



**CALIFORNIA STATE SCIENCE FAIR
2003 PROJECT SUMMARY**

Name(s) Evangeline Wong	Project Number S1619
Project Title Does an Optimal Level of Salt Concentration Exist for Plants?	
Objectives/Goals This experiment's purpose is to determine whether an optimal level* of salt concentration exists for radish plants. I expect that an optimal level exists at 2×10^{-4} M, because the concentration is not high enough to dry out the plants; this allows plant growth to continue. * optimal level: high percentage of germination at relatively high level of salt concentration.	
Abstract Eight hundred randomly selected radish seeds were planted in cups filled with perlite * as well as water or salt water solutions of four different molarities (.2 M, .02 M, 2×10^{-3} M, 2×10^{-4} M). Cups were placed in storage boxes to create a dark environment to promote rapid growth. Growth was recorded through the measurement of each plant height (mm) from the collar to the hypocotyl arch. Plants grew for eight days, during which coloration, size, and the number of leaves were also noted and compared. This data was compared to that of plants grown in water solutions. An ANOVA program calculated the variance between the different plant growths. * holds the plant in place	
Methods/Materials Eight hundred randomly selected radish seeds were planted in cups filled with perlite * as well as water or salt water solutions of four different molarities (.2 M, .02 M, 2×10^{-3} M, 2×10^{-4} M). Cups were placed in storage boxes to create a dark environment to promote rapid growth. Growth was recorded through the measurement of each plant height (mm) from the collar to the hypocotyl arch. Plants grew for eight days, during which coloration, size, and the number of leaves were also noted and compared. This data was compared to that of plants grown in water solutions. An ANOVA program calculated the variance between the different plant growths. * holds the plant in place	
Results According to my data, my hypothesis is correct; nearly 65% of the radish plants germinated in the 2×10^{-4} M solution. However, there was a surprisingly high rate of plant germination in the .02 M salt solution; nearly 40% of the radish plants germinated in the .02 M solution.	
Conclusions/Discussion I planted the radish seeds in salt solutions of different molarities to determine the "optimal level of salt concentration." If an optimal level exists, then this finding can help provide cost-effective and environment-friendly usage of recycled salt water. These findings can ameliorate the water shortages recurring in California and address soil salinity increases resulting from droughts and water cutbacks of the Colorado River. This experiment's relevance to water problems in California as well as the world is undeniable.	
Summary Statement This experiment suggests that an optimal level of salt concentration exists at .02 M and 2×10^{-4} M.	
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