

## SUMMER PHYTOPLANKTON IN THE CATALAN SEA

(Western Mediterranean)

by

Zoila R. Velásquez

Instituto de Investigaciones Pesqueras

Passeig Nacional s/n

BARCELONA-3

## SUMMARY

The analysis of phytoplankton samples taken during cruise TANIT 79 carried out in August 1979 on board the Spanish *R/V García del Cid* in the Catalan Sea, showed the three main group of species, coccolyths, diatoms and dinoflagellates, to be represented by *Helicosphaera carteri*, *Calyptosphaera* sp., *Thoracosphaera heimii* and *Calyptosphaera oblonga* in the first group, *Leptocylindrus danicus*, *Thalassionema nitzschioides*, *Coscinodiscus* sp. and *Rhizosolenia alata* var. *gracillima* in the second, and *Exuviaella compressa*, *Oxytoxum crassum*, *Peridinium brochii*, *Exuviaella baltica*, *Phalacroma ovatum* and *Ceratium fusus* in the third group.

Overall predominance of the coccolyths was observed in a large area to the south while the diatoms showed the largest abundance in a narrow strip near the Catalan coast and in the Golfe du Lion, and the dinoflagellates appeared uniformly distributed and, unlike the diatoms, extremely healthy and active. The geographic distribution of the phytoplankton biomass in the region appears quite different depending on whether it is represented by total cell counts or by chlorophyll-a concentrations. Chlorophyll-a poor cells appeared in the Golfe du Lion area, central part of transect B, between Marseille and Menorca, and stations located to the southwest in transect C, between Barcelona and Menorca. On the contrary, cells from a large area extending to the northeast of the Catalan coast and northern part of the islands, showed a high

chlorophyll-a content. This fact may be interpreted as due to the existence of younger and more active populations in the central part of the Catalan Sea and older populations in the Golfe du Lion.

The species composition showed a relatively large importance of the coccolyths, especially in the southern half of the area studied. Margalef (1969) found various species of coccolyths in summer to be important: *Coccolithus huxleyi*, *Cricosphaera carterae*, *Syracosphaera* sp., *Rhabdosphaera stylifera* and *Helicosphaera carteri*, most of which were also found in the present study. According to this author, *C. huxleyi* and *H. carteri* form important populations at depths in excess of 100 m. In the present study they were found to increase their concentration with depth, showing their maximum values between 75 and 100 m.

The largest abundance of coccolyths seemed to be related to the existence, in the central Catalan Sea, of Mediterranean water with salinity in excess of 37.8 ‰ at all depths, showing a weaker stratification than adjacent areas affected by less saline continental or Atlantic waters (Salat and Cruzado, 1980). This weaker stratification allows a slow but continuous vertical flow of nutrients to the base of the photic zone (Cruzado 1980), where coccolyths, rich in chlorophyll-a and with low light requirements, find optimum growing conditions.

The presence of diatoms, on the other hand, mostly confined to the Golfe du Lion, seems to be related to previously developed populations whose history would be difficult to trace, probably originated near the Rhone river. More difficult would be to interpret the existence of local blooms such as the one formed by *Leptocylindrus danicus* in the central part of the region, like the ones previously described for other species (Margalef 1969). The dinoflagellates distribution, very homogeneous, does not seem to be related to any of the main environmental features. However, with a healthy appearance, consequence of their activity, this group probably plays an equilibrating role between the generally eutrophic diatoms and the deep rearing coccolyths.

## REFERENCES

- Cruzado, A. 1980. Nutrients in the Catalan Sea. XXVII Congress and Plenary Assembly of the C.I.E.S.M., Cagliari 9-18 October, Chemical Oceanography Committee.
- Margalef, R. 1969. Composición específica del fitoplancton de la costa catalano-levantina (Mediterráneo Occidental) en 1962-1967. Investigación Pesquera, 33(1),345-380.
- Salat, J. and Cruzado, A. 1980. Masses d'eau dans la Méditerranée Occidentale: Mer Catalane et eaux adjacentes. XXVII Congress and Plenary Assembly of the C.I.E.S.M., Cagliari 9-18 October, Physical Oceanography Committee.

