

PhD

Title and Author

Comparative analysis of dioxin and dioxin-like compounds in sediments from different anthropogenic impact reservoirs

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Abstract (~500 words)

The PCDDs (polychlorinated dibenzo-*para*-dioxins), PCDFs (polychlorinated dibenzofurans) and dl-PCB (dioxin-like polychlorinated biphenyls) are a group of synthetic organic chemicals that can be found in many compartments of the environment, especially in organisms that are at the top of the food chain and may accumulate their significant amounts. Their transfer in the environment is related to the water and biogeochemical cycles. Moreover, toxicity, persistence and accumulation of PCDDs, PCDFs and dl-PCBs in the environment and their biomagnification throughout the water and land food chains affect them as a long-term risk to humans and animals. Thus one of the main objectives of the modern science concerning the PCDDs, PCDFs and dl-PCBs is establishing the processes which may determine transport and deposition of above mentioned substances in ecosystems to regulate of their allocation.

The key element of the Ecohydrology theory is the regulation of water-biota interplay from the top of the basin, up to the costal zone towards the change of allocation of excess nutrients and pollutants, like PCDDs, PCDFs and dl-PCBs, into non available pool such as soil, sediments, wood, biomass/bioenergy, fodder or at least from more dynamic -opportunistic (e.g. toxic cyanobacteria), to less dynamic pool within organisms (zooplankton, fish, macrophytes).

Similarly, to reduce PCDD, PCDF and dl-PCB concentrations in the environment and their transfer and bioaccumulation in the food (e.g. fish) it is necessary to perform research towards the change of their allocation into non available pool. Nevertheless, the first step to obtain above mentioned goal should be estimation of the existing knowledge in the issue of PCDDs, PCDFs and dl-PCBs environmental pollution.

Therefore, the present study reports the concentration of PCDFs and dl-PCBs in bottom sediments collected from different types of reservoirs and determines the role of the reservoir catchment characteristics (catchment scale, catchment land use, reservoir water retention time) on the reservoir sediment contamination with respect to spatial and seasonal differences of obtained results.

SWITCH Deliverable Contribution

Assessment of the environmental status of the Sokolowka river watershed based on chemometric analyses:

- Measurement of the PCB, PCDD, and PCDF congener concentrations and profiles.
- Evaluation of the river sediment toxicity based on TEQs.

Description of how PhD contributes to goals/objectives of deliverables

Acquired information provide a basis for appropriate ecosystem management strategies so that good ecological status of the Sokolowka River watershed can be achieved by the time indicated by the European Commission, i.e. by 2015.

The research results have been made available to both public and scientific communities; they have been presented at scientific meetings and published in peer-reviewed journals.