

Increasing α -Amylase Activity of Thermo Stable Enzyme Produced by Strain BR₁

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The aim of this work is to increase the α -amylase production by the strain BR₁. The organism was inoculated to activation medium containing (gl^{-1}) soluble starch 2.0, and nutrient broth 25.0) and incubated at 45°C and pH 7.0 (100rpm). At 16h, the temperature was increased to 50°C and incubated for 8 hrs (100rpm). This inoculum (20%;v/v) was transferred to fermentation medium and incubated at 50°C. The fermentation medium contained (gl^{-1}) soluble starch, 2.0; $\text{CaCl}_2 \cdot 2\text{H}_2\text{O}$, 0.005; $\text{MgCl}_2 \cdot 6\text{H}_2\text{O}$, 0.005; FeCl_3 , 0.005; K_2HPO_4 , 2.5; KH_2PO_4 , 10.0; Peptone 2.0; NaCl, 1.0; $(\text{NH}_4) \text{SO}_4$, 2.0. At 72h maximum α -amylase activity (22units) was obtained. When surfactants such as Sodium dodecyl sulphate (0.05% w/v) and Tween 80 (0.1, 1.0 and 5.0% v/v) were added to the fermentation medium, α -amylase produced was 1.68, 21.22, 18.22 and 18.11units respectively.. Hence there was no significant increase in α -amylase production when SDS and different concentration of Tween-80 were added to the fermentation medium. To improve α -amylase production in the fermentation medium, the inducer, succinic acid (0.1 and 0.5 gl^{-1}) was added, and the enzyme production was 14.47 and 14.45units respectively at 72h. Therefore succinic acid also did not improve α -amylase production. In the next set of experiments amount of soluble starch in the fermentation medium was varied in the range of 2-10 gl^{-1} while all other contents of the fermentation medium kept the same. The maximum activity of 31 Units was obtained in the medium containing 4.5 gl^{-1} soluble starch. Then to the fermentation medium containing 4.5 gl^{-1} soluble starch different amount of sesamum oil (2.25, 4.5, 9.0, 18.0, 22.5 & 27.0 ml^{-1}) was introduced. α -mylase production was increased to 64.9 units in the medium containing 18 ml^{-1} sesamum oil. Coconut oil (3.0 ml^{-1}) completely stopped α -amylase production. In the fermentation medium containing 4.5 gl^{-1} soluble starch and 18.0 ml^{-1} sesamum oil, 65 units of α -mylase activity was obtained, which is 3 times more than that obtained in fermentation medium. Further experiments are in progress to increase the α -amylase production.

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