

Screening of Multicopper Oxidases Enzymes in Filamentous Fungi

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Introduction: Multicopper oxidases (MCOs) are a family of enzymes widely distributed in nature, which catalyse the oxidation of a variety of substrates (mainly aromatic compounds and metals) reducing the oxygen molecule into water. Biotechnology industry has interest in MCOs due to their use as 'green' catalysts. In nature fungi express extracellular hydrolytic and oxidative enzymes that are needed to degrade all the wood polymers. The objective of this study was to select filamentous fungi MCOs's producers, aiming enzyme purification and biotechnological applications. **Material and Methods:** A total of 75 fungi from Fungal Biotechnology Biochemistry Culture Collection (BBF, EACH/USP), were tested to determine their MCOs activity by employing screening techniques on solid media. Culture were growth at 30°C, for 10 days and tested in plate activity assays adding a solution of 10 mM of ABTS, N-dimethyl-p-phenylenediamine sulfate (DMPPDA), guaiacol and 2,6-dimethoxyphenol (DMP). The overlay solutions were discarded after 10 minutes of incubation. **Results and Discussion:** Different degrees of enzymatic activity were observed depending on color intensity of reaction product: green halo with ABTS oxidation, brown halo with guaiacol, pink halo for DMPPDA and yellow halo with DMP. A significant number of fungi showed MCOs activity against one or all substrates. 40 isolates (55 %) were able to produce at least one type of enzymatic activity studied. However, among the isolates that produce the described enzymes, only 16 (20 %) were considered as good producers of at least one enzyme. **Conclusions:** The patterns observed of activity on assays in plate for each fungi MCO against the different substrates suggest that remarkable biochemical differences exist between them. Studies of biochemical characterization of enzymes will evidence their biotechnological applications.

Key words: Multicopper oxidases, Enzyme, Fungus.

Support: FAPESP nº 2012/50153-5.