

Trace Elements in *Mytilus galloprovincialis* LMK from Sozopol and Nessebar Areas, Bulgaria

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INTRODUCTION

During the period 1988-1989 the study [1] was continued to determine some trace elements in *Mytilus galloprovincialis* Lmk from Sozopol and Nessebar (Bulgarian Black Sea coast). Samples cultivated (suspended culture) and rock mussels were taken seasonally and analysed for Cu, Zn, Pb and Cd concentrations. In October 1988 quantitative determinations of four samples were made for other 9 metals.

MATERIALS AND METHODS

The preliminary preparation of the samples was carried out in accordance with the methodology recommended by FAO [2]. Approximately 2g of mussel meat, homogenized and dried at 105°C was weighed with an analytical balance, placed into a quartz glass and 15 ml concentrated solution of HNO₃ was added attentively. In 24 h the mixture was vaporized on a sand bath up to the volume of 5-6 ml and then 5 ml of HClO₄ was added to the solution and again vaporized up to the same volume. The solution obtained was placed into a 50 ml beaker and bidistilled water was added up to the mark. The samples were analysed by a AAS "Perkin Elmer 2380" in graphite furnace HGA - 400 applying the method of a standard addition and 0.5% (NH₄)₂HPO₄ as a matrix modifier in Pb determination.

The same technique following an extraction of the analysed elements with APDC and MIBK was used to determine other 9 metal components in 4 mussel samples (October 1988).

RESULTS AND DISCUSSION

In Table 1 means of trace metal concentrations in 13 samples cultivated and rock mussels, are given.

The concentration variations of those elements in cultivated and rock mussels from Sozopol and Nessebar areas were comparable with the reproducibility of the analytical method. The relative standard deviation, Sr (n=5) for the concentrations presented does not exceed 10%.

Table I. Means of trace elements concentrations in *Mytilus galloprovincialis* Lmk from Sozopol and Nessebar mussel farms, 1988-1989 *)

Period	Average concentrations (mg/kg dry weight)			
	Cu	Zn	Pb	Cd
1988 / X	18.0	93.6	12.3	1.9
1989 / II	9.7	102.1	11.0	1.7
IV	9.9 (12.8)	91.7 (138.3)	6.3 (7.9)	1.3 (2.0)
X	16.3 (18.1)	99.0 (125.4)	8.6 (8.7)	1.4 (1.4)
XI	8.1	83.2	-	-

*) In parentheses concentrations of trace elements in rock mussels

The following concentrations (mg/kg dry weight) were found for the trace elements in October samples (1988): 27.2 ± 5.3 for Bi, 7.0 ± 0.7 for Ni, 13.7 ± 2.2 for Mn, 2.8 ± 0.4 for Co, 338.4 ± 32.9 for Fe, 18.2 ± 3.5 for Ba, 15.0 ± 2.8 for Cr, 30.2 ± 5.8 for Mo and 48.3 ± 9.4 for V.

In comparison with the concentrations previously determined, the new analyses showed increased values for Cu, Zn, Pb and Cd in mussels attributed likely to increased total pollution of the Black Sea area during the period of study. The comparative results for cultivated and rock mussels (regarding a definite mussel farm & season) indicate higher concentrations for rock mussels. The increased values for trace elements in cultivated mussels (spring generations 1988) in October 1988 and February 1989 is attributed mostly to higher concentrations of those components in the sea water along the coast in 1988. It should be noted that the concentrations of the analysed elements are higher in the samples, collected in October 1988 and 1989.

REFERENCES

1. StamoV, S., S. Zlatanov, Rapp. Comm. int. Mer. Médit., 31 (1988), 2, p 160.
2. Bernard, M., (1976) Manual of methods in aquatic environment research, FAO, Part 3; p. 48-70.