

Abstract

Protease production was tested in six distinct *Aspergillus strains*, including *Aspergillus niger* (AN1, AN2), *Aspergillus fumigatus* (AP1, AP2), and *Aspergillus flavus* (AF1, AF2). Maximum enzyme activity was 3.7 U/ml, 3.4 U/ml for two strains of *Aspergillus niger*, and 4.6U/ml,4.2 U/ml for two strains of *Aspergillus fumigatus*, all produced by solid-state fermentation. Media diluents, sugar source, nitrogen source, and agricultural substrate all played a role in optimizing *A. niger's* enzyme synthesis in the medium, with Dil 3 (5.1 /ml), Fructose (5.1 U/ml), peptone (3.7 U/ml), and wheat bran and soya bean meal (3.7 U/ml) generating the highest protease value. For protease production, 30⁰C (3.7 U/ml), 120 hrs (6.5 U/ml), and 7 (3.7 U/ml) were optimal. *A. fumigatus'* enzyme activity was maximized by cultivating the fungus under the optimal nutritional and physical conditions of D5 (4.8U/ml), sucrose (4.8U/ml), Peptone (4.7U/ml), substrate wheat bran and soya bean meal (4.7U/ml), 30°C (5 U/ml), 120 hrs (7 U/ml), and pH 8 (6.8 U/ml).