CALIFORNIA STATE SCIENCE FAIR
2002 PROJECT SUMMARY

Name(s)
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Project Number
22760

Project Title
Echinacea: Myth or Miracle?

Abstract

Objectives/Goals
Echinacea, the herbal extract that is marketed as a product that boosts your immune system, was used in this experiment to test whether this herb had an effect on pathogens topically, disrupting or slowing their growth or production.

Methods/Materials
Five tomatoes were used in three separate trials. The first tomato was untouched and used as a control.| The surfaces of the remaining four tomatoes were exposed to pathogens from a rotting tomato. Echinacea was then applied to the surface of one of the four tomatoes in the trials to determine if it would inhibit t€ growth of bacteria and mold. Rubbing alcohol was applied to the surface of another tomato, as it is a known substance that destroys bacteria. As the skin of the tomato forms a formidable physical barrier t| the entrance of microorganisms, one tomato was dropped from two meters after contact with pathogens to damage its protective coat. The tomatoes were kept in plastic bags and stored in a dark location for seven days.

Results
In two trials the tomatoes treated with rubbing alcohol and Echinacea showed little to no sign of bacterial growth. In the third trial every tomato with the exception of the control tomato showed signs of deterioration by the end of the trial.

Conclusions/Discussion
Echinacea applied topically appeared to slow the growth and spread of pathogens. The nature in which Echinacea is effective is unclear. If effective, when taken orally, it assists the defenses of the immun| system. When pathogens metabolize and multiply, tissue that has been invaded is damaged and host cells are destroyed. If Echinacea promotes the development of phagocytes, or white blood cells that destroy pathogens by surrounding and engulfing them, it would not necessarily follow that the substance would effectively destroy bacteria topically. Echinacea is often used to help cure the common cold, sore throats,€ runny nooses, and sinusitis. The sources of pathogens causing these illnesses are often viral and not effected by phagocytes.

Summary Statement
Echinacea, when applied topically, inhibits the growth of pathogens.

Help Received
Patricia Morris assisted with photography