

Environmental Cs-137 Concentration Factors for Black Sea Biota. - Preliminary Data

Iolanda OSVATH*, Alexandru BOLOGA** and Constantin DOVLETE*

*Environmental Radioactivity Research Laboratory, Institute of Meteorology, C.P.11-2, Bucharest (Romania)

**Romanian Marine Research Institute, Constantza (Romania)

Using field-derived data, Cs-137 concentration factors (CF) were calculated for some common species of fish, mollusca and macrophyta populating the Romanian sector of the Black Sea. The preliminary data presented in this paper are based on the analysis of 140 of the biota samples and 60 of the surface water samples collected during 1987-1989.

Water sampled quarterly from one 30 Nautical miles (Nm) offshore and four shore-line locations (Fig. 1), unfiltered, was infra-red evaporated to residue. Collected from the same area (43°45' N to 44°15' N, within 30 Nm offshore), biota samples - whole body for fish and algae and soft part for mollusca - were washed, then ashed at 450°C.

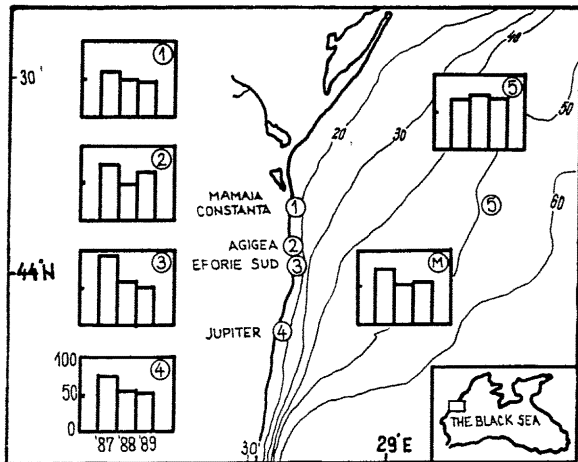


Fig. 1 Cs-137 concentration in Black Sea water (mBq/l) in 1987, 1988 and 1989 : annual mean values for each sampling site (1-5); annual mean values for all sampling sites together (M), used in CF computation.

Gamma spectrometrical analyses were performed using low-background, high resolution equipment.

Concentration factors were computed for Cs-137, as radionuclide of major interest following the Chernobyl accident in 1986. Annual mean values (including all sampling points) of Cs-137 concentration in water (Bq/l), and individual, as well as annual mean per species values of Cs-137 concentration in marine biota (Bq/kg fresh weight) were used in computations. The concentration factors thus obtained (Table 1) are in agreement with those in (IAEA, 1985; GOMEZ et al, 1987).

Table 1

Species	Characteristics	Concentration factor range			
		annual mean	individual values	annual mean	individual values
<i>Sprattus sprattus phalericus</i>	P, E	62-69	33- 93		
<i>Engraulis encrasicolus ponticus</i>	P, E	35-59	17- 59		
<i>Merlangius merlangus euxinus</i>	D, F	45-50	38- 61		fish
<i>Gobius melanostomus</i>	D, E	53-61	45- 53	35-69	17- 93
<i>Trachurus mediterraneus ponticus</i>	P, E	50-53	45- 67		
<i>Mytilus galloprovincialis</i>	B, E, F	13-27	8- 37		
<i>Mya arenaria</i>	B, E, F	24-47	21- 42		mollusca
<i>Scapharca inaequivalvis</i>	B, E, F	9-38	13- 58	9-38	8- 58
<i>Rapana thomasiana</i>	G, F	21-27	9- 37		
<i>Enteromorpha intestinalis</i>	C, F	30-49	19- 60		
<i>Enteromorpha linza</i>	C, F				macro-algae
<i>Cladophora sericea</i>	C, F	24-33	22- 33	24-60	19-124
<i>Bryopsis plumosa</i>	C, F	26-44	26- 44		
<i>Ceramium elegans</i>	R, F	43-60	19-124		

D-demersal P-plankton-feeder E-edible F-feedstock ingredient
 B-Bivalvia G-Gastropoda C-Chlorophyta R-Rhodophyta

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