

## OPTIMIZATION OF CULTURE CONDITIONS FOR $\alpha$ -AMYLASE PRODUCTION BY BACILLUS LICHENIFORMIS

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The work was aimed to optimize the culture conditions for  $\alpha$ -amylase production by *Bacillus licheniformis*. The medium used to optimize the culture conditions contained (g/L-1) soluble starch, 2.0; peptone, 2.0;  $(\text{NH}_4)_2\text{SO}_4$ , 2.0; NaCl, 1.0;  $\text{KH}_2\text{PO}_4$ , 2.5;  $\text{K}_2\text{HPO}_4$ , 1.0;  $\text{FeCl}_3$ , 0.01;  $\text{MgCl}_2$ , 0.01; and  $\text{CaCl}_2$  0.01 at pH 7.0.  $\alpha$ -Amylase production was studied at different temperatures and the culturing temperature was optimized as 42°C, and the highest  $\alpha$ -amylase activity produced was 32.1 U/mL-1 at 48h and which was 1.14 times higher than the control. When  $\alpha$ -amylase production (36.2 U/mL-1) was highest in the medium with the initial pH of 7.0 at 42°C at 48h and was 1.12 times higher than the control. The storage period of the *Bacillus licheniformis* in agar slant containing (g/L-1) nutrient agar, 25.0 and starch, 3.0 at pH 7.0 before inoculation was studied and 24h old bacteria gave the highest  $\alpha$ -amylase activity (40.2 U/mL-1) at 48h, which was 1.14 times higher than the control. When the age of the inoculum in the activation medium was 12h, highest  $\alpha$ -amylase activity was produced (45.8 U/mL-1) at 48h and this was 1.14 times higher than the control. Based on the optimization studies, the  $\alpha$ -amylase production by *Bacillus licheniformis* was increased by 1.63 fold than under the non-optimized conditions.

**Keywords:** Activity,  $\alpha$ -amylase, *Bacillus licheniformis*, Optimization, Inoculum.

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