Effective half-lives of ^{137}Cs in some terrestrial plants observed after the Fukushima nuclear accident

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To estimate the radiocesium decreasing rates from some terrestrial plants, measurements of ^{137}Cs in herbaceous plants and tree leaves were carried out in 2011-2015. The sampling was carried out in Chiba, ca. 200 km south of the Fukushima Daiichi Nuclear Power Plant (FDNPP). Details of the sample treatment and measurement method are reported elsewhere [1, 2]; plants used were some trees (e.g., persimmon, red robin, *etc*.) and herbaceous plants (e.g. giant butterbur, grass, *etc*.).

In the first three years after the FDNPP accident, all plant species showed single exponential declines in ^{137}Cs concentration. However, longer period of time, the decrease rates became slower and a combination of two exponential curves fits better in five years after the accident. The fitting result are shown in Figure 1 for persimmon tree leaves. Effective half-life (T_{eff}) values of short- and long-time periods were 0.44 y and 2.4 y, respectively. Interestingly, these values are similar to those observed after the Chernobyl accident for tee tree leaves [3]. For herbaceous plants, however, longer half-lives were observed for the long-time period. This results was probably because trees still partially retained ^{137}Cs that was taken through their above ground parts in 2011 and recycled it into their bodies, although herbaceous plants simply reflects bioavailable fraction in soil each year.

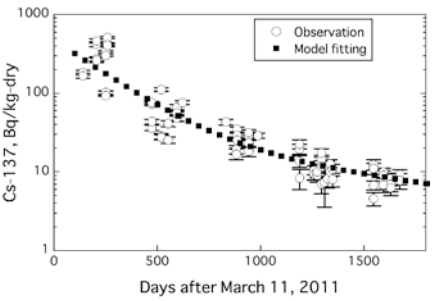

Figure 1: ^{137}Cs concentration change in persimmon leaves.

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[1] Tagami & Uchida (2015) *J. Environ. Radioactiv.* **141**, 8-13. [2] Tagami & Uchida (2015) *J. Environ. Radioactiv.* **141**, 138-145. [3] Ünlü et al. (1995) *Health Phys.* **68**, 94-99.