CALIFORNIA STATE SCIENCE FAIR
2002 PROJECT SUMMARY

Name(s)
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Project Number
22272

Project Title
Extremozymes

Abstract

Objectives/Goals
The objective of my project was to grow one-celled organisms in pond water with different nutrients added and to freeze them to see if some cells continue to grow and others don#t.

Methods/Materials
Eight glass jars were filled with 1 1/2 cups pond water, each two jars had a different additive added, either Peptone, Sodium Bicarbonate, and Yeast Extract, and two jars with nothing added. All the jars wet allowed to sit in the sun for two weeks. After being in the sun, one jar for each additive and the contr| were placed in the freezer for 72 hours. After being in the freezer, the jars were allowed to thaw in th| sun. After they thawed all samples were observed under a microscope (must have a 1000x lens) andt sketched.

Results
When the pond water was observed, one-celled organisms were seen in all the experimental groups.t observed single bacteria in the Peptone experimental group and clusters of bacteria in the Peptone control. In the Yeast experimental group I observed something I wasn#t expecting: one-celled organisms that I did| not see in the control group. I saw larger cell masses in the control sample of the Sodium Bicarbonate than in the experimental group. There was algae in both Sodium Bicarbonate groups.

Conclusions/Discussion
Is it possible to freeze cells without killing them? Yes, some one-celled organisms survived freezing. From my research I found that some cells are chemically protected and produce their own #anti-freeze# (for example, glycerol). Cells surviving in freezing temperatures are important because on Europa, one | Jupiter#s moons, scientists think there is a frozen lake and it is possible that there are bacteria under the ice. If some cells can survive freezing, then it is possible that there is life in outer space.

Summary Statement
I grew one celled organisms in pond water with different nutrients added and froze them to see how various types of cells are affected.

Help Received
Mother helped design backboard; Used microscope at Humboldt State University under the supervision of Dr. Patricia Siering.