

## Optimization of Cadmium Biosorption by *Ochrobactrum Sp*, a Novel Biosorbent, Isolated from Chemical Pesticide-Contaminated Soils

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**Background & Objectives:** Heavy metal contamination in soil and water environments is one of the world's major environmental problems. In the past few decades, metal removal by microbial biomass as an adsorbent has been emerged. The biosorption term is a metabolism-independent binding of heavy metals on the surface of dead/inactive biological materials.

**Methods :** In this study biosorption cadmium (II) ion from aqueous solutions by inactive *Ochrobactrum sp.* was investigated in batch conditions. Effect of different experimental parameters including; initial pH, contact time, temperature and initial concentrations of cadmium ions on cadmium uptake were evaluated. Langmuir and Freundlich isotherm models were used to analyses the equilibrium data at different initial cadmium concentration.

**Results:** In this experiment, the optimal conditions for Cd biosorption were established: 200 ppm Cd (II) for 2h at 30 °C and pH 6.0. In this condition,  $q_e$  (mg g<sup>-1</sup>) was 39.8. Results indicated that cadmium uptake could be described by the Langmuir adsorption model ( $q_{max}=83.33$ ).

**Conclusion:** Results obtained in this study demonstrated that Cd loading capacity of *Ochrobactrum sp.* cells was 39.8 mg g<sup>-1</sup> and maximal Cd biosorption with Langmuir model was 83.33 mg g<sup>-1</sup>. Therefore it can be conclude that *Ochrobactrum sp.* isolated from chemical – pesticide contaminated soils is well suited for the removal of Cd (II) from aqueous solutions.

**Keywords:** Pesticide-contaminated Soils; Cadmium Biosorption; *Ochrobactrum Sp*