



ENVIRONMENTAL RADIOACTIVITY INVESTIGATIONS IN THE GEORGIAN SUBTROPICAL REGION

S. PAGAVA, P. KAKASHVILI, M. AVTANDILASHVILI, G. KHARASHVILI,
Z. ROBAKIDZE, V. RUSSETSKI, G. TOGONIDZE
Radiocarbon and Low-Level Counting Section,
I. Javakhishvili Tbilisi State University,
Tbilisi, Georgia

D. BARATASHVILI
Selection and Plants Protection Department,
Batumi Botanical Gardens of Georgian Academy of Sciences,
Batumi, Georgia

Environmental changes in the contamination of the Georgian subtropical region have been investigated by analysing anthropogenic and natural radionuclides in samples of soil and tea leaves for possible chromosome mutations. As the tea industry in Georgia is an important economic activity, such investigations are of great importance. The changes in the morphology of tea leaves, their colour, blossoming, growth inhibition or stimulation, prolongation of the germination period and levels of tannin-katechin complexes have been investigated.

The results of radionuclide measurements in soil and tea leaves (^{40}K , ^{210}Pb and ^{137}Cs) are presented in Table I. Elevated concentrations of ^{137}Cs were observed in soil samples due to fallout from Chernobyl, however, no direct relationship between the concentration of ^{137}Cs in soil and tea leaves has been observed. Cyto-genetic analyses of tea primary roots will be presented and compared for different time periods.

Further, ichthyofauna samples taken from the Georgian subtropical areas were analysed for anthropogenic (^{137}Cs) and natural (^{40}K) radionuclides. The observed concentrations of ^{137}Cs were low, close to the detection limit of the order of 0.4 Bq/kg dry weight (Table II). Some of the investigations were carried out [1] in the framework of the IAEA Technical Co-operation project "Marine Environmental Assessment of the Black Sea Region".

REFERENCE

- [1] AVTANDILASHVILI, M., BURCHULADZE, A., PAGAVA, S., ROBAKIDZE, Z., RUSSETSKI, V., TOGONIDZE, G., Radiological Background of the Georgian Part of the Black Sea. Proceedings of the International Symposium on Marine Pollutions, IAEA, Vienna, (1999) 338-339.

TABLE I. Radionuclides in soil and tea samples

Sample ID	Sample type	Activity (Bq/kg) dry weight			
		K-40	¹³⁷ Cs	²¹⁰ Pb	²²⁶ Ra
TB-2229	Soil	205 ± 17	549 ± 11	154 ± 30	101 ± 20
TB-2231	Tea leaves	299 ± 23	23 ± 2	<MDA	<MDA
TB-2247	Soil	255 ± 15	278 ± 6	116 ± 29	70 ± 16
TB-2248	Tea leaves	468 ± 37	20 ± 2	<MDA	<MDA
TB-2249	Soil	180 ± 13	201 ± 5	115 ± 29	50 ± 16
TB-2250	Tea leaves	307 ± 38	15 ± 2	<MDA	,MDA
TB-2234	Soil	246 ± 17	334 ± 7	167 ± 31	126 ± 19
TB-2235	Tea leaves	414 ± 25	8 ± 2	<MDA	<MDA
TB-2232	Soil	201 ± 17	538 ± 11	187 ± 34	101 ± 16
TB-2233	Tea leaves	312 ± 23	12 ± 2	53 ± 21	<MDA

TABLE II. Ichthyofauna

Sample ID	Species	Activity [Bq/kg]	
		⁴⁰ K	¹³⁷ Cs
TB-2213	Mugil cephalus Linne	83 ± 4	0.4 ± 0.2
TB-2215	Odontogadus merlangus euxinus	70 ± 6	0.9 ± 0.3
TB-2211	Mullus barbatus, E	47 ± 6	< MDA
TB-2217	Mullus barbatus, E (spawn)	93 ± 23	< MDA
TB-2212	Platichthys flesus luscus, P	42 ± 6	< MDA
TB-2214	Cottus gobio, Z	63 ± 6	0.6 ± 0.4
TB-2216	Salmo trutta labrax	95 ± 7	< MDA