SEASONAL VARIABILITY OF CHLOROPHYLL *A* CONCENTRATION IN THE WATER COLUMN OF MALIA BAY (SOUTH AEGEAN SEA)

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In order to study the seasonal variability of the chlorophyll *a* concentrations in the water column of the coastal system in Crete, five sampling cruises of the "R/V Philia" were conducted in Malia bay in November 1992 and March, May, August and November 1993. Samples were collected at three transects (MX2, MX4, MX7) perpendicular to the coast line (Fig.1) each one including three stations (A, B and C) at depths of 10, 30 and 70 m respectively. The number of samples per station ranged from two at the 10 m depth stations (at 0 and 10 m from the sea surface), to four at the 30 m depth stations (0, 10, 20 and 30 m from the surface), and five at the 70 m depth stations (0, 10, 20 30 and 50 m from the surface). Water samples, collected by 5 l Niskin bottles, were filtered on board through Whatman CF/F filters which were subsequently stored at -20°C, and analysed for chlorophyll *a* and phaeopigments with a Turner fluorometer (YENTSCH and MENZEL, 1963). Analyses for nutrients concentration were performed after STRICKLAND and PARSONS (1972). The vertical profile of temperature, salinity and dissolved oxygen at each sampling station was obtained by means of CTD measurements. The results of the chlorophyll *a* analysis revealed rather high concentrations in March 1993 (Fig.2) which exceeded by 10 times those measured at the same stations in all other seasons. The maximal and minimal values recorded per month respectively were: 0.05-0.57 µg/l in November 1992, 0.90-4.90 µg/l in March 1993, 0.08-1.13 µg/l in May, 0.06-0.72 µg/l in August and 0.09-0.53 µg/l in November 1993. The same holds true for phaeopigments which showed a more or less similar pattern.

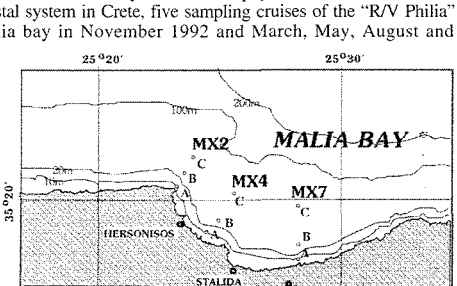

Fig. 1. Sampling stations in Malia Bay

As far as the vertical distribution is concerned, the highest concentrations during late spring and summer were found below the thermocline (30-40 m), while in November and March the distribution of phytoplankton in the water column was more or less uniform. In November 1993 however, the prolongation of the hot season resulted in a vertical distribution similar to that of the August. Phytoplankton biomasses seem to be influenced by the hydrodynamic pattern in the bay and the nutrients availability. The gradual development of the water stratification (late spring to autumn) inhibits photosynthesis due to nutrients depletion in the surface layer while during winter and early spring, mixing of the surface layers with deep, nutrients rich water masses, as well as the increase in precipitation influencing the coastal zone, form favourable conditions for the phytoplankton bloom. Figure 3 shows a considerably higher phosphate concentrations found in March at all depths. This is particularly important for Eastern Mediterranean marine ecosystems where phosphorus is a limiting factor for phytoplankton development.

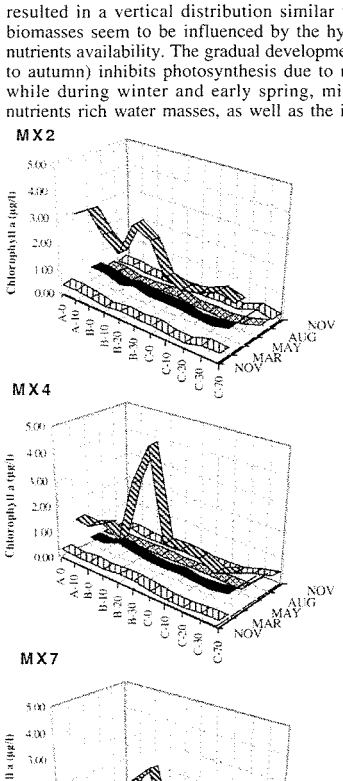

Fig. 2. Seasonal variability of chlorophyll a concentration in 3 transects, differents depths and distance from shore.

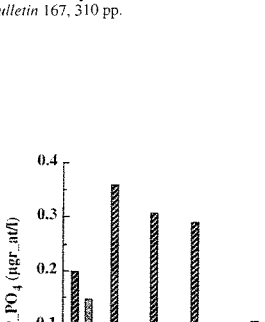

Fig. 3. Average seasonal concentration of phosphates in the water column at different depths.

REFERENCES

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