CALIFORNIA STATE SCIENCE FAIR
2010 PROJECT SUMMARY

Name(s)
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Project Number
S1824

Project Title
The Effects of Environmental and Artificial Substances or Conditions on the Growth of Mycorrhizal Fungi

Abstract

Objectives/Goals
Mycorrhizal fungi are the basis of our plants' existence. The fungi has long been considered as a plant. Research has shown many times the role of the mycorhizal fungi in the mineral intake and nutrient transport of a plant and proved that without the fungi, less variety of plants would be able to survive or some would have to evolve to have the traits that can adapt to the environment. A research conducted by Northern Arizona University showed that soil fertility is a key driver of the growth and adaptation of arbuscular mycorrhizal (AM) symbiosis. It has also concluded that soil fertility might be the main cause for the evolution of mycorrhizal fungi, allowing them to adapt to different environments. If soil fertility has that much of an effect on an organism essential for plant's life, what can environmental pollutants do to the fungi?

Methods/Materials
I've acquired different types of fungi by digging up soil around tree roots. Assuming that the fungi take part in the absorbing of minerals and nutrients for the plants (aka mycorrhizal fungi), the things that affect the growth of the fungi can be considered to affect the growth of plants in that region. Growing the fungi in sabouraud agarose gel, I applied different pollutants to see the effect they have on the growth of the fungi.

Results
The results complied with the hypothesis that natural and artificial pollutants will affect the growth of mycorrhizal fungi. The control, agar without any pollutants, had numerous hyphae and spores that was TNTC. Coke had far less hyphae than the control, which was surprising since fungi grow well in areas with high concentration of glucose. The fungus grown on the south pole of the field flourished but the fungus cultured on the north pole had fewer hyphae. This may imply that the orientation of the magnetic field can have different effects on the growth of mycorrhizal fungi. The agar affected by ultraviolet rays wasn#t affected as much as expected. The plated agar was left exposed to UV rays for around one hour in this experiment; more exposure may be needed for a more significant result. Unleaded gasoline and motor oil killed off most of the fungus on the plates. Diluted vinegar had the most hyphae growth besides the control. There were areas TNTC. I took the average of the numbers and gave the estimation to the best of my ability. Acid of pH4 did not affect the growth of hyphae drastically.

Summary Statement
Applying pollutants and substances onto the fungi, an observation can be made about the degree in which the substances are effecting the fungi and also the plant life.

Help Received
Used lab equipment at Clovis West High School under the supervision of Dr. Rebecca