CALIFORNIA STATE SCIENCE FAIR
2002 PROJECT SUMMARY

Name(s)
Matthew P. Gassmann; Amanda M. Marsh

Project Number
22322

Project Title
Water, Filtration, and Microorganisms

Abstract

Objectives/Goals
Our project sought to determine if water samples filtered with a two-stage filtration system would exhibit less of an enteric bacteria colony count when compared to unfiltered water samples from the same site.

Methods/Materials
Water samples were collected from three different water sites. These samples were labeled and filtered with a two-stage filtration system, cultured onto MacConkie agar plates, and incubated at 35° C. After 48 hours, the agar plates were analyzed to establish colony counts. They were examined and photographed under black light, and observed for plate characteristics and the presence of E. coli. The cultures were refrigerated in a double sealed container until review of the photographs. The cultures were then disposed of as biohazard.

Results
The filtration process did not completely remove bacterial contamination from the irrigation canal water or the Madera River water samples, but the colony counts were approximately 45-64% less in the filtered samples.

The cultures were grown on a selective agar conducive to enteric organisms. The cultures used lactose for fermentation and fluoresced under black light, thus indicating the presence of E. coli in both the filtered and unfiltered samples.

Conclusions/Discussion
We concluded that our hypothesis was correct because the two stage filtration system produced water samples that had almost half the total number of colonies per plate than the unfiltered samples.

In addition, the unfiltered agricultural run-off did yield a higher colony count than the other sample areas, as predicted by our hypothesis. The agricultural run-off 1ml sample yielded almost two and one-half times (2 ½ x) the total colony plate count as the unfiltered Madera River 1 ml sample.

The claim of the two stage filtration unit that it filters almost 100% of microorganisms may be exaggerated. Our findings indicated a filtration level of about 50%. The filter was more effective in filtering the clean water samples than the more contaminated samples.

Summary Statement
Our project sought to determine whether or not a two-stage filtration system filtered enteric organisms from three independent water sample sites.

Help Received
Dad helped type report. Moms drove to sample sites, to lab, and to obtain materials; also helped to review research and mount data onto board. The Microbiology dept. at lab supervised incubation of agar plates. Science dept.at intermediate school provided magnifying lenses for colony counting.