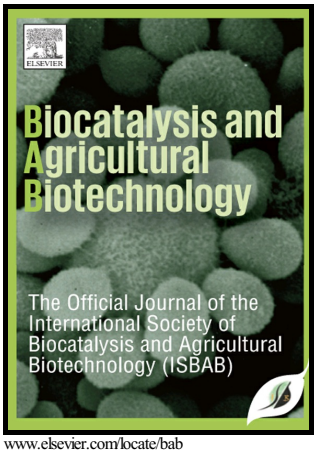

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Application of Central Composite Design as a Strategy to Maximize the Productivity of *Agaricus bisporus* CU13 Laccase and Its Application in Dye Decolorization

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Abstract

The optimization of laccase production by *Agaricus bisporus* CU13 under submerged fermentation conditions was conducted via response surface methodology. Incubation period, cultivation pH value, carbon sources, and nitrogen sources parameters were studied using 2, 2´-azino-bis (3- ethylbenzothiazoline-6-sulphonic acid) (ABTS) as substrate for laccase activity evaluation. Response surface methodology (RSM) was used to optimize the fermentation medium composition through studying the major effective factors resulted from the one factor per time study as follows: pH values (pH 5.0 - 9.0), soluble starch concentration (7.5 - 17.5 g/L), yeast extract concentration (2.5 - 12.5 g/L), and incubation time (15 - 35 days). Central composite design (CCD) revealed that the pH value of 6.99, 15 g/L soluble starch, and 5.52 g/L yeast extract were the optimum values for laccase production after 24 days of incubation at 28 °C. The optimization statistics leads to the improvement of laccase activity by 156% in comparison with pre-optimization values, which reveals the efficiency of the proposed model. *A.*

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