Abstract

Endocrine disruptors are natural or manmade substances which affect hormonal systems of organisms. Biologically relevant concentrations are commonly being detected in the environment. The effluents of wastewater treatment plant present their significant secondary source. Due to their occurence and quantity the interest in mixtures increases. Ecotoxicological assays with genetically modified *Saccharomyces cerevisiae* were aplied to verify reliability of predictive mathematical models for mixtures of standards (estrone, 17β-estradiol, 17α-ethinylestradiol, estriol, bisphenol A, irgasan, 4-nonylphenol). Chromatographic analysis along with yeast assays were used for the evaluation of real samples of wastewater treatment plant effluents and sediments.

Schindler's predictive model and Full logistic model (FLM) were more reliable for predicting the whole dose-response curve compared to Generalized concentration addition (GCA). Predicted values of a parameter EC_{50} from all three models were comparable to empirical measurements. Three out of four samples exhibited estrogenic activity 0.65 – 1.70 ng/L 17β-estradiol ekvivalent (EEQ) above the limit of detection 0.13 – 0.33 ng/L EEQ. Antiestrogenic activity was detected in one of the samples. Prediction could be carried out only in the case of the sediments 27.30 ± 6.35 ng/g EEQ. This was caused by no or negligible amounts of seven analytes in the wastewater treatment plant effluents. The concentration were too low to show any response by the yeast assay (75 ± 16 – 312 ± 67 ng/L bisphenol A). Prediction overestimated the measured total effect in sediment which was sampled in a recipient of wastewater treatment where the antiestrogenic response was detected.

Key words: endocrine disruptors, xenoestrogens, ecotoxicity models, FLM, GCA, wastewater