

**APPLICATION AND CHARACTERIZATION OF MICROPARTICLE-SIZE
BIOSORBENT FROM PEEL WASTES OF CALAMANSI
(*CITRUS MICROCARPA*) FOR THE REMOVAL OF
COPPER (II) FROM CONTAMINATED WATER**

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ABSTRACT

Copper pollution causes various health hazards and harmful biochemical effects to living creatures. The purpose of this study is to develop and characterize Microparticle-size Biosorbent from the peel wastes of Calamansi (*Citrus microcarpa*) for the removal of Copper from contaminated water. Waste peels were cleaned, shredded, dried and milled to create the Microparticle-size Biosorbent. Pretest-Posttest control Group design was followed in triplicates. Treatments: T1- 0.5g, T2- 1g and T3- 1.5g of Microparticle size Biosorbent were screened for the removal of copper from water using 1119 ppm Copper solution and at same time the untreated control was done. Using Acetylene-flame Atomic Absorption Spectrophotometer the Copper concentrations were analysed. One-way Analysis of Variance and Duncan's Multiple Range Test at 0.05 level of significance showed that the means are significantly different in terms of adsorption efficiency and capacity. T1 with 0.5g of Microparticle-size Biosorbent gained the highest adsorption efficiency with 60.17 % and highest capacity with 67.33mg/g. Pearson's Bivariate Correlation analysis revealed that the amount of the Microparticle-size Biosorbent is inversely proportional to its adsorption efficiency and capacity. Fourier Transform Infrared Radiation Spectroscopy revealed that the biomaterial is mainly composed of carboxylic acids and of carboxylates, while Field Emission Scanning Electron Microscopy showed that the particles have rough and irregular surfaces and irregular shapes with an average particle size of 36.41 μm . Therefore, the Calamansi peels Microparticle-size Biosorbent can be used or modified for the treatment of wastewater, for water filtration systems and for in situ remediation of Copper contaminated bodies of water.

Keywords: Calamansi; Microparticle-size; Biosorbent; Copper; Characterization.