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Study of brown algae *Sargassum ilicifolium* biomass in bio-absorption of various concentrations of phosphate

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Abstract

One of the most important inorganic pollutants is phosphate ion, found in different amounts in urban, industrial and agricultural water, and it is possible to enter the surface and underground water resources. Today, various adsorbents are used to remove or decrease excess elements from aquatic environments. In this study, marine algae, *Sargassum ilicifolium* was studied as a bioadsorbent for removal of phosphate ion. In this experiment, various range of pH including (pH 2, 3, 4, 5, 6, 7 and 8), the amount of *S. ilicifolium* biomass (0.01, 0.3, 0.05, 0.1, 0.15, 0.2, 0.3 and 0.4 g) and the initial concentration of phosphate ion (50, 100, 150, 200, 250, 300 and 350 mg L⁻¹) at contact time (0-60 minutes) on removal of phosphate ions from aqueous solution was investigated. Phosphate concentration was measured by spectrophotometric method at 890 nm wavelength. The results of this experiment showed that marine macro algae, *S. ilicifolium* had the best phosphate absorption capacity of 653.33 mg g⁻¹ in the most suitable conditions and the phosphate removal efficiency was 71.79%. The most suitable conditions for phosphate absorption were obtained at 0.01 g L⁻¹ algal biomass, pH: 2 and 350 mg L⁻¹ of initial phosphate concentration. The results of this study showed that the dry powder of algae, *S. ilicifolium* is suitable for removal of phosphate ions from aqueous solution and is an appropriate bioactive agent for urban and agricultural wastewater treatment.

Keywords: Absorption Bio, Organic Adsorbent, Seaweed Phosphate, *Sargassum ilicifolium*