**ABSTRACT**

Water is an essential natural resource for sustaining life and environment. It is a nature's free gift, but clean and safe drinking water becomes scarce due to rapid industrialization and urbanization. The elevated levels of nitrate (N03∼) in drinking water leads to severe impacts on the environment. Water hyacinth (WH) an aquatic weed grow at a faster rate in polluted waters containing dissolved nitrogen and phosphorous. The present study focused on the removal of nitrate anions from aqueous solution through adsorption technique. The chosen biomaterial is chemically modified using phosphoric acid to enhance its sorption efficiency, thereafter referred as modified water hyacinth (MWH). To characterize the surface functional group and morphology of the adsorbent scanning electron microscopy and FT-IR analyses are recorded. The competence of the sorbent material is experimentally verified through various operating factors likely particle size, adsorbent dosage, agitation time, initial concentrations of nitrate ions, pH of the medium, an effect of co-ions and influence of temperatures on nitrate-modified water hyacinth system through batch mode. The residual concentrations of nitrate ions from aqueous solutions are analysed using the UV-visible spectrophotometer. Langmuir and Freundlich's models are applied to describe the adsorption capacity. Isotherm plots reveal the mono linearity of both the isotherms onto nitrate-modified water hyacinth system.