

Interactive comment on “Ultraplankton distribution and upper ocean dynamics in the eastern Mediterranean during winter” by M. Denis et al.

M. Denis et al.

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General comments:

We want to reassure the referee. The samples were analysed soon after the cruise and the related results were part of the doctorate of V. Martin in 1997. We do not think that our data should be considered as outdated, even if we did not focus on the resolution of cyanobacteria ecotypes. The vertical distributions of cyanobacteria at stations 24-25 are quite similar to that recently reported by Tanaka et al (Fig. 5, Deep-Sea res. 2007) in the Levantine basin.

Referee 1 wished also to see nutrient data included in our reported study and we have
C3620

done it (see joined figures). The objective of this study is to investigate possible links between ultraplankton distribution and hydrodynamic structures. Consequently, ultraplankton cannot be the only player. Such a task, at a basin scale, cannot end up as a short paper. The referees asked to add nutrient data and look at additional relationships. This increases the number of figures and does not shorten the paper.

Specific comments:

Title:

We appreciated the suggestion of the referee and modified the title accordingly. The new title also takes into account comments of referee 3 and was modified as : “Ultraplankton basin-scale distribution and hydrodynamism in the eastern Mediterranean Sea in winter”.

Abstract:

The last sentence has been transferred to the discussion with the addition of the basin-scale aspect.

Introduction:

We understand that the referee is essentially a specialist in biology. We found more consistent to describe first the environment in which phytoplankton develops before focusing on phytoplankton itself, since the aim of the study is to characterise the impact of hydrodynamic structures on phytoplankton distribution.

Materials and Methods:

Pg 6845 L 4-16: Indeed, this paragraph is not as essential as the following. We therefore suppressed it to shorten the manuscript.

Pg 6846 L 7: The final concentration (2%) for paraformaldehyde was made more explicit in the text.

Pg 6846 L 15-19: the data analysis of FCM was moved after the experiment as requested.

Pg 6847 L 4: "small" and "large" were replaced by "pico" and "nano" here and further.

Pg 6853 L 5: same answer as for referee 1: The relationship of Verity et al. needs the bio-volume of the cells. We estimated a mean equivalent cell diameter for the clusters from the mean forward scatter signal compare to that of the beads. This is rough estimate but remains realistic.

Results:

Pg 6853 L 3-5 & Pg 6854 L 3-4: we agree with the referee and removed the end of the related sentences.

Discussion:

We have added the chemical data and hope that the referee will be satisfied by this complement.

Pg 6864 L 14-15: we do not think that this sentence is absolute. In our interpretation it simply means that when concentrations are too low there are not enough data to support a significant relationship.

Figures:

Fig. 1: All the 47 stations of Figure 1 were sampled for flow cytometry analysis as it can be checked on Table 3.

Fig. 3: Bars are not necessary since values are reported on isolines.

Fig. 9: Nanoeukaryotes and picoeukaryotes are used consistently with the text.

Fig. 10 and 13: symbols are better explained.

Fig. 12: the legend of the X axis has been added (Distance (km)).

