

**EFFECT OF FOOD TYPE ON ,
DEVELOPMENT, COMPETENCY
AND SETTLEMENT OF
SEA URCHIN LARVAE**

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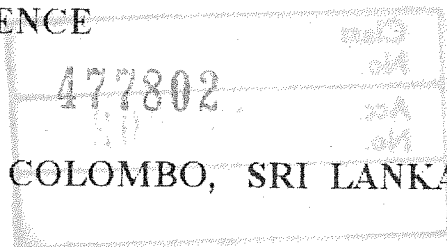
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ABSTRACT

The influence of phytoplankton species on development of common benthic sea urchin was studied in the laboratory using *Dunaliella tertiolecta*, *Isochrysis galbana* and *Thalassiosira weissflogii* as phytoplankton food species and *Stomopneustes variolaris* as the sea urchin species. Phytoplankton were cultured in the laboratory and administered to sea urchin larvae from their first feeding stage up to settlement stage in 4 feed combinations comprising *Dunaliella*, *Dunaliella+Thalassiosira*, *Dunaliella+Isochrysis* and *Isochrysis+Thalassiosira*. Feed performance effect on sea urchin larval development was evaluated by monitoring growth, development, settlement and survivorship.

Dunaliella and *Dunaliella+Isochrysis* mixture supported rapid growth and development to rudiment stage. Comparing the larval development on these two feeds, *Dunaliella+Isochrysis* mixture was less effective after the 28th day of development. Larvae fed with *Dunaliella+Isochrysis* mixture required a longer period to attain settling stage than larvae fed with *Dunaliella* on its own. Larvae fed with *Dunaliella+Thalassiosira* and *Isochrysis+Thalassiosira* showed slow development and higher mortality. These larvae did not develop beyond the 4-arm development stage and died on the 29th and 20th



of days of development, respectively. In control larvae that did not receive any food, body lengths and arm lengths increased and although they survived until the end of the experiment they did not develop beyond the 4-arm stage of development.

Considering the larval arm lengths of larvae fed with *Dunaliella+Thalassiosira*, *Isochrysis+Thalassiosira* and starved control, larvae in unfed control had longer arms than those that received the feed treatments at early 4-arm development stage.

This study demonstrates that available algal diets affect larval development and recruitment into the benthic marine environment. It shows that good larval growth and development are promoted by algal diets having a satisfactory make up, such as fatty acid composition. The thesis discusses how environmental factors influence phytoplankton composition and how phytoplankton in turn affects recruitment processes and the composition of benthic environments.

The study also shows that the morphological responses shown by larvae to limitation in nutrition can be used to assess nutrition status of larvae under field conditions and the possibility of developing it as a field bio-assay method.