CALIFORNIA STATE SCIENCE FAIR
2015 PROJECT SUMMARY

Name(s)

Muhammad Abd-Allah

Project Number

J0501

Project Title

The Impact of Vitamins in Negating Hydrogen Peroxide Oxidant Effects on Seed Germination

Abstract

Objectives/Goals

Which antioxidant vitamin (A, E or C) will negate the harmful oxidant effects of hydrogen peroxide (H202) in preventing seeds from germinating?

Methods/Materials

Using bean and radish seeds, eight groups in Petri dishes were set up: water only, water + Vitamin A, water + Vitamin C, water + Vitamin E, H202 only, H202 + Vitamin A, H202 + Vitamin C, and H202 + Vitamin E. There were 3 dishes in each group with 25 radish seeds in each dish for the radish category and 10 bean seeds in each dish for the bean category. 10 ml of water or H202 were placed in the dishes. Each dish sat under light for an average of 12 hours every day. 5 ml of water or H202 were added periodically to keep the seeds moist. After 4.5 days I counted how many radish seeds germinated, and after 6 days I counted how many bean seeds germinated since the bean seeds take longer to geminate.

Results

H202 had a negative effect on seed germination. Vitamins A and E negated the effects of the H202. Vitamin C harmed seed germination even more. Radish seeds were affected more than bean seeds.

Conclusions/Discussion

Vitamins A and E are antioxidants that can counter the oxidant effects of bean and radish seed germination irrigated with H202. The use of antioxidants can help block the free radical effects of oxidants in the environment such as disease in humans and crop yield in plants.

Summary Statement

My project examined how vitamins A, C, and E blocked the negative oxidant effects of H2O2 on seed germination.

Help Received

My father helped count the seeds that germinated and set up of the Petri dishes.