ANNUAL CYCLE OF *DINOPHYSIS* SPP. IN THE GULF OF TRIESTE

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Since 1930 (SCHILLER, 1933-37) toxic species belonging to the *Dinophysis* genus occured in Adriatic Sea but only from 1989 these dinoflagellates have been correlated to cases of DSP (Diarrhetic Shellfish Poisoning) along the coasts of Emilia Romagna (BONI *et al.*, 1992). Because of the presence of DSP toxins in mussels, molluscs harvesting and marketing were prohibited every summer since 1989 with negative economic effects. *Mytilus galloprovincialis* farms represent one of the major industries in the Gulf of Trieste employing 200 people and producing 9000 t. yr-1. As 200 *Dinophysis*/liter are sufficient to render mussels toxic (ALVITO *et al.*, 1990), a toxic phytoplankton monitoring programme in mussel farms seawater became necessary.

From September 1990 until September 1991, a monitoring programme to identify *Dinophysis* spp. was carried out in a mussel farm located 200 m offshore in the Gulf of Trieste. Water samples were collected at 0.5 m, 2 m, 5 m, 10 m and at the bottom (13 m). *Dinophysis* species were identified and counted according to UTERMÖHL (1958) method after sedimentation of 100 ml of a preserved sample (CABRINI and DEL NEGRO, 1992).

Dinophysis is never observed as the dominant dinoflagellate in the Gulf of Trieste; in fact, the higher density corresponds to 870 cells/liter (Fig.1). A significant presence was found in September and October 1990; subsequently, sporadic occurences were detected until May 1991 when *Dinophysis* spp. were again present. *D.* cf. *acuminata*, *D. caudata*, *D. fortii*, *D. rotundata*, *D. sacculus* and *D. tripos* were identified along the water column and among these species *D. fortii* and *D.* cf. *acuminata* were the most abundant ones.

The vertical distribution underlines the presence of *Dinophysis* along the water column. At surface *Dinophysis* spp. were detected from September to October 1990 and reached maximum value (190 cells/l) with *D. caudata*. The year after *D.* cf. *acuminata* was the most abundant species reaching 180 cells/l in May. At 2 m, the 1990 temporal trend is similar to surface distribution: the highest value is recorded in October with 610 cells/l of *D. fortii*. This species reached significant concentrations also at 5 m in 1990 with density higher in September than in October and it was present in 1991 too. At 10 m *Dinophysis*, particularly *D. fortii* and *D. caudata*, was observed in autumn 1990. An unusual presence of *D. rotundata* was recorded in the next January. Few cells, particularly *D. fortii*, occured then in May and September. At the bottom, density as well as specific diversity were always lower than at the other depths.

According to previous papers (CABRINI *et al.*, 1987/88; DEL NEGRO *et al.*, 1992), a seasonality of *Dinophysis* presence is evident at all the considered depths. A different seasonal pattern in specie-specific composition is shown: *D. fortii* and *D. caudata* are dominant in autumn while *D.* cf. *acuminata* reaches maximum values in early spring. Quantitatively *Dinophysis* prefers the middle depths rather than surface.

From these observations it results that *D. caudata* decreases from 190 to 30 cells/liter in surface, while *D. fortii* increases from 20 to 610 cells/liter at 2 m depth in only seven days. For this reason the monitoring programme on *Dinophysis* must be intensified at the points of view frequency and depth number in order to control this toxic species in the whole water column.

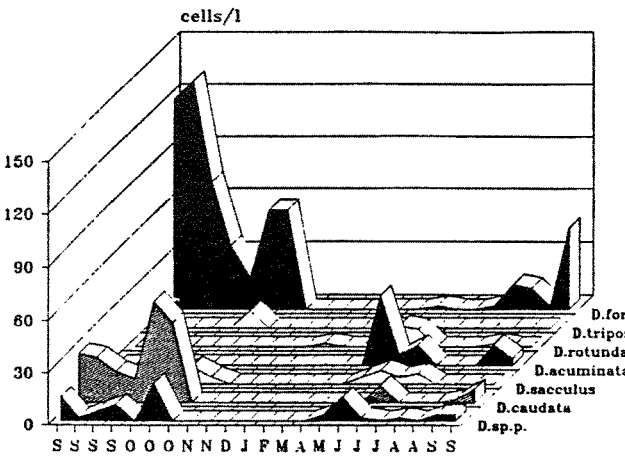

Fig. 1 - Distribution of *Dinophysis* (cells/l represents mean value for the water column).

REFERENCES

ALVITO P., SOUSA I., FRANCA S., SAMPAYO M. A. DE M. 1990.- Toxic Marine Phytoplankton. E. Granlj, B. Sundstrom, L. Edler, D.M. Anderson (Eds.). Elsevier : 443-448.

BONI L., MANCINI L., MILANDRI A., POLETTI R., POMPEI M., Viviani R. 1992.- *Sci. Total Environ.*, Suppl. 1992 : 419-426.

CABRINI M. & DEL NEGRO P. 1993.- *Biologia Marina*, suppl. Notiziario S.I.B.M., 1 : 251-254.

CABRINI M., MILANI L., HONSELL G., FONDA UMANI S. 1987-1988 - *Nova Thalassia*, 9 : 11-52.

DEL NEGRO P., CABRINI M. and TULLI F. 1993.- Production, Environment and Quality. Bordeaux Aquaculture '92. G. Barnabè and P. Kestemont (Eds.). European Aquaculture Society. Special Publication N. 18 : 555-562.

SCHILLER J. 1933-37.- Leipzig, Akad. Verlag., vol. 10 (3), Teil 1, 1-617 (1931-33): Teil 2, 1-590 (1935-37).

UTERMOHL H. 1958.- *Mitt. int. Ver. Theor. angew. Limnol.*, 9 : 1-38.