# C-III4

## Fluorescence Characteristics Due to Phytoplankton Chlorophyll and Optical Transparency of Northeastern Mediterranean Waters

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*In situ* fluorescence and light data together with the hydrological data collected during the two expeditions (July 1988, March 1989) to Northeastern Mediterranean are presented and discussed. Continuous *in situ* profiles of fluorescence could be particularly valuable for estimating biomass and productivity in coastal waters where particulate matter and Gelbstoff limit the use of satellite imagery (Mackey, *et al.*, 1989).

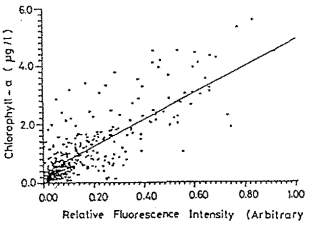


Figure 1. Calibration curve of *in situ* fluorescence and extracted chlorophyll-a (The data from The Sea of Marmara and The Black Sea were influnced for extra support)

Calibration of fluorescence against chlorophyll-a determined on discrete samples collected from depths was performed and extracted chlorophyll concentrations were well-correlated to chlorophyll fluorescence (Figure 1) by a linear equation of:

$$Chl1\text{-}a = 4.85\ (Fluo) + 0.32\ (n=390).$$

Subsurface chlorophyll-a maxima observed in the NE Mediterranean (Yilmaz *et al.*, 1988; Salihoğlu *et al.*, 1989) was clearly and statistically confirmed by *in situ* fluorescence data. As summarized in Table 1, max fluorescence due to chlorophyll-a was measured as

Table 1. Relative Surface Fluorescence(SF), Maximum Fluorescence Intensity (MFI), Depth of Maximum Fluorescence (DMF) and Depth of Zero Flourescence (DZF) in the Northeastern Mediterranean

| | July, 1988 | | | March, 1989 | | |
|---|---|---|---|---|---|---|
| | Min. | Max. | Ave. | Min. | Max. | Ave |
| F(X10$^{-2}$, arbitrary unit) | 0 | 5 | 2 (n=63) | 0 | 14 | 5 (n=40) |
| MFI( " ) | 3 | 10 | 5 (n=61) | 7 | 34 | 14 (n=40) |
| DMF (m) | 57 | 120 | 88 (n=59) | 10 | 88 | 52 (n=40) |
| DZF (m) | 57 | 135 | 113 (n=57) | 70 | 130 | 104 (n=41) |

deep as 120 m and the max depth of zero fluorescence determined as 135 m. The depth of max fluorescence is more deeper in summer than the depth measured in early spring because of light inhibition. On the other hand the quantitative fluorescence values are relatively higher in spring since the bloom time is determined as February-March in the NE Mediterranean. The deepest 1 % light transmission was measured as 120 m (average being 105 m) in the region so the euphotic zone is thick and the photosynthetic activity is observed in the deeper parts of euphotic layer.

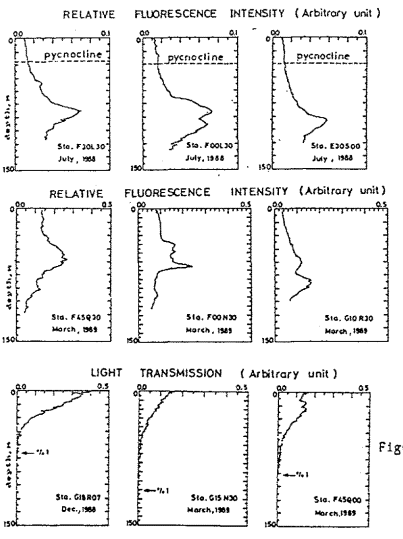


Figure 2. Continuous *in situ* profiles of relative fluorescence and light penetration at selected stations in the Northeastern Mediterranean

Some specific examples of deep chlorophyll-a maxima which were obtained by continuous fluorescence measurements in the water column and the vertical profiles of light penetration are illustrated in Figure 2. As is seen from the figure there is no match with pycnocline and the max fluorescence (summer examples). Euphotic layer is hydrologically homogeneous due to the presence of convective mixed layer caused winter cooling in March examples but still the deep fluorescence peaks were clearly observed.

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