

Heavy metals and other elements in *Zostera marina* L. on the Trabzon Coast Line  
(Black Sea; Turkey)

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The marine phanerogam *Zostera marina* forms vast beds was found along the Black Sea coastline at depths rarely exceeding 5-20 m. It has been studied that importance of the diversity and abundance of sea grass comes from their role as primary producers and they have a very important role in detritus formation. They constitute also a natural resource that must not only be protected but also investigated, assessed and managed.

In addition that in previous papers (TUNCER, 1988, 1989) the abilities of *Z.marina*, *Posidonia oceanica* and some algae were accumulated some heavy metals from sea water.

Eel grass *Zostera marina* were collected by Scuba diving the period between June and August 1991 in the Sana coastline (Trabzon) at a depth of 16-18 m. in homogeneous beds. This area is affected by domestic and some hydrocarbons wastes coming directly from pumping stations and harbour activities.

All materials were brought to the laboratory, the epiphytes were scraped off, and samples were oven-dried for 24 hr at 105°C. then leaves and shoots (15-20 g. D. W) were mineralised in Pyrex vessels with  $\text{HN}_3 : \text{HClO}_4$  (5 : 1) under the reflux. Each sample was made in triplicate, filtered and assayed using AAS for heavy metal analysis.

Some principal elemental composition has also been analysed by Spectrometry, Colorimetry and Kjeldall.

All the mean results were summarized in Table I.

Table I. Some Heavy metal and Elemental Composition in the Marine Phanerogam *Zostera marina*.

Element	Symbol	Unit	Leaves	Shoots
Cadmium	Cd	ppm	1.05	1.05
Calcium	Ca	%	1.08	2.58
Chromium	Cr	ppm	1.52	2.20
Cobalt	Co	ppm	3.04	3.14
Copper	Cu	ppm	0.84	0.60
Iron	Fe	mg/g	9.37	0.51
Lead	Pb	ppm	1.17	3.14
Magnesium	Mg	%	0.12	0.27
Manganese	Mn	ppm	138.40	91.60
Nickel	Ni	ppm	4.80	3.56
Nitrogen	N	%	1.65	0.92
Potassium	K	%	1.24	1.10
Phosphate	P	%	0.20	0.23
Sodium	Na	%	2.10	2.16
Zinc	Zn	ppm	3.63	23.22

According to our present results, the levels of element concentration vary among the leaves, and shoots. Our data, are in conformity with (GRAUBY *et al.*, 1991) in a marina phanerogam *Posidonia oceanica*. Some of heavy metals Fe, Zn, Cu, Pb and Cd used in antifouling paints was applied to boats, and it may be considered that contamination of *Z.marina* is directly related with these metals (BYRAN, 1976). There is a need for further investigation into the other species.

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