Abstract

The main purpose of this study was to improve the mannanase producing strain *Aspergillus awamori* (IIB 037) by chemical mutagenesis. The wild strain of *A. awamori* (IIB 037) was subjected to five different strong chemical mutagens (sodium azide, ethyl methyl sulfonate (EMS), ethidium bromide, methyl-N'-nitro-N-nitrosoguanidine (MNNG) and nitrous acid) to enhance the mannanase production. Sixty six mutant strains were primarily screened on the basis of mannananolytic zone of hydrolysis and subjected to submerged fermentation for quantitative evaluation of mannanase production. The mutant strain of *A. awamori* Aaw.N50 treated with nitrous acid (50mM concentration) showed the maximum production of mannanase (45.6±0.03 U/ml). There was 2.3folds increase in the mannanase activity after the mutagenic treatment. This mutant was selected for further enhancement of mannanase production by optimizing the cultural conditions as fermentation media, incubation time, pH of media, temperature, nitrogen source, carbon source and inoculum size of spores. The optimization of wild strain was also done in order to compare with the results of mutant strain for the production of mannanase. The maximum production of mannanase (22.02±0.01 U/ml) was obtained by cultivation of wild strain at the optimized conditions (72h of incubation, 30°C temperature, pH 5, 4% of spore's inoculum, LBG as carbon source and yeast extract as nitrogen source). While, the mutant strain of *A. awamori* Aaw.N50 produced 55.85±0.06 U/ml of mannanase when cultivated at: 30°C temperature, 96h of incubation, pH 5.5, 4% of spore's inoculum, using LBG as carbon and yeast extract as nitrogen source. After the optimization of cultural conditions, mutant strain (Aaw.N50) gave 1.22fold increase in the mannanase production.