

Food Type Effect on the Population Growth of the Freshwater Rotifer *Brachionus angularis*

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Abstract

To investigate the effect of different diets on the growth of *Brachionus angularis*, four single component diets (*Chlorella vulgaris*, *Nannochloris* sp, baker's yeast, dry yeast) and three combination diets (*C. vulgaris* + *Nannochloris* sp. + baker's yeast + dry yeast, *C. vulgaris* + baker's yeast 7:3 , 3:7, respectively) were used. The population growth of *B. angularis* fed a combination food was better than any single component food. The rotifers fed a mixture of *C. vulgaris*, *Nannochloris* sp., baker's yeast and dry yeast showed the highest growth of 0.648, while those fed dry yeast only showed the lowest growth of 0.200.

Introduction

For production of fish and crustacean larvae that need preys less than about 120 μm , much smaller species or strains of rotifer than the popular food organisms, *B. plicatilis* or *B. calyciflorus*, need to be prepared.

Therefore, in the present study, we chose a small-sized freshwater rotifer, *Brachionus angularis* with a lorica length of about 100 μm to develop a small-sized live food organism. *B. angularis* generally occur in eutrophic lakes (Walz, 1987b; Walz and Gschloessl, 1988). Several studies of *B. angularis* have been done on population dynamics (Walz, 1987a), ingestion and filtration rates (Walz and Gschloessl, 1988), and toxicity of a pesticide (Gama-Flores et al., 2004). However, there have been no studies on the growth of *B. angularis* under culture conditions in laboratory.

The purpose of the present study is to investigate the growth of *B. angularis* under conditions of different diets in laboratory.

Materials and Methods

B. angularis was collected for isolation and laboratory culture from a reservoir in Jeonbuk, Korea by a plankton net (mesh size, 30 μm). The rotifer was isolated under a microscope (Nikon, SMZ-U) to be cultured.

To find the effect of different diets on the growth of the rotifer, four single component diets (*Chlorella vulgaris*, *Nannochloris* sp., baker's yeast, and dry yeast) and

three combination diets (*C. vulgaris* + *Nannochloris* sp. + baker's yeast + dry yeast, *C. vulgaris* + baker's yeast 7:3, 3:7, respectively) were used. The diets used here were always maintained at a density of 1.5×10^6 cells/ml under a light:dark regime of 16:8 according to Jose et al. (2004). The experiments were performed in triplicates. The specific growth rate (r) of *B. angularis* was determined at maximum density following Rico-Martinez and Dodson (1992).

Results & Discussion

Of the three single component diets, *Chlorella vulgaris* supported the highest maximum growth of 251.3 inds./ml with a specific growth rate of 0.460. However, The rotifers fed mixed diets comprising more than two different components showed significantly higher population densities or specific growth rates than any single component diet ($p < 0.05$).

Among all the tested diets, Mix1 of four components (*C. vulgaris*, *Nannochloris* sp., baker's yeast, and dry yeast) combined showed the highest maximum density of 487.7 inds./ml with a specific growth rate of 0.648. The rotifers fed dry yeast showed the lowest population density of 42 inds./ml or the lowest specific growth rate of 0.200.

References

- Gama-Flores, J. L., S.S.S. Sarma, S. Nandini. 2004. Acute and chronic toxicity of the pesticide methyl parathion to the rotifer *Brachionus angularis* (Rotifera) at different algal (*Chlorella vulgaris*) food densities. *Aquatic Ecology*, 38, 27-36.
- Rico-Martinez, R. and Dodson S. I. 1992. Culture of the rotifer, *Brachionus calyciflorus* Pallas. *Aquaculture*, 105, 191-199.
- Walz, N. 1987a. Comparative population dynamics of *Brachionus angularis* and *Keratella cochlearis*. *Hydrobiologia*. 147, 209-213
- Walz, N. 1987b. Stoffumsatz und kinetik von regulations prozessen bei Zooplankton-Populationen, Alaysen und modelle in rotatorien-chemostaten und um plankton eines Sees. Habilitationsschrift Faculty of Biology, Univ. Munich. 225pp.
- Walz, N. and T. Gschloessl. 1988 Functional response of ingestion and filtration rate of the rotifer *Brachionus angularis* to the food concentration. *Verh. int. Ver. Limnol.* 23, 1993-2000.