

UPTAKE OF AMERICIUM-241 BY PLANTS FROM CONTAMINATED CHERNOBYL EXCLUSIVE ZONE TEST SITE SOILS

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The result of the monitoring shows that in the soil and biological objects of the environment the accumulation of americium-241 is observed and in course of time its concentration has increased many times after Chernobyl catastrophe and has a trend to increase in future about 40 times. Purpose of our research deals with contaminated Chernobyl exclusive zone polluted by trace radionuclides, its behavior and accumulation in different plant species. Special attention will be devoted to bioavailability of ^{241}Am on plants *Galium rivale*, *G. tinctorium*, *G. aparine*, *G. intermedium*, *Berteroa incana*, *Artemisia absinthium*, *A. vulgaris*, *Centaurea borysthenica*, *C. arenaria*, *Cirsium arvense*, *Succissa pratensis*, *Solidago virgaurea*, *Linaria vulgaris*, *Lepidium ruderales*, *Stenactis annua*, *Veronica maxima*, *Verbascum lychnitis*, *Euphorbia cyparissias*, *Genista tinctoria*, *Erigeron canadensis*, *Oenothera biennis*, *Betula pendula* and *Quercus robur* which were collected from Chernobyl district, Kopachi district and Yanov district.

The plant samples of *Oenothera biennis*, *Betula pendula* and *Quercus robur* were collected from Yanov district where density of contaminated soil by ^{241}Am was 660 kBq/m^2 and by ^{137}Cs was 27 MBq/m^2 , accordingly.

Gamma spectroscopy measurements and radiochemical methods were used to estimate activity concentration of radionuclides ^{137}Cs , ^{90}Sr , ^{238}Pu , $^{239+240}\text{Pu}$, ^{241}Am . Above mentioned radionuclides were measured in dry vegetation green mass of plant samples and dry soils.

In plant samples of *Oenothera biennis*, *Betula pendula* and *Quercus robur* contamination by isotope ^{137}Cs was $(5.8 \pm 1.5) \times 10^6$, $(7.4 \pm 1.1) \times 10^5$ and $(2.6 \pm 0.2) \times 10^6$ Bq/kg per dry mass, respectively. For above mentioned plant samples ^{241}Am amounted 47 ± 5 , 45 ± 3 и 3.2 ± 0.2 Bq/kg, accordingly. The transfer ratio from soil to plants for ^{137}Cs ranged in interval from 0.2 to 0.03 Bq/kg : Bq/m². For all samples the transfer ratio soil to plants of ^{241}Am did not exceed 7×10^{-5} Bq/kg : Bq/m².

Coefficient relatively content of radionuclides $^{241}\text{Am}/^{239+240}\text{Pu}$ for different plant samples varied from 3.2 to 8.3, while this coefficient for soil from Yanov district was about 1.1.

In contradistinctions to plutonium, compounds of ^{241}Am have relatively high solubility; that is why americium is more easily transferred from soil to plants.

Most soil-to-plant concentration ratios for radionuclides ^{137}Cs , ^{90}Sr , ^{238}Pu , $^{239+240}\text{Pu}$, ^{241}Am in high plants grown in Chernobyl zone soils estimate genetically hazard from the radionuclides mentioned above and will be used in dose and risk assessment models in future.