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Feasibility of using live feed for regulating concentrations of  
ammonical nitrogen in water / Hemalatha Raja Sekaran.

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**FEASIBILITY OF USING LIVE FEED FOR REGULATING  
CONCENTRATIONS OF AMMONICAL NITROGEN IN WATER.**

**Hemalatha a/p Raja Sekaran**

**This project report is submitted in partial fulfillment of the requirement of the  
degree of Bachelor of Science in Agrotechnology (Aquaculture)**

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## ABSTRACT

A preliminary study on feasibility of using live feed for regulating ammonical nitrogen in water had been undertaken. The maximum feeding rate of *Moina macrocopa* in three different population densities of *Chlorella* spp. had been determined. The individual feeding rate in  $1.0 \times 10^5$  cell ml<sup>-1</sup>,  $1.0 \times 10^6$  cell ml<sup>-1</sup> and  $1.0 \times 10^7$  cell ml<sup>-1</sup> were  $1.053 \times 10^4$  cell hr<sup>-1</sup> ind<sup>-1</sup>,  $1.063 \times 10^5$  cell hr<sup>-1</sup> ind<sup>-1</sup> and  $2.478 \times 10^5$  cell hr<sup>-1</sup> ind<sup>-1</sup> respectively. The feeding rate increased with the increase of population density of *Chlorella* spp. besides that, the maximum growth rate and maximum ammonium uptake by *Chlorella* spp. was also accessed. The growth rate of *Chlorella* spp. increased simultaneously with the increase of total ammonium uptake from the culture medium. Finally, the amount of nitrogen transferred from *Chlorella* spp. to *Moina macrocopa* was also determined by culturing *Moina macrocopa* in green water containing *Chlorella* spp. for five days and analyzing the nitrogen content using proximate analysis. From the result, the amount of nitrogen transferred was high whereby one individual of *Moina macrocopa* is equivalent to  $1.157 \times 10^4$  *Chlorella* spp. cells in terms of nitrogen content. Therefore, *Chlorella* spp. can be used to remove ammonical nitrogen in water while *Moina macrocopa* can reduce excess population density of phytoplankton due to nutrient overloading. The findings from this study suggest that *Chlorella* spp. and *Moina macrocopa* can be applied to regulate ammonical nitrogen in water which is one of the main causes of eutrophication.

## ABSTRAK

Kajian tentang kebolehan makanan hidup untuk mengawalatur kandungan ammoniakal-nitrogen di dalam air telah dijalankan. Kadar pemakanan maksima oleh *Moina macrocopa* di dalam tiga kepadatan sel *Chlorella* spp. yang berbeza telah ditentukan. Kadar pemakanan maksima oleh setiap individu pada  $1.0 \times 10^5$  sel  $\text{ml}^{-1}$ ,  $1.0 \times 10^6$  sel  $\text{ml}^{-1}$  dan  $1.0 \times 10^7$  sel  $\text{ml}^{-1}$  adalah  $1.053 \times 10^4$  sel  $\text{jam}^{-1}$   $\text{ind}^{-1}$ ,  $1.063 \times 10^5$  sel  $\text{jam}^{-1}$   $\text{ind}^{-1}$  dan  $2.478 \times 10^5$  sel  $\text{jam}^{-1}$   $\text{ind}^{-1}$  masing-masing. Kadar pemakanan oleh *Moina macrocopa* telah meningkat dengan peningkatan kepadatan sel *Chlorella* spp. Selain itu, kadar pertumbuhan maksima dan kadar pengambilan ammonium maksima oleh *Chlorella* spp. juga ditaksir. Kadar pertumbuhan sel *Chlorella* spp. telah meningkat, selanjara dengan peningkatan jumlah pengambilan ammonium. Akhir sekali, jumlah pemindahan nitrogen dari *Chlorella* spp. kepada *Moina macrocopa* juga telah ditentukan dengan mengkultur *Moina macrocopa* di dalam air hijau yang mengandungi sel *Chlorella* spp. selama lima hari dan menjalankan analisa proksimat untuk menentukan kandungan nitrogen. Daripada keputusan yang telah diperolehi, jumlah kandungan nitrogen yang dipindahkan adalah tinggi iaitu satu individu *Moina macrocopa* adalah setara dengan  $1.157 \times 10^4$  sel *Chlorella* spp. dari segi kandungan nitrogennya. Oleh itu, *Chlorella* spp. boleh digunakan untuk menyingkirkan ammonia-nitrogen di dalam air manakala *Moina macrocopa* boleh digunakan untuk mengurangkan kepadatan populasi fitoplankton berlebihan yang disebabkan oleh keterlebihan nutrien. Penemuan dalam kajian ini mencadangkan bahawa *Chlorella* spp. dan *Moina macrocopa* boleh digunakan untuk mengawalatur ammonia-nitrogen di dalam air yang merupakan salah satu punca utama eutrofikasi.