

## THE MAIN NUTRIENTS CONCENTRATION FROM INTRA TISSUE WATER OF BENTHOS ORGANISMS FROM MURES BASIN

### CONCENTRAȚIA PRINCIPALILOR NUTRIENȚI ÎN APA INTERSTITIALĂ A UNOR ORGANISME BENTONICE DIN BAZINUL MUREȘULUI

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*In the hydrographic basin of Mures river, aboard an altitude gradient, were taken samples of intra tissue waters from benthonic organisms for research the nutrients concentrations. The reference point was represented by a dairy cow farm where the agricultural fields of this is applied the organic fertilization with manure. The intra tissue water samples from benthonic organisms were prelevated in spring and autumn and the prelevate dates are the same with spread manure dates. At the intra tissue water level, concentrations value of N and P are bigger at the second data prelevations than first data prelevations and we can conclude that the benthonic oligochetas activity increase, more than, they density increase in Mures basin. The high concentrations of  $NH_4$  show as that Mures basin is a zone characterized by high degree of anoxia and this fact is supported by significant differences between seasonal prelevations. The explication is the manifestation to the cumulated and at distance effects of introduction in water to some organic products, very probably washed from neighborhoods agricultural field. Were calculated values of Student test for seasonal comparisons and were founded significant differences between nutrients concentration values at first and second prelevations.*

**Key words:** intra tissue water, nutrient, benthonic organisms.

#### Introduction

The active zoo benthos is made by oligocheta, amphypoda and mollusca species. These modified the sedimentary materials through different methods: some particles are partial digested but they mineralization is accelerated by intestinally transit; they activity favor the oxygen and other electronic acceptors inmoving in deep lays and accelerate the mineralization; the changes at water-sediment interface are influenced by bioturbidity.

The intensive agriculture and food industry determined the important increasing of nutrients inputs in aquatic ecosystem and eutrophysation process.

## Materials and Methods

The samples from intra tissue water were taken aboard an altitudinal gradient to flow water sense. The samples were taken with seasonality (March – September/October). The prelevations were realized using the quantitative methods. Conservation and working samples were made using the classical methods. The fields along side the farm have 10 degrees back fall, the zone been in C vulnerability categories, according to implementation plan for 91/676/EEC Directive. This zone has a vulnerability potential to surface water pollution with nitrates from agricultural sources by run-off process.

## Results and Discussions

In table no. 1 are presented the result obtained from samples taken from hydrographic basin of Mures.

The variations of concentration value are:

- 0.191 – 1.223  $\mu\text{g/ml}$   $\text{NO}_3$
- 0.029 – 23.20  $\mu\text{g/ml}$   $\text{NH}_4$
- 0.002 – 0.092  $\mu\text{g/ml}$   $\text{PO}_4$

Table no. 1.

### Concentration values of different forms of N and P from intra-tissue water

Data	Station	Intra-tissue water $\mu\text{g/ml}$			
		N-NH <sub>4</sub>	N-NO <sub>3</sub>	N <sub>anorg</sub>	P
05.03.04	P1	0.029	0.452	0.481	0.000
	P2	0.095	0.348	0.443	0.004
	P3	0.029	1.223	1.223	0.007
	P4	0.281	0.874	0.874	0.002
21.09.04	P1	0.035	0.772	0.772	0.000
	P2	-	-	-	-
	P3	-	-	-	-
	P4	23.20	0.191	23.40	0.092

The concentration levels of different forms of N and P from intra tissue water from Mures stations, at the first data prelevation are presented in Figure no. 1.

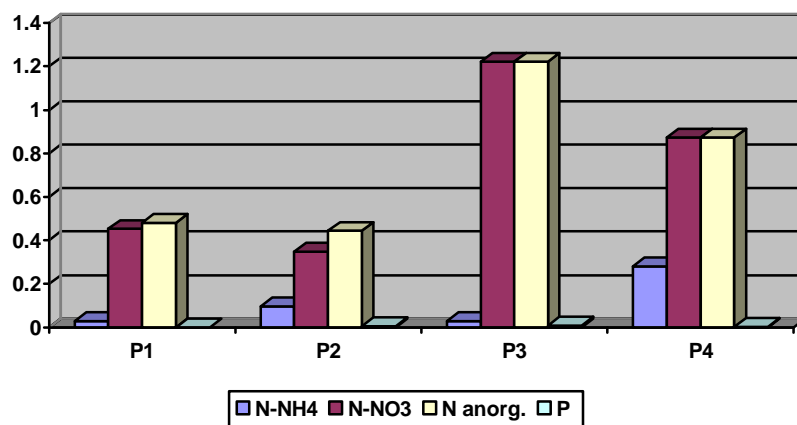


Figure.no.1. - The concentration levels of different forms of N and P from intra tissue water from Mures stations, at the first data prelevation

