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# Assessment of radio cesium and natural radionuclides in mosses and study of their distribution in a mountainous region in Central Portugal

Airborne transport is responsible for the long-range spreading of pollutants via atmospheric pathways. A fission product such as 137Cs, serves as an effective tracer for studying the distribution of pollutants and its mechanisms through the atmosphere. Its propensity to be airborne transported on aerosols, combined with its half-life of 30 years, enables assessment over a timescale spanning several decades. Additionally, lithogenic radioisotopes are valuable indicators of transfer processes, especially in a region as Central Portugal, where the soil is naturally rich in these isotopes and their progeny.

Measurements of these radioisotopes were performed, among others, in mosses. These non-vascular and non-root plants are relevant for studying atmospheric contamination due to their capability to absorb nutrients from precipitation and dry deposition. Samples were collected from the Serra da Estrela and Beira Interior region in Portugal, at altitudes ranging from 400 to 1500 m. 137Cs,7Be, and lithogenic isotopes such as 226Ra, 228Ra and 40K were assessed using gamma spectrometry.

The samples were geolocated using a dual frequency handheld GNSS receiver for subsequent Geographic Information System (GIS) data processing. The results were mapped to analyze the local distribution of radioactivity and to evaluate potential correlations with proxies linked to the region's morphology.

Results suggest that both artificial and local radioisotopes are distributed according to various mechanisms, indicating complex patterns of airborne transport and deposition.

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