ABSTRACT

The present research work is concerned with the indirect biotransformation of L-tyrosine to dopamine (DA) by calcium alginate entrapped conidiospores of *Aspergillus oryzae*. Different strains of *A. oryzae* were isolated from soil. Out of 13 isolated strains, I-2 was selected as the best producer of DA. The wild type of I-2 was improved by treating it with different concentrations of EMS. Among seven EMS treated variants, EMS-6 was selected as it showed a maximum of 43 µg/ml of DA activity. The strain was further exposed with L-cysteine HCl to make it resistant against environmental stress and back mutation. To enhance the stability of DA activity, the conidiospores of selected mutant variant *A. oryzae* EMS-6 strain were entrapped in calcium alginate beads. Different parameters for immobilization were investigated and the activity of DA was determined. After immobilization, the activity of DA was further increased from 44 µg/ml to 62 µg/ml under optimized conditions (1.5 % sodium alginate, 2 ml inoculum and 2 mm bead size). The effect of additional carbon and nitrogen sources was also investigated. DA activity increased to 90 µg/ml when the growth media was supplemented with 0.1 % peptone and 0.2 % sucrose. The conditions of the reaction mixture were also optimized to enhance the tyrosinase activity of entrapped conidiospores. Under optimized conditions viz. pH 3, temperature 55°C, and time of incubation 70 min, the activity of DA expressed by the mutant variant was determined as 124 µg/ml. Hence, from the results of the present study it was observed that elevated level of DA activity was successfully achieved by EMS-induced mutagenesis.