

**GLUCOSE CONCENTRATION AND INOCULUM SIZE ON
CITRIC ACID PRODUCTION BY *Aspergillus* sp M 2**

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Production of citric acid from glucose by a mutant strain of *Aspergillus* sp M 2 [developed in our laboratory] was investigated in surface culture using a liquid medium (100ml) containing two different concentrations (50 and 100g l⁻¹) of glucose with fixed amounts (g l⁻¹) of NH₄NO₃, 0.5; KH₂PO₄, 0.5; MgSO₄, 0.1 peptone, 7.0; ZnSO₄, 0.1 × 10⁻³; ferrous ammonium sulphate 0.1 × 10⁻³; CuSO₄ · 5H₂O 0.06 × 10⁻³ methanol 30ml l⁻¹ and aungilly oil, 2.0ml l⁻¹. In order to determine the total sugar required for citric acid production and to overcome the inhibitory effect of glucose on growth, the fermentation media containing initial concentrations of 50g l⁻¹ and 100g l⁻¹ glucose were supplemented with the same amounts of glucose as the glucose in the medium was used up. In both experiments, citric acid production reached the maximum of 27g l⁻¹ and the total glucose utilized was 110g l⁻¹. Hence in future experiments, the initial concentration of glucose was kept at 140g l⁻¹ even though only 110g l⁻¹ glucose was utilized. Excess 30g l⁻¹ glucose was added as a safety measure to ensure that the organism did not utilize citric acid as a carbon source. The effect of using spore inoculum and mycelial inoculum was investigated. The results show that the citric acid production with the mycelial inoculum reached a maximum on the 17th day and with spore inoculum on the 21st day. This apparently is not a significant advantage as the preparation of the mycelial inoculum takes about three days. When fermentation in 1 l scale was carried out with a glucose concentration of 140g l⁻¹ and 65h old 10% (v/v) mycelium as inoculum, the citric acid production reached a maximum of 45.2g l⁻¹ at 26th day. To produce the citric acid in large scale the inoculum should have sufficient amount of mycelium. Hence the growth pattern of *Aspergillus* sp M2 from spores was studied. The results showed that the mycelia reached mid log phase in 38h and 32h with the spore and mycelial inocula respectively. Maximum citric acid (28g l⁻¹) was produced from 140g l⁻¹ glucose on 18th day when a mycelial inoculum (0.372g (dry wt) / 100ml medium) at mid log phase was used.