

### Optimization of the medium for better $\alpha$ -amylase production from *Bacillus Licheniformis*

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The present study is concerned with the improvement of *Bacillus licheniformis*  $\alpha$ -amylase production by media optimization. The enzyme production [ $50.52(\pm 0.84)$  UmL<sup>-1</sup>] was highest in the fermentation medium which contained (gL<sup>-1</sup>) soluble starch, 2.0; peptone, 2.0; (NH<sub>4</sub>)<sub>2</sub>SO<sub>4</sub>, 2.0; NaCl, 1.0; KH<sub>2</sub>PO<sub>4</sub>, 2.5; K<sub>2</sub>HPO<sub>4</sub>, 1.0; FeCl<sub>3</sub>, 0.01; MgCl<sub>2</sub>, 0.01; and CaCl<sub>2</sub> 0.01 at pH 7.0. When  $\alpha$ -amylase production was studied at different concentrations of K<sub>2</sub>HPO<sub>4</sub> the highest activity ( $53.33\pm 0.47$ ) was produced with 2.5gL<sup>-1</sup>K<sub>2</sub>HPO<sub>4</sub> at 48h. It was noticed that the  $\alpha$ -amylase production ( $55.67\pm 0.86$ UmL<sup>-1</sup>) was maximum with 1.0gL<sup>-1</sup> of KH<sub>2</sub>PO<sub>4</sub>.

Among the different concentrations used  $\alpha$ -amylase production ( $62.22\pm 0.92$ UmL<sup>-1</sup>) was highest with 4.0gL<sup>-1</sup> peptone. At the concentration of 4.0gL<sup>-1</sup>starch highest  $\alpha$ -amylase production ( $64.79\pm 0.62$ UmL<sup>-1</sup>) was obtained at 48h. Varying (NH<sub>4</sub>)<sub>2</sub>SO<sub>4</sub> concentration in the fermentation media showed the highest  $\alpha$ -amylase activity ( $66.64\pm 0.86$  UmL<sup>-1</sup>) at the concentration of 1.0 gL<sup>-1</sup>. When the NaCl concentration in the medium was optimized it showed the highest  $\alpha$ -amylase production ( $69.53\pm 1.02$ UmL<sup>-1</sup>) at the concentration of 1.0 gL<sup>-1</sup>. Thus medium optimization has increased the  $\alpha$ -amylase production from  $47.01(\pm 0.22)$  UmL<sup>-1</sup> to  $69.53\pm 1.02$  UmL<sup>-1</sup>.

**Key words:**  $\alpha$ -Amylase, Optimization, *Bacillus licheniformis*