Scaling Up of α-Amylase Production by *Bacillus lichenifomis* ATCC 6346 to Large Laboratory Level

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Thermostable α-amylases have wide industrial applications. Before going for industrial scale it has be tested at large laboratory scale and then in pilot scale. Thus in this study the effect of increasing the reactor volume on α-amylases production was studied. *Bacillus lichenifomis* ATCC 6346 of 12h old obtained by incubating at 42°C and 100rpm in activation medium was inoculated to fermentation medium. The activation medium contained (gL^{-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 (gL^{-1}) soluble starch, 4.0; $(NH_4)_2SO_4$, 5.0; peptone, 6.0; $FeCl_3$, 0.01; $MgCl_2.6H_2O$, 0.01; $CaCl_2.2H_2O$, 0.01; KH_2PO_4, 4.0 and K_2HPO_4, 7.5. The volumes of the fermentation medium containing conical flask were varied from 250 to 2000mL. Under all different volumes of the reactors, the media volume to reactor volume ratio was maintained as 1:10. Growth of *B.licheniformis* ATCC 6346 was decreased with increase in the reactor volumes. Highest growth (at 600nm) of 1.879 was obtained in the reactor which had 250mL volume at 24h, 42°C and 100rpm and 85.4% of growth was obtained in the reactor which had 2000mL volume under the same conditions and α-amylase production was decreased from 46.3 to 30.2 UmL^{-1}. When the reactor volume was 250ml, reduction in pH was not observed at 12h but other reactor volumes pH was reduced at 12h.When the medium to reactor (2L flask) volume ratio was varied from 1:10 to 2.5:10, maximum growth (1.604, 600nm) was obtained in the medium to reactor volume ratio was 1:10 at 24h, 42°C and 100rpm. When the media volume to flask volume ratios were 1:10, 1.5:10, 2:10 and 2.5:10, highest α-amylase activity (30.2 UmL^{-1}) was obtained at the ratio of 1:10 at 48h.