

DOKTORSKÝ STUDIJNÍ PROGRAM/*DOCTORAL STUDY PROGRAM*

VYPSÁNÍ TÉMATU/*LISTING OF TOPIC*

Study Program: **Agricultural Specialization**

Branch of Study: **Exploitation and Protection of Natural Resources**

Department of: **Soil Science and Soil Protection**

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Form of Study: **Full_time**

Type of Theme: Disposable

Topic: Geochemistry of silver isotopes in contaminated soils

Hypotheses:

(I) Ag isotopic composition is variable in contaminated soils

(II) $^{109}\text{Ag}/^{107}\text{Ag}$ ratios are applicable for tracing source pollution or as an indicator of post-depositional (chemical) soil processes.

Summary: The territory of the Czech Republic is long-term affected by the mining and processing of silver (Ag) ores. The use of stable Ag isotopes (^{109}Ag and ^{107}Ag) represents an excellent opportunity to study the geochemistry and the fate of anthropogenic Ag. Currently, Ag typically enters the environment in the form of nanoparticles, which are for their antibacterial effect widely used in healthcare, cosmetics, textile industry, etc. Nevertheless, there is limited information on the behaviour of Ag and its isotopes in the environment. Ag-contaminated soils and mining/smelting wastes from the regions of Příbram and Kutná Hora can pose as suitable analogues to study the anthropogenic Ag cycle(s) in the environment. The proposed research is clearly novel, it can bring a number of new findings about Ag, listed by the US Environmental Protection Agency (2014) as a priority pollutant.

The proposed project includes a combination of fieldwork, laboratory analysis and international cooperation. In addition to the scholarship, the successful candidate will receive special funding from grant projects.

Funding Sources: Czech Science Foundation (project No. 23-04891S), internal resources.

In Prague

dne/Date: 12.04.2023

Podpis/Signature: