Removal of metronidazole antibiotic from contaminated water using a coagulant extracted from Plantago ovata

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ABSTRACT

A coagulant was successfully extracted from Plantago ovata by a method using a FeCl₃-induced crude extract (FCE). FCE was investigated for its coagulation potential to remove metronidazole (MNZ) from water. Tests were done to evaluate the effects of solution pH, FCE dose, MNZ concentration, and solution temperature on removal of MNZ by FCE. A low coagulant dose, 1.75 mg/L, achieves a high MNZ removal percentage, 89.3%, at neutral pH and room temperature. MNZ removal by FCE increased from 18 to 89.3% with increased FCE quantity from 0.75 to 1.75 mg/L. The low concentration of MNZ, 10 mg/L, was completely removed by FCE. Coagulant process did not depend on water temperature. The sludge volumetric index and sludge volume were also studied. Overall, the results indicate that developed FCE was an efficient coagulant that presents an attractive coagulant method for application in treating contaminants in water.

Keywords: Coagulant; Contaminated water; Metronidazole; Plantago ovata

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