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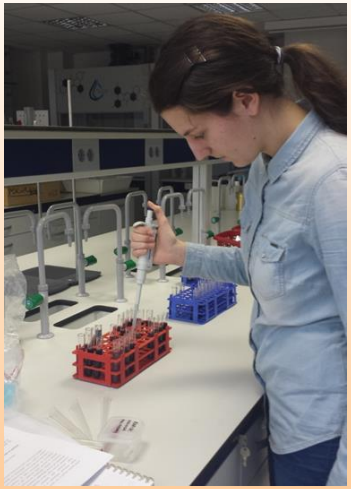

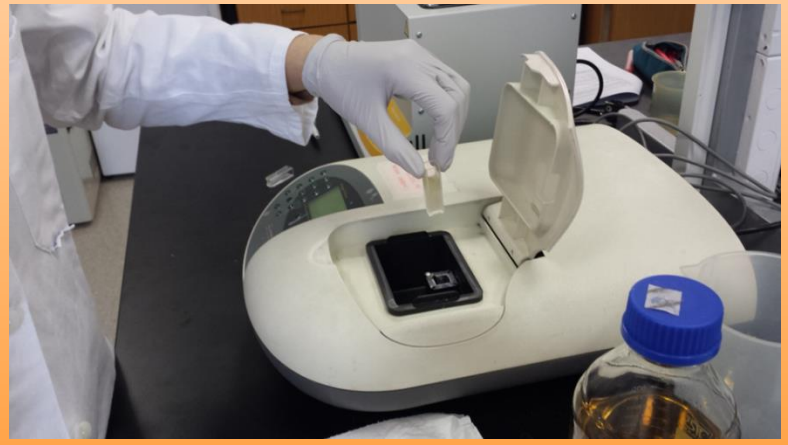

COMPARATIVE ANALYSIS OF CAESIUM IN RED BELT CONK (*Fomitopsis pinicola*)

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INTRODUCTION

Fomitopsis pinicola is noted for its medicinal properties as well as for being able to absorb and accumulate a number of harmful substances, including radioactive caesium (^{137}Cs).

The aim of this study was to determine the amount of ^{137}Cs in different parts of red belt conk (*Fomitopsis pinicola*) fruiting bodies, compare them to concentrations of other mushroom species from the same site and to determine the amount of ^{137}Cs in water and methanol extracts of *F. pinicola* fruiting body.

MATERIALS AND METHODS

Samples of *Fomitopsis pinicola* were collected in Slovenia from trunks of damaged spruces or their stumps on Pokljuka (which is known for contamination with radioactive ^{137}Cs from Chernobyl), Gorjuše, Kofce and in Radovna. The ground mushrooms: *Cortinarius caperatus, Hydnum repandum, Craterellus cornucopioides, Boletus edulis, Lactarius semisanguifluus* were collected on the same site. Folin – Ciocalteu´s method and Soxhlet method were used to determine the content of total phenols in the samples. The content of radioactive caesium (^{137}Cs) in *F. pinicola* conks and in the ground mushrooms was determined with gamma spectroscopy (well type scintillation detector NaI(Tl)). A link between the content of caesium and polyphenols wanted to be established. The content of ^{137}Cs in water and methanol extracts of *F. pinicola* conks was also determined, and the transfer factor ratio of ^{137}Cs from fungi to extract regarding these two solvents was calculated.

RESULTS

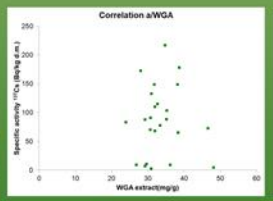
Our data of caesium concentration in 6 out of 12 samples (contrary to the results of other research) shows that there is an average of 1,22 times more ^{137}Cs in the conk's core compared to its cortex. It was also noted that caesium content drops with the rising age of each layer of the conk. The value of ^{137}Cs in *F. pinicola* conks was one to two orders of magnitude higher in samples harvested in the areas more contaminated with antropogene radioactive material than other parts of Slovenia, mainly as Chernobyl fallout legacy. The European Council Regulation 733/2008 states that ^{137}Cs the highest permissible radionuclide concentration in products for transport and trading for food consumption is set to 600 Bq/kg of fresh mass. The value of ^{137}Cs in our samples does not exceed 216,7 Bq/kg of fresh mass and, therefore, the samples are considered safe for consumption.

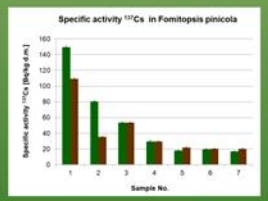
The concentration of ^{137}Cs in the ground mushrooms is up to three orders of magnitude higher compared to *F. pinicola* samples. The highest concentration of ^{137}Cs was found in *Cortinarius caperatus*.

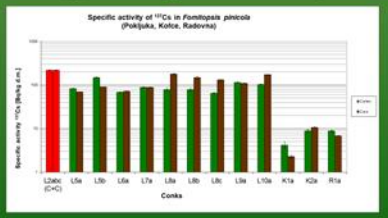
The content of ^{137}Cs showed to be significantly higher in water extracts compared to the content in methanol extracts. Transfer factor ratio of ^{137}Cs from fungi to extract regarding these two solvents is 2,1 ± 0,2 in favour of water. Considering the amount of ^{137}Cs the water extract would be more harmful for consumption.

CONCLUSION

We have established that caesium does not bind to polyphenols, as we initially predicted, which is advantageous for the use of polyphenol extracts for healing purposes. We also discovered that in methanol extraction, the transfer of ^{137}Cs from the fruiting body into the extract is significantly lower than in water extraction. Therefore, the method of extraction with methanol is recommended, especially in contaminated areas.







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