

Free report on hypothesis

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Introduction

Of the over 6, species of anthozoans found worldwide, the northern Gulf of Mexico only has a few, *Renilla mulleri* is one of these. Commonly known as the “ sea pansy” the *Renilla mulleri* is an anthozoan colony characterized by elongated white polyps that are vividly luminescent when handled in the dark. Under stimulus, these waves of luminescence move concentrically across the colony. Other characteristics include a short peduncle, which anchors to the substratum and makes distinct trails in the mud and the ability of the colony to use water to inflate itself.. It can be differentiated from the *Renilla reniformis* by the shape of the frond, which in the *R. reniformis* is not conspicuously wider than long and the sclerites of the stalk, which are shorter than those in *R. mulleri*. *Renilla reniformis* is also bioluminescent.. Because of its bioluminescence the closely related *Renilla reniformis* is commonly used in molecular biology. . In tests it has been postulated that the bioluminescence of *Renilla Mulleri* is connected to an intracellular structure that is involved in the bioluminescent process. . Because of their value to scientific research, the luminescent products Luciferase and Green Fluorescent Proteins derived from the *Renilla mulleri* are available for purchase on line. The ability of the *Renilli mulleri* to habituate itself is one of the characteristics of the species and the topic of this laboratory study. Variables to be considered are the degrees both the stimulus and the response. In order to determine this both electronic and mechanical stimulus will be used.

The *Renilla mulleri* will acclimate itself to repeated stimuli, including consistent mechanical stimulus and electric stimulus utilizing increased voltage set for 1 volt on the initial trial and increased in subsequent trials.

Methods and Methodology

Materials

Light safe specimen container (three sided box covered in a black trash bag)

Blunt-ended glass rod

Renilla mulleri

Glass bowls

Electronic stimulator

Red pen light(s)

Stopwatch

Renilla mulleri were kept in complete darkness for between 20 to 30 minutes and only a red light was used during the course of the experiment.

Mechanical Stimulation was created by stimulus with a glass rod. To standardize the pressure each time only gravity was permitted to provide the force for the stimulation. In order to effect this both hands were used. The researcher formed an “ O” shape with one hand and dropped the probe through this shape. Care was taken to keep “ O” shaped hand in the same location to provide identical stimulation each time. The timer was set for 5 seconds once the probe touched the rachis of the *Renilla*, the timer was started to commence the 5 second response test.

After 5 seconds was completed one minute of recovery time was allowed. All observations of bioluminescence from the *Renilla mulleri* that occurred in this time period were recorded along with the type of wave observed (point, wave, or combination of point and wave). Habituation was determined to be when, after displaying responses, the specimen stops responding to stimulus. When this occurred and “ H” was recorded in the data for each trial in which habituation was observed. A series of 12 mechanical stimulus trials was conducted.

Electrical Stimulation

Habituation occurred when after displaying responses, the specimen stops responding to stimulus. When this occurred, an “ H” was included in the data for each trial in which habituation was observed. The series was repeated for a course of 12 trials. The voltage was increased by 1 volt in each successive trial.

Conclusion

The *Renilla mulleri* did habituate to both mechanical and electric stimulation.

Discussion

The data showed that the *Renilla mulleri* did habituate to repeated stimulation. Interesting, the habituation times, when charted out, formed a wave pattern. In the Mechanical Stimulation Trials the time taken to bioluminescence dropped to its lowest points in the 8th, 9th and 10th trials and began increasing on the 11th trial. The time taken to habituation followed a similar pattern. This wave pattern was repeated in the electric stimulation trials as well.

References

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