THE EFFECTS OF DIETARY LIPID SOURCES ON THE *MACROBRACHIUM ROSENBERGII* POST LARVAL PRODUCTION AND FATTY ACID COMPOSITION

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Introduction

One of the major constraints in developing aquaculture industry of udang galah *Macrobrachium rosenbergii* in the developing south-east Asia countries is the larval dependence on *Artemia* nauplii which is costly and nutritionally variable with unpredictable global supply (Sorgeloos and Leger, 1992). The development of a specific artificial larval diet for this specie is therefore very much desired. Knowledge on the nutritional requirements of the larval *M. rosenbergii* is an essential prerequisite for the formulation of a nutritionally sufficient and balanced diet. This information is very scarce although the specie has been routinely hatchery produced for more than 30 years since the discovery of the larval rearing technique (Ling, 1969). Our earlier study has shown that lipid is the most important energy source for *M. rosenbergii* larvae. This study was conducted to determine the effects of different plant oils on the larval survival, growth and fatty acid composition.

Materials and Methods

Prawn larvae were reared in ten 70L rectangular fiberglass tanks at a stocking density of 30 larvae L^{-1}. The water salinity was maintained at the range of 12-15 ppt. The tanks were randomly assigned to five different treatments. Four isonitrogenous and isocaloric diets (55% protein and 12% lipid) of different sources of plant oils (palm oil, coconut oil, corn oil and soybean oil) were used. The larvae were gradually weaned to the diets from Stage IV to Stage X. The controls were fed solely on *Artemia* nauplii. All treatments were duplicated. No water change was made during the study. Larval growth was monitored using mean development stage (Lovett and Felder, 1988) while water parameters (temperature, DO, pH, ammonia-N and salinity) were monitored every 2-3 days. This study was terminated at the 10^{th} day after the first postlarva was observed. Final survival and growth were determined while samples were from each tanks for biochemical and fatty acid analyses.

Results and Discussion

No growth differences were observed among the treatments. Similarly no differences in survival rates among larvae fed different plant oils were noted. These values (24.4-33.2%) were however significantly lower ($P<0.05$) than that of the control (44.4%). Post-larval production was significantly higher ($P<0.05$) for larvae fed with corn oil and soybean oil compared those on other oils. Although lower, the values were statistically similar to that of the controls. No significant differences in the prawn dry weight and lipid content were found in all treatments. However, the controls and those fed on soybean oil had significantly higher protein contents. The fatty acid composition of the prawns was generally reflected those of dietary lipid sources. Higher content of C18:0, C20:4n6 and C20:5n3 in the postlarvae strongly indicated the ability of larvae and early postlarvae to elongate and desaturate C16:0, C18:2n6 and C18:3n3, respectively. This feature is quite limited in marine penaied shrimp larvae (Jones et al. 1979). Despite the significant differences in n3 and n6 contents, the larval n3:n6 ratios among treatments were remarkably similar indicating the importance of such ratio in the larval fattly acid metabolism.

Conclusions

Further study on dietary C18:2n6:C18:3n3 ratio could provide more insights on the prawn larval fatty acid metabolism and development of prawn larval feed.

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