

Decolorization of azo dye Methyl Orange with crude fungal laccase obtained by growing *Ganoderma spp.* on cereal mix

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In recent years, one of the biggest environmental problems is the pollution of water with colored wastewater which has negative effect on the environment and human health. Wastewaters contain complex structural compounds, such as azo dyes that used today in many industrial fields. Removing of azo dyes from wastewater using traditional methods is an extremely complex and in many cases ineffective process. In recent decades, there is a tendency towards the application of environmentally acceptable methods of removing synthetic dyes from wastewater. Method which has proven to be very effective, is the degradation of synthetic dyes using various fungal enzymes. In this study, the crude fungal laccase (31,42 U_{mL}⁻¹) obtained by growing fungal mycelium *Ganoderma spp.* on cereal mix was used for decolorization of Methyl Orange. Decolorization procedure was carried out at different temperatures (30-70 °C) and pH (3-8) in order to determine the optimal conditions for dye decolorization. The incubation time was 180 min and every 15 min during the incubation time, the change in color intensity was monitored spectrophotometrically at 472 nm and decolorization efficiency (DE) was calculated. The optimal pH was 5 with DE of 57 % at 30 °C, while in the case of other pH values, DE was lower. The lowest DE (1,2 %) was in the case of pH 8, which indicates that laccase activity decreases in the alkaline medium. The optimal temperature of decolorization was 50 °C with DE of 62 % at pH 5, while the DE was lower at higher and lower temperatures, which is in accordance with the literature data on the laccase activity optimal temperature of the *Ganoderma spp.* The lowest DE was 35 % at 70 °C and pH 5. The obtained results show that laccase with good decolorization properties can be obtained using cheap agro-industrial wastes, such as cereal mix. The low cost of laccase production as well as the relatively high DE in a short time may further broaden its application in wastewater treatment.