

# CONSIDERATIONS REGARDING Cu AND Ni DETERMINATION FROM MARINE ENVIRONMENTAL SAMPLES OF BLACK SEA USING FAAS\*

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Our paper presents new results concerning Cu and Ni determination in marine biotope (sediment and water) and biocenosis (algae, crustaceans and fish) samples collected in 2005 and 2006 along the Romanian seacoast of Black Sea, between Mangalia and Vama Veche. The quantitative determinations were made by flame atomic absorption spectrometry (FAAS) technique. In all analyzed solid samples, the Cu concentration varied from 6.3650 to 20.6942  $\mu\text{g/g}$  and Ni from 2.2831 to 82.7266  $\mu\text{g/g}$ .

In seawater samples, heavy metal concentrations were of  $\mu\text{g/L}$  levels.

*Key words:* flame atomic absorption spectrometry, metals, algae, crustaceans, fish, water, sediment.

## 1. INTRODUCTION

Romanian Black Sea coastal areas are strongly influenced by human and industrial polluting activities. Most metals are naturally occurring components of the marine environmental, but anthropic inputs determine increased levels of heavy metals in coastal zones. Only small quantities of these trace metals remain in the seawater and the rest accumulate in bottom sediments or enter the metabolic processes of marine organisms [2].

## 2. EXPERIMENTAL

These are many analytical techniques used for the determination of trace polluting metals from environmental samples: flame atomic absorption spectrometry (FAAS) [1, 3–6], graphite furnace atomic absorption spectrometry

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(GFAAS) [2, 7, 8] inductively coupled plasma incorporating atomic emission spectrometry (ICP–AES) [9] or mass spectrometry [10, 11].

#### SAMPLES

We collected marine flora, fauna, sediment and water samples in 2005 and 2006 from the Romanian Black Sea southern part, between Mangalia and Vama Veche.

The solid samples were mineralized with Hach Digesdahl device. The seawater samples were pH-adjusted and prepared with methyl-isobuthyl-cetone.

Table 1 presents details about analyzed solid samples.

All samples were analyzed by flame atomic absorption spectrometer.

*Table 1*

Detailed about analyzed solid samples

Sample I.D.	Sample Mass (g)	
	2005	2006
Shells	0.6044	0.5214
Shrimp	0.8798	0.8149
Anchovy	0.6870	0.5030
Hanos	0.7579	0.7599
Algae	0.6645	0.6667
Sediment	0.6084	0.7929

### 3. RESULTS AND DISCUSSIONS

The followed heavy metals were Cu and Ni.

Tables 2 and 3 present comparative new results regarding Cu and Ni determined concentrations in marine biotope and biocenosis in 2005 and 2006 from the Romanian Black Sea southern corner, between Mangalia and Vama Veche using FAAS method.

The obtained values of heavy metals' concentrations in seawater samples are lower than the accepted values in Romanian standards [12].

*Table 2*

Cu and Ni concentrations in marine biotope in 2005 and 2006 determined by FAAS

Metal / Sample I.D.	Cu		Ni	
	2005	2006	2005	2006
Seawater [ $\mu\text{g/g}$ ]	143.4	157.4	159.8	170.8
Sediment [ $\mu\text{g/g}$ ]	13.1656	14.6424	6.2623	9.7616

Table 3

Cu and Ni concentrations in marine biocenosis in 2005 and 2006 determined by FAAS

Metal / Sample I.D	Cu		Ni	
	2005	2006	2005	2006
Shells	12.3759	20.6942	82.7266	7.3360
Shrimp	6.3650	19.5790	14.2816	3.1783
Anchovy	15.5676	13.9562	7.9912	3.7972
Hanos	17.0998	10.0736	4.3475	2.2831
Algae	13.2279	14.7742	3.9729	14.6092

Our registered level of copper in sediment samples were comparable to those observed by A. Oros and coworkers (15.81  $\mu\text{g/g}$ ) [2].

The Ni concentrations, measured in shell samples, varied between 7.3360–82.7266  $\mu\text{g/g}$ . These results are higher than 0.85  $\mu\text{g/g}$  from Aviles estuary, an industrialized area in the Asturias region of Spain [13].

The maximum Cu content, 14.7742  $\mu\text{g/g}$ , encountered in 2006 algae samples is generally higher than 6.60  $\mu\text{g/g}$  2005 value found by T. Petislead *et al.* [10].

#### 4. CONCLUSIONS

The monitoring of trace heavy metals in marine biotope and biocenosis from the Romanian Black Sea ecosystem is very important for human population health.

To conclude our work, we can say that the pollution degree is not so noticeable to become a potential danger.

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