

Abstract

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Cosmogenic Beryllium-7 in Soil, Rainwater and Selected Plant Species to Evaluate the Vegetal Interception of Atmospheric Fine Particulate Matter.

Beryllium-7 is a radionuclide produced in the upper atmosphere by cosmic-ray spallation with ions of carbon, oxygen and nitrogen. It is one of radionuclides that can be used to trace the fine particulate matter of 2.5- μm diameter (PM 2.5) and smaller. In this work, Be was determined in leaves of 10 plant species collected from streets, parks and open land and in 5 consecutive rains over Alexandria, Egypt. ^7Be levels were also measured in soil covered by each type of plant as well as in the nearest uncovered soil to be reference values to determine its intercepted amount and consequently PM. The lowest interception, 17.7 %, was by *Ficus elastica* L., while *Ficus retusa* L. intercepted about 45 %. Radiologically, the annual effective dose due to the usage of *Thymelea hirsute* plant leaves as a medicine and *Nicotiana glauca* Graham for smoking were 0.013 and 0.66 μSv , respectively. The observed levels in rainwater indicated that 2.5. ^7Be decreased consecutively from 3.1 Bq kg^{-1} in the first rain to 0.71 Bq kg^{-1} in the last one during the 2016/2017 rain season. The wet deposition of ^7Be is less than 1 % of its total deposition on the ground.