

ABSTRACT

The present study is concerned with the optimization of process parameters for alkaline protease production by *Bacillus subtilis* IH₇₂ under solid state fermentation. The strain was provided from the Institute of Industrial Biotechnology, Govt College University, Lahore. The optimum incubation temperature, incubation period and moisture level for the production of alkaline protease were found to be 37°C (74.0 U/g), 48 hrs, (75.0 U/g), and 100% (77.15 U/g), respectively. Different agricultural byproducts were evaluated as fermentation substrates and maximum enzyme (85.03 U/g) synthesis was achieved when wheat bran was used as substrate. By partial replacement of wheat bran with guar meal maximum enzyme yield was further enhanced (89.15 U/g). The best extractant, diluent and pH of diluent for protease production were found to be distilled water (88.92 U/g), D₂ ((% w/v), CaCO₃, 0.5⁰/_K; peptone, 0.1; glucose, 0.1; yeast extract, 0.1) (101.23 U/g) and 9.5 (105.69 U/g), respectively. The production of alkaline protease by *Bacillus subtilis* IH₇₂ was also studied by adding different carbon and nitrogen sources to the fermentation medium. Sucrose at a concentration of 1% (108.8 U/g) and nutrient broth at a concentration of 1.5% (117.0 U/g) and diammonium hydrogen phosphate at a concentration of 0.1% (121.4 U/g) were found to be the best carbon and nitrogen (organic and inorganic) sources, respectively. The inoculum at a concentration of 25% (126.8 U/g) was found to be best for protease production by *Bacillus subtilis*. The overall production was increased about 0.58 folds with optimum conditions.