Potential of Water Purification of Turbid Surface Water Sources in Remote Arid and Semi-Arid Rural Areas of Rajasthan by Moringa Oleifera (Drumstick) Tree Seeds

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Abstract : Rajasthan is among regions with greatest climate sensitivity and lowest adaptive capabilities. In many parts of the Rajasthan surface water which can be highly turbid and contaminated with fecal coliform bacteria is used for drinking purposes. The majority rely almost exclusively upon traditional sources of highly turbid and untreated pathogenic surface water for their domestic water needs. In many parts of rural areas of Rajasthan, it is still difficult to obtain clean water, especially remote habitations with no groundwater due to quality issues or depletion and limited feasibility to connect with surface water schemes due to low density of population in these areas to justify large infrastructure investment. The most viable sources are rain water harvesting, community managed open wells, private wells, ponds and small-scale irrigation reservoirs have often been the main traditional sources of rural drinking water. Turbidity is conventionally removed by treating the water with expensive chemicals. This study has to investigate the use of crushed seeds from the tree Moringa oleifera (drumstick) as a natural alternative to conventional coagulant chemicals. The use of Moringa oleifera seed powder can produce potable water of higher quality than the original source. Moringa oleifera a native species of northern India, the tree is now grown extensively throughout the tropics and found in many countries of Africa, Asia & South America. The seeds of tree contains significant quantities of low molecular weight, water soluble proteins which carries the positive charge when the crushed seeds are added to water. This protein binds in raw water with negatively charged turbid water with bacteria, clay, algae, etc. Under proper mixing, these particles make flocks, which may be left to settle by gravity or be removed by filtration. Using Moringa oleifera as a replacement coagulation in such surface sources of arid and semi-arid areas can meet the need for water purification in remote places of Rajasthan state of India. The present study accesses to find out laboratory based investigation of the effect of seeds of Moringa tree on its coagulation effectiveness (purification) using turbid water samples of surface source of the Rajasthan state. In this study, moringa seed powder showed that filtering with seed powder may diminish water pollution and bacterial counts. Results showed Moringa oleifera seeds coagulate 90-95% of turbidity and color efficiently leading to an aesthetically clear supernatant & reduced about 85-90% of bacterial load reduction in samples.

Keywords : bacterial load, coagulant, turbidity, water purification
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