

Retinomotor response in larvae of brown-marbled grouper, *Epinephelus fuscoguttatus*

Abstract

The brown-marbled grouper *Epinephelus fuscoguttatus* is an important species for aquaculture, however, there is no data about visual threshold in order to estimate the optimum light intensity for larval rearing. This study examined the retinomotor responses of 14, 28 and 42 days old larvae of *E. fuscoguttatus* under seven orders of magnitude of light intensities from 0 lx to 100 lx to determine the visual thresholds. The retinae of 14 days old larvae had a single layer of outer nuclei, of the same number as the cone cells, indicating absence of rod cells. The 28 days old larvae had more nuclei in the outer nuclei layer than cone cells, indicating the appearance of rod cells. The retinomotor response was quantified as an increase in the expansion of the pigment epithelium and a decrease in the contraction of the cone myoids. The retinomotor response was absent in 14 days old larvae and weakly evident in 28 days old larvae. The retinal pigment layer was thinner at light intensity <1 lx than at 10-100 lx. The retinae of 42 days old juveniles showed a clear retinomotor response during 0.1-10 lx and 10-100 lx is necessary for cone vision of *E. fuscoguttatus*. Therefore, the larvae should be exposed to the light intensity >10 lx in the larval rearing tanks. Full retinal function at age 42 days would be prepared for their benthic life style in next stage of 45-50 days juveniles.