CALIFORNIA STATE SCIENCE FAIR
2011 PROJECT SUMMARY

Name(s)

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Project Number

31917

Project Title

Effects of Food Types on Survival and Development of California Spiny Lobster Phyllosomas, Panulirus interruptus

Abstract

Objectives/Goals

Larval California spiny lobsters, Panulirus interruptus, were reared on 5 different diets to study survivorship and metamorphic development. This species has never been successfully raised in captivity before due to the lack of information available on how to sustain life (i.e. food, temperature, tank design). The goal of this study is to provide information on what food types phyllosomas need to live through their larval period so that they can be raised in an aquaculture setting. In addition, morphological development for this species has not been thoroughly studied. Obtaining information on when certain stages occur and on how they are characterized is another objective of this study.

Methods/Materials

1. 5 cultures of 10 phyllosomas were reared, each culture fed its assigned diet. All cultures were fed Tetraselmis enriched Artemia nauplii and were supplemented as follows: 1. Artemia nauplii only; 2. gonadal material; 3. larval fish; 4. rotifers & copepods; 5. gonadal material, larval fish, rotifers, and copepods.
2. Each tank was cleaned daily. During this time, deaths were recorded. Deceased phyllosoma were measured and photographed.
3. Survivorship was analyzed with PAST-generated survivorship probability curves.

Results

The survivorship probability curves show that the larval fish and Artemia nauplii only diets promote the longest survivorship and the greatest amount of growth. In addition, diets including gonadal material were detrimental to survivorship.

Conclusions/Discussion

The larval fish and Artemia nauplii diets were the most beneficial, while the gonadal material was extremely detrimental. The largest and most morphologically advanced phyllosoma, which was part of the larval fish supplemented culture, reached stage VIII after 179 days. This is the longest survivorship and the furthest stage reached for this species in captivity. This research could be used for aquaculture applications in the future. Using the larval fish supplemented diet, development could be more thoroughly tracked. Also, using this diet, other conditions (i.e. tank design or water quality) could be improved to promote increased survivorship. Similar designs could additionally be applied to closely related species. Aquaculture for this species would encourage conservation of wild stocks and increase economic benefits as the California spiny lobster is currently valued at $46 per pound.

Summary Statement

Effects of food types on larval California spiny lobsters was studied for aquaculture applications, resulting in the longest-living phyllosoma and most advanced morphological stage reached in captivity.

Help Received

Used lab equipment at Cabrillo Marine Aquarium.

Preliminary