

## Biosorption of cadmium(II) and lead(II) from aqueous solutions by fruiting body waste of fungus *Flammulina velutipes*

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### ABSTRACT

The biosorption of Cd<sup>2+</sup> and Pb<sup>2+</sup> by fruiting body wastes of macrofungi *Flammulina velutipes* was studied. The factors affecting absorption including pH, initial metal concentration, biosorbent dosages and mutual competitive biosorption of both metal ions were focused. The sorption of Cd<sup>2+</sup> and Pb<sup>2+</sup> was increased with pH value from 2 to 6 and maximum biosorption was at pH 6. The quantity of Cd<sup>2+</sup> and Pb<sup>2+</sup> adsorbed increased with the initial concentration of metal ions and both metals removal gradually increased with the biosorbent dosage. There existed mutual competitive biosorption between Cd<sup>2+</sup> and Pb<sup>2+</sup> when they were in the same solution. The Langmuir isotherm model fitted both metal ions sorption data well in the experiment and the calculated maximum sorption capacity of Cd<sup>2+</sup> and Pb<sup>2+</sup> by *F. velutipes* was 8.4317 mg/g dry biomass with R<sup>2</sup> of 0.9228 and 18.3486 mg/g dry biomass with R<sup>2</sup> of 0.9280, respectively. Pseudo-first order equation fitted for adsorption data of Cd<sup>2+</sup> with R<sup>2</sup> of 0.9504, while pseudo-second order equation more fitted for adsorption data of Pb<sup>2+</sup> with R<sup>2</sup> of 0.9917.

**Keywords:** Biosorption; Cd<sup>2+</sup>; Pb<sup>2+</sup>; *Flammulina velutipes*; Langmuir isotherm; Pseudo-first and second-order equation

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