

DOKTORSKÝ STUDIJNÍ PROGRAM

NÁVRH TÉMATU/PROPOSAL OF THEME

Zvolit/Choose

Studijní program/ *Study Program*: **Life Sciences**

Katedra/Department of: **Agroenvironmental Chemistry and Plant Nutrition**

Školitel (včetně titulů), email/Supervisor, email: **prof. Ing. Jiřina Száková, CSc, szakova@af.czu.cz**

Konzultant (včetně titulů)/Co-supervisor: **prof. Ing. Pavel Tlustoš, CSc., Dr.h.c., Ing. Zuzana Čadková, PhD.**

Forma studia/Form of Study: **Full_time**

Typ tématu/Type of Theme: **Disposable**

Téma/Theme:

Interaction of parasites and metal(loids) in small mammals

Hypotéza/Hypothesis:

i) When As and other elements like Cd, Pb and Zn are present at high concentrations in a chyme, the gastrointestinal helminths produce specific compounds which can have a beneficial effect on the health of the mammalian hosts; ii) Parasitic excretory/secretory products can modify As transformation and affect bioaccessibility of other environmental pollutants (Cd, Pb and Zn) in the intestinal tract; iii) Activity of helminth specific compounds can support the host defence capability against harmful effects of risk elements and increase the chance of the host survival in a contaminated environment.

Anotace/Annotation:

Studies investigating health risk from environmental contamination via different elements have shown that small terrestrial animals living in such areas often suffer more from parasites than animals living in a clean environment. This thesis will clarify the role of parasites for animals living in areas polluted by hazardous elements. We want to find out if the parasites of the digestive tract of small mammals produce specific compounds having a positive effect on the health of the animal when elements such as As, Cd, Pb or Zn are present in high concentrations. To proof this idea, several in vivo and in vitro experiments will be carried out. Small animals infected with parasites will be collected at two sampling sites. The total element and enzymatic profile of animal organs, the digestive tract and the parasites will be determined. Laboratory experiments with various host/parasite models will verify the results from the natural environments. This will be the first thorough study investigating possible positive effects of parasites on the animals living in a contaminated area.

The main objective of the work is to elucidate the response of the host/parasite system on the element exposure in terrestrial ecosystems will be examined. The effect of helminth infection on the As speciation in the hosts will be determined for the first time; mechanisms modifying element bioaccessibility in the host intestine will be identified

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