DRIED SABA BANANA (*Musa saba*) PEEL BIOMASS: A POTENTIAL BIOSORBENT FOR THE REMOVAL OF LEAD IONS FROM AQUEOUS SOLUTION

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ABSTRACT

Background: Heavy metal contamination on water is not a new problem, but it is still a global concern. Heavy metals bring serious threat to human health. Physical and chemical methods have been used for removal of heavy metals from wastewater. However, these methods are costly and not ecological friendly. These made researchers' attention turned to the use of biological adsorption in treatment of wastewater. This study aimed to determine the potential of Saba banana peels (BP) in the removal of Pb(II) ions from aqueous solution. **Methods:** An adsorbent prepared using Saba banana peel biomass was used for the adsorption of Pb(II) ion from aqueous solution. Batch experiments were performed on aqueous solutions under optimized conditions of pH, adsorbent dosage, and initial Pb(II) ion concentration at room temperature. **Results:** The highest % removal obtained for solution pH was 99.20% at pH 6; for adsorbent dose was 98.11% at 2.5 mg/mL; and for initial Pb(II) concentration was 81.82% at 20 ppm. The Q_{max} obtained was 192.308 mg/g which is close to $Q_{max, exp}$ = 173.59 mg/g. The Q_{max} value is important to identify the biosorbent highest adsorption capacity and as such useful in large scale considerations for wastewater treatment. Equilibrium data relating to the adsorbent fitted well to Freundlich isotherms indicating physisorption process with linearized coefficient of 0.9881. **Conclusion:** The experimental data obtained demonstrated that Musa saba banana peel biomass, which are abundant in the local market and discarded as waste materials can be a potential low-cost adsorbent in partial treatment for Pb(II) ions in wastewaters.

Keywords: Banana peel, Bio-adsorption, adsorption, Pb (II), Isotherm, Langmuir, Freundlich, aqueous solutions

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