

## MODELLING DYNAMICS OF PHYTOPLANKTON IN THE MEDITERRANEAN

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Phosphorus, nitrogen and silica have been recognized as elements most often participating in nutrient limitation of phytoplankton growth in the Mediterranean. According to in situ enrichment studies, phosphorus tends to limit phytoplankton growth more intensively than nitrogen (JACQUES *et al.*, 1973; FIALA *et al.*, 1976; POJED and KVEDER, 1977). OWENS *et al.* (1989) concluded that in the western part N limitation is more probable than P limitation. Finally, there are parts of the Mediterranean where silica has been demonstrated to limit phytoplankton growth more often and more intensively than either phosphorus or nitrogen (MORKOC *et al.*, 1994).

Models of processes that describe phytoplankton growth limited by a single nutrient have been perfected over 20 years and a lot is known about their ability to reproduce phytoplankton dynamics. Here we report on development of models that combine the above three nutrients to describe and predict phytoplankton growth in the Mediterranean Sea. Specifically we are trying to answer the following questions: What is the extent of each nutrient in limiting phytoplankton growth? What other processes we need to consider at the minimum to correctly describe observed recurrent phytoplankton peaks? Finally, how much are the bacteria and zooplankton affecting phytoplankton dynamics?

### REFERENCES

- JACQUES G., CAHET G., FIALA M., PANOUSE M., 1973. Enrichissement de communautés phytoplanctoniques néritiques de Méditerranée nord-occidentale. *J. Exp. Mar. Biol. Ecol.*, 11: 287-295.
- FIALA M., CAHET G., JACQUES G., NEVEUX J., PANOUSE M., 1976. Fertilisation de communautés phytoplanctoniques. I. Cas d'un milieu oligotrophique: Méditerranée nord-occidentale. *J. Exp. Mar. Biol. Ecol.*, 24: 151-163.
- POJED I. and KVEDER S., 1977. Investigation of nutrient limitation of phytoplankton production in the northern Adriatic by enrichment experiments. *Thalassia Yugosl.*, 13: 177-196.
- OWENS N.J.P., REES A.P., WOODWARD E.M.S., MANTOURA R.F.C. Size-fractionated primary production and nitrogen assimilation in the north-northwest Mediterranean Sea during January 1989. *In: First Workshop on the Northw. Med. Sea, CEC Water. Poll. Res. Rep.*, Paris, pp. 1216-34.
- MORKOC E., TUGRUL S., OKAY O.S. and LEGOVIC T, 1994. Eutrophication and hydrochemical characteristics of the Izmit Bay. *In: Proc. of Int. Spec. Conf. on Mar. Disp. Sys.*, Istanbul, pp. 335-344.