ABUNDANCE AND DIVERSITY OF ROTIFERA IN THE GARMAT ALI REGION PONDS, BASRAH-IRAQ.

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Received Fep. 2008; accepted in March 2008

Abstract

The study is based on Samples of Rotifera collected from three ponds located inside the University campus, Garmat Ali region Basrah, Iraq. The samples were investigated for the density changes and for the diversity. There were found 26 species of Rotifera belong to 20 genera. The maximum recorded density was (51 ind. / l) which observed in May/2006 at pond 1, whereas the minimum density was (0.6 ind / l) recorded at pond 1 in November/2006. The total density was (225 ind. / l) at pond 1. It was found that the diversity of Rotifera (no. of spp.) is greater at pond 2 and pond 3 compared with pond 1. There were 22 species at pond 2 and pond 3 but only 9 species at pond 1.

INTRODUCTION

Actually there are only few records of rotifera in the aquatic systems of Basrah. Al- Saboonchi *et al.* (1986) reported 19 species in their study on the seasonal abundance of Rotifera in Garma marshes, southern Iraq. Abdual - Hussein and Al - Saboonchi (1989) had recorded the *Brachionus* Rotifera in the Shatt Al-Arab River. Ali and Abdulla (1999) investigated the relationship between the rotifers biomass and the phytoplankton in the Shatt Al-Arab river at the region between Al- Chibassy and Al-Khora. Ahmed *et al*. (2005) investigated the rotifers community qualitatively and quantitatively in another site of the Shatt Al-Arab river located between Al-Dair and Khalid bridge. Ahmed and Mohammed, (2006) studied Rotifera community of three marshes in the southern Iraq .In this study we aimed at identify the Rotifera community in the pond systems of Garmat Ali region in Basrah , southern Iraq.

MATERIALS AND METHODS

During the period from May 2006 to April 2007 monthly samples of rotifer were collected. These samples were taken from three ponds located inside the University campus of Garmat Ali, near Shatt Al- Arab river .The three pond selected were, pond one (1) is located near a cow husbandry of the Agriculture College, pond two (2) is located near the engineering College, the samples were taken before the water entering a fish ponds. pond three (3) is located near the back door of the University campus, the samples were taken after the water coming out of a fish ponds .

The samples were collected by a standard plankton net of a mesh size of 53 micron (mouth aperture of 40 cm diameter), The net was towed for 20 meter distance , plankton samples then fixed by 4 % formalin solution. Compound microscope was used for specimens examination and the Rotifera were classify with the aids of different identifications references (Edmonson ,1959 ; Pontin , 1978 ; Mizuno, 1987; Kutikova , 2002).

RESULTS

Fig.1. Shows the total density of rotifers (ind. / l.) in the three studied ponds (1 , 2 and 3) at Garmat Ali region, during the period from May/2006 to April/ 2007 .An increase in Rotifera density was recorded in May and August at all ponds. whereas the density value were fluctuated in the other months. At pond 1 the peak of the density (51 ind / l) was occurred in May and the lower density value (0.6 ind. / l) was recorded in November. At pond 2 the Maximum density of Rotifera was reported in February (42 ind./l), but the minimum value was (0.8 ind. / l) occurred in September. At pond 3, the peak value of the density reached in May (45 ind. / l), then declined to it's minimum value (0.9 ind. / l) in October.

Table (1) represents the species - composition of Rotifera in the three studied stations during the period from May 2006 – April 2007 . It is apparent that the list consists a 26 species of Rotifera belonging to 20 different genera.

Figs. 2 , 3 and 4 , shows the percentage occurrence of Rotifera species in the three pond (1 , 2, and 3) respectively. (However, the percentage value less than 1% is not appeared in the figures but it given in tables 2 , 3 and 4).

Fig. (2) indicates the presence of 9 species of Rotifera at pond (1), belonging to 9 genera. The most abundant in this pond species was *Brachionus plicatilis* which has the highest percentage of occurrence (90 %) , next were *Asplanchna* sp. and *B.angularis* which compose 3.4 % and 3.06 % , respectively .Whereas the lowest occurrence was 0.01 % recorded for *Synchaeta* sp. .

Fig. (3) shows a 22 species of Rotifera recorded at pond 2. However, the species was belonging to 18 different genera, *B. plicatilis* was most abundant and represented 52.5 % of rotiferan community, following it were *B. calyciflours* and *Asplanchna* sp. which constituted 15.8 % and 7.9 % ,respectively. The species, *Squatinella mutica*, *Platyias quadricomis* and *Pompholyx complanata* were constituted the lowest values (0.05 %). On the other hand , the records of *Hexarthra* sp. in this pond is a new to the southern Iraqi water.

