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FUNGAL LACCASES PRODUCTION USING TOMATO-BASED MEDIUM: A FACTORIAL DESIGN APPROACH

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Abstract

This study was aimed to stimulate laccase production by *Trametes pubescens* MUT 2400 by using a tomato-based medium. Two sequential 2x2 factorial designs were used to determine the effect of carbon (C) and nitrogen (N) source concentration on laccase activity and biomass concentration; copper was used as the sole inducer (0.75 mM). Analysis of the first factorial design showed that N had a strong positive effect on the maximum laccase activity, which occurred at day 12 of cultivation and final biomass concentration. When both C and N concentration (25% v/v, 28.7 g/L) were set at the high level, laccase activity and biomass growth were maximal (9.5 U/mL and 7.15 mg/mL). A second factorial experiment with C and N concentrations in the ranges of 25 - 50 % v/v and 28.7 - 48.7 g/L, respectively, established based on the results of the first one, showed that laccase activity could be further increased by either increasing C or N to their high levels. The enzymatic peak occurred at the 17th day in this second design with a maximum laccase activity of 28.6-32.8 U/mL. Laccase peak occurred when reducing sugars were completely depleted from the medium. The results of this study indicated that laccase activity could be enhanced by acting on nutrient content, and tomato-based medium is a good fermentation substrate.

Key words: factorial design, fungi, laccases, tomato-based medium

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