Vertical distribution of Noctiluca miliaris Suriray in the Gulf of Trieste during spring 1982

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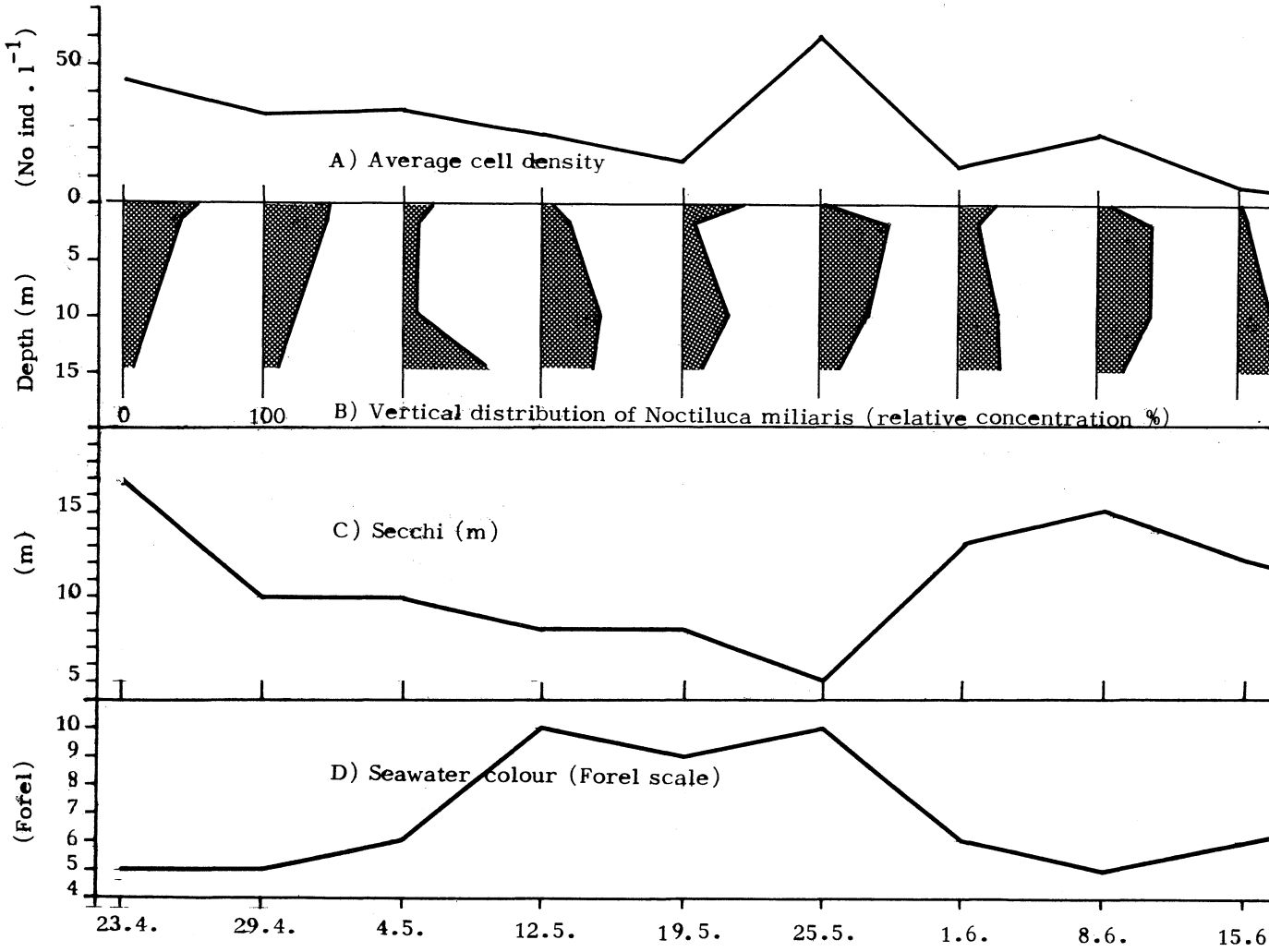
Red tides due to Noctiluca miliaris in the Gulf of Trieste (North Adriatic) were reported in 1977 (Cassinari et al., 1979) and 1980 (Malej, 1982). During the spring of 1982 only localized minor outbreaks were recorded, though Noctiluca counts (number per litre) were not significantly lower than in 1980. Since very little work has been done on the vertical distribution of this organism, though it may be one of the most important factors in the formation of visible water discolorations, we made a preliminary investigation during the spring of 1982.

One station was situated inside the Gulf, lying about 1 mile from the shore. Water samples were collected at 0, 2, 10 and 15 m using a 21 Nansen sampler, at approximately weekly intervals from April to July; all samples were taken between 9 and 12 a.m. Cells were counted immediately upon collection of the water sample. Temperature was measured with a reversing thermometer, salinity was determined by argentometric titration, data on water transparency were collected using a 30 cm-diameter Secchi disc, and seawater colour on the Forel scale.

The temperature and salinity profiles indicate that the waters were mixed until the end of March and began to stratify in April, to become well stratified in May. The strongest salinity and temperature differences from surface to bottom occurred in the last 10 days of May (31.5 to 36.5 %) and first 10 days of June (14.3 to 22.4°C). Secchi disc values began to reduce in the last week of April (Fig. 1) and the minimal transparency coincided with the highest average cell number (May, 25).

The average Noctiluca counts were less than 1 cell . 1^{-1} before mid-April. In the last 10 days of April the Noctiluca density increased to above 30 cells . 1^{-1}, and than it fell only to rise again and reached the maximal value of 60 cells . 1^{-1} on May, 25. After that time the cell counts diminished again, to fall to under 1 cell . 1^{-1} in the last days of June (Fig. 1).

The present investigation shows that Noctiluca was not homogeneously distributed throughout the water column, neither was it always most abundant in the surface and 2 m layers. It seems that the influence of the vertical structure of the environment (using temperature and salinity markers) on Noctiluca vertical distribution is not of crucial importance and probably ascending (by exchanging heavy kations for lighter ammonia ions) and sinking (after releasing ammonia and taking up food, Brockmann et al., 1977) might prevailingly account for the different vertical distribution.


(No ind . l^{-1})
50
0
A) Average cell density
Depth (m)
5
10
15
0
100
B) Vertical distribution of Noctiluca miliaris (relative concentration %)
(m)
15
10
5
C) Secchi (m)
(Forel)
10
9
8
7
6
5
4
D) Seawater colour (Forel scale)
23.4.
29.4.
4.5.
12.5.
19.5.
25.5.
1.6.
8.6.
15.6

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