Abstract

The aim of present study was the isolation of peroxidase producing bacteria from different compost samples collected from various areas of Lahore. Thirty four bacterial strains were isolated by primary screening and their secondary screening was carried out by using submerged fermentation. Bacterial isolate AR-8 showed the maximum enzyme activity (18±0.02 U/mL/min) and was identified as *Bacillus halotolerans* by using 16S rRNA genome sequence analysis. Different physical (incubation time, temperature, pH and inoculum size) and nutritional (carbon source, nitrogen source and their concentrations) parameters were optimized. Maximum enzyme production was obtained after 72 hours of incubation, 35°C temperature, 8 pH with 4% lignin as carbon source and 3% nitrogen source when F3 fermentation medium was inoculated with 2% inoculum size. Scale up studies were performed using stirred fermenter up to 2 liters and the cultural parameters i.e. incubation time, temperature, pH and agitation rate were also optimized at the laboratory scale yielding enzyme activity of 238±0.02 U/mL/min. Kinetic analysis of different growth parameters (maximum specific growth rate, product yield coefficient and specific product yield coefficient) was done in order to analyze the validity of results. Fermentation kinetics revealed that the maximum product yield coefficients were also obtained after 72 hours of incubation, 35°C temperature, 8 pH and 150 rpm agitation rate.