

¹³⁷Cs MONITORING IN THE ROMANIAN SECTOR OF THE BLACK SEA

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Natural and artificial radionuclides in the biotic and abiotic components of the Black Sea environment are being monitored within the framework of national and international programmes (BOLOGA, 1992; BOLOGA *et al.* 1994). The Romanian programme, results of which are given in this paper, aims :

- to monitor the space and time trends of radionuclide distribution in the marine environment,

- to increase knowledge of environmental distribution coefficients for marine sediment and concentration factors for the locally relevant species of marine biota,

- to produce an assessment of individual and collective doses to the Romanian population from radionuclides in the Black Sea, through internal and external exposure pathways.

Radionuclide concentration data obtained within this programme were included in the Romanian environmental radioactivity data base (OSVATH *et al.*, 1992), GIRMED (CIESM) and GLOMARD (IAEA) marine radioactivity data bases. A summary of ¹³⁷Cs data, based on samples analysed thus far, is presented here for the years 1986-1991. Samples were collected off the Romanian coast as follows :

- bottom sediment, surface and bottom sea water along profiles offshore the Danube mouths, at least twice a year,

- beach sediment, surface sea water and molluscs from nearshore and surface sea water along the Constantza profile, quarterly,

- macrophytes and fish, several times a month during April through September.

The samples were processed according to standard methodologies (BOLOGA *et al.*, 1991). High resolution, low background gamma spectrometric analyses were performed employing CANBERRA Quanta and Jupiter systems. From a greater number of samples collected and processed during the period 1986-1991, over 600 samples have been analysed to date.

During the interval between 1986 and 1991, ¹³⁷Cs levels in the northwestern Black Sea have decreased considerably (Fig.1), but have not reached the pre-Chernobyl values. A ¹³⁷Cs residence time of about 15 years can be estimated from a simple model. The relatively slow decrease of ¹³⁷Cs concentrations in bottom sediment as compared to sea water confirms the radionuclide retention ability of sediment. The evolution of ¹³⁷Cs concentrations in sea food following the major nuclear accident at the Chernobyl NPP in 1986, is an important component of the Romanian monitoring programme. From our data it can be concluded that ¹³⁷Cs concentrations in edible marine organisms have always remained below FAO "action levels" (FAO, 1986) in the study area, as illustrated in the case of fish (Fig.2). Similar trends were observed for molluscs and macrophytes.

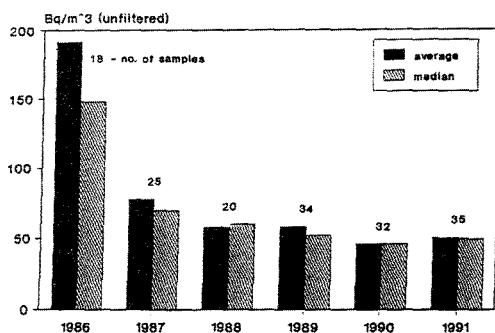


Fig.1. Cs-137 in NW Black Sea surface water

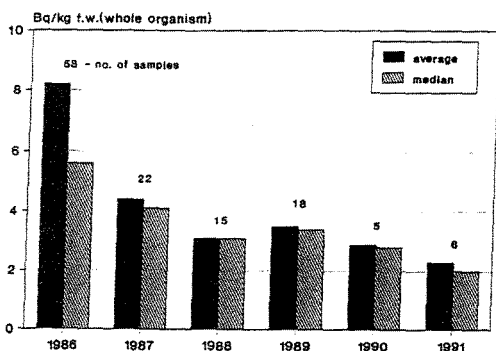


Fig.2. Cs-137 in fish from NW Black Sea

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