In pond 4 (Fig.4), shows that the Rotifera community composed of 22 species belonging to 17 genera .The highest recorded percentage was that of *B. plicatilis* (67.7 %), followed by *Trichocerca* sp. and

Asplanchna sp. which constituted 9 % and 5 %, respectively. The lowest percentage was 0.057 % for *Mikrocodides* sp. Which is a new record for the southern Iraqi water.

DISCUSSION

The small studied ponds are man-made resulted from a digging process in the land and that flooded by different irrigation process, i.e. running water, drainage water. Rotifers greatly influenced directly and indirectly by algal density and other micro-organisms such as bacteria and the small particles of organic matter and dissolved substances , because these small animals mostly feed on bacteria, algal cells, small protozoa , or organic detritus (Pourriot, 1965; Arndt,1993). And for the same resons several investigators considered Rotifera as good bio-indicators for the water quality of the various aquatic ecosystems, such as, pollution, nitrification, salinity and toxicity (Sladecek, 1983) . In present study we took three ponds which had their waters coming from different resources. Pond 1 water was influenced by fertilizers as it's coming from a cow husbandry station which caused a large nutrient substances particularly nitrogen (N) and phosphorus (P) (to be released in the pond water). These nutrients can stimulating the algal growth. Under these conditions , the copepods and other predators (small shrimp and fish)can not survive for long time and are ultimately disappear from the habitat of the pond. Thus we found a high density of rotifers in this pond but with low diversity (9 specie) as compared with the other two ponds, due to their great ability to tolerate the eutrophication.

The close relationship between the phytoplankton biomass and rotifera density is quit clear as the former forms a basic food to the latter (Downing and Rigler, 1984). good diversity of Rotifera species in pond 2 and pond 3 which influenced by Garmat Ali river and drainage water, respectively. Rotifetra was the most diverse group compared with other groups of invertebrates.

In the present study it was represented by twenty six species , *B. plicatilis* was the most dominant species in the three stations during all the study period and mostly with high density. This species can survive, grow and reproduce very well in high eutrophication waters. So great populations of the rotifer *B. plicatilis* appear in the brackish eutrophication waters than other species of Rotifera ,copepods and small shrimp (Fengqi, 1996). Furthermore, the existence of some species like *B. calyciflorus* at pond 2 reveal an organic pollution at that station. Other species had a different densities and percentages which was clear in the figures 2,3 and 4, they almost occur in pond 2 and pond 3, except some species like *Keratella cochlearis* , *Platyias quadricomis*, *Squatinella mutica* and *Pompholyx complanata* which occurred only in pond 2 and *B. quadridentus*, *B. rubens* and *Mikrocodides* sp. which was recorded in pond 3 only.

Compared with the studies of Rotifera community in the Shatt Al-Arab river, Garmat Ali river and the marshes, there is a good deal of abundance and diversity of Rotifera species in this ponds, which may be considered as a perfect environment for Rotifera to diversity and flourished.

Acknowledgments

We wish to thanks Prof. Malik H. A. , General Director of the Marine Science Center, for his encouragement and laboratory facilities, also our grateful to Prof. Salman D. S. for reading the manuscript.

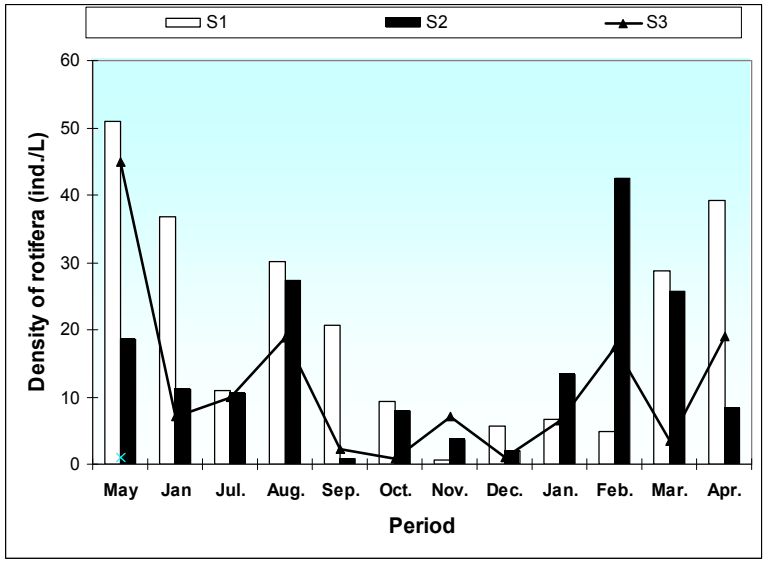

Fig.(1) Total density of Rotifera (ind. / l) in three ponds from Garmat Ali during the period from May 2006– April 2007.

Table 1. List of rotifers species recorded from three ponds at Garmat Ali region, during the period from May 2006 – April 2007.

