

**Title: QUALITATIVE EVALUATION OF CELLULASES PRODUCTION BY FILAMENTOUS FUNGAL *Aspergillus* AND *Penicillium* GENERA**

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**Abstract:**

Cellulases are a group of hydrolytic enzymes capable of hydrolyzing the cellulose to smaller sugar components. A large number of microorganisms are capable of degrading cellulose, only a few of these microorganisms produce significant quantities of enzymes capable of completely hydrolysing cellulose. Fungi are the main cellulase-producing microorganisms. Cellulases have enormous potential in industries and are used in food, beverages, textile, laundry, paper and pulp industries. Most of the commercial cellulases (including  $\beta$ -glucosidase) have been produced from the *Trichoderma*, *Penicillium* and *Aspergillus* genera. In this context, this study aimed to evaluate the qualitative production of cellulases by filamentous fungi *Aspergillus* and *Penicillium* genera. 16 filamentous fungi were selected, eight out of every genus, belonging to the Environmental Microbiology Laboratory collection of Rio Claro Campus of UNESP. The isolates were reactivated from -20 ° C in Potato Dextrose agar and incubated at 28°C for 7 days. After growth on PDA, cellulose activities were determined by using plate screening medium with carboxymethyl cellulose (CMC) as the only Carbon source. The plates were incubated in BOD (28 ± 1 °C) for four days to allow fungal growth, then again incubated for 18h at 50 °C which is the optimum temperature for cellulase activity. After incubation, 10 mL of 1% Congo - Red staining solution (0.1 M Tris HCl, pH 8) was added to the plates for 30 min. The staining was then discarded and 10 mL of 1 M NaCl was added to the plates for 15 minutes. Clear zones was observed only around colonies of the active fungal strains. Cellulase production was indicated by the appearance of an orange halo around the colony, indicative of areas of hydrolysis. This halo was measured for subsequent calculation of the Index of Enzyme Activity (IEA) using the expression: diameter of hydrolysis zone/diameter of colony. Values equal or greater than 2, indicate that the isolate has good potential in the production of the enzyme, enabling further studies of the species. From the 16 strains tested by Congo Red stain, 14 samples were positive, these strains, only *Penicillium* sp. LMA 167, *P. radicum* LMA 1109, *P. islandicum* LMA 1128 and *Aspergillus versicolor* LMA 961 exhibited IEA greater > 2. In the present study, it could be concluded that 87,5% of fungal cultures showed cellulolytic activity. Among these fungal cultures, *P. islandicum* was noticed to show maximum zone of hydrolysis of carboxymethyl cellulose.

**Keywords:** Cellulose; cellulolytic fungi; screening of cellulases, Filamentous fungi.

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