

## **Fermentation conditions affecting growth and red pigment production of *Monascus purpureus* FTC 5391**

### **ABSTRACT**

Studies on optimization of fermentation conditions for cell growth and red pigment production by *Monascus purpureus* FTC 5391 were carried out in shake flask cultures at 37 °C. The suitable initial culture pH for red pigment production was varied from pH 5.5 to 9, but through this study the optimum initial culture pH was stated at 6.5. The optimal inoculum size for red pigment production was 10% and a decrease in inoculum size resulted in a decrease in mycelial growth and red pigment production. Study on the effect of different nitrogen sources such as  $(\text{NH}_4)_2\text{HPO}_4$ ,  $(\text{NH}_4)_2\text{H}_2\text{PO}_4$ ,  $\text{NaNO}_3$ ,  $\text{NH}_4\text{NO}_3$ ,  $(\text{NH}_4)_2\text{SO}_4$ ,  $(\text{NH}_4)_2\text{S}_2\text{O}_8$ ,  $\text{NH}_4\text{Cl}$ , peptone, yeast extract, monosodium glutamate (MSG), urea and tryptone, showed cell growth and red pigment production preferred organic nitrogen sources as compared to inorganic nitrogen sources. MSG as nitrogen source gave superior growth and red pigment production compared to other organic nitrogen sources. MSG at 1.2% (12 g/litre) was optimal for cell growth and red pigment production. Using 5% (50 g/litre) glucose and 1.2% (12 g/litre) MSG as the carbon and nitrogen source respectively, we found that  $\text{K}_2\text{HPO}_4$  (2.5 g/litre),  $\text{KH}_2\text{PO}_4$  (2.5 g/litre),  $\text{MgSO}_4 \cdot 7\text{H}_2\text{O}$  (1.0 g/litre),  $\text{KCl}$  (0.5 g/litre),  $\text{ZnSO}_4 \cdot 7\text{H}_2\text{O}$  (0.01 g/litre),  $\text{FeSO}_4 \cdot 7\text{H}_2\text{O}$  (0.01 g/litre) dan  $\text{MnSO}_4 \cdot \text{H}_2\text{O}$  (0.03g/litre) gave maximal cell growth and red pigment production.

**Keyword:** *Monascus purpureus*; pH; Inoculum size; Monosodium glutamate; Red pigment; Fermentation