

UV AND CHEMICAL INDUCED MUTATIONS FOR INCREASED CITRIC ACID PRODUCTIVITY BY *ASPERGILLUS NIGER* P₁

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Production of citric acid is entirely a microbe oriented process. *Aspergillus niger* excretes citric acid (primary metabolite) in trace amount. Thus mutants are used for commercial citric acid production. In this study, citric acid producing *A. niger* was isolated from natural source and multiple mutation was carried out by different methods. Among *A. niger* from different sources (such as decaying lime, laboratory waste and kitchen waste), *A. niger* P₁ from decaying lime was selected. When the fungus was cultivated in surface culture in liquid medium [containing (g l⁻¹) NH₄NO₃, 0.75; KH₂PO₄, 0.5, MgSO₄.7H₂O, 0.1; peptone, 14.0; ZnSO₄.7H₂O, 0.1x10⁻³, ferrous ammonium sulphate, 0.1x10⁻³ and CuSO₄.5H₂O; 0.06x10⁻³] citric acid productivity obtained at room temperature was 0.27g l⁻¹ d⁻¹. From the spores (6 days old) of parent *A. niger* P₁, natural mutants were selected based on high Acid Unitage value (AU=Diameter of acid zone/Diameter of a colony) produced in bromocrasol green indicator bacteriological agar plates. Among 2 natural mutants selected *A. niger* P₂ was confirmed as the best citric acid producer. The citric acid productivity of this mutant was 0.49 g l⁻¹ d⁻¹, ie. two time increase in citric acid productivity was obtained. The spores of *A. niger* P₂ was mutated by UV-irradiation (254nm, 10min, 6.0cm from the UV source). Among the mutants, *A. niger* UV₁ showed highest citric acid productivity (1.21g l⁻¹ d⁻¹) and this achieved to 2.5 folds productivity. This productivity was increased further to 3.21g l⁻¹ d⁻¹ by supplementing the medium with 30g l⁻¹ methanol and 2.0ml l⁻¹ gingili oil. *A. niger* UV₁ was again subjected to UV-mutation and the *A. niger* UV₂ obtained gave 2.67g l⁻¹ d⁻¹ citric acid productivity. The ethyl methane sulphonate (2%,v/v; 75 min) induced mutation of *A. niger* UV₂ gave a mutant *A. niger* CM₁ giving a citric acid productivity of 7.2g l⁻¹ d⁻¹.

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