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COMPARISON OF CITRIC ACID PRODUCTION BY *ASPERGILLUS NIGER* UV_2 IN LIQUID SURFACE CULTURE AND SOLID STATE FERMENTATION

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Citric acid was produced by inoculating spores of *Aspergillus niger* UV_2 to the liquid medium (50ml) consisting (gl^{-1}) glucose 140.0; NH_4NO_3, 0.5; KH_2PO_4, 0.5; $MgSO_4.7H_2O$, 0.1; peptone, 7.0; $ZnSO_4.7H_2O$, $0.01x10^{-3}$; ferrous ammonium sulphate, $0.1x10^{-3}$ and $CuSO_4.5H_2O$, $0.06x10^{-3}$ and (mll^{-1}) methanol, 30 and gingili oil, 2.0 and incubated at 30°C. The final concentration of spores was $1x10^{-7}$ spores ml^{-1}. Highest amount of citric acid obtained was 38.6gl^{-1} at 15d. Citric acid production decreased after the complete utilization of sugar. When the fungus was grown in solid state medium where paddy husk (42.5g) was impregnated with liquid medium (50ml) at 50% water content, 5.9 gkg^{-1} of citric acid was produced at 3d with complete utilization of the reducing sugar. Even though citric acid productivity was higher in solid state fermentation (0.198 gd^{-1}) than in liquid surface fermentation (0.129 gd^{-1}), the product yield and efficiency were lower (8.9, 9.01%) in solid state fermentation than in liquid surface fermentation (26.3, 26.4%). In the optimization of inoculum for citric acid production, 38h old mycelium produced 30.6gl^{-1} citric acid at 20th day and increased production (49.5 gl^{-1}) was observed at 18th day when 65h old mycelium was used as inoculum. But 46.8 gl^{-1} citric acid was produced at 21st d when the medium was inoculated with spores. When the solid-state medium was inoculated either with 40 or 60h old moldy husk 4.8 and 3.5 gkg^{-1} citric acid was produced at 3rd day respectively. When the medium was inoculated with spores, 6.0 gkg^{-1} citric acid was produced at 3rd d. The spore inoculum was best among the three types of inocula used for citric acid production. Though citric acid production in the media inoculated with 40 and 60h old mycelia was 20 and 30% lower than that obtained in the medium inoculated with spores. To avoid the difficulties in the preparation of spores 40h old moldy husk could be used in solid-state fermentation while in liquid surface culture 65h old mycelial inoculum must be used for high citric acid production.