CALIFORNIA STATE SCIENCE FAIR
2004 PROJECT SUMMARY

Name(s)

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Project Number

S0816

Project Title

Moringa oleifera: Nature's Coagulant

Abstract

Objectives/Goals

The purpose of this project is to evaluate the coagulating properties both Moringa Oliefera seed kernel powder and Moringa Oliefera De-oiled seed powder and compare their effectiveness to common coagulants. #Effectiveness# was determined within each coagulants respective optimum conditions, and based on the following criteria: turbidity, and removal of coliform bacteria. The vast majority of our experimentation was comprised of a series of jar tests on synthetic water samples, followed by screening of the samples for various impurities. The primary focus of this project is its application to the third world; in reference to the coagulant#s potential to prevent the spread of waterborne diseases.

Methods/Materials

In order to test our hypothesis, we first determined the #optimum# operating conditions for each coagulant. Using these optimum conditions, an additional series of jar tests was conducted for each coagulant on waters of varying turbidities. In addition to these tests, water samples synthetically #contaminated# with e. coli cultures were screened before and after coagulation for total coliform populations. In this manner, the coagulant#s anti-bacterial qualities were quantified.

Results

Both moringa Oleifera seed kernel powder and moringa oleifera de-oiled seed powder effectively lowered turbidities of cloudy waters. Their effectiveness, although not quite as robust as conventional coagulants, proved comparable. As predicted, the de-oiled version of the seed powder proved more efficient than the original version. Also it was observed that both moringa coagulants were more effective in more turbid waters. The coliform tests didn't display bacteria-removal capabilities in either moringa coagulant; this however, may be a result of the preparation of synthetic turbidity.

Conclusions/Discussion

Although not quite as effective as commercial coagulant, the moringa coagulants proved an effective alternative. The coagulating properties of the moringa powder are sufficient to produce clean drinking water; and could effectively improve water-sanitation in third-world countries at a low cost.

Summary Statement

Our project evaluates the effectiveness of both moringa oleifera seed powder and moringa oleifera de-oiled seed powder in removing turbidity and coliform bacteria from drinking water supplies.

Help Received

Borrowed equipement from South Bay System Authority; Used lab facilities of Hillsdale High School; under supervision of Stephen Maskel and Charlie Bissell