

STUDIES ON THE EARLY DEVELOPMENT
AND LARVAL REARING OF
Oxyeleotris marmoratus (Bleeker)

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Abstract of thesis presented to the Senate of Universiti Putra Malaysia in fulfillment
of the requirement for the degree of Master of Science.

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Chairman: Abol-Muhaffi Ambok Bolong, Ph.D.

Faculty: Science and Technology

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Some aspects on the early development and larval rearing of *Oxyleleotris marmoratus* were studied. The pattern of food selection by the larvae was analysed using Ivlev's *electivity* index. The larvae commenced feeding on phytoplankton on day 2 after hatching with the slight selection for *Chlorella* and *Closterium*. The *Brachionus* and nauplii of copepods were preferred by larvae from day 3 to day 10 after hatching and subsequently replaced by bigger size prey such as *Cyclops* and *Moina* thereafter. *Cyclops* was found to be the most preferred food during the larval stage. The prey selectivity by the larvae could be attributed to change in mouth size, mobility of the larvae and the prey, its size and type.

The development of the digestive tract was examined histologically up to 35 days from hatching. The first signs of lipid and protein absorption could be identified as lipid vacuoles and eosinophilic granules in the rectum on day 3 and day 5, respectively after hatching. The intestinal epithelial cells showed accumulation of

lipid from day 7. By day 10 to 15, the formation of stomach was complete and storage of ingested food had begun. It became functional by day 30 as indicated by the appearance of gastric glands.

In the treatments of different diets from the first feeding until 10 days after hatching, the growth and survival rate were highest for the larvae fed with the combination of green water and nauplii of copepods (0.14 mm.day^{-1} and 43.20%, respectively). Larvae fed with single feed of *Spirulina*, rotifer, artificial diet or infusoria showed least growth and high mortality. Although algae did not support the growth, the survival rate of larvae improved significantly when green water was given in combination with other feeds.

Growth and survival rates of the larvae were significantly affected when the larvae were reared at 24°C , 26°C , 28°C , 30°C , and 32°C . High daily growth rate was obtained in treatments at 28°C , 30°C , and 32°C (different significantly compared to 24°C and 26°C). For the survival rates, best results were at 28°C and 30°C which is significantly different compared to 24°C , 26°C , and 32°C ($P < 0.05$). Consequently, temperatures of 28°C to 30°C are recommended for larval rearing of this species.

The use of probiotic bacteria namely Photosynthetic bacteria (PSB) and Super probiotic *Bacillus* mix (Super PB mix) greatly improved survival rates of the larvae (68.67% and 61.73%, respectively) when they were used in combination with green water. These probiotic bacteria may contribute to improving the intestinal microbial balance of *O. marmoratus* larvae.