EXPRESSION PROFILE OF OXIDASES GENES FROM *PLEUROTUS OSTREATUS* GROWN IN SUBMERGED FERMENTATION SUPPLEMENTED WITH TEXTILE DYES

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Introduction. *Pleurotus ostreatus* is a white rot fungus capable of degrading many xenobiotic and recalcitrant compounds due to their ability to produce a nonspecific enzyme system able to catalyze the oxidation of many types of organic compounds (1) including textile dyes. Several studies had demonstrated the influence of the structure of dyes on the patterns of expression of oxidases produced by this fungus during the process of growth and dye oxidation.

The objective of this research was to study by RT-PCR the temporal expression of genes that codify for laccase, manganese peroxidase and versatile peroxidase during growth and textile dyes oxidation process by *P. ostreatus*.
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Methods. The fermentations were performed in 125 ml Erlenmeyer flasks containing 50 ml of basal medium (BM) (2) supplemented with 500 ppm of either Acetyl Yellow G (AYG) or Remazol Brilliant Blue R (RBBR). The cultures were incubated at 25 °C for 23 days on a rotary shaker at 120 rpm. Mycelium samples were taken at 144, 264, 312, 360, 504 and 552 h of fermentation, rinsed with 0.9% NaCl and stored at -70 °C until the total RNA extraction procedure and RT-PCR assays were performed.

Results. Figure 1 shows the biomass production of *Pleurotus ostreatus* in submerged fermentation. The growth parameters maximal biomass (Xmax) and specific rate growth (μ) for each tested condition shown that the presence of RBBR and AYG dyes reduce the μ, and increase the Xmax values, however not significant differences (P>0.05) were found.

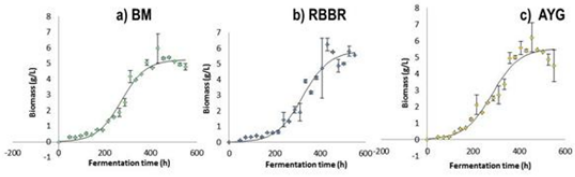

Fig.1 Growth of *P. ostreatus* in submerged fermentation with a) BM, b) RBBR and c) AYG

The expression profile of *P. ostreatus* oxidases genes during growth and decolorization kinetics (Fig. 2) shown that the addition of RBBR and AYG dyes increased the expression level of all tested genes however it fluctuated in each monitored phase. Patterns generated for each oxidases gene, suggest that the laccase in conjunction with its isoforms as well as manganese peroxidase and versatile peroxidase genes contribute to the decolorization of the dyes. The poxa1b gene seems to be the highest constitutively expressed. On the other hand, induction was mainly observed for the versatile peroxidase gene at specific times of both conditions.

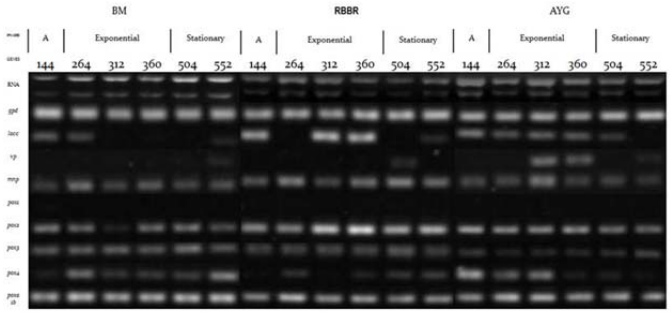

Fig.2 Expression profile of oxidases genes during *P. ostreatus* growth in a)BM ,b) RBRR and c) AYG.

Conclusions. RBBR and AYG dyes acted as inducers of activity and modified the profile expression of oxidases genes. The induction level being highly sensitive to differences in dye chemical structures. Oxidases induction by dyes may represent a response developed by fungi against toxic compounds.
Furthermore enzymatic and molecular studies of oxidases produced by *P. ostreatus* will contribute to have enzyme selection criteria leading to the development of effective bioremediation methods.

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