	Species List		Species List
1	*Brachionus plicatilis*	14	*Polyarthra vulgaris*
2	*B.calyciflorus*	15	*Phliodina* sp.
3	*B. angularis*	16	*Cephallodella* sp.
4	*B. quadridentus*	17	*Epiphanus* sp.
5	*Brachionus rubens*	18	*Euchlanis dilatata*
6	*Asplanchna* sp.	19	*Monostyla* sp.
7	*Mikrocodides* sp.	20	*Lecan* sp.
8	*Notholca striata*	21	*Hexarthra mira*
9	*Keratella quadrata*	22	*Colurella* sp.
10	*Keratella cochlearis*	23	*Pompholy complanata*
11	*Keratella valga*	24	*Platyias quadricomis*
12	*Synchaeta* sp.	25	*Lepadella patella*
13	*Squatinella mutica*	26	*Trichocerca* sp.

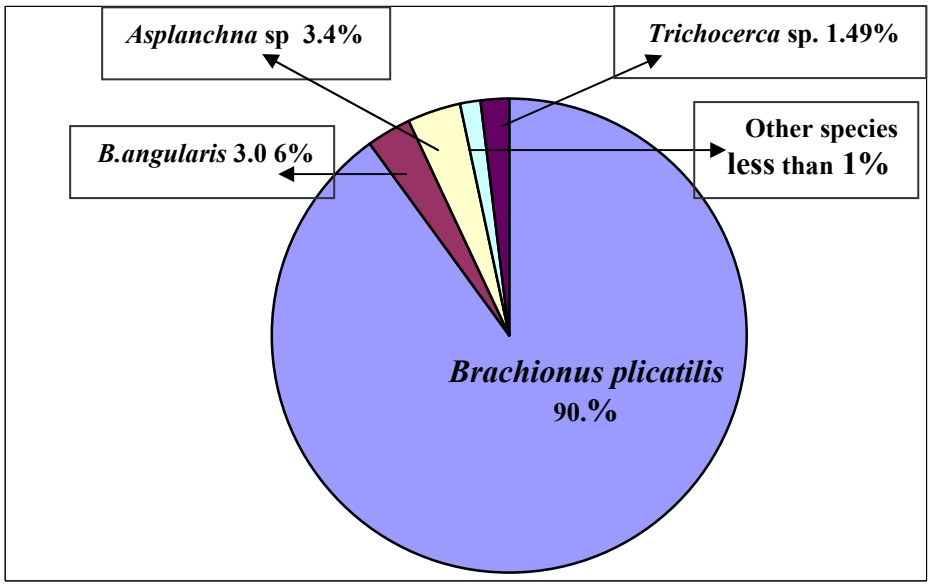

Fig.(2) The percentage occurrence of Rotifera, collected from pond (1) during the period from May 2006 – April 2007 .

Table 2.The species of Rotifera less than 1% of occurrence at pond (1).

The Species	Percentage of Occcurence (%)
Cephallodella sp.	0.56
Keratella quadrata	0.46
Notholca striata	0.41
Epiphanus sp.	0.39
Polyarthra vulgaris	0.14
Synchaeta sp.	0.01

