A preliminary report of two native freshwater rotifers
From Tabasco, México

Dr. Jeane Rimber Indy*
Dr. Wilfrido Miquel Contreras-Sánchez
M.C. Salomon Páramo-Delgadillo
Dr. Lenin Arias-Rodríguez
Dr. Carlos Alfonso Álvarez-González
M.C. Ulises Hernández-Vidal
M.C. Alejandro Mcdonal Vera

Abstract

The morphometric characteristics of two native wild freshwater rotifers was examined as well as trial cultured experiment in laboratory fed with Nannochloropsis oculata, the salinity tolerance of the rotifers, and the catchability larvae fish Bay Snook Petenia splendida to the mobility of rotifers. Rotifer Brachionus angularis and B. quadridentatus brevispinus were collected and identified. Trial cultured to the lowest salinity tolerance was in 5 and 10 ppt. The freshwater rotifers B. angularis and B. quadridentatus used in this study have present several characteristics: smallest size, slow mobility and easily captured by the larvae; and also could survived in lowest salinity of 5 and 10 ppt is to be considered as potential candidate for use as prey in the culture of larvae freshwater, brackish or marine finfish.

Introduction

Several characteristics of rotifer including their very small size, and relatively slow motility have contributed to their usefulness as a good prey for active larvae, and can be used as a living food capsule and vector which transmits adequate supplies of macro-micronutrients, vitamins, or even antibiotics to the fish larvae (Lubzens, 1987). In addition they have habit of staying suspended in the water column, high reproduction rate and high density cultures. They can tolerate temperature of between 15 – 31 °C and the optimal pH for its culture is between 6-8 (Ludwig,1993). In general, rotifer has both nutrient content and a high rate of daily production.
However, the level of polyunsaturated ω-3 fatty acid in rotifer is affect both survival and growth rate of fish larvae. In this sense, the most common rotifer used as food for finfish larvae rearing world-wide, is the SS monotype of rotifer called *B. rotundiformis* that has been used in the research line for many projects, while in freshwater fish and shrimp aquaculture, *B. calciflorus* and *B. angularis* are the commonly cultured freshwater rotifer. However, for larvae with very small mouths, it is intended to have greater proportion of super small rotifer strain that also cover the nutritional requirement.

**Objetive and Reason**

During the last year, we have surveyed several fish ponds located in Biological Sciences Division, Universidad Juarez Autónoma de Tabasco, México and could collect such *Brachionus* freshwater rotifer. In this study, we firstly examined the morphometric characteristics of two native wild freshwater rotifers, and trial cultured experiment in laboratory fed with *Nannochloropsis oculata*, tried to know the low salinity tolerance fed with *N. oculata*. Since there is no information yet on the salt stress tolerance to freshwater wild rotifers, we tested the lowest salinity tolerance of wild freshwater rotifers from our collections. This method is proposed to brackish water larvae fish or shrimp culture. Also, we tried to know the cathability of new hatched larvae Bay Snook *P. splendida* to the mobility of rotifers, and finally to provide new information of native freshwater rotifers collected from Tabasco, Mexico.

**Materials and Methods**

Rotifers used were collected from several fish ponds located in Biological Sciences Division, Universidad Juárez Autónoma de Tabasco, Tabasco, Mexico. The sampling sites were man-made fish ponds with maximum depth of 1.5 m and two species of freshwater rotifer *B. angularis* and *B. quadridentatus* were collected. The salinity, temperature, and pH of the pond were recorded and sampling rotifers from the corner of the pond were conducted using plankton net. For a clarification of identification specimens, the image files of each individual were sent to Ghent University, Belgium.
Clone cultured of this animal was carried out in freshwater at room temperature of ± 27-28°C. Each individual culture was initiated by collecting 10 female rotifers and putting in the glass petridisc containing of 5 ml of microalgae *N. oculata*, prior to individual culture experiments, the morphometric characters in terms of lorica length and width, width and height of anterior spines were measured based on Fu et al. (1991) and Hagiwara et al. (1995), then the specimens were photographed with digital camera (Sony cyber shoot 7.2 megapixel).

Observation of the rotifer grow was conducted every day during three days. Then the rotifer was cultured into a flask 200 ml and continued feeding with *N. oculata* arranged with continuous lighting and aerated for 24 hours at 22°C for better growth of rotifers in the laboratory. To know the salinity tolerance, we tried to feed them with *N. oculata* in low salinity 5 and 10 ppt and observed for a week. Also, in order to know the catchability of the larvae to rotifers cloned, trial experiment was made. We tested to give 10 ml of the cloned rotifer in 0 ppt as prey to five new hatched Bay Snook *P. splendida*, and observed under a stereo microscope (Iroscope Mode ES-24).

**Results**

The salinity was 0 ppt, pH ranged 5-6, and the fluctuation of water temperature varied from 27-29°C. Rotifer *B. angularis* showed two very short spines which were almost invisible, while *B.quadridentatus brevispinus* showed six anterior spines. Generally, the measurements compared with *B.rotundiformis* strain from Mazatlan, Mexico the total size of the freshwater rotifers collected from UJAT fish pond were smaller than those of SS type *B. rotundiformis*. The size of lorica length and width of rotifers from fish pond were almost similar. In low salinity 5 and 10 ppt fed with *N.oculata* the rotifers cloned surprisingly still alive and reproduced well. Observations on cloned rotifers cultured in 0 ppt as prey to new hatched larvae Bay Snook *P. splendida* showed the prey feeding was terminated in 25-30 minutes.

**Discussion**

Body size is one of the rotifer characteristics that is considered as a critical feature and
determines their adequacy as food for a young larva. The present results on morphometric variables reveal that the local strain classified as *B. angularis* and *B. quadridentatus* as according to the category of Segers (personal communication) having size smaller than those *B. rotundiformis*. For larvae with smallest mouth, the body size of rotifer *B. angularis* and *B. quadridentatus* could be considered in using it as living food of the larvae fish.

In three weeks observations fed in green water microalgae *N. oculata*, the rotifer reproduced very fast, and so seems that the environmental factors were favorable for their growth. Shiri *et al.* (2003) observed the survival rate of 69.2% in the rotifer fed on green water containing algae, also advocated that rotifers should be maintained in green water condition as this will help to ensure that they remain nutritious and relevant to the fry. Tried culture rotifers in low salinity 5 and 10 ppt for a week, showed surprising result which they are still alive and reproduced well. Their ability to survive is to considered one step toward culture rotifer for finfish larval rearing worldwide of super small rotifer. However, is still necessary to maintain culture to performance their growth in large scale. This step is remaining for future studies.

**Conclusion**

The freshwater rotifers *B. angularis* and *B. quadridentatus* used in this study have present several characteristics: smallest size, slow morbidity and easily captured by the larvae; and could survived in lowest salinity of 5 and 10 ppt is to be considered as potential candidate for use as prey in the culture of larvae freshwater, brackish or marine finfish.

**References**
