

SOIL-TO-PLANT TRANSFER FACTORS FOR RADIONUCLIDES IN SAMPLES OF LEMON BALM (*MELISSA OFFICINALIS*) COMMONLY USED AS A MEDICINAL PLANT

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In recent decades, the study of medicinal plants has become the focus of ever more extensive research all over the world, due to diversity and potential that medicinal plants have as source of medicinal products. Generally, studies related to medicinal plants aims to characterize the active compounds of the plant for scientific evidence of their therapeutic properties. However, studies of the ²³⁸U and ²³²Th natural radionuclides series distribution in such plants are sparse. A medicinal plant containing high concentrations of natural radionuclides can cause health problems, since it is commonly used over long periods. Lemon balm (*Melissa officinalis* Linn.) is a medicinal and aromatic herb popularly used to make tea, which serves as a sedative, promote sleep, and stress and anxiety reduction. The objective of this work was to determine the concentration of naturally occurring radionuclides ²³⁸U and ²³²Th series, primarily focusing on the determination of soil-to-plant transfer factors (TF) for Lemon balm samples. The plants were obtained from the seeds, transferred after three months to field conditions. The essays were carried out in the Municipal Gardening School experimental area, in Ibirapuera Park, *São Paulo*, Brazil. The experimental design was completely randomized, being three cropping systems (control, organic and conventional) and two types of fertilization (presence and absence of microelements). The transfer factors for natural uranium (²³⁸U and ²³⁴U) and thorium (²³²Th and ²³⁰Th) isotopes were obtained in Lemon balm samples harvested at two distinct times (summer/outumn and autumn/winter). The content of U and Th isotopes in Lemon balm leaves and soil was determined by alpha spectrometry after radiochemical separation by ionic exchange resins and measurement with a silicon surface-barrier detector. Reference materials IAEA-300 and IAEA-326 were used for quality control of the measurements. The results were submitted to analysis of variance and compared by the Tukey test (p<0.05) using the software Statistic.