Sensory-mediated feeding behaviour in the larvae of marble goby (Oxyeleotris marmorata)

ABSTRACT

This study was conducted to determine the senses that facilitate prey detection in the marble goby (Oxyeleotris marmorata) larvae. The ingestion ratios of live (generate chemical and mechanical stimuli) or frozen Artemia nauplii (generate chemical but no mechanical stimuli) by the intact or free neuromast (mechanoreceptor)-ablated O. marmorata larvae (11 mg/L streptomycin treatment before feeding) under the light or dark (fish vision was obstructed) condition were examined. Vision, mechano-, and chemoreceptions were all found to be essential in prey detection of the O. marmorata larvae. Prey movement has a significant influence as a visual stimuli on the O. marmorata larval feeding as the Artemia nauplii ingestion ratio was approximately 40% higher with significant ($p = 0.001$, $d = 3.0$), when the intact larvae were fed with the live (78.1 ± 1.5%), rather than the frozen (40.9 ± 2.8%) Artemia nauplii, under the light condition. This result was assured when no significant difference ($p = 0.572$, $d = 0.2$) was found between the ingestion ratios of frozen Artemia nauplii by the intact O. marmorata larvae under light and dark conditions. These findings demonstrate that prey detection in the O. marmorata larvae was facilitated by multi-modal senses, allowing O. marmorata larvae to survive in their natural habitats.