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# *Interactive comment on* "Winter phytoplankton blooms in the offshore south Adriatic waters (1995–2012) regulated by hydroclimatic events: Special emphasis on the exceptional bloom of 1995" *by* Mirna Batistić et al.

**Mirna Batistić et al.**

mirna.batistic@unidu.hr

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Answers on Referee#2 comments and sugestions: 1. The most important comment is that the data on phytoplanton abundances originated from 1994 and 1995. We agree that these data are 22 years old, but they have not been published before and naturally could not be explained before due to the lack of knowledge on key environmental changes. In February 1995 we catched very unusual (for the open South Adriatic) high phytoplankton abundances. Now, in the light of the new knowledge of the hydroclimatic changes from 90 's and Bimodal Oscillating System (BiOS) as feedback mechanism



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between Ionian and Adriatic Sea, this event can be explained. Actually, winter bloom was happened at the same time when East Mediterranean Transient (EMT) was at its peak. Civitarese et al. (2010) suggested for the EMT period a local increase of primary production and autotroph biomass in the southern Adriatic and Ionian Sea. However, till now, the lack of appropriate biological and chemical observations pertinent to the EMT peak period did not allow a proper quantification of the related changes in the Mediterranean Sea. Additionally, in that time also satellite chlorophyll observation (SeaWiFS) did not exist to confirm high phytoplankton abundance during the wintertime. In general, the data on phytoplankton during winter months are very scarce for the open South Adriatic. One reason is that winter in the open South Adriatic generally has been considered a non-productive season with no significant phytoplankton abundances. Therefore, we used satellite data from the first available year 1997 and after till 2012 (presented in details with Hoevmoeller diagram, Fig. 13) in order to investigate if winter bloom in the open South Adriatic was happened only during the EMT or maybe occur regularly.

2. Discussion is long due to coupling of the physical-chemical and biological status of the South Adriatic in last two decades. This includes data collected in the fields, satellite Chl-a, and already published data both on phytoplankton and environment.

3. Methodology approach:

Preservatives: Phytoplankton samples were preserved with 2% neutralized formaldehyde solution, and analysed within one month after collection. A number of fixatives have been used in conjuction with the inverted microscope technique to enumerate phytoplankton, and no single fixation is ideal for all purposes. Formalin gave uneven results, as others preservatives, and this depends from different taxonomic group, size-fraction, dilution and storage-time, etc. (UNESCO 1976). Fixation and preservation varied even within the same genus (e.g. Chrysochromulina, sensu HÅLLFORS, G., MELVASALO, T., NIEMI, A. & VILJAMAA, H. 1979. Effect of different fixatives and preservatives on phytoplankton counts. Publications of the Water Research Institute,





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National Board of Waters, Finland, No. 34., and references therein), evidently depending upon the species in question and external conditions (e.g. temperature, salinity, etc.). Some flagellate species were well preserved, some others not at all. As with Lugol, weakly silicified diatoms tended to dissolve with time. Considering the results using formaldehyde preserved samples (see Jasprica, 2000: Pelagic Ecology Methodology, and references therein), nearly 30% of the naked flagellates and monads 2-4 micrometers in size were lost, but no loss was recorded in >5 micrometers size-fraction. The smallest differences between the preservatives were obtained during the vernal diatom bloom (HÅLLFORS et al. 1979). The fairly heavily silicified diatoms predominating in this sample were rather indifferent to the various preservatives. Finally, the most recently papers dealing with the phytoplankton in the Adriatic Basin and in wider area using formaldehid as preservative are publishing, i.e. formalin is still in wide use (e.g., Bastianini et al. ,Medit. Mar. Sci., 17/3, 2016, 751-765; Stefano Accoroni, Patricia M. Glibert, Salvatore Pichierri, Tiziana Romagnoli, Mauro Marinic and Cecilia Totti, 2015, Harmful Algae 45 (2015); 14–25, Malešević et al. 2015 Acta Bot. Croat. 74 (2), 333–343, etc.).

Nutrients: The most common method for determination of nutrients is Strickland and Parsons (1972). This was cited in our paper, but we'll also add improved method for the ammonium determination (Ivančić and Degobbis 1984) which has also been applied in our analyses (Ivancic, I., and Degobbis, D. (1984). An optimal manual procedure for ammonia analysis in natural waters by the indophenol blue method. Water Res. 18, 1143–1147. doi: 10.1016/0043-1354(84)90230-6)

Oxygen saturation (O2/O2′): We can present oxygen saturation as %, but this parameter in literature has also common been presented as fraction (e.g., 87% = 0.87). Meteorology: Met data are well described and accordingly this, figures are very informative. The most important facts for the subject are highlighted (i.e. "There were no significant cooling events important for enhanced vertical convection."), but we can explain this in some more details.

Specific comments: We did not understand what “basic” data presentation mean. Moreover, phytoplankton abundance and environmental parameters are presented in figures (5-9, 11) with all details. However, we agree that some figures are small, and this will be improved. In Fig. 13, scale will be improved. We did not understand Rev#2 question “why figures imbedded in the text”? Actually, figures are not imbedded in the text, according to journal rules.

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