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Biotransformation of benzeldehyde to L-phenylacetylcarbinol, an intermediate in L-ephedrine production, by immobilized *Saccharomyces cerevisiae*

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Background and Aims: this study tried to measure and compares the immobilized yeast saccharomyces cerevisiae with free cells on the production of L- phenylacetylcarbinol. L- Phenylacetylcarbinol is the precursor of decongestant drugs like ephedrine and pseudoephedrine.
Methods: For immobilization of saccharomyces cerevisiae, the pre cultured yeast cells in YPD medium were centrifuged and re suspended in sodium alginate solution(30g/lit), after that the solution dropped with needle into calcium chloride solution. The transformation conditions such as medium, PH, temperature and aeration rate were same for free and immobilized yeasts. After inoculation of the cells into transformation medium, Benzeldehyde added to medium as substrate and sampling performed once every two hours. Extraction of L-pac was done by dichloromethane extraction method. For measuring the rate of conversion of Benzeldehyde into L-PAC the samples were analyzed by gas chromatography method.
Results: In this study the biotransformation of Benzaldehyde to L-PAC studied in aerobic and anaerobic conditions. Gas chromatography results indicate that the production of L-PAC in anaerobic-anaerobic condition is four times more than aerobic-aerobic condition. Furthermore the optimal time of L-PAC production in immobilized yeasts were less than hours ten ,so it showed that the biotransformation rate in immobilized yeasts is more than free yeasts and also according to the gas chromatography results L-PAC production in immobilized yeasts is three time more than free yeasts.
Conclusions: As mentioned above by immobilization of yeast cells the biotransformation rate significantly increased. In addition since the immobilized cells can be used several times, so by immobilization of the yeast cells the production costs will reduce.

Keywords: Immobilization; Transformation; Pseudoephedrine; Decongestant