Microphytobenthic chlorophyll biomass in the Gulf of Trieste (Northern Adriatic)

Aleksander VUKOVIC

Institute of Biology, Marine Biology Station, PIRAN (**Slovenia**)

Microphytobenthos, that is sediment associated microflora, have recently been recognized as important primary producers in shallow nearshore areas. While phytoplankton structure, biomass and production as well as benthic macroalgae have been extensively investigated in the Gulf of Trieste little attention has been paid to benthic microflora.

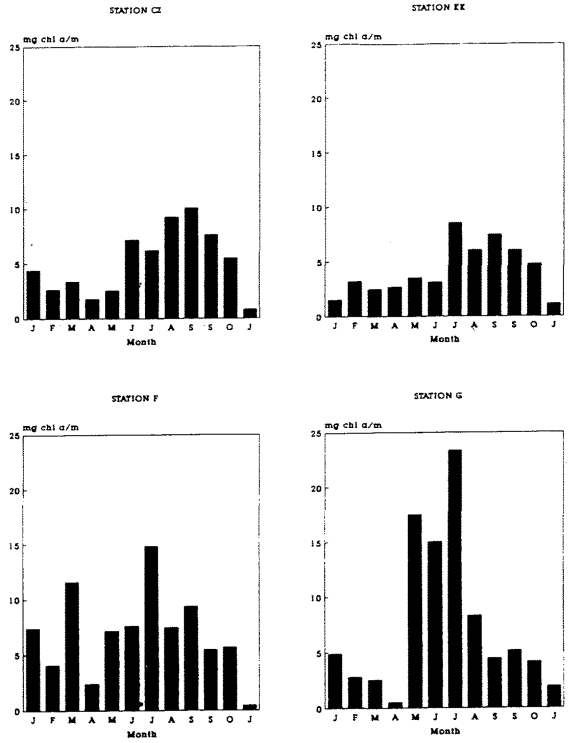
Within Alpe-Adria campain we have followed microphytobenthic biomass with approx. monthly frequency at four locations having depths 20 to 22 m. Sediment was sampled with a gravity core sampler and the top 1 cm was used for analyses. Chl *a* and phaeopigment were determined following the procedure 2 described by SUNDBACK (1986). Chl *a* values varied between 0.47 and 23.37 mg/m with lower values found at locations in the central part of the Gulf of Trieste (stations KK, CZ). At these stations the variations were moderate (mean 4.68 mg/m2, SD 2.60), while higher values with larger variation were measured at the entrance into the Gulf (stations F, G; mean 7.25 mg/m2, SD 5.65).

Generally, at all stations the highest microphytobenthic chl *a* biomass occured in "summer clear waters", that is during the period with favourable temperature and light conditions (Fig. 1).

The phaeopigment contents of the sediment varied between 1.29 to 80.84 mg/m and also showed peak values in summer, partly reflecting increased sedimentation of phytoplankton. This is also indicated by increased sedimentation rates measured during this time of the year (POSEDEL & FAGANELLI, 1991).

Microphytobenthic chl a was generally lower than respective value of the phytoplankton representing from 5 to 60 % of the total chlorophyll a at particular station; larger propo~tions of total chl a due to benthic microalgae were recorded in July (> 40 % at all stations). However, higher concentrations observed during summer-autumn may partly originate from sedimentation of viable phytoplankton cells.

The differences observed among the stations could not be attributed to different nutrient and transparency conditions and we belive that besides sediment type and particular hydrodynamic conditions (causing accumulations of microphytobenthos at some areas) the disturbance of the sediment due to human activities (fishing with beam trawl) may control the distribution of benthic microalgae.



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Polychaeta trophic groups in some offshore Biocoenoses in the Northern Adriatic

Elvis ZAHTILA

Center for Marine Research, "Ruder Boskovic" Institute, ROVINJ (**Croatia**)

Offshore polychaeta in the Northern Adriatic have not been explored so far, from the trophic viewpoint, though among the benthos organisms they particularly indicate the highest degree of the trophic - functional adaption, and they are included into nearly all levels of the trophic steps in the sea.

