CALIFORNIA STATE SCIENCE FAIR
2017 PROJECT SUMMARY

Name(s)

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Project Number

J1914

Project Title

Saline Hydroponics

Abstract

Objectives/Goals

I wanted to learn if the concentration of NaCl in the water used to grow Jade Plants hydroponically would affect their growth. I believe the concentration of NaCl will affect their growth and condition.

Methods/Materials

Using 21 clippings of Jade Plant (each with a five cm stem and six leaves), I placed these into 21 jars, marked and divided into groups of 7. Into the first seven, I poured 75 mL of distilled water. For the next seven, I dissolved 15 g of NaCl in a liter of distilled water to get roughly estuary salinity-15ppt. I measured out 75 mL of this solution into the next seven jars. Then I did the same for the next seven, except with 35 g of NaCl for roughly ocean salinity-35ppt.

Results

The plants in "ocean" water fared worst. Their stems and leaves broke down, decomposing, and no roots formed. Those in the "estuary" water fared slightly better; some hadn#t yet completely collapsed. The specimens in the distilled water proved to grow best of all. They grew roots and remained firm to the touch, green, and sturdy. This shows a clear negative correlation between the concentration of salt and the plant condition/growth.

Conclusions/Discussion

This proves that the concentration of NaCl in the water used to grow Jade Plants hydroponically affects the growth of the plants negatively. The NaCl must have dehydrated the plants, and caused necrosis, which was the reason for their quick deterioration in health. This shows that saline water also dehydrates plants, and that their cytoplasm salinity is less than the water around it, which was why they tried to dissolve the salt water and withered up.

Summary Statement

High concentrations of NaCl in the water used to grow Jade Plants hydroponically negatively impact their growth and present condition.

Help Received

None. I designed, created, and performed this experiment by myself.