

ABSTRACT

The present study concerned with isolation of bacterial strain, optimization of culture conditions, production, and scale-up study of α -amylase. The technique used to investigate the α -amylase production was (OVAT) and all the parameters optimized by static submerged fermentation methodology. Maximum growth rate and enzyme production by *Bacillus* species were recorded at 37°C temperature, with inoculum volume 10ml where the pH kept as 7 for 24 hrs. The yield of α -amylase was enhanced with 1.5g of maltose and 1g of yeast as carbon and nitrogen source. Different metal ions (CaCl₂, MgSO₄, KH₂PO₄, FeSO₄, NaCl, and ZnSO₄) supplemented in growth medium for production of α -amylase by *Bacillus* species in same concentrations. The highest growth showed by CaCl₂ was (1.41± 0.01U/ml) MgSO₄ (1.05±0.03U/ml), KH₂PO₄ (0.26± 0.08U/ml), FeSO₄ (0.42± 0.01U/ml), NaCl (0.37± 0.06U/ml), and ZnSO₄ (1.02±0.05U/ml). Among all those tested metals a marked enhancement was showed by CaCl₂. After optimising, scale up study was carried out in 1L fermenter with all maximums attained optimised isolates. After 24 hrs the production of α -amylase reached (2.83 mg/L) at 7 pH. The α -amylase is cost-effective enzyme produced by agro-industrial waste potato peel from *Bacillus* species by using advanced technique submerged fermentation. These results indicate that α -amylase from *Bacillus* species can be used in various commercial sectors.