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Experimental investigation of *Sterculia foetida* and *Moringa oleifera* as a coagulant for water and wastewater treatment

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ABSTRACT

A study on the coagulant activity of plant-based coagulants, *Sterculia foetida* and *Moringa oleifera*, which identifies their potential in purifying water to curb the crisis of water shortage in developing and underdeveloped nations. This entails the need of a comparatively cheap and affordable water treatment solution to eliminate the shortcomings of chemical aids such as cost and pH. The experimentation is restricted to laboratory-scale treatment of synthetically prepared kaolin solution in distilled water and tap water of initial turbidity 595 and 844 NTU, respectively, and pH 7.8–7.9 with coagulant dosages between 20–800 mg. A novel work on *S. foetida* seeds has been presented which is compared with *M. oleifera* coagulant on the basis of turbidity and pH. The effect of solvents like distilled water, NaCl, and NaOH for active coagulant extraction from seeds is significantly observed on turbidity removal. *S. foetida* shows up to 97% turbidity reduction when NaCl and NaOH are used and 96% with powder dosages. *M. oleifera* extracted in NaCl gives a higher turbidity reduction of 97.4% for 20 mg dosage. The coagulants prepared naturally prove to provide a breakthrough in wastewater treatment, and the industrial scale-up could be a pioneer in cost-effective water treatment methods.

Keywords: Coagulation; *Moringa oleifera*; Soxhlet extraction; *Sterculia foetida*; Turbidity; Wastewater treatment

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