ABSTRACT

Cellulose is commonly hydrolyzed by enzyme called cellulase, which is produced by several microorganisms including fungi. Cellulases have broad potential in different industries like beverages, textile, feed and paper industry etc. In the present study acidophilic cellulase producing fungi have been isolated and were optimized for cellulase production and its activity. Out of 32 fungal isolates from soil samples, six most productive strains were selected for further characterization and enzyme optimization. Fungal isolates GCU-Z-AF9, GCU-Z-AF15, GCU-Z-AF23, GCU-Z-AF24, GCU-Z-AF26 and GCU-Z-AF27 showed maximum enzyme activity of 0.521U/ml, 0.575U/ml, 0.494U/ml, 0.740U/ml, 0.449U/ml and 0.513U/ml respectively. Partial sequencing of 18S rRNA revealed that the fungal isolates belonged to three genera of fungi *i.e., Aspergillus, Trichoderma* and *Hypocrea.* GCU-Z-AF9, GCU-Z-AF15 and GCU-Z-AF27 belonged to genus *Aspergillu,* GCU-Z-AF23 and GCU-Z-AF26 belonged to genus *Trichoderma* whereas GCU-Z-AF24 belonged to genus *Hypocrea.* Production of cellulase was measured through enzyme assay. The highest enzyme production was recorded at 25°C while optimum activity was noted at pH 2. The cellulase enzyme was most active and stable at pH range of 2-5 while the maximum enzyme activity was recorded at temperature ranges from 25-30°C. Different agricultural byproducts were employed for cellulase production in SSF at low pH. Substrates cellulose and rice husk showed the most cellulase enzyme production at pH 2.