

Selection of white-rot fungi to formulate complex and coated pellets for Reactive Orange 165 decolourization

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Abstract

Six strains of white-rot fungi isolated from southern Chile were evaluated for their ergosterol/biomass correlation and ligninolytic potential in solid medium to formulate pellets for Reactive Orange 165 (RO165) decolourization. The fungus *Anthracoxyllum discolor* was selected to formulate complex pellets (fungal mycelium, sawdust, and activated carbon), coated pellets (complex pellet + alginate) and simple pellets (fungal mycelium). The activity of ligninolytic enzymes (laccase, manganese peroxidase, manganese-independent peroxidase, and lignin peroxidase) was evaluated in both the complex and coated pellets in modified Kirk medium, and the morphology of the pellets was studied using scanning electron microscopy (SEM). Complex pellets of *A. discolor* showed a higher enzymatic production mainly MnP (38 U L^{-1} at day 15) compared to coated and simple pellets. Examinations using SEM showed that both pellets produced a black core that was entrapped by a layer of fungal mycelium. Decolourization of RO165 was demonstrated with all the pellets formulated. However, the highest and fastest decolourization was obtained with complex pellets (100% at day 8). Therefore, complex pellets of *A. discolor* can be used for the biological treatment of wastewater contaminated with RO165.

Introduction

The increasing use of synthetic dyes in the textile, paper, cosmetics, leather dyeing, pharmaceutical, and food industries has resulted in serious environmental pollution ([Tang et al. 2011](#)). Over 10,000 dyes and 7×10^5 ton annual are commercially available worldwide and 5-10% of the dye stuff is lost in the industrial effluents. As a result, they generate a