



EFFECTS OF FEEDING *Chlorella vulgaris* CULTURED ON DIFFERENT CONCENTRATIONS OF NITROGEN AND PHOSPHOROUS ON THE POPULATION GROWTH AND PROXIMATE COMPOSITION OF THE ROTIFER *Brachionus calyciflorus*

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Introduction

Rotifers are widely used as a live food for the early stages of fish of commercial importance and must meet their nutritional requirements for optimal development and growth. Long-term enrichment of rotifers with microalgae is well known for marine species, but knowledge in freshwater species is lacking and thus, the aim of this research was to evaluate population growth and proximate composition (protein, lipid, and moisture contents) of the rotifer *Brachionus calyciflorus* fed on *Chlorella vulgaris*, cultivated on different concentrations of phosphorus (P) and nitrogen (N).

Materials and Methods

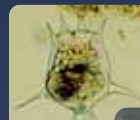
1. Microalgae culture

Table I. Initial concentration of P and N on the culture medium of *Chlorella vulgaris*

Treatments	Concentration (mg l ⁻¹)	
	P	N
Control	2.5	2.5
P 1.25	1.25	2.5
P 0.625	0.625	2.5
N 1.25	2.5	1.25
N 0.625	2.5	0.625



2. Rotifer populations growth



3. Biomass proximate analysis

Crude protein by Peterson's modification of micro Lowry method

Crude lipid by Bligh and Dyer (1959)

Moisture by AOAC (1990)

4. Data analysis

Population growth rate, $r = (\ln N_t - \ln N_0) t^{-1}$

Data analysis of population growth rates, contents of protein, lipid and moisture were analyzed by a Kruskal-Wallis test ($P < 0.05$)

Results

Table II. Population growth rate and maximum density of *Brachionus calyciflorus* fed on *Chlorella vulgaris* cultured different concentrations of P and N.

Treatment	Population growth rate	Maximum density (org ml ⁻¹)
Control	0.40 ± 0.01a	171 ± 4a
P 1.25	0.50 ± 0.005b	171 ± 4a
P 0.625	0.49 ± 0.005b	190 ± 5b
N 1.25	0.35 ± 0.005c	192 ± 5b
N 0.625	0.34 ± 0.006c	182 ± 3c

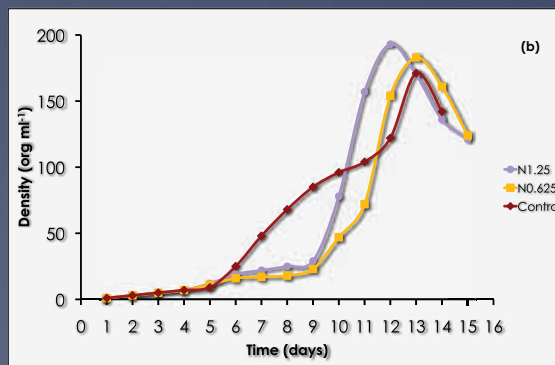
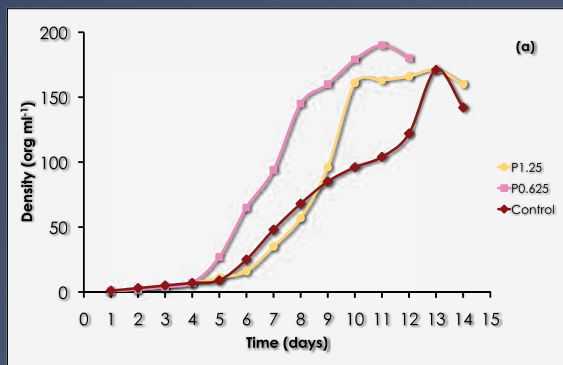


Figure 1. Population growth of *Brachionus calyciflorus* fed on *Chlorella vulgaris* cultured on different concentrations of P (a) and N (b).

Table III. Proximate composition of *Brachionus calyciflorus* biomass fed on *Chlorella vulgaris* cultured different concentrations of P and N.

Treatment	Crude protein (% in dry weight basis)	Crude lipid (% in dry weight basis)	Moisture (%)
Control	33.9 ± 0.2a	11.4 ± 0.003a	94.5 ± 0.1
P 1.25	26.3 ± 2.2b	15.1 ± 0.03b	91.2 ± 0.1
P 0.625	27.2 ± 2.1b	14.1 ± 0.04b	93.5 ± 0.1
N 1.25	30.5 ± 0.7a	17.6 ± 0.02c	94.3 ± 0.02
N 0.625	20.9 ± 6.2c	18.5 ± 0.1c	94.5 ± 0.1

Conclusions

The present research shows that *Brachionus calyciflorus* fed on microalgae cultured on low P might be used on freshwater fish larvae cultures and help to reduce costs without affecting the production and nutritional quality of rotifers.