

**The influence of macrozooplankton on the fatty acid composition
of particulate matter collected by sediment traps**

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Zooplankton can affect significantly particulate matter vertical fluxes and modify the suspended and sedimenting particle composition (NOJI, 1991). In 1991, during a sediment trap experiment, carried out in the northeastern Adriatic sea, 25 km off Rovinj, the influence of macrozooplankton, probably mostly actively swum into traps (free swimmers), on fatty acid and hydrocarbon composition of entrapped material was investigated. Analyses were performed on total samples, samples free of macrozooplankton and isolated macrozooplankton (>1 mm in length), collected monthly from 25 April to 5 August 1991.

Zooplankton total fatty acid concentrations gradually decreased from 25/4 to 23/7, significantly influencing the total samples concentrations (Tab. 1). Fatty acid composition of the zooplankton caught from 25/4 to 21/6, in addition to the highest fatty acid concentration observed, contained high proportions of PUFA, which partly exceeded or were in the same ranges observed in healthy growing zooplankton (MORRIS, 1971). In this period the microphytoplankton densities, probably the main zooplankton food source, were the highest in the investigate period. Related to this, fatty acid composition indicated diatoms as one of the most important source of sediment trap zooplankton free fraction. Other sources were also microzooplankton and fecal pellets, indicated by domination of shortchain alkanes and PR/C₁₇ ratio higher than one. From 21/6 to 23/7 zooplankton fatty acid concentrations decreased, PUFA proportion reached minimal values, and reversal of the PR/C₁₇ ratio occurred in zooplankton samples, while in the rest of material the ratio remained above one. These results indicated prevailing of starving conditions for zooplankton. In fact, microphytoplankton densities were significantly reduced in the water compared to the previous periods (Tab. 1). Moreover, in this period large mucilaginous aggregates massively appeared, additionally subtracting food from zooplankton.

The results have shown that fatty acid composition of the sediment trap material significantly depends upon macrozooplankton composition.

It should be claimed out that beside the quantity of the free swimmers in sediment traps, very important factor is the physiological condition of the zooplankton. The need of separated analyses is shown.

Table 1. Fatty acid concentration (c), percentage composition of saturated (sat.), monounsaturated (MUFA) and polyunsaturated fatty acids (PUFA), PR/C₁₇ ratio and microphytoplankton fraction density (>20µm, on 20 m depth, mF), in the total (T), zooplankton free (ZF) and zooplankton (Z) samples.

Sampling intervals	c (mg/g)	Sat.	MUFA	PUFA (%)	PR/C ₁₇	mF 10 ⁴ /dm ⁻³
T 25/4	2.65	41.7	31.8	26.4	4.6	5.1
ZF 14/5	0.81	55.2	30.1	14.2	6.2	
Z 15.31	28.8	32.9	38.3	2.6		
T 14/5-	3.61	46.4	37.5	16.1	5.8	27.5
ZF 21/6	0.59	35.8	42.4	21.7	5.2	
Z 12.19	25.3	28.7	45.9	5.5		
T 21/6-	0.87	78.6	18.4	3.1	1.4	0.81
ZF 8/7	1.16	88.9	9.7	1.3	3.6	
Z 5.14	65.8	28.5	5.7	0.7		
T 8/7-	2.52	49.0	22.0	28.9	1.8	0.66
ZF 23/7	4.63	45.9	36.3	17.8	4.2	
Z 2.29	67.9	26.5	5.6	0.5		
T 23/7-	1.20	35.9	28.9	34.5	1.5	2.50
ZF 5/8	2.63	39.2	32.1	28.6	2.6	
Z 4.81	55.9	28.9	15.1	1.0		

REFERENCES

- MORRIS R.J., 1971. - Variations in the fatty acids composition of oceanic euphasiids. *Deep Sea Res.*, 18: pp. 525-529.
 NOJI T.T., 1991. - The influence of macrozooplankton on vertical particulate flux. *Sarsia*, 76: pp. 1-9.