CALIFORNIA STATE SCIENCE FAIR
2012 PROJECT SUMMARY

Name(s)

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Project Number

S2204

Project Title

Copepod Culturing: Conditions and Designs for Maximum Yield per Generation, Year 2

Abstract

Objectives/Goals

Copepods are essential food sources for captive marine animals. However, due to their slow reproductive rate in laboratories, copepods are not a viable food source for some organisms. In addition, pelagic copepods are notorious for their delicateness and cannibalism, resulting in difficulty when producing large volumes. Previously, culture conditions for the species Tigriopus californicus were explored, resulting in a 260% increase in copepod population by feeding Isochrysis algae. This year, the effects of DHA and ARA, the two major HUFA components of Isochrysis, were compared. In addition, a specialized tank that solves for all problems associated with culturing pelagic copepods was designed.

Methods/Materials

Trials testing fatty acid diets lasted four weeks. Cultures were 5gallon buckets with an air pump, starting off with 100 gravid females of T. californicus. Every two weeks, water was agitated to keep copepods in suspension, and three 20ml samples were taken. The average of samples was used to estimate the population. Tanks were built for the pelagic species Acartia tonsa using a fiberglass container as a base. PVC piping with 45 and 150 micron mesh was used for automatic adult and nauplii separation.

Results

Cultures fed on high DHA diets yielded 37% more than those fed a combination of the two HUFA#s, and 80% more than those fed ARA. A. tonsa tanks successfully separated nauplii from the adults with steady parameters.

Conclusions/Discussion

The data suggests DHA components in copepod diets over doubles the population per generation. Moreover, the A. tonsa tank increased the ease of culturing pelagic copepods.

Summary Statement

Copepod reproduction in laboratory cultures was maximized by manipulating diet and environmental factors.

Help Received

Parents gave me transportation to and from the aquarium; Mr. Starodub guided me through the scientific method; Dr. Kiersten Darrow allowed me to use her facility.