



“Gheorghe Asachi” Technical University of Iasi, Romania



PESTICIDE REMOVAL BY FILAMENTOUS FUNGI USING ELECTROCHEMICAL TECHNIQUES

Ülküye Dudu Gül^{1*}, Hülya Silah²

¹Department of Bioengineering, Faculty of Engineering, Bilecik Seyh Edebali University, 11210, Bilecik, Turkey

²Department of Chemistry, Faculty of Sciences, Bilecik Seyh Edebali University, 11210 Bilecik, Turkey

Abstract

Bioremediation is an alternative approach for the removal of pesticides from wastewater, offering advantages such as cost-effectiveness and environmental friendliness compared to other wastewater treatment methods. This study aimed to assess the removal capacity of two filamentous fungal strains for the commonly used pesticide Cyromazine (CYR) and to monitor the pesticide removal using electrochemical techniques. The fungal strains, *Rhizopus arrhizus* and *Aspergillus versicolor* were cultivated in a molasses medium with and without the CYR pesticide. The utilization of sugar refinery waste molasses proved valuable in terms of cost reduction and waste reuse. The optimal pH levels (3, 4, 5, 6, 7, and 8) and CYR concentrations (3, 5, 7, and 10 mg/L) for achieving maximum CYR removal were determined. The results indicated that the cultures of *Rhizopus arrhizus* and *Aspergillus versicolor* achieved maximum removal efficiencies of 81.51% and 87.86% for CYR, respectively. Notably, this is the first paper reporting the successful removal of CYR from aqueous solutions using living fungal strains, specifically *A. versicolor* (a wild strain isolated from Turkey) and *R. arrhizus*, while monitoring CYR levels via electrochemical methods. The findings presented in this study serve as valuable insights for the development of new electrochemical applications in *in-situ* bioremediation processes.

Keywords: bioremediation, cyromazine, electrochemical analysis, fungi, pesticide

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* Author to whom all correspondence should be addressed: e-mail: ulkuyedudugul@gmail.com; Phone: +902282142436