C3622

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C3623

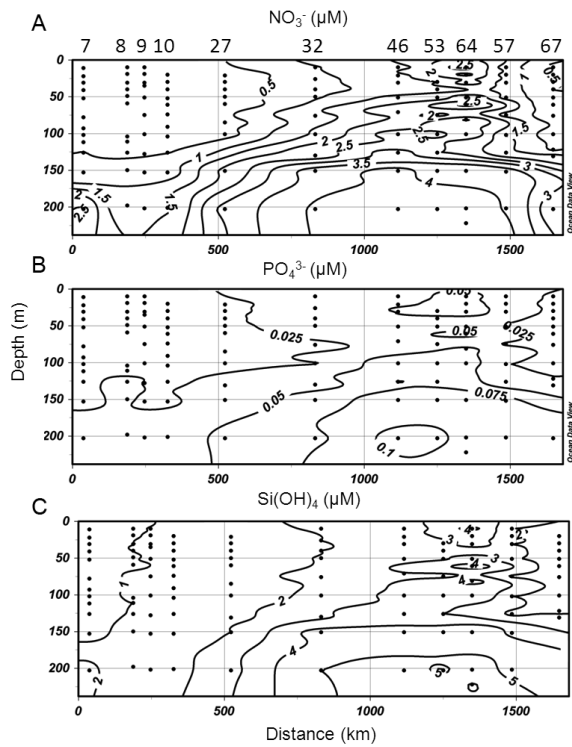


Fig. 1. Vertical distribution of (a) nitrate (NO_3^-), (b) phosphate (PO_4^{3-}) and (c) Silicate (Si(OH)_4) down to 200 m along the cross section through the eastern Mediterranean Sea (similar to Fig. 4). Stations

C3624

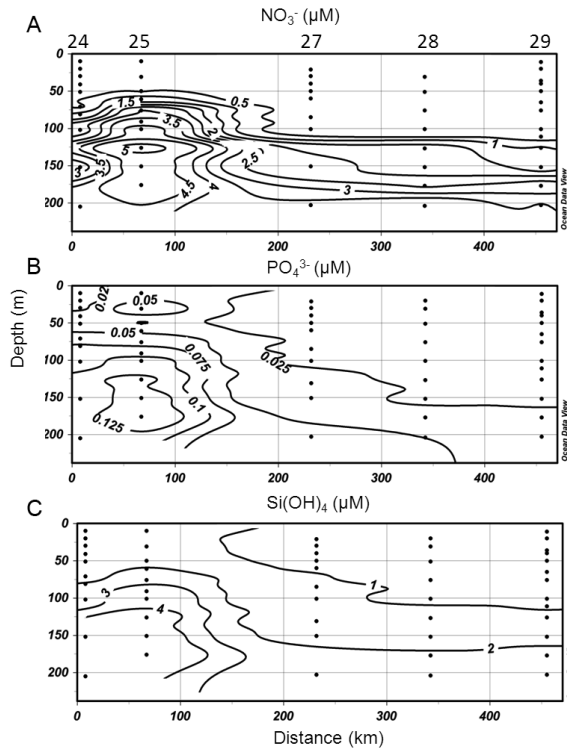


Fig. 2. Vertical distribution of (a) nitrate (NO_3^-), (b) phosphate (PO_4^{3-}) and (c) Silicate (Si(OH)_4) down to 200 m along the north-south transect defined by stations 24 to 29.

C3625

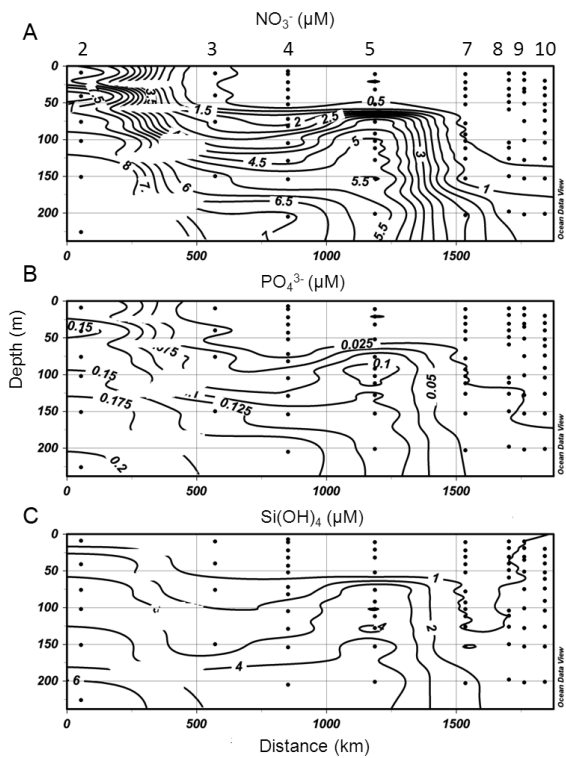


Fig. 3. Vertical distribution of (a) nitrate (NO_3^-), (b) phosphate (PO_4^{3-}) and (c) Silicate (Si(OH)_4) down to 200 m across the western Mediterranean Sea and the western part of the Ionian Sea.