

**PLT34. THE EFFICIENCY OF USING LACCASES FOR ACID BLUE 193
DYE DECOLOURATION**

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Abstract

The study aimed to investigate the efficiency of using extracellular, copper-containing oxidase enzymes (laccases) for decolouration of commercial textile dye Acid Blue 193. The decolouration efficiency was assessed at different dye's concentrations (10^{-2} mM, $2.5 \cdot 10^{-2}$ mM, $5 \cdot 10^{-2}$ mM, $1.5 \cdot 10^{-1}$ mM, $4 \cdot 10^{-1}$ mM, $8 \cdot 10^{-1}$ mM), at optimum identified pH conditions (pH 4.0). Tests were conducted directly in spectrophotometric cuvettes, samples being monitored periodically in visible field during 24 h of reaction. By consecutively assessing laccases activity at 10^{-2} mM, $2.5 \cdot 10^{-2}$ mM and $5 \cdot 10^{-2}$ mM initial dye concentration, a continuous increase of decolouration efficiency from 75.2 ± 0.3 to $88.9 \pm 0.2\%$ was recorded. Contrary to these results, at a higher dye's concentration, decolouration efficiency decreased to 82.5 ± 0.4 and $65.3 \pm 0.2\%$ for initial dye concentration of $4 \cdot 10^{-1}$ mM and $8 \cdot 10^{-1}$ mM, respectively. However, no inhibition effect on laccase activity was recorded during performed experiments, a direct relation being noticed between initial dye concentration and decolored concentration which increased from $0.75 \pm 0.1 \cdot 10^{-2}$ mM (10^{-2} mM initial dye concentration) to $52.5 \pm 0.8 \cdot 10^{-2}$ mM ($8 \cdot 10^{-1}$ mM initial dye concentration). In the case of all tested concentrations, highest laccase activity was registered in the first minute of reaction. Moreover, decolouration process presented Michaelis-Menten kinetics, K_m constant value being $2.2 \cdot 10^{-1}$ mM with V_{max} of $8.7 \cdot 10^{-2}$ mM/min.

Keywords: *laccase, textile dye, white-rot fungi*