

## The atmospheric deposition of uranium and thorium on vegetals

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The transfer of telluric radionuclides such as uranium and thorium to plants by roots uptake has been widely studied whereas the atmospheric deposition remains poorly known up to now. The main reason is the very low activity in the air (usually below  $0.1 \mu\text{Bq}\cdot\text{m}^{-3}$ ) which remains difficult to measure. In order to circumvent this difficulty aerosols sampling was carried out downwind the releases of a nuclear fuel facility where plants species were also taken. The atmospheric releases by the nuclear facility involve mainly  $^{238}\text{U}$  (about  $200 \text{ kg}\cdot\text{y}^{-1}$ ) and  $^{230}\text{Th}$  which is emitted by artificial ponds containing radioactive wastes, under solid (mud) and liquid forms. Thus the activity of uranium and thorium isotopes was determined in aerosols filters, deposition collectors and plants by ICP-MS after acidic digestion.

Compared to remote site, plants taken at the edge of the nuclear facility exhibit higher  $^{238}\text{U}$  and  $^{230}\text{Th}$  activity due to the atmospheric deposition [1, 2]. The atmospheric releases of these radionuclides is confirmed by the high  $^{238}\text{U}/^{232}\text{Th}$  and  $^{230}\text{Th}/^{232}\text{Th}$  activity ratios recorded by both plants and aerosols as compared to the soil, usually considered as the major source of radionuclides in the terrestrial environment. Aerosols and plants data further allow the estimation of parameters useful for modeling consequences of releases in the environment namely the foliar transfer factors and the dry deposition velocity.

[1] Pourcelot *et al* (2011) *J. Env. Monit.* **13**, 1327-1336. [2] Jeambrun *et al* (2012) *J. Env. Monit.* **14**, 2902-2912.