

The structure of planktonic communities in a meromictic coastal lagoon
(*Estany del Cibollar, Majorca*)

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The *Estany del Cibollar* (*Albufera d'Alcudia*, Majorca) is a small coastal lagoon (3.99 ha, 8.25 m maximum depth, and 3.30 m average depth). It is characterized by a permanent meromixis due to the presence of seawater at depth. This phenomenon causes thermal inversion during winter and anoxia in the monimolimnion (MOYA *et al.*, 1987). At the chemocline, the concentration of dissolved oxygen increases sharply (up to 24 mg O₂/l and 330% saturation in April). Where oxygen is depleted, H₂S is present, increasing in concentration towards the lake floor. Analysed nutrient values indicate an eutrophic situation. Nitrogen in nitrate form is found in high concentrations at surface levels due to the inflow of a tributary stream whilst at depth, nitrate is replaced by ammonium. Phosphorus shows a progressive increase in the monimolimnion, especially close to the bottom due to its redissolution from the sediment.

Planktonic communities found in the *Estany del Cibollar* were sampled monthly during 1991. A very distinctive pattern of distribution of these communities, in response to the existence of meromixis, may be confirmed (MIRACLE *et al.*, 1983).

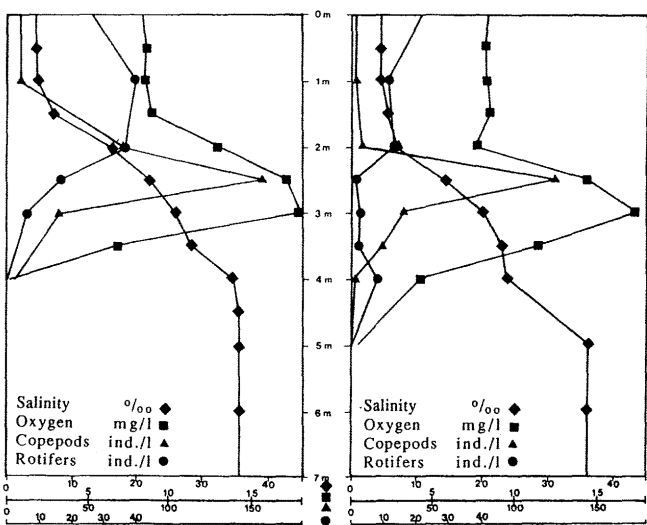
The phytoplanktonic community present in the mixolimnion is basically formed by Cryptophyceae and Chrysophyceae, with densities varying between 1000 and 10 000 cells per millilitre.

There is a significant concentration of cyanobacteria of the genus *Synechococcus*, which shows maximum densities in the metalimnion (up to 17 million cells per millilitre). The high oxygen values registered at this level are the result of the activity of this population and coincide with maximum values of Chlorophyll-a (CRAIG, 1987).

In the upper part of the monimolimnion, a community of phototrophic sulphur-oxidizing bacteria is present which utilises the existing H₂S.

The zooplanktonic community is dominated by copepods and rotifers. Their respective distributions show a different spatial distribution related to physicochemical and biotic factors throughout the vertical profile (FERRARI *et al.*, 1982).

The vertical structure of the planktonic communities and the distribution of the physico-chemical parameters are given in the diagrams and table enclosed. They illustrate two different points in the annual cycle: March and June.



MARCH 1991			JUNE 1991			
Chl. a (mg/m ³)	Phytoplankton (cells/ml)	<i>Synechococcus</i> (cells/ml)	Depth (m)	Chl. a (mg/m ³)	Phytoplankton (cells/ml)	<i>Synechococcus</i> (cells/ml)
2.94	1504	-----	0	1.84	9761	-----
2.93	4716	-----	1	1.45	7243	-----
4.25	5882	6.16x10 ⁶	2	1.14	-----	1.03x10 ⁶
4.39	8452	6.19x10 ⁶	2.5	3.76	8856	2.98x10 ⁶
9.83	-----	17.06x10 ⁶	3	6.58	-----	12.05x10 ⁶

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