Abstract

In present study, the phytase producing *Aspergillus oryzae* strain UJIIB-29 was exposed to chemical mutagens (Nitrous acid, Sodium azide and Ethyl methanesulfonate) to increase the phytase production. After mutagenesis, 62 mutant fungal colonies were screened qualitatively. This resulted in the screening of 30 positive and negative mutant strains. These 30 mutant strains were subjected to quantitative screening by submerged fermentation in PSM (phytase screening media). Nitrous acid treated mutant strain of *Aspergillus oryzae* NA-4 gave maximum phytase activity i.e. 44±0.017 U/ml/min that was 1.9 times higher as compared to phytase production i.e. 23.1±0.012 U/ml/min by wild strain of *Aspergillus oryzae* UJIIB-29. Optimization of different cultural conditions such as cultural media, Incubation period, temperature, media pH, carbon source, carbon source concentration, nitrogen source, nitrogen source concentration and inoculum size for both wild and mutant strain was carried out to enhance the phytase production. The maximum phytase activity was observed when 4% inoculum of *A. oryzae* was inoculated in glucose phosphate broth medium with 1% starch as carbon source and 0.4% ammonium sulphate as nitrogen source for 168h of incubation at 30°C and 4.5 pH. Under optimized conditions maximum phytase activity was observed i.e. 58.98±0.023 U/ml/min. Optimization resulted in 1.33 folds increased in phytase activity 58.98±0.023 U/ml/min as compared to the enzyme activity i.e. 44±0.017 U/ml/min before optimization.