

EFFECT OF LIVE FOOD AND ARTIFICIAL DIETS
ON THE LARVAL DEVELOPMENT AND
REARING OF SEA BASS (*Lates calcarifer*)

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**EFFECT OF LIVE FOOD AND ARTIFICIAL DIETS
ON THE LARVAL DEVELOPMENT AND REARING
OF SEA BASS (*Lates calcarifer*)**

THIS THESIS IS DEDICATED TO

MY PARENTS,

MY WIFE HERMIAN, MY WIFE SYAFRIZAL AMANDA LIA BERIZA

AND MY SON RAFIZ AL AKBOM

**Thesis Submitted in Fulfilment of the Requirement for the Degree of
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Abstract of thesis presented to the Senate of Universiti Putra Malaysia
in fulfillment of requirement for the degree Master of Science

**EFFECT OF LIVE FOOD AND ARTIFICIAL DIETS
ON THE LARVAL DEVELOPMENT AND REARING
OF SEA BASS (*Lateolabrax niloticus*)**

By

SYAPRIZAL

January 2001

Chairman: **Abol-Munaff Annuak Salong, Ph.D.**

Faculty: **Science and Technology**

THIS THESIS IS DEDICATED TO

MY PARENTS,

MY WIFE HERMIAH, MY DAUGHTER AMANDA LIA HERIZA

AND MY SON HAFIZ ALKIROM

Four major experiments namely, (i) effects of delayed feeding, (ii) effects of live food and artificial diets, (iii) effects of live food and artificial diets on the growth, survival rate (SR) and development of the digestive tract of sea bass (*Lateolabrax niloticus*) larvae, and (iv) effects of live food and artificial diets on the growth, survival rate (SR) and development of the digestive tract of sea bass (*Lateolabrax niloticus*) larvae.

Delayed feeding showed that larvae could not survive when feeding was started on the 5th and 6th day after hatching (DAH). There is no significant difference in the SR and total length (TL) when the larvae were fed on the 2nd and 3rd DAH ($P > 0.05$). Larvae fed from the 2nd DAH revealed lower SR and TL compared to larvae fed from the 3rd and 4th DAH. Histological studies showed that the intestine and liver of sea bass larvae fed from the 4th–6th DAH were not well developed. This study indicates the larval feeding should be done at least on the 2nd DAH.

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Four major experiments namely (i) effects of delayed feeding, (ii) effects of live food and artificial plankton (AP), (iii) replacement of *Artemia* by microencapsulated diet (MD), and (iv) use of probiotic bacteria were conducted to evaluate the growth, survival rate (SR) and development of the digestive tract of sea bass (*Lates calcarifer*) larvae.

Delayed feeding showed that larvae could not survive when feeding was started on the 5th and 6th day after hatching (DAH). There is no significant difference in the SR and total length (TL) when the larvae were fed on the 2nd and 3rd DAH ($P>0.05$). Larvae fed from the 4th DAH revealed lower SR and TL compared to larvae fed from the 2nd and 3rd DAH. Histological studies showed that the intestine and liver of sea bass larvae fed from the 4th –6th DAH were not well developed. This study indicates that initial feeding should be done at least on the 3rd DAH.

Sea bass larvae fed only with AP at their first feeding stage showed poor growth and died after the 8th DAH. Larvae fed only with rotifer (control) showed the highest growth and SR and was significantly different when compared to the larvae fed with a mixture of rotifer and AP ($P < 0.05$). Histological studies revealed that the intestine and liver of sea bass larvae fed with AP were not well developed. This finding showed that the total substitution of rotifer by AP for the first feeding is impossible.

In the replacement of *Artemia* by MD as a food item, feeding *Artemia* up to 25th DAH followed by MD showed better growth compared to *Artemia* feeding up to the 15th and 20th DAH, respectively. Feeding *Artemia* up to the 30th DAH showed lower growth rate without any significant difference in SR. Results showed that better growth and SR were obtained when *Artemia* was supplied together with MD from 10th, 15th and 20th DAH up to 30th DAH compared to when MD alone. Poor SR and growth in larvae fed with MD might be due to very low specific activity of enzymes and incomplete development of digestive system. This indicates that replacement of *Artemia* by MD is possible only after 25th DAH. However, combination feeding may improve the growth and SR of sea bass larvae.

The application of probiotic bacteria from the first feeding until 30th DAH revealed that SR of the sea bass larvae treated to photosynthetic bacteria (PSB) was $50.21 \pm 8.5\%$ higher than that of other probiotics. This indicates that PSB could enhance SR of the sea bass larvae.