

Abstract

Moringa oleifera plant is unique due to its coagulation effect on turbid water. However, the extent to which the seed's powder coagulant changes the physico-chemical characteristics of treated water has not been discussed in previous studies. In addition, there are limited data and information on the optimum concentration of *M. oleifera* seed powder coagulant and the nature of the sludge that forms after the treatment of water. The aim of this study is to examine the extent to which *M. oleifera* seed powder can be used as a coagulant in treating different types of turbid waters and how it changes the physico-chemical characteristics of treated water. Samples of turbid water were subjected to various dosages of dry *M. oleifera* seed powder concentrations to determine the degree of clarification, changes in physico-chemical characteristics of water and the proportion of sludge formed after coagulation process. The results showed that *M. oleifera* seed powder leads to reduction of water turbidity from 461 NTU to about 15 NTU within 45 min. Significant clarification of turbid water occurred at the mean optimum concentration of *M. oleifera* seed powder coagulant (0.20 g/l) and maximum optimum concentration of 0.50 g/l. The mean water turbidity reduction efficiency was 64% with the maximum efficiency of 95%. Increasing coagulant concentration above 0.50 g/l led to an increase in water turbidity, electrical conductivity, salinity and total dissolved solids (TDS). The sludge formed after water treatment was found to be equivalent to 10% of the total volume of treated water. There are also significant differences in the effectiveness of coagulant derived from various provenances of *M. oleifera* found in Eastern and Coastal regions of Kenya in terms of turbidity reduction.