"WATER CLARIFICATION USING MORINGA OLEIFERA (DRUMSTICK SEEDS)"

PROJECT REPORT

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ABSTRACT

Lack of sanitation and drinkable water is the world's biggest health threat. About 4 billon cases of diarrhea are reported annually of which two million ends in death. Every day about 6 thousand children die due to lack of clean drinking water. Today, more than one billon people in developing countries use contaminated water for drinking and cooking purpose and Moringa is regarded as the remedy to reduce the incidence of water borne diseases which is one of the main causes of deaths in developing countries. United Nations has formulated Millennium Development Goals, which aims at reducing half the number of people without access to safe water by 2015.The target can be met only by the use of locally available resources and by the promotion of low cost treatment methods.

However in many communities of developing countries water clarification methods like flocculation, coagulation and sedimentation are often inappropriate because of high cost and low availability of chemical coagulants the use of plant materials as natural coagulants to clarify turbidity of wastewaters is of common practice since ancient times. Among which powdered roasted grains of Zea mays were used by soldiers in Peru as a means of settling impurities in the 16th and 17th century. In India, ancient writings refer to the use of the seeds of the Nirmali tree Strychnos potatorum as a clarifier. The sap of tuna cactus (Opuntia fiscus indica) is widely used in Chili as water purifying agent. Similarly, dried beans (Vicia faba) and peach seeds (Percica vulgaris) are widely used for this purpose in Bolivia and Peru.

Of all plant material investigated, a seed of Moringa oleifera are one of the most effective sources of primary coagulant for water treatment and can be compared to those as of alum (conventional chemical coagulant).The Moringa oleifera tree, commonly known as drumstick and horseradish, is a native of Northern India. It is widely grown throughout the tropics. The tree is drought resistant, fast growing and even grows in poor soils. The traditional use of Moringa oleifera seeds for domestic water treatment is a common practice in rural areas of Sudan.

Our study is mainly concerned in reducing the turbidity and enhancing the quality of water using a natural coagulant which is easily available as a vegetable to treat water in household communities.

Moringa oleifera is a natural plant coagulant which has the potential for water treatment and, is a sustainable low cost alternative to chemicals like ferric chloride and alum that may have negative environmental, economic, and health effects. The coagulation mechanism of dry Moringa oleifera seeds was studied and compared with that of Alum.1% by weight solution at a dose of 3 ml/L of Moringa oleifera resulted in over 96.36% turbidity removal, by Coagulation and flocculation and settles out the turbidity to the bottom and supernatant is removed before boiling and subsequent consumption. A comparative study was made between powdered and solution form of Moringa coagulant among which solution form was more efficient. From this natural Moringa coagulant Hardness was reduced to 37 %, Iron was reduced to 97 % and Nitrate was also reduced to 39%.

OBJECTIVES

- To use Moringa oleifera seed as a natural coagulant, an alternative to synthetic coagulants.
- To attain maximum turbidity removal.
- To provide potable water at low cost without any side effects.
- To reduce nitrate and iron to its permissible limits.
- The sludge production is also greatly reduced, and is essentially organic in nature.
- To remove hardness from water.
- To make comparative study with conventional coagulants.