ISEE 2023
KAOHSIUNG, TAIWAN

35th Annual Conference of the International Society for Environmental Epidemiology

September 17-21, 2023

Kaohsiung, Taiwan

Connecting the East and the West, One Health in One Planet

Abstract E-Book

ISEE

#ISEE2023

www.ISEEconference.org

EP-019[Exposures » Food/nutrition]

Applicability of wild mushrooms to monitor environmental contamination of europium in Leicester, England

Antonio Peña Fernández[1], Manuel Higueras[2], Tziana Sgamma[1], Mark D. Evans[1], Edna Segura[2], M. Carmen Lobo Bedmar[3]

[1]Leicester School of Allied Health Sciences, De Montfort University, Leicester, LE1 9BH, UK

[2]Scientific Computation & Technological Innovation Center (SCoTIC), Universidad de La Rioja, Logroño, Spain.

[3]Dpt. Agroenvironmental Research. IMIDRA. Finca el Encín, Crta. Madrid-Barcelona Km, 38.2, 28800 Alcalá de Henares, Madrid, Spain.

BACKGROUND AND AIM:Although the current levels of europium (Eu) in topsoils monitored across Leicestershire (UK) did not represent an oral/dermal toxic risk for the population, wild mushrooms were collected in the same areas to gain a better picture of its environmental distribution and risks.
METHOD:106 mushrooms were collected from Leicester city and Bradgate Park, and species were identified by DNA barcoding. Eu was monitored by ICP-MS in cleaned/dried/homogenised mushrooms [LoD=0.00056 µg/g dry weight (dw)] and in 850 topsoils collected in these areas.
RESULTS:Eu concentrations were higher in mushrooms collected in urban areas, although without significance (median and ranges, in µg/g dw): 0.0016 (0.0004-0.2891) vs. 0.0013 (0.00036-0.0529), which might be attributed to fertilisers. However, levels of Eu varied between mushrooms collected across the four cardinal subareas in which the city was divided (p-value=7E-9), which might indicate differences in urbanisation, as Eu is used in flat screen displays and optical fibres. Although a correlation between the content of Eu in mushrooms and their respective topsoil/subareas was not found, a similar distribution was found. Thus, significantly higher median concentrations of Eu were found in the NE (0.0047, 0.8110) and lower in the NW (0.00087, 0.5960), in mushrooms and topsoils (all in µg/g dw and µg/g, respectively). Moreover, Eu significantly varied between the three main mushroom species collected (ranges, in µg/g dw; p-value=7E-15): Agaricus bitorquis (edible; 0.00079-0.00706), Panaeolus foenisecii (poisonous; 0.00104-0.17146) and Mycena citrinomarginata (unclassified; 0.00123-0.07117). Moreover, Eu was only detected in 54.5% of the A. bitorquis samples, although detected in all the other main species collected.
CONCLUSIONS:The levels of Eu found were similar/lower than those reported in other major monitoring studies performed in other European countries, suggesting that the environmental presence of Eu would represent a minimal risk for Leicestershire's population, including those individuals that pick up wild mushrooms for consumption.

Keywords: Europium, mushrooms, Leicester, topsoils, risks.