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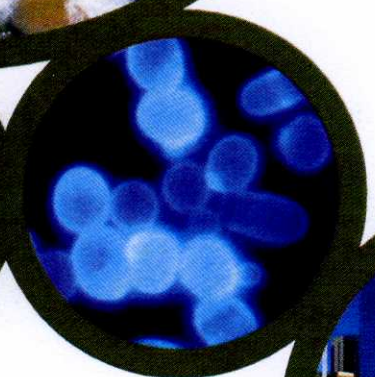

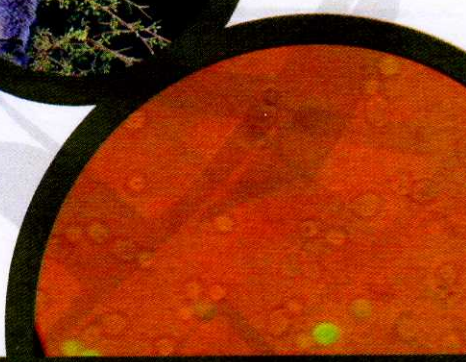

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FUNGAL MECHANISMS OF TEXTILE DYES BIODEGRADATION

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Reactive dyes are widely used in the textile industry. Coloured effluents from dyestuff and textile industries, the major producers and users of azo dyes, not only produce visual pollution but can also be detrimental to life, as they are usually resistant to biological treatment. Additionally, fungi, mainly white rot fungi, have shown the ability to degrade numerous aromatic organopollutants, including textile dyes, via oxidative mechanisms till their complete mineralisation, avoiding the formation of anilines as intermediates. In our work, textile azo dyes were synthesized using aminobenzoic and aminosulphonic acids as diazo components and bioaccessible groups such as 2-methoxyphenol (guaiacol) and 2,6-dimethoxyphenol (syringol) as coupling components. The bioaccessible groups are present in the lignin structure and seem to be access points to the ligninolytic enzymes produced by white rot fungi. The fungal biodegradation of the azo dyes were studied in order to establish the relationship between the chemical structure of the dye and the extent of biodegradation. The rule of the non-specific fungal ligninolytic enzymatic system, lignin peroxidases, manganese peroxidases and laccases, as well as the enzyme glyoxal oxidase wich produce H2O2 for the activities of both peroxidases were studied. Reactive Black 5 and the anthraquinone-based polymeric dye Poly R-478 have been currently used to screen the fungal biodegradation under alkaline conditions (pH ≥ 8.0). In order to adapt the fungi to this alkaline condition a chemostat is now used. To perform this work the fungi used were supplied by the culture collection Micoteca da Universidade do Minho (MUM).