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Production of Natural Coagulant from Moringa Oleifera Seed for Application in Treatment of Low Turbidity Water

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ABSTRACT

This study focused on developing an efficient and cost effective processing technique for Moringa oleifera seeds to produce natural coagulant for use in drinking water treatment. The produced natural coagulant can be used as an alternative to aluminum sulphate and other coagulants and used worldwide for water treatment. This study investigates processing Moringa oleifera seeds to concentrate the bio-active constituents which have coagulation activity. Moringa oleifera seeds were processed for oil extraction using electro thermal soxhlet. Isolation and purification of bio-active constituents using chromatography technique were used to determine the molecular weight of the bio-active constituents. The molecular weight of bio-active constitu-ents found to be in a low molecular weight range of between 1000 – 6500 Dalton. The proposed method to isolate and purify the bio-active constituents was the cross flow filtration method, which produced the natu-ral coagulant with very simple technique (oil extraction; salt extraction; and microfiltration through 0.45 µm). The turbidity removal was up to 96.23 % using 0.4 mg/L of processed Moringa oleifera seeds to treat low initial turbidity river water between 34-36 Nephelometric Turbidity Units (NTU) without any additives. The microfiltration method is considered to be a practical method which needs no chemicals to be added com-pared to other researchers proposed methods. The natural coagulant produced was used with low dosages to get high turbidity removal which considered to be a breakthrough in this study and recommended to be scaled up for industry level. The product is commercially valuable at the same time it is minimizing the cost of water treatment.

KEYWORDS

Moringa Oleifera, Drinking Water Treatment, Bioactive Constituents, Coagulation, Flocculation,Turbidity

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