

The scientific objective of the project includes the analysis of the impact of antioxidants: vitamins C and E and natural estrogens - 17 $\beta$ -estradiol and estrone on the process of butyltin compounds biodegradation, with a simultaneous consideration of the modifications of selected cellular lipids and proteins in the selected strains of filamentous fungi.

During the realization of this project, studies aimed at improving the process of dibutyltin (DBT) decomposition by selected strains of filamentous fungi will be carried out. This stage is mainly related to the selection of the nutrient of culture medium i.e. carbon and nitrogen sources and macroelements, such as magnesium, calcium, potassium. Furthermore, parameters of culturing i.e. temperature and the degree of oxygen saturation will be adjusted. Successively, the influence of vitamins C, E and natural estrogens - estrone (E1), 17 $\beta$ -estradiol (E2) on the rate of butyltins degradation by the selected fungal strains, along with the recognition of derivatives will be analyzed. Moreover, cytochrome P450-mediated degradation of dibutyltin will be verified indirectly through the application of compounds which inhibit the activity of this enzyme complex. Then, the toxic effects of tributyltin (TBT) and dibutyltin alone and mixed with antioxidants toward selected fungal strains will be tested. These studies will primarily refer to the cell membranes as a target structure of butyltins action. The following elements will be examined: generation of reactive oxygen species, lipid peroxidation, permeability and polarization of cell membranes, ergosterol level and phospholipid profile with an oxidized fatty acids. The last stage of the research will be involve identifying of changes in the set of fungal proteins produce during the exposure to butyltins without or in the presence of antioxidants.

The main reason for choosing the subject of this project is a threat posed by butyltin compounds not only to environmental microbes, marine organisms, but also to human as the last link of the food chain. For this reason, treatment of environment contaminated by butyltins is so important and priority task to perform. Particularly noteworthy here are microscopic filamentous fungi, due to the large tolerance to high concentrations of toxic substances, diversity of metabolic pathways and poor specificity of enzymes involved in the degradation processes. Moreover, reducing oxidative stress associated with the presence of butyltins, may be a way to increase the efficiency of the process of the compounds decomposition. Among the antioxidants, vitamins C, E and 17 $\beta$ -estradiol, estrone, as one of products of the decomposition of E2 by microorganisms were selected.

Achieving of information about the molecular background of the process of butyltins decomposition by filamentous fungi in the presence of antioxidants may lead in future to creation of new and effective systems of environment treatment.