

Stable Element Variation in Sediments and Macrophytes from Rumanian Black Sea Coast the Last Decade

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Bottom sediments on the Rumanian Black Sea coast as well as the algae *Enteromorpha linza* and *Ceramium rubrum* sampled during 1989 from the sea beach were analysed by INAA for determining certain selected stable elements. During the last ten years an increasing concentration in Zn, Cr, As, Sb, Se and Hg was observed. Co was found decreasing in sediments and *Enteromorpha linza* but increasing in *Ceramium rubrum*. Sc was found decreasing in sediments but slightly increasing in algae.

Sediment samples from the bottom of the Rumanian Black Sea (45°08'N, 29°57'E, to 44°08'N, 28°57'E, 12-17 nautical miles offshore and 29-43 m depth were collected together with *E. linza* and *C. rubrum* on the sea side beach during March-June 1989. After rinsing the algae the samples were dried. The samples were analysed by INAA. About 100 mg of each sample were irradiated along with an equal quantity of standards under same conditions in the VVRS-2 reactor in Bucharest (flux 10^{12-13} n/cm²sec). Counting has been performed by using a Ge(Li) detector (2.8) keV resolution coupled with a pulse height analyser.

The results obtained in this work concerning As, Co, Cr, Cs, Hg, Sb, Sc, Se, Th, U and Zn are given in Table 1. In a previous paper it has been outlined that the content of the selected stable elements was increasing in *E. linza* and *C. rubrum* during 1986 (SALAGEAN et al., 1988). Nowadays, four years later, the concentration of As, Co, Sb, Hg and Zn was found increased. Also Sc was found increased in *C. rubrum* while in *E. linza* was decreased at S. Eforie but increased at Mangalia. The mean value as a whole of Sc in *E. linza* is about the same as before. Uranium is almost constant in both algae while Th is slightly increased in *C. rubrum*. In the bottom sediments at Portitza sampling site at the south of Danube river, higher concentration of the elements was observed than at the other sampling sites: Zn (615 ppm), Cr (130 ppm), As (8.4 ppm) (SALAGEAN et al. 1988). The Cs value (8.9 ppm) related to illite presence explains the highest accumulation of Cs-137 at Portitza site.

Table 1. Stable element content (ppm dry matter) in sediments and algae sampled from the Rumanian Black Sea coast during 1989

ELEMENT	S E D I M E N T S					Enteromorpha linza		Ceramium rubrum	
	Sulina	Sf.Gheorghe	Portitza	Constantza	South Eforie	Mangalia	South Eforie	Mangalia	
As	6.2±1.7	11.2±2.7	18.4±4.4	5.7±1.4	<5	<4	<7	<4	
Co	7.3±0.2	7.5±0.2	15.5±0.4	5.2±0.1	1.7±0.1	2.8±0.2	5.1±0.3	4.4±0.2	
Cr	75 ± 3	50 ± 2	130 ± 5	27 ± 1	5.2±0.7	16 ± 1	31 ± 1	24 ± 1	
Cs	2.9±0.1	3.0±0.2	8.9±0.4	1.9±0.1	0.5±0.12	0.81±0.10	2.3±0.2	1.6±0.2	
Hg	<1.8	<2.1	<2.0	<1.9	<2.1	<1.5	2.6±0.9	<1.7	
Sb	0.9±0.1	0.94±0.09	2.2±0.1	0.56±0.06	0.4±0.1	0.48±0.07	1.4±0.1	0.75±0.09	
Sc	6.5±0.2	5.9±0.2	15.4±0.5	3.5±0.1	0.06±0.02	1.52±0.04	4.6±0.1	3.1±0.1	
Se	<1.3	1.2±0.6	<3	<1.5	<2.5	<1.6	<3.3	1.3±0.5	
Th	4.8±0.1	4.5±0.1	11.5±0.3	2.9±0.1	0.52±0.06	1.6±0.07	3.6±0.1	2.5±0.1	
U	1.1±0.2	1.7±0.2	2.8±0.4	0.9±0.2	<1	1.1±0.4	1.4±0.6	1.5±0.5	
Zn	296±18	133±21	615±43	155±15	150±9	230±14	298±30	310±23	

REFERENCES

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