Title: Degradation and detoxification of Reactive Blue 235 dye by filamentous fungi

Authors: Santoro, E.P.[1], Almeida, G.C.S.[1], Santos, D.M.[1], Silva, P.P.B.[2], Ghizelini, A.M [1], Reinert, F.[2], Macrae, A.[1].

Institution: [1]Laboratorio de Biotecnologia Sustentável e de Bioinformática Microbiana, Programa de Pós-graduação em Biotecnologia Vegetal e Bioprocessos, Centro de Ciências da Saúde, Universidade Federal do Rio de Janeiro (UFRJ); [2]Laboratório de Fisiologia Vegetal, Centro de Ciências da Saúde, Universidade Federal do Rio de Janeiro (UFRJ)

Textile industries are of great economic importance, but are also great environmental polluters due the presence of textile dyes in their effluents. Textile dyes are molecules that have complex structures and are considered recalcitrant because they are resistant to degradation. Effluent treatment is expensive and generally not efficient at removing dyes; consequently, dyes are released into rivers. Without adequate treatment they cause changes in ecosystems by decreasing the transparency of waters and the penetration of solar radiation affecting fundamental biological processes. Textile dyes with chemically active groups that react covalently with important cellular molecules can be very toxic for all organisms. A need to prevent dyes with aromatic structures is required. In this study we aimed to use lignolytic filamentous fungi isolated from mangroves to degrade and detoxify reactive textile dyes. The lignin molecule has an aromatic ring structure that shares several common features with recalcitrant synthetic molecules. Fungal strains 66Jm and 78GJb, identified as *Cladosporium cladosporioides* and *Cladosporium sphaerospermum,* were used to degrade the Reactive Blue 235 dye at different concentrations (10, 25, 50 and 100 mg/ L). Complete degradation of the dye at concentrations 10, 25 and 50 mg/ L was seen for both strains after a 5 day incubation. At a concentration of 100 mg / L complete degradation was seen after 7 days. The phytotoxicity of the dye and the post-degradation compounds were evaluated by the germination rate of *Brassica juncea* seeds. The germination rate of seeds soaked in water was 87% (control), seed germination decreased to 32% when soaked with dye at a concentration of 100 mg/ L. The beneficial effect of adding degrading fungi to the dye was seen by comparing germination rates. Where seeds were soaked with dye treated by strain 66Jm and 78GJbp the germination rates were similar to those with for (82% and 74% respectively). These results demonstrate that these fungi reduce the toxic effect of Reactive Blue 235 on seed germination and indicate the biotechnology potential of both strains.

Keywords: Biodegradation, filamentous fungi, detoxification, reactive dyes, Reactive Blue 235

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