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SHORT COMMUNICATION – III

Preliminary Trials on juvenile *Macrobrachium rosenbergii* Production under modified Static 'Green water' Conditions

INTRODUCTION

The methods of juvenile production of Udang Galah (Macrobrachium rosenbergii) *have been documented by several workers (Ling, 1969; Ling and Costello, 1976; Fujimura 1966, 1967, 1968, 1972; Fujimura and Okamoto, 1970; Sandifer et al., 1976).*

The methods given by these workers involve intensive hatchery management such as frequent water change and cleaning of larval tanks to ensure good sanitation. Such a technique would involve wastage of seawater and at the same time is labour intensive.

To overcome the above mentioned problems a study was conducted at the hatchery of the Faculty of Fisheries and Marine Science, Serdang, to produce "Udang Galah" juveniles without water change and by using "green water' at salinities 6–8°/oo and 12–14°/oo respectively. Previous studies by Cohen et al. *(1976) have conclusively shown that 'green water' is an efficient system to remove toxic metabolites such as ammonia from the culture medium. The 'green water' which mainly consists of unicellular algae such as* Chlorella *is produced by exposing water of salinity 6°/oo which contained* Sarotherodon mossambicus *to sunlight (Fujimura, 1966).*

PENDAHULUAN

Cara-cara pengeluaran anak Udang Galah (Macrobrachium rosenbergii) *telah dilapurkan oleh beberapa orang penyelidik (Ling, 1969; Ling dan Costello, 1976; Fujimura 1966, 1967, 1968, 1972; Fujimura dan Okamoto, 1970; Sandifer et al., 1976).*

Cara-cara yang diberikan oleh penyelidik-penyelidik ini memerlukan pengurusan penetasan dan semaian yang intensif seperti penukaran air yang kerap dan juga pembersihan tanki-tanki anak Udang untuk menjamin kebersihan. Teknik demikian akan melibatkan pembaziran air laut dan juga kerja-kerja pengeluaran menjadi intensif.

Untuk mengatasi masalah yang telah dikemukakan, satu kajian telah dijalankan di kawasan penetasan, Fakulti Perikanan dan Sains Samudra Serdang, bertujuan untuk mengeluarkan anak Undang Galah dengan menggunakan 'air hijau' pada saliniti 6–8°/oo dan 12–14°/oo tanpa penukaran air. Kajian-kajian Cohen et al. *(1976) telah menunjukkan bahawa 'air hijau' adalah satu sistem yang berkesan untuk meresap bahan-bahan metabolit yang beracun mithalnya ammonia daripada ramuan penyemai. 'Air hijau' ini yang mangandungi kebanyakkan fitopelankton seperti* Chlorella *disediakan melalui pendedahan air mengandungi* Sarotherodon mossambicus *dan pada saliniti 6°/oo kepada cahaya matahari (Fujimura, 1966).*

MATERIALS AND METHODS

In the present investigation, 'green water' was filtered through a plankton net No. 10 and transferred into four tanks of 130 litre capacity. The salinity of two of the tanks were increased to 12°/oo with filtered seawater. Each tank contained about 110 litres of culture water. The tanks were aerated and located below transparent plastic roofing and as such they were exposed to sunlight for a minimum of 10 hours per day. There was neither water change nor cleaning of the tanks but the volume of the water was maintained at a constant level by topping up whenever necessary with 'green water'.

About 2,000 – 2,500 larvae were estimated from a newly hatched batch of "Udang Galah" and they were released into each of the four tanks.

The feeding schedule of the "Udang Galah" larvae is given in Table 1. Egg custard was

TABLE 1

Feeding Schedule for "Udang Galah" Larvae

Time	AGE IN DAYS			
	1–5	6–10	11–20	More Than 20
0830	Egg Custard	Egg Custard + *Artemia**	Egg Custard + *Artemia**	Egg Custard + *Artemia**
1130	Egg Custard	Egg Custard	Egg Custard	Egg Custard
1430	Egg Custard	Egg Custard	Egg Custard	Egg Custard
1615	Egg Custard	Egg Custard + *Artemia*	Egg Custard + *Artemia*	Egg Custard + *Artemia*

* This was only given when the overnight feed of *Artemia* had been consumed.

prepared according to the method given by Ling (1969). Larvae of 1–10, 11–20 and more than 20 days old were given egg custard which had been passed through sieves of mesh sizes 0.23 mm, 0.35 mm and 0.60 mm respectively. About 2.5 ml of egg custard suspension was delivered in a circular fashion around the point where the air bubbles broke the water surface to ensure even distribution of the particles. After a lapse of five minutes, observations were made to see whether most of the larvae were clasping the food particles. If it was found otherwise, further additions of the feed were given. In the case of feeding with *Artemia* nauplii, the eggs were hatched in aerated funnels on alternate days. At the prescribed times (Table 1), about 2 ml of *Artemia* nauplii as well as the egg cases were scooped from the hatching funnel with a plankton net and delivered equally to the four tanks.

DISCUSSION

In earlier trials (Unpublished) it was found that tanks containing *Artemia* egg cases, which had been intentionally introduced, gave greener 'green water' and it was surmised that the egg cases might have contributed some essential micro-elements to the culture water. When the egg cases eventually settled at the bottom of the culturing tanks they subsequently provided good substrata for the growth of epiphytic algae. The algae might have contributed to the purification of the culture water by removing toxic metabolites such as ammonia.

Under the conditions of the present study juvenile "Udang Galah" were first observed in all tanks 34 days after the beginning of the trials. After 53 days, at the termination of the trials, the average survival rate of juveniles cultured at 6–8°/oo and 12–14°/oo were 39.6% and 36.9% respectively. Though previous studies by Ling (1969) and Sandifer *et al.*, (1976) have indicated that the most preferreds alinities for "Udang Galah" juvenile production were in the range of 12–16°/oo, the preliminary result of this study shows that there was no significant difference in production between salinities 6°/oo and 12°/oo.

The production of juvenile "Udang Galah" in our trials at salinities 6°/oo and 12°/oo were 8.9 and 8.3 juveniles per litre of water respectively. This was within the range of 7–41 juveniles per litre for recirculating systems using 'green water' as reported by Sandifer *et al.*, 1976. It may be inferred that juvenile production of "Udang Galah" under our present system, where no intensive hatchery management techniques were employed, could be more economical in the final analysis than standard methods previously employed. However, further trials are in progress to support our present findings.

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