Identification of the trophic groups and their nomenclature is based on the works of FAUCHALD and JUMARS (1979) and MAURER and LEATHEM (1981). The suggestion of GAMBI *et al.* (1982) has been taken into consideration, and the new group "omnivores" has been introduced.

The polychaeta fauna has been stated from three Biocoenoses: from Coastal terrigenos ooze; Coastal detritic and from Coastal detritic mixed with ooze. Among total 88 species of polychaeta with 5536 samples it has been established 13 trophic groups. On the explored bottom of the Northern Adriatic offshore, the most numerous are the polychaeta which feed with detritus and with organic mud digging and burrowing in the sediment. The greatest abundance is showed by the group BMX (Burrowers, Motile, non-Jawed) 50.7%, thank to species *Notomastus latericeus* and *Sternaspis scututa* which make 50.5% of the total number of the units. All other groups are following behind this like SDT (Surface, Deposit-feeders Discretely motile, Tentaculate) 7.3%, in which dominates the species *Chaetozone setosa*, the CMJ (Carnivore, Motile, Jawed) 12.1%, OMN (Omnivores) 8.3%, and FDT (Filter-feeders, Discretely motile, Tentaculate) which includes only the species *Owenia fusiformis* and still occupies 6.2% of the total trophic group abundance. Groups with the smallest abundance are: FST (Filter-feeders, Sessile, Tentaculate), CMX (Carnivore, Motile, non-Jawed), SMX (Surface, Deposit-feeders, Motile, non-Jawed), BMJ (Burrowers, Motile, Jawed), CDJ (Carnivore, Discretely motile, Jawed) SDJ (Surface, Deposit-feeders, Discretely motile, Jawed) and SST (Surface, Deposit-feeders, Sessile, Tentaculate) which share together 3.5% of the trophic abundance (Fig. 1).

Great quantity of organic substance in Biocoenose of Coastal terrigenous ooze at the sites under the influence of the riverbone silt causes great density of the polychaeta assemblages, especially of the burrowing. In this Biocoenose we distinguish two aspects which differ according to their participation of the mud fraction in the sediment. These distinctions are visible also in respect to the trophic groups which confirm that for the diffusion of the burrowing groups it is not decisive only the quantity of the organic substances in the sediment, but also the size of the sediment particles enabling easier digging.

On the other hand the filter-feeding group is nearly completely absent from this Biocoenose, but it is properly developed only in the Biocoenose of the Coastal detritus bottom together with the omnivores. We isolate from the filter-feeding the *Owenia fusiformis* in which the moderate sedimentation and the silt do not disturb it and create dense population especially in the Biocoenose of the Coastal detritic mixed with ooze. The carnivores group is equally developed in all the three explored Biocoenoses, and probably the concentration of their prey influences mostly their diffusion.

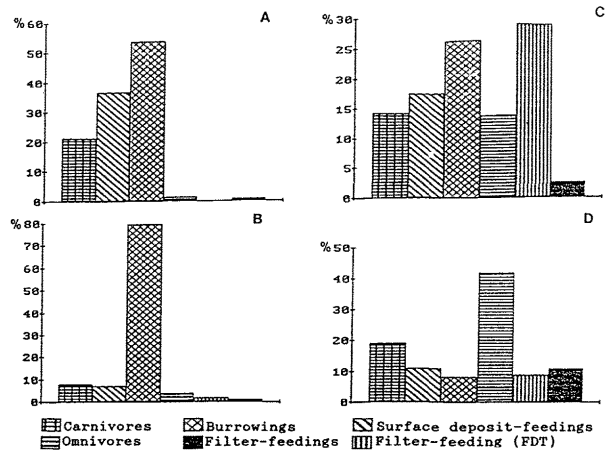

Fig 1. Trophic groups. A: Coastal terrigenous ooze (clayey-silty-sand), B: Coastal terrigenous ooze (silty-clay), C: Coastal detritic with ooze, D: Coastal detritic.

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