At the intra tissue water level, concentrations value of N and P are bigger at the second data prelevations than first data prelevations and we can conclude that the benthonic oligochetas activity increase, more than, they density increase in Mures basin.

The concentration levels of different forms of N and P from intra tissue water from Mures stations, at the second data prelevation are presented in Figure no.2.

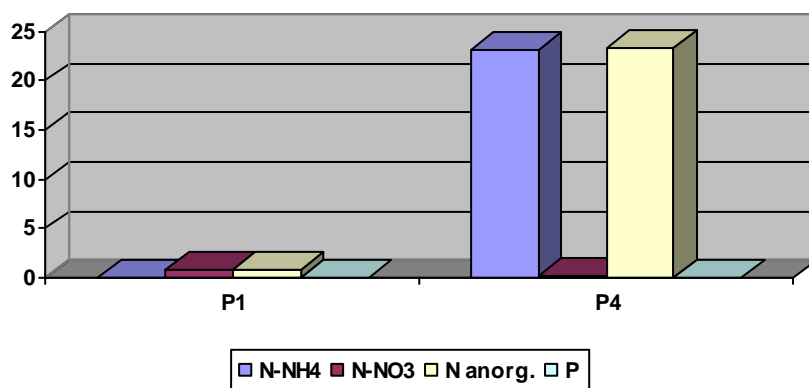


Figure no.2. - The concentration levels of different forms of N and P from intra tissue water from Mures stations, at the second data prelevation

The high concentrations of  $\text{NH}_4$  show as that Mures basin is a zone characterized by high degree of anoxia and this fact is supported by significant differences between seasonal prelevations (see table no. 2.)

Aboard the altitudinal gradient, the  $\text{NH}_4$ ,  $\text{NO}_3$  and  $\text{PO}_4$  concentration values are bigger down the river than up the river (the farm is reference point).

The cause is manifestation of cumulative effects of introducing in water to the organic matters, probably washed from beside agricultural fields.

In Table no. 2 are presented the calculated values of Student test for seasonal comparisons.

*Table no. 2*

**The calculated values for Student test  
for seasonal comparisons in Mures basin**

Specification	Intra tissue water		
	N- $\text{NH}_4$	N- $\text{NO}_3$	P
t calculated	<u>1.6225</u>	0.6923	1.5128
t critical value $\alpha = 0.05$	2.776		
t critical value $\alpha = 0.02$	<u>1.533</u>		

The critical values for Student test were read to level probability 95% and 20%. The 20% probability level ( $\alpha = 0.02$ ) is used in ecology very frequently because if we work with a big  $\alpha$  risk, we minimize the  $\beta$  risk which represent the probability of not observing an environment degradation when it exists. Such an interpretation affects an entire community, an ecosystem, and thus, this strategy is correct.

Another reason for this probability level interpretation was sample error (the number of observations in each stations was small).

Are significant differences at intra tissue level in Mures basin between seasons regarding the N- $\text{NH}_4$  and this fact can indicate an azoth cycling activities of benthonic oligocheta species.

### **Conclusions**

For 20% probability level, in the hydrographic basin of Mures, the seasonal differences were significant for concentration values of N- $\text{NH}_4$ , from intra tissue water.

Are significant differences at intra tissue level in Mures basin between seasons regarding the N- $\text{NH}_4$  and this fact can indicate an azoth cycling activities of benthonic oligocheta species.

The prelevations dates for samples which are the same with manure fertilization dates, we determinate to conclude that these bigger concentrations values of N in water are consequence of wrong manure management or a wrong calculated manure fertilizer doses which must spread on certain surface.

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