PLATE SCREENING OF DECOLOURISATION OF TEXTILE DYES BY FUNGI USING ALKALINE CONDITIONS

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Background: A large amount of dyes are used for dyeing textiles which generate large amounts of alkaline industrial effluents. Thus, these effluents must be previously treated to reduce their aesthetic, toxic and carcinogenic effects in water receptors. Recently, it has been an increasing interest in using white rot fungi (WRF), which degrade lignin and xenobiotic compounds including dyes, to treat these effluents.

Objective: Screening WRF for degradation of textile dyes in alkaline conditions.

Methods: Twelve different WRF strains obtained from the Micoteca da Universidade do Minho (MUM) culture collection were used. Screening for Poly R-478 and Reactive Black 5 decolourisation were carried out on plates containing Yeast Nitrogen Base with 5 gL^{-1} saccharose and 0.1 gL^{-1} Poly R-478 or Reactive Black 5 (pH 4.5). The effect of pH in a range from 8 to 10 was studied. The mycelia growth and decolourisation of each fungus was recorded based on the clear zones formed after incubation at 30°C over 14 days.

Results: The first screening gave four strains with best results concerning the dyes decolourisation: *Trametes versicolor* MUM94.04, MUM04.100, MUM04.101 and *Phanerochaete chrysosporium* MUM94.15. To refine the screening the pH influence was studied with intervals of 0.5. MUM94.04 and MUM04.100 showed good growth and decolourisation abilities for pH 9.5. The strains were able to decolourise more efficiently Reactive Black 5 than Poly R-478.

Conclusions:

1. The results showed that increase of alkaline conditions turn the fungal decolourisation more strictly.
2. The two *Trametes versicolor* strains are now under study to determine which ligninolytic enzymes are produced.

References: 1 Martins, M.A.M. et al. Research in Microbiology (2002) 153:361-368.