CALIFORNIA STATE SCIENCE FAIR
2014 PROJECT SUMMARY

Name(s)
Mary Y. Liu

Project Number
34071

Project Title
Potential of Nitric Oxide to Control Escherichia coli Bacteria

Abstract

Objectives/Goals
The objective of my project is to determine whether nitric oxide gas has any effects on Escherichia coli, and the effects of duration of treatment, temperature, and nitric oxide concentrations on the results.

Methods/Materials
Agar plates inoculated with E. coli bacteria were placed in fumigation chambers and were fumigated with nitric oxide gas under ultralow oxygen conditions for different durations, under different temperature, and with different concentrations of nitric oxide. Each treatment was replicated 4-6 times. Afterwards, the inoculated agar plates were incubated at 30°C for 24 hours to determine the effects of nitric oxide fumigations on the growth of the E. coli by comparing its growth to the controls and controls under ultralow oxygen conditions.

Results
Nitric oxide was found to have some inhibitory effects on E. coli. Fumigation was also found to be most efficient when given a longer treatment period and higher nitric oxide concentrations. No complete inhibition was achieved however.

Conclusions/Discussion
Nitric oxide has some inhibitory effects on E. coli bacteria, but can not completely kill the bacteria. Nitric oxide fumigation, when used for other purposes, may have additional benefits when inhibiting the growth and development of bacteria.
Character

Summary Statement
The purpose of my project is to determine the effects of nitric oxide fumigation on Escherichia coli and its efficiency.

Help Received
Dr. Yongbiao Liu- guided and assisted in project, provided lab space and equipment