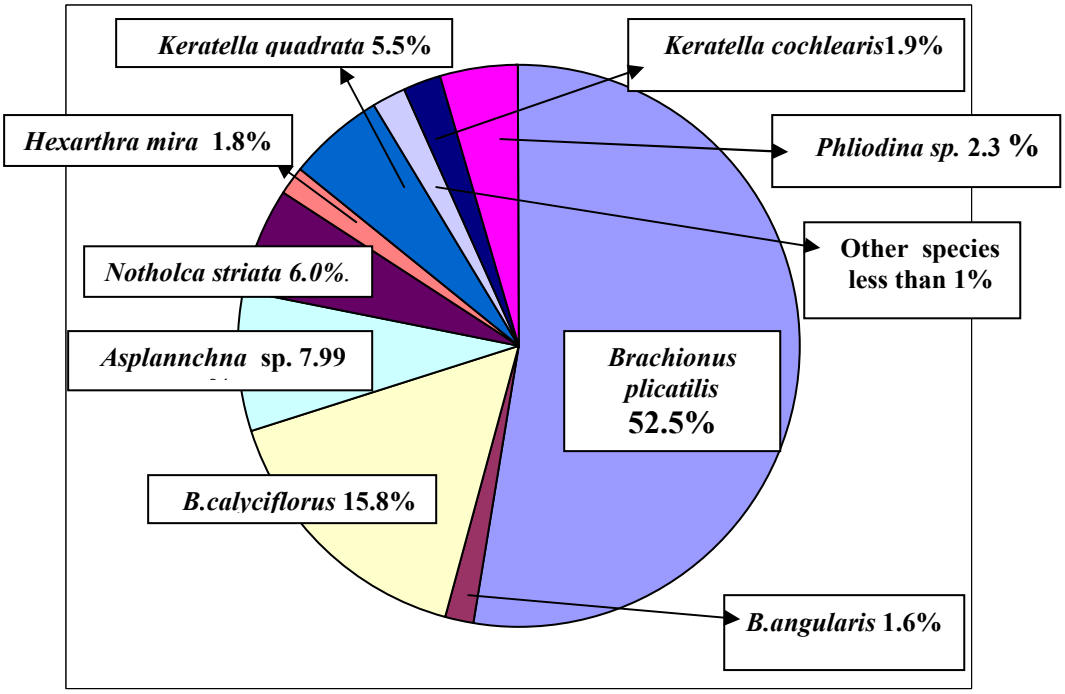

Fig.(3) The percentage occurrence of Rotifera collected from pond (2) during the period from May 2006– April 2007 .

Table3.The species of Rotifera less than 1% of occurrence at pond (2).

The Species	Percentage of Occcurence (%)
Trichocerca sp.	0.76
Epiphanus sp.	0.64
Synchaeta sp.	0.55
Keratella valga	0.45
Cephallodella sp.	0.41
Monostyla sp.	0.39
Lepadella patella	0.38
Colurella sp.	0.35
Lecan sp.	0.2
Polyarthra vulgaris	0.13
Squatinella mutica	0.05
Platyias quadricomis	0.05
Pompholy complanata	0.05

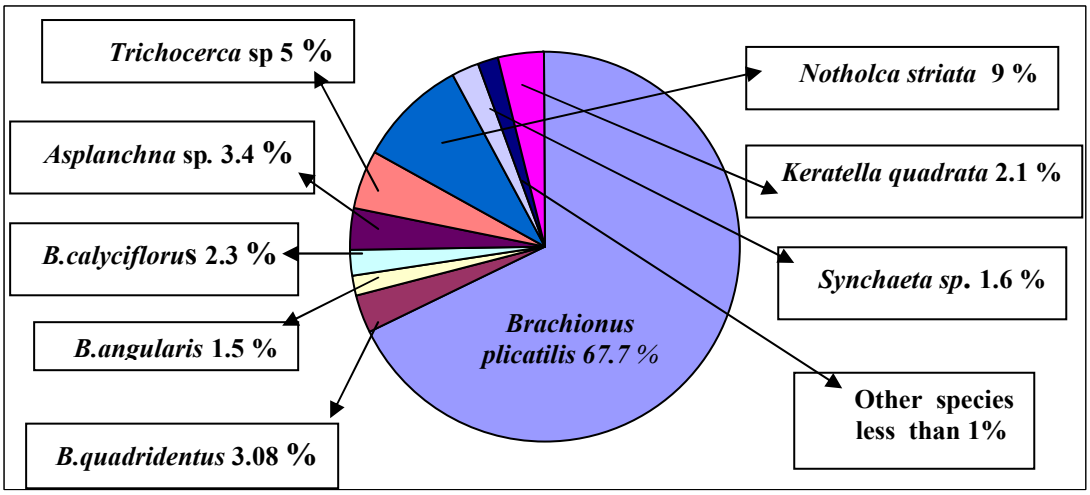

Fig.(4) The percentage occurrence of Rotifera ,collected from pond (3)during the period from May 2006 – April 2007 .

Table 4.The species of Rotifera less than 1% of occurrence at pond 3.

The Species	Percentage of Occcurence (%)
Polyarthra vulgaris	0.59
Phliodina sp.	0.51
Cephallodella sp.	0.47
Epiphanus sp.	0.45
Monostyla sp.	0.4
Keratella valga	0.36
Hexarthra mira	0.36
Colurella sp.	0.17
Lepadella patella	0.17
Brachiouns rubens	0.157
Lecan sp.	0.11
Euchlaris dilatuta	0.11
Mikrocodides sp.	0.057

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كثافة وتنوع الدولابيات في برك منطقة كرمة علـــــي في البصرة / العراق

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الخلاصـــــة

جمعت عينات الدولابيات من ثلاث برك مختلفة في منطقة كرمة علي في موقع جامعة البصرة تمثل ثلاث محطات. درست كثافة وتنوع الدولابيات وسُجل وجود 26 نوع تعود الى 20 جنس. بلغت اعلى كثافة 6 فرد/ لتر في المحطة (1) خلال شهر آيار/2006 وادنى كثافة خلال تشرين الثاني من نفس السنة 0.6 فرد/ لتر في المحطة (1) ايضاً. الكثافة الكلية وصلت الى 225 فرد/ لتر في المحطة (1). اعلى تنوع للدولابيات سجل في المحطتين (2) و(3) حيث بلغ 22 نوع بينما سجلت 9 انواع فقط في المحطة (1).