CALIFORNIA STATE SCIENCE FAIR
2014 PROJECT SUMMARY

Name(s)

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Project Number

34707

Project Title

Examining the Significance of Dens and Manipulable Environments of Wild-Caught and Captive-Raised Octopus bimaculoides

Abstract

Objectives/Goals

Octopuses in the wild live in an environment in which they can manipulate their surroundings, though this is not always true in captivity. This experiment strived to determine if a manipulable environment may reduce the impacts of stress experienced by octopuses in captivity.

Methods/Materials

Nine captive-raised and nine wild-caught Octopus bimaculoides were kept in separate tanks each with a different type of environment: deprived, supplied, and manipulable. Once a week for four weeks, each octopus was tested for four different indicators of stress: growth by weight, incidence of inking in response to a stressor, change in respiration rate in response to a stressor, and behavioral reaction in response to a stressor based on an established ethogram. Data from each test was analyzed with two-factor ANOVA tests.

Results

An interaction of both factors -- origin and environmental treatment -- yielded significance for behavioral reaction in response to a stressor ($p=0.029$) and changes in respiration in response to a stressor ($p=0.017$).

Conclusions/Discussion

Thus the origin of an O. bimaculoides and the manipulability of its environment significantly impact their ability to respond to stress in a captive environment. An octopus in captivity would benefit from living in a manipulable environment. This study, as well as possible future trials and studies on different species of octopus with a larger sample size, will give a more concrete understanding of how octopuses should be kept in captivity.

Summary Statement

The project focused on determining if a manipulable environment in captivity would help octopuses better cope with stressful events.

Help Received

Used facilities, organisms, and materials at Cabrillo Marine Aquarium's Aquatic Nursery. Staff helped analyze statistics and correctly care for animals.