

# A COMPARATIVE STUDY OF ENVIRONMENTAL FRIENDLY AND CHEAP BIOSORBENTS FOR REMOVAL OF FLUORIDE FROM AQUEOUS SOLUTIONS

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**SUMMARY:** Adsorption is considered as the most promising treatment technology for fluoride (F) removal from aqueous solutions. The present study reports the efficiency of *Padina sanctae crucis* algae, *Sargassum hystrix* algae, *Moringa Oleifera* seed ash, and Shrimp shell waste in removal of F from aqueous solutions in batch system. Experiments were performed at room temperature and the effects of experimental parameters such as biosorbent dose, contact time, pH, and initial F concentration were studied. Optimum pH values of biosorption were determined as 7, 3, 7 and 11, for *Padina sanctae crucis* algae, *Sargassum hystrix* algae, *Moringa Oleifera* seed ash, and Shrimp shell waste, respectively. The highest removal adsorption was at 48 g/L adsorbent dose, 5 min contact time, initial F concentration of 8 mg/L (97% F removal) for *Padina sanctae crucis* algae, and 40 g/L adsorbent dose, 60 min contact time and initial F concentration of 5 mg/L (100% F removal) for *Sargassum hystrix* algae. In the case of *Moringa Oleifera* seed ash, and Shrimp shell waste, the highest removal adsorption was at 64 g/L adsorbent dose, 10 min contact time, initial F concentration of 8 mg/L (81% F removal) and 18 g/L adsorbent dose, 60 min contact time and initial F concentration of 3 mg/L (98.5% F removal), respectively.

The results showed that all examined biosorbents in this study can be used as an environmental friendly, effective and cheap adsorbent for removal of F from water especially in rural and remote areas due to its easy operation as well as it can be used for removal of F from industrial effluent containing high level of F.

Key words: Biosorption, *Moringa Oleifera* seed, *Padina sanctae crucis* algae, *Sargassum hystrix* algae, Shrimp shell waste

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