

Effect of Different Nitrogen Sources on α -amylase Production from *Bacillus licheniformis* ATCC 6346

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The effect of different nitrogen sources on thermo-stable α -amylase production by *Bacillus licheniformis* ATCC 6346 was investigated. Single colony of *Bacillus licheniformis* ATCC 6346 from nutrient agar slants (grown at 37°C for 24h) was transferred to activation medium and incubated at different temperatures varied from 37°C to 65°C in a rotary shaker (100rpm). There was no growth observed at 60°C and above. The bacteria, incubated in activation medium at 42°C for 12h, was used as inoculum. The nutrient agar medium contained (g l⁻¹) nutrient agar, 25.0 and soluble starch, 3.0 and the activation medium contained (g l⁻¹) nutrient broth, 25.0 and soluble starch, 3.0. The fermentation medium was inoculated with inoculum (20%, v/v) and incubated at 42°C and 100rpm. The fermentation medium contained (g l⁻¹) soluble starch, 4.0; (NH₄)₂SO₄, 5.0; peptone, 6.0; FeCl₃, 0.01; MgCl₂.6H₂O, 0.01; CaCl₂.2H₂O, 0.01; KH₂PO₄, 4.0 and K₂HPO₄, 7.5. The strain *B.licheniformis* ATCC 6346 reached log phase at 12h. Highest growth (OD_{600nm}, 1.895) was obtained at 12h and the highest α -amylase activity (44.43Uml⁻¹) was obtained at 48h. The peptone (6g l⁻¹) in the medium was replaced by same amount of Tryptone, Yeast extract, and oil containing oil seed cakes such as sesamum, mustard, ground nut, coconut and soy meat while all other contents of the fermentation medium were kept the same. The highest α -amylase activity (52.27Uml⁻¹) was produced in the medium containing soy meat after 48 h of fermentation and negligible amount of enzyme activity (0.691Uml⁻¹) was obtained in the medium containing coconut oil seed cake. Completely oil removed oil seed cakes (in the range of 2-30 g l⁻¹) such as sesamum, mustard, ground nut and soy meat were used to improve the α -amylase production. Maximum α -amylase activity was obtained in the media containing groundnut 39.36Uml⁻¹ (14g l⁻¹), soy meat 44.62Uml⁻¹ (18g l⁻¹), mustard 58.14Uml⁻¹ (18g l⁻¹), and sesamum 56.64Uml⁻¹ (18g l⁻¹) at 48h of fermentation. 6g l⁻¹ of completely oil removed oil seed cakes such as groundnut (34.42Uml⁻¹), mustard (46.01Uml⁻¹) and sesamum (46.79Uml⁻¹) gave higher enzyme production than oil containing oil seed cakes where the enzyme production was decreased in presence of soy meat (41.75Uml⁻¹).

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