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

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Abstract

Samples of Rotifera genus Brachionus were collected from Al-Barka and Al-Nagara region in Al-Hammar 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 season 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 trophy; 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-Hammar 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 trophy 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).
Plate 1 - A: *Brachionus plicatilis*; B: trophy.

Plate (3)- A: *Brachionus rubens*; B: trophi

Plate (4)- A: *Brachionas calyciflorus*; B: trophy and C: resting egg.
Table(1) : Monthly and total density (ind./ l) of *Brachionus* species in Al- Hammar marsh during period from Feb. 2006 to Jan. 2007

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<td><em>Brachionus angularis</em></td>
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<td><em>B. calyciflorus</em></td>
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<td>0.98</td>
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<td><em>B. quadridentatus</em></td>
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<td>0.04</td>
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<td><em>B. rubens</em></td>
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<td><em>B. urceolaris</em></td>
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<td><em>B. plicatilis</em></td>
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<td>0.64</td>
<td>0.50</td>
<td>0.62</td>
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<td>0.66</td>
<td>0.61</td>
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<td><strong>Total</strong></td>
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<td>0.01</td>
<td>0.66</td>
<td>2.78</td>
<td>1.39</td>
<td>2.40</td>
<td>2.55</td>
<td>1.43</td>
<td>0.65</td>
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The changes in density of Rotifera genus *Brachionus* at months from Feb-2006 to Jan-2007 were shows 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


Gurney, R. (1921). Fresh-water crustacean collected by Dr. P. A. Buxton in Mesomopotania and (Persia). J- Bombay Natural History Society, 27(4) :835-844.


Brachionus (Rotifera: Monogononta) دراسة تصنيفية وبيئية للجنس

في هور الحمار، جنوب العراق

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الخلاصة

جمعت عينات الدواليب من جنس Brachionus من نطاقتي البركة والترفه في هور الحمار، جنوب العراق للدراسة بTên نوع Brachionus من شباط 2006 إلى كانون الثاني 2007 لغرض دراسة التنوع الحيائي والكثافة. سجل وجود 6 أنواع تابعة لهذا الجنس تم دراستها تصنيفيا وحدد كثافة كل نوع شهريا خلال فترة الدراسة. بلغت الكثافة الكلية 2.78 فرد / لتر خلال شهر حزيران بينما أقل كثافة في شهر آذار 0.01 فرد /لتر.