



DECOLORIZATION OF SYNTHETIC ORANGE II EFFLUENT WITH DIFFERENT CRUDE LACCASE EXTRACTS FROM *Trametes*: EFFECT OF pH and NaCl

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Introduction. The potential applications of fungal laccases (EC 1.10.3.2) are immense due to the existence of multiple isoforms with significant biochemical differences and wide oxidative versatilities. In recent studies, *T. versicolor* HEMIM-9 has been shown to produce different laccase isoforms in the presence of wood aqueous extracts (beech, pine and cedar). Using isoelectric focusing, we observed 7, 6, 4 y 3 distinct isoforms in the control (no inducer added), and in the presence of cedar, beech and pine, respectively. On the other hand, contaminated effluents may contain one or more dyes at different concentrations, in acid or alkaline conditions and high NaCl content. For this reason, we evaluated the decolorization of a synthetic azo dye (orange II) effluent, using different crude laccase extracts at different pH's and in the presence of NaCl.

Methodology. The Orange II decolorization experiments were realized using 100 U/L of laccase activity and 50ppm of the dye during 24h with shaking of 150 rpm at 30°C. The effect of pH (3, 5 and 7) was examined, and also, the presence of 10 and 100 mM of NaCl, in a synthetic orange II dye effluent. Decolorization was measured using a Beckman (DU 640) spectrometer at 480 nm.

Results. The results obtained from the decolorization of the effluent at different pHs, and in the presence of 10 and 100 mM of NaCl are presented in figure 1 (A, B and C). Significant differences were detected in the decolorization with the laccase control (no inducer) and the other laccases (induced with beech, pine and cedar). At pH 3 y 7, lower decolorization percentages were observed, approximately 20 % y 45%, respectively.

Meanwhile, at pH 5, decolorization reached 85%. With respect to the presence of NaCl at the three different pH's, a similar effect was observed. However, the presence of NaCl evidently affected the decolorization, as much as 50% in the case of some extracts at pH 5.

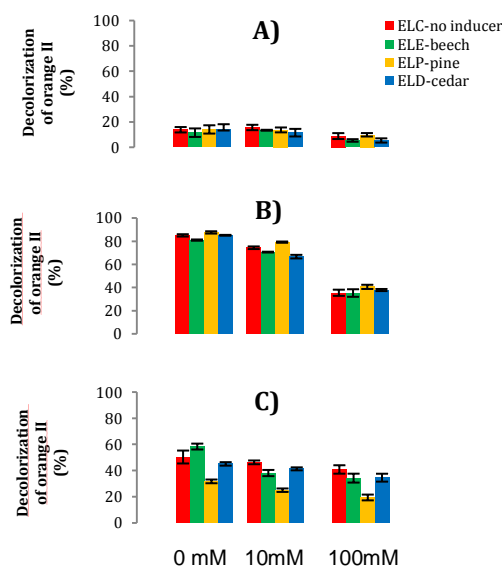


Fig. 1. Decolorization of synthetic orange II effluent (50 ppm) after 24h by different crude laccase extracts at pH 3, 5 y 7 and in presence of 10 and 100 mM NaCl.

Conclusions. The differences in the Decolorization of the synthetic effluent by each extract under different pH's and NaCl could indicate the presence of different catalytic activities of laccase isoforms.

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References

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