



CALIFORNIA STATE SCIENCE FAIR 2008 PROJECT SUMMARY

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Project Title A Comparison of Different Water Purification Methods	
<p style="text-align: center;">Abstract</p> <p>Objectives/Goals The purpose of this study is to compare the efficiencies of ancient water purification methods against the efficiencies of modern water purification methods. It was hypothesized that modern water purification methods would be more effective in removing bacteria, dissolved solids, salts, and turbidity.</p> <p>Methods/Materials The ancient methods that were tested were: the Hippocrates Sleeve (straining water through a conical fabric bag before boiling it); Susruta Samhita (coarse gravel and sand filtration before boiling the water); simply boiling the water; the Scottish Water Treatment (charcoal and sand filtration); and the Lucas Antonius Portius method (sand filtration). The modern purification methods were Reverse Osmosis (membrane purification), and UV light purification (agitating the water with a UV Light bulb). A large water sample was collected from a local river to be purified. After the methods were performed on the river water, the water was collected and frozen in individual, sterilized containers. Then, five tests (Conductivity, TDS, pH, Optical Density, and APC) were run on each of the samples to determine the presence and concentrations of salts, dissolved solids, pH, turbidity, and bacteria.</p> <p>Results The experiment refuted the notion that Reverse Osmosis can remove all impurities from the water sample as it removed relatively little bacteria from the river water. The hypothesis that modern purification methods were more effective than ancient methods was not entirely correct because UV light was second to boiling in reducing the most bacteria. Reverse Osmosis however did remove the most salts, dissolved solids, and reduced turbidity. The Susruta Samhita method and the Hippocrates Sleeve method performed relatively well in all areas.</p> <p>Conclusions/Discussion The results indicated that many of these methods such as boiling, the Hippocrates Sleeve, and the Susruta Samhita method are very plausible choices for inexpensive water purification in the modern day. In areas that have poor infrastructure, the use of these methods is ideal.</p>	
Summary Statement This project studied how ancient water purification methods compare to modern ones.	
Help Received Father helped collect water. Mother helped with display board. Dr. Hoobler of Purfresh advised and provided guidance during project. Used lab equipment at Purfresh Inc. under the supervision of Dr. Hoobler.	