

ISOLATION AND IDENTIFICATION OF AN EFFICIENT CELLULOSE-DEGRADING FUNGAL SPECIES, *ASPERGILLUS NOMIUS* FROM SOIL

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Cellulase is a group of enzymes consisting of exoglucanase, endoglucanase, and β -glucosidase that act on cellulose sequentially to degrade to glucose monomers. Due to the high activity, availability, and stability of fungal cellulases, they have many potential applications in industries such as bioethanol, textiles, paper, food and beverage. Since there is limited work on glucose production from leaf litter and plant biomass using fungal cellulases, this study aimed at the molecular-based identification of efficient cellulolytic fungal species. Different fungal species were isolated from soil samples collected from four different locations in Sri Lanka: 1) the “Mini-Sinharaja” premises, 2) Botany Department in University of Peradeniya, 3) a compost soil sample and 4) a leaf litter contaminated soil sample from Nikaweratiya and screened for their cellulolytic activity using Gram’s iodine and Congo red tests and identified up to the genus level by observing the colony morphology and microscopic features of fungal cultures. The filter paper assay quantitatively determined the most efficient cellulose-degrading fungal species. During the molecular identification, fungal genomic DNA was extracted, and Internal Transcribed Spacer (ITS) region-based PCR amplification was carried out using ITS1 and ITS2 primer pair followed by sequence analysis. Eleven different fungal species were isolated, and ten species of these gave positive results upon the formation of a yellow colour halo region around the colonies in both Congo red and Gram’s iodine tests, thus confirming their cellulolytic activity. The fungal isolate with the highest cellulolytic activity was identified as *Aspergillus nomius* by a phylogenetic analysis. Since fungi have gained attention as prominent cellulase producers, this study contributed to the molecular identification of an efficient cellulose-degrading fungal species in plant biomass-contaminated soil samples. Further research can characterize industrially valuable properties of cellulases and media optimization for *Aspergillus nomius*.

Keywords: *Aspergillus nomius*, Cellulolytic fungi, Filter paper assay, Fungal cellulases, ITS region