

Radioecologically Important Stable Element Concentration in two Mollusc and one Polychaete Species

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The content of certain stable elements in the molluscs *Mytilus galloprovincialis*, *Mya arenaria* as well in the polychaete *Melina palmata* sampled at different depths from the Rumanian Black Sea bottom was studied by instrumental neutron activation analysis.

The increase of chemical industry and the intensive use of certain pollutant elements can exceed their normal concentration in sea water which may have toxic effects to biological systems in the sea. From the radioecological point of view the study of stable elements in natural systems, such as the marine environment, is important since radionuclides introduced into the sea follow similar pathway to the stable elements already present. During June 1989 mussels *M. galloprovincialis*, *M. arenaria* and *M. palmata* polychaete were sampled from the bottom of the Black Sea at a depth 29-40 m. and analysed for certain radioecologically important stable elements.

After rinsing with distilled water and removal of the shells, the soft tissues and byssus were separated. *M. palmata* samples were only rinsed. All samples were dried, grounded to a fine powder and irradiated along with an equal quantity of the IAEA reference material MA-M2/TM in the VVR-S2 nuclear reactor of Bucharest (thermal neutron flux 10^{12-13} n/cm²sec). All measurements were carried out by using a high resolution Ge(Li) detector coupled with a multichannel analyser.

Data for the 12 selected stable elements (As, Co, Cr, Cs, Hg, Rb, Sb, Sc, Se, Th, U and Zn) in the species mentioned above are given in Table 1. As it can be seen the Se content (<0.7 ppm) is lower in *M. palmata* polychaete, while all the other elements in the same species were found to present the highest values at Portitza site. At Sulina in total tissue of *M. galloprovincialis* 513 ppm Zn and 11 Cr were found while at Portitza in *M. palmata* the values were 1230 ppm for Zn and 117 for Cr. The concentration levels of the elements are higher in soft tissues of *M. galloprovincialis* than in byssus. By comparing the results obtained with those reported for *M. galloprovincialis* sampled during 1987 at about the same sites, (SALAGEAN et al., 1988) a decrease in Zn and Se content is observed while an increase in the elements As, Co, Cr, Cs and Th is presented.

Table 1. Stable element concentration (ppm dry matter) in two mollusc and one polychaete species sampled from the Rumanian Black Sea coast during 1989

ELEMENT	SULINA		SFINTUL CHEORGHIE		PORTITZA		CONSTANZA	
	Byssus	Total tissue	Byssus	Total tissue	Byssus	Total tissue	Byssus	Total tissue
As	8.6±2.1	8.4±3.3	14.3±3.4	5.9±2.5	27.0±6.0	15.7±3.6	5.0±2.0	
Co	2.7±0.1	1.4±0.1	2.0±0.1	1.0±0.05	13.6±0.4	2.1±0.1	1.4±0.1	
Cr	10.8±0.6	3.1±0.3	5.8±0.5	2.6±0.3	117±5	10.0±0.5	2.6±0.3	
Cs	0.6±0.1	0.26±0.06	0.47±0.08	0.21±0.05	8.2±0.3	0.7±0.1	0.20±0.05	
Hg	1.1±0.5	1.5±0.5	<2	0.7±0.4	<1.8	<0.8	1.1±0.4	
Rb	6.9±1.4	4.4±1.1	15.4±1.5	11.9±1.4	122±5	10.8±1.2	4.9±1.1	
Sb	0.20±0.04	0.08±0.03	0.21±0.06	0.11±0.04	1.9±0.1	0.22±0.04	<0.1	
Sc	1.21±0.04	0.34±0.01	1.00±0.03	0.70±0.02	13.7±0.4	1.15±0.04	0.032±0.01	
Se	4.3±0.09	3.9±0.5	4.9±1.0	3.6±0.6	<0.7	5.4±1.0	4.2±0.9	
Th	0.88±0.04	0.24±0.03	0.78±0.05	0.70±0.04	10.6±0.3	0.9±0.04	0.21±0.03	
U	0.31±0.15	0.30±0.15	0.6±0.2	<0.4	2.8±0.6	<0.3	<0.4	
Zn	513±26	366±20	453±24	234±20	1230±15	235±12	201±11	

REFERENCES.

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