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CHANGES OF GROWTH AND POLYPHENOLOXIDASE ACTIVITY OF GREEN MICROALGAE STRAINS USEFUL FOR ENVIRONMENTAL PHYCOREMEDIATION INDUCED BY BENZO[A]ANTHRACENE

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Polycyclic Aromatic Hydrocarbons (PHAs) are comprised of two or more benzene rings and their major source is the incomplete combustion of organic material and are mostly used as intermediaries in agricultural products, lubricating materials, and other chemical industries. The possible fates of PAHs in the environment include physical, chemical and biodegradation. However, their degradation by microorganism in aqueous environmental is often limited by their low water solubility allowing the accumulation in soil, plants, fishes and invertebrate. It has been proved that PAHs can cause carcinogenic and mutagenic effects; they are also potent immunosuppressants. The PAHs degradation pathway of bacteria and ligninolytic fungi has been extensively investigated, but the metabolism of PAHs in plant and microalgae remains unknown. Our research is focused on the identification of green microalgae (Chlorophyta) accession able to remediate waters containing PHAs, specifically benzo[a]anthracene (B[a]A). Here we report the results of the growth and release of phenoloxidases into the growth medium. The *Ankistrodesmus braunii* (Abr); *Chlamydomonas reinhardtii* (Cre); *Chlorella emersonii* (Cem) and *Raphidocelis subcapitata* (Rsu) were previously identified and cultivated in presence of sub-lethal concentration of B[a]A. The enzymatic activity of cell-free supernatants has been evaluated in the presence of ABTS and its oxidation was monitored by following the absorbance increase at 420 nm, pH 3.0. The four selected microalgae species were grown in BB medium with or without B[a]A. After 3, 7, 10, 12 and 14 days of inoculum, the optical density of cultures and the laccase activity of the medium without cells, were evaluated by ABTS assay. B[a]A has affected either microalgae growth and laccase activity. Cre and Abr strains had not shown differences in growth between control and treatment, while the growth of strain Cem and Rsu were affected by B[a]A. The same behaviour was observed for the laccase activity. For all strains, the maximum enzymatic activity was observed at day 7, then it decreased significantly. The lowest laccase activity reduction rate was detected for the Cre and Abr and the enzymatic activity of treated cell medium has ranged from 8 mU/ml for Cem to 25 mU/ml for Cre. Further investigation are needed to elucidate the genetic bases of microalgae response to this xenobiotic molecule, that will be useful in finding similar genes in higher plant genomes.