig.1. The highest value of total density was 2.78 ind / l in May -2006, whereas the lowest value was 0.01 ind / l in March-2006. The species *Brachionus calyciflorus* density has the minimum value (0.01ind/l) in March-2006 compared with the other species, and for the same species the density was reached 2.24 ind / l in Jan-2007, represented the peak of species densities in all months during this study.

References

- Ahmed, H.K. ; and Mohammed, H.H. (2006). The Rotifera community in the South marshes of Iraq. Marsh Bulletin, Vol.1, No.1, p: 54-58.
- Al-Saboonchi, A. A.; Brak, N. A. and Mohmmod, A. M. (1986). Zooplankton of Garma marshes, Iraq.J.Biol.Sci.Res., 17(1): 33-40.
- Edmondson, W. T. (1959). Freshwater biology. Second edition, New York, London, 1248 pp.
- Gurney, R. (1921). Fresh-water crustacean collected by Dr. P. A. Buxton in Mesopotamia and (Persia). J- Bombay Natural History Society, 27(4) :835-844.
- Pennak,R.W. (1989). Fresh-water Invertebrates of the United states, 3rd ed. John wiley & Sons, New York : 420-494.
- Ruttner-Kolisko,A.(1974). Plankton Rotifera Biology and Taxonomy. Supplementary Ed. English translation of Vol. XXVI, part 1:Chapter "Die Rotatorien" .
- Taylor,H.L.(2005). Rotifers. Habital to Archival slide-laboratory and field methods for working with Rotifers and other Micro-invertebrates. Taylor labrotory (Serbin Printing, Inc.), Sarasota, FL.
- Wallace, R.L.; Terry, W.S.; Ricci, C. and Nogrady, T. (2006). Rotifera: Vol.1: Biology, Ecology and Systematics (2th edition) .Kenobi Productions , Backhuys Publishers.

دراسة تصنيفية وبيئية للجنس *Brachionus* (Rotifera: Monogononta)

في هور الحمار، جنوب العراق

هدى كاظم احمد و عبدالحسين حاتم غازي

قسم الاحياء البحرية / مركز علوم البحار / جامعة البصرة

الخلاصة

جمعت عينات الدولابي من جنس *Brachionus* من منطقتي البركة والنقاره في هور الحمار، جنوب العراق للفترة من شباط 2006 الى كانون الثاني 2007 لغرض دراسة التنوع الحياتي والكثافة. سجل وجود 6 انواع تابعة لهذا الجنس تم دراستها تصنيفيا وحددت كثافة كل نوع شهريا خلال فترة الدراسة. بلغت الكثافة الكلية 2.78 فرد / لتر خلال شهر حزيران بينما اقل كثافة في شهر آذار 0.01 فرد /لتر.