

Załęska-Radziwiłł, M., Łebkowska, M., Kalinowski, R. Assessing the Effects of the Safety Concentrations of Some PAHs on the Aquatic Biocoenosis. *Ochrona Srodowiska* 2008, Vol. 30, No. 4, pp. 19–28.

Abstract: The effects of the so-called safety concentrations on the aquatic biocoenosis in a model laboratory microcosm ecosystem were verified for the following PAHs of choice: naphthalene, phenanthrene, anthracene and pyrene. The safety concentrations were calculated using the results of laboratory single species toxicity tests. Structural and functional changes in the aquatic ecosystem were assessed by quantitative and qualitative analysis of the phyto- and zooplankton, bottom sediment, vascular plant growth, enzymatic reactions, as well as microbiological and physicochemical parameters. During the final period of the experiments algae growth was observed, primarily of the chlorophyta *Scenedesmus quadricauda* and *Sele-nastrum capricornutum*, and in some samples also *Chlorella vulgaris*. The experimental conditions applied favored a high growth of *Heterocypris inconguretus* and *Brachionus calyciflorus*. No PAH-influenced deaths were found to occur in the fish species *Lebistes reticulatus*. Microscopic examinations of the bottom sediment have revealed the presence of numerous protozoa both in the controls and in the PAH containing samples. Enzymatic activity of the bottom sediment fluctuated in the course of the experiments, according to the inflow of the food substrate coming from the atrophy of the organisms. Microbiological examinations make it clear that between the 14th and 42nd day of the test the number of bacteria in the water decreased by an order of magnitude in all the samples as compared to the number determined within the first 7 days. Summing up, the results obtained from a 42-day experiment conducted in a model aquatic ecosystem have demonstrated that the safety concentrations of the PAHs chosen, which were established in the course of single species toxicity tests, exert no adverse effect either on the structure or on the functionality of the aquatic biocoenosis.

Keywords: PAH, naphthalene, phenanthrene, anthracene, pyrene, safety concentration, aquatic biocoenosis, microcosm.