Mucous filaments development under controlled conditions : some detected organisms

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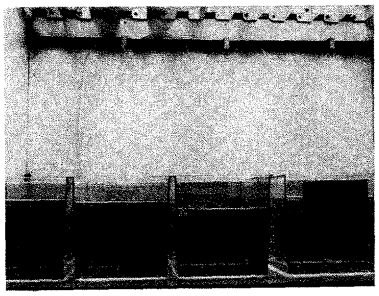


Sea water samples under controlled conditions

During July 1991 surface sea water samples (50 liters) were collected in the Gulf of Trieste.

10 liters of water was directly placed in plastic tanks, 40 liters were filtered through different meshes (10 l through 150 µm mesh, 10 l through 20 µm mesh, 10 l through 10 µm mesh and 10 l through 1.2 µm filter).

The tanks were placed under controlled conditions: 12 cool-white fluorescent lights on a light-dark cycle of 16:8 at 20°C.

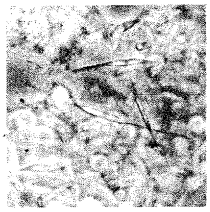
Mucous filaments developing inthe tanks. (—— = 6 cm)

After eight days the formation of some mucous filaments in the not filtered water occurred.

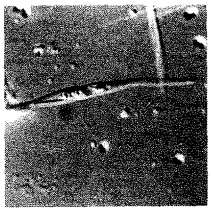
Two days later, mucous aggregates were detected also in 150 µm filtered water.

The filaments were observed under light microscope and SEM.

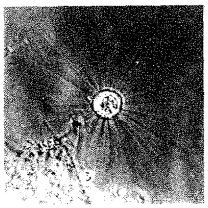
The most representative organisms were measured and photographed.



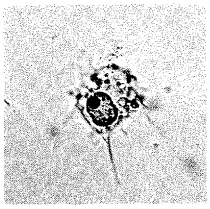
Mucous filament observed under inverted microscope. (—— = 25 µm)



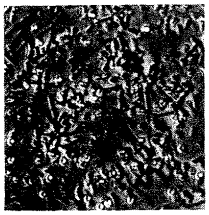
Nitzschia closterium (Ehr.) W.Sm. (—— = 15 µm)



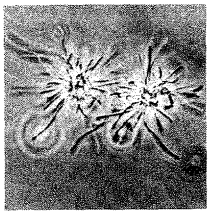
Heliozoan. (—— = 20 µm)



Ameboid form. (—— = 30 µm)



Coccoid and filamentous bacteria. (—— = 8 µm)



Unidentified not photosynthetic form. (—— = 100 µm)

Small scale structure of the phytoplankton biomass in the Gulf of Trieste (North Adriatic)

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Sampling of biological parameters such as biomass of plankton organisms and chlorophyll a concentrations was carried out in the Gulf of Trieste, the depth of which does not exceed 30m. Sampling was restricted to a spatial scale of a few metres. This fact presents a limitation in estimating the standing crop of phytoplankton since its concentration is probably constrained by physical processes which occur over small spatial scales of the order of 1m or less (COWLES *et al.*, 1990). Therefore, a small scale profiler (F-probe), developed by the Centre for Water Research, Western Australia, was used to observe changes in the vertical distribution of temperature and Chl *a* with a vertical resolution of about 3 cm for a conventional drop speed of about 1 m/sec. The fluorescence of Chl *a* was measured with a Sea Tech fluorometer mounted on the probe.

Vertical profiles of the water column temperature and Chl *a* concentrations were measured in September and October 1991 at six stations in the southern part of the Gulf of Trieste (surface area of the Gulf approx. 20 x 30 km2). Discrete samples were taken at four depths (0, 5, 10m and bottom) and Chl *a* determinated fluorometrically (STRICKLAND and PARSONS, 1972).

From profiles measured in September it was found that Chl *a* vertical distribution was related to the temperature stratification of the water column (Fig.1). On the same figure the results of Chl *a* analyses from discrete samples are shown (signs). Maximum values were found at 16 and 17 m. At the first group of stations in the Gulf of Trieste (KK, CZ and G) the highest concentrations started at 8m depth, while at the second group of Gulf stations (M, F and F1) they were restricted to a thin layer of the water column (from 14,7 to 18,5m). This distribution agrees well with the stratification. The first group of stations had developed stratification below 9 m depth, while the second one had a thermocline which was deeper and more pronounced. F-probe profiles showed that yet unknown horizontal inhomogeneity of meteorological conditions (wind field mainly), which led to intense surface mixing of the water column at some stations (M, F and F1), was present. As a consequence, a temporary affinity of hydrographic properties occured within the first and the second group of stations of the Gulf at the sampling time.

In October the phytoplankton biomass was displaced deeper into a thin layer close to the bottom. Chl *a* vertical distribution followed the temperature structure. The deep thermocline (ranging from 16 to 22m) was the result of wind mixing and convection due to surface cooling. Below the thick mixed layer Chl *a* concentrations started to increase, reaching their maximum values at the bottom or approx. 1m above it (Fig.1). The exception was station M (28m depth), where a relatively sharp thermocline from 22 to 28 m prevented phytoplankton from settling.

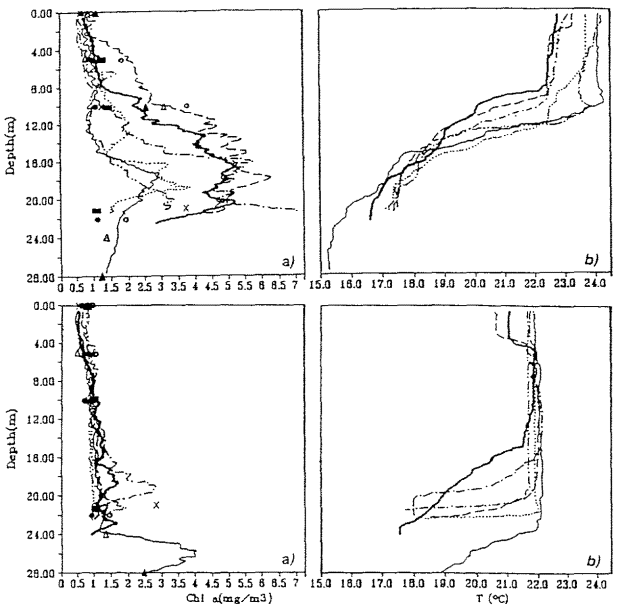

Figure 1: Vertical profiles of chlorophyll *a* (a) and temperature (b) done on September (top), and October 1991 (bottom).

Profiles using F-probe (curves) and values of laboratory analyses (signs) were performed at stations: CZ (—— and ▲), F (—— and ■), F1 (····· and ●), G (– – – and ○), KK (—·— and x), M (—— and ▲).

REFERENCES

COWLES J.T., DESIDERIO R.A., MOUN J.N., MYRICK M., GARVIS D. and ANGEL S.M., 1990.- Fluorescence microsstructure using a laser/fibre optic profiler. *Ocean Optics* 10: 336-345.

STRICKLAND J.D.H. and PARSONS T.R., 1972.- A practical handbook of seawater analysis. *Bull. Fish. Res Board Can.* 167: 1-310.

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