The Effect of Antioxidants on Crown Gall Disease in Plants

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Turmeric and beta carotene, two antioxidants, have been known to have many benefits. Antioxidants prevent oxidation. This is a natural aging process that can damage cells and lead to disease. The purpose of my experiment is to test the effects of antioxidants on crown gall disease in plants. The hypothesis for the experiment is if carrots treated with antioxidants are exposed to Agrobacterium tumefaciens than the tumor growth on the pericycle will be smaller. Crown gall disease causes tumor growth on the pericycle due to the soil-borne bacteria Agrobacterium tumefaciens. This bacteria was inoculated on all carrot samples prior to any experimentation. In this experiment, there were five solutions used; water (the control), a 1% turmeric solution, a 10% turmeric solution, a 1507mcg beta carotene solution, and a 151mcg beta carotene solution. My experiment measures the width of the carrots' pericycle to determine if there was an increase in tumor growth, decrease in tumor growth, or indicate no evidence of tumor growth, after exposure to turmeric, beta carotene, or water. Measurements were taken on day fourteen and day sixteen of the experiment. The data from the experiment supported the hypothesis. Additionally, the results indicate that higher concentrations of antioxidants produced smaller tumor growth on the pericycle. These results are significant because if antioxidants can reduce tumor growth in carrots, a safe method could be used to minimize the effects of crown gall disease in plants.

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