CALIFORNIA STATE SCIENCE FAIR
2015 PROJECT SUMMARY

Name(s)
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Project Number
S2203

Project Title
The Neural Limitations of Small Invertebrates

Abstract

Objectives/Goals
According to scientific research, the only animals capable of feeling pain are those that can feel fear, anxiety, distress and terror, similar to what humans feel when we receive noxious stimuli. Contrary to popular belief, new research implies that it is possible that certain invertebrates can feel anxiety. The purpose of this experiment was to observe species of invertebrates and place them under extensive stimuli to see if they exhibit anxious behavior.

Methods/Materials
Brine shrimp was selected for this experiment, an invertebrate that it normally attracted to light. Electrical shocks were used as the stress-inducing stimuli for the purpose of creating an anxious environment. The brine shrimp were first placed in a container that was half dark and half light, and their natural behavior in the container was observed. The shrimp were then moved into a separate container where they received mild electrical shocks. After, they were placed back into the half dark container where they were observed to see if there was a difference in their behavior.

Results
Naturally, brine shrimp are more attracted to lighter areas than darker areas. This was observed when the brine shrimp were placed in the container that was half dark and half light. After the brine shrimp were exposed to stress-inducing stimuli in the form of electrical shocks, their behavior in the half dark container changed slightly. On average, more brine shrimp preferred the darker side of the container after experiencing the electrical shocks than before they were exposed to them.

Conclusions/Discussion
Through experimentation, it was discovered that after exposure to the stress-inducing stimuli, more brine shrimp preferred to stay in the section that was dark. This suggests that brine shrimp, which were originally believed to have too simple a neural system to express anxiety, may in fact possess the ability to exhibit the common signs of anxiety or depression. If further research is conducted in this area and the results are similar, the implications may call for a restructuring of the way in which invertebrates are regarded.

Summary Statement
Small invertebrates may posses the ability to exhibit anxiety and depression, which implies the ability to feel pain.

Help Received
Parents assisted in gathering and aquiring materials.