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## Application of bifunctional *Mangifera indica* L.-loaded *Saccharomyces cerevisiae* as efficacious biosorbent for bivalent cobalt and nickel cations from different wastewaters: equilibrium and kinetic studies

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### Abstract

Baker's yeast (*Saccharomyces cerevisiae*) was immobilized on mango (*Mangifera indica* L.) leaves to prepare a novel, low cost, and eco-friendly biosorbent Mi-yeast. The fabricated biosorbent was characterized by FTIR and SEM and applied to remove Co(II) and Ni(II) ions from aqueous solutions via batch mode technique. The biosorption equilibria were established in 30min and the experimental data were applied to Freundlich, Langmuir, and Dubinin-Radushkevich isotherm models. The maximum biosorption capacities were found to be 526mgg(-1) for Co(II) at pH 6 and 250mgg(-1) Ni(II) at pH 7. Among four kinetic models, the experimental data were best described by the second-order expression. Different foreign ions were found to have a negligible interfering effect on the biosorption capacities. Mi-yeast could be regenerated using 0.2M HCl during repeated biosorption-desorption cycles with 4-7% loss in metal efficiency after five cycles. The potential applications of Mi-yeast for selective removal of Co(II) and Ni(II) from different real wastewater samples of different matrices were also applied using a micro-column technique.

### Keywords

**Author Keywords:** Biosorption; *Mangifera indica*; Co(II); Ni(II); Yeast; Wastewater

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