

Accumulation and soil-to-plant transfer of radionuclides in the Nile Delta coastal black sand habitats

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Abstract

The radionuclide content was estimated in the soil of three black sand habitats in the Mediterranean coast of Egypt, namely, sand mounds and coastal sand planes and dunes. In addition, a total of 14 heavy minerals found in the soils were characterized. The soil to plant transfer of uranium and thorium was tested on three black sand species, namely, *Cakile maritima* Scop., *Senecio glaucus* L. and *Rumex Pictus* Forssk. The transfer of thorium and uranium radionuclides from the soil to plant is complex process that is subjected to many variables; among which are the organic matter and clay content of the soil, the type of radionuclides and plant species. The study revealed a strong negative relationship between uranium and thorium uptake by *S. glaucus* and *R. pictus* and the clay and organic matter content of soil. Concentration of thorium in the soil has a negative correlation with soil-to-plant transfer factor. The study results suggest the possibility of using black sand species for phytoremediation of soils contaminated with radioactive elements. The potentiality of *S. glaucus* as phytoremediator of radionuclides polluted soils is greater than *R. pictus* which in turn outweigh *C. maritima*.

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