

Heavy Metals Mobility in Small Urban Streams

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Heavy metals and their mobility within a system of a watercourse as well as their toxic impacts on organisms are one of the most serious environmental problems, especially in small urban streams.

Theoretical part of this thesis deals with processes and factors affecting heavy metals behaviour in water environment and summarizes knowledge of current international research. Heavy metals distribution between liquid (water) and solid (bottom sediment) phases and influencing conditions are not quite clear till this time. This was the reason for the experimentation with heavy metals in laboratory conditions as well as for the assessment of heavy metals distribution in real conditions of an urban stream affected by urban drainage.

The first step of work was the development of an appropriate methodology for the research (laboratory experiments as well as field monitoring). The methodology was created by experimental comparison and modification of current methodologies with the aim to select the most suitable methodology with respect to accuracy, simplicity and accessible laboratory equipment.

Laboratory experiments examining behaviour of copper, zinc and lead were performed. Factors affecting heavy metals behaviour (pH, hardness) and factors associated with human activities and urban drainage (higher concentrations of chlorides and nitrates) were modified and their effects were investigated. Sorption possibilities of metals onto contaminated sediment and metals behaviour under conditions of limited amount of sediment have been studied as well.

During field monitoring distribution of studied heavy metals and basic physical and chemical water quality parameters have been followed for a studied stream – the Botič creek. The risk assessment of copper, zinc and lead for the water environment has been performed.