

# Patchy distribution of phytoplankton pigments in South Adriatic oligotrophic environment - winter 2015

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## BACKGROUND

Chlorophylls and associated carotenoid pigments are being used to map the chemotaxonomic composition of phytoplankton in the oceans. Compared with larger eukaryotic cells, photosynthetic picoplankton possesses better nutrient uptake capabilities which result in its dominance and higher level of importance with increased oligotrophy.

## RESULTS

Pigment concentration was extremely low (chlorophyll *a* (*Chl a*) maximum concentration was 190 ngL<sup>-1</sup>) reflecting oligotrophy of the environment. Fluorescence signal was detected in depths up to 450 m, which was also confirmed by HPLC pigment analyses of *Chl a*. Beside *Chl a*, most frequently detected and in highest concentrations were: 19' hexanoyloxyfucoxanthin, fucoxanthin, 19' butanoyloxyfucoxanthin, zeaxanthin and one unidentified pigment (marked with x) (Figure 2). All pigments showed high patchiness in their spatial distribution. The unidentified pigment was detected at 500 m depth, i.e. in the layer where *Chl a* was not detected any more. Its identification is the following step in the research.

## STUDY SITE & METHODS

In order to determine spatial distribution of phytoplankton pigments in oligotrophic environment in winter conditions an oceanographic cruise was conducted in southern Adriatic from February 28<sup>th</sup> till March 3<sup>rd</sup> 2015 (Figure 1). Two major transects were investigated: (i) Dubrovnik to 1000 m isobath, and (ii) 1000 m isobath to Lastovo island. Total of 45 CTD casts was performed in order to compare bio-optical measurements of chlorophyll fluorescence (*Chl F*) with pigment concentration. A total of 117 samples were collected on the basis of CTD profile and fluorescence signal and analysed by high-performance liquid chromatography (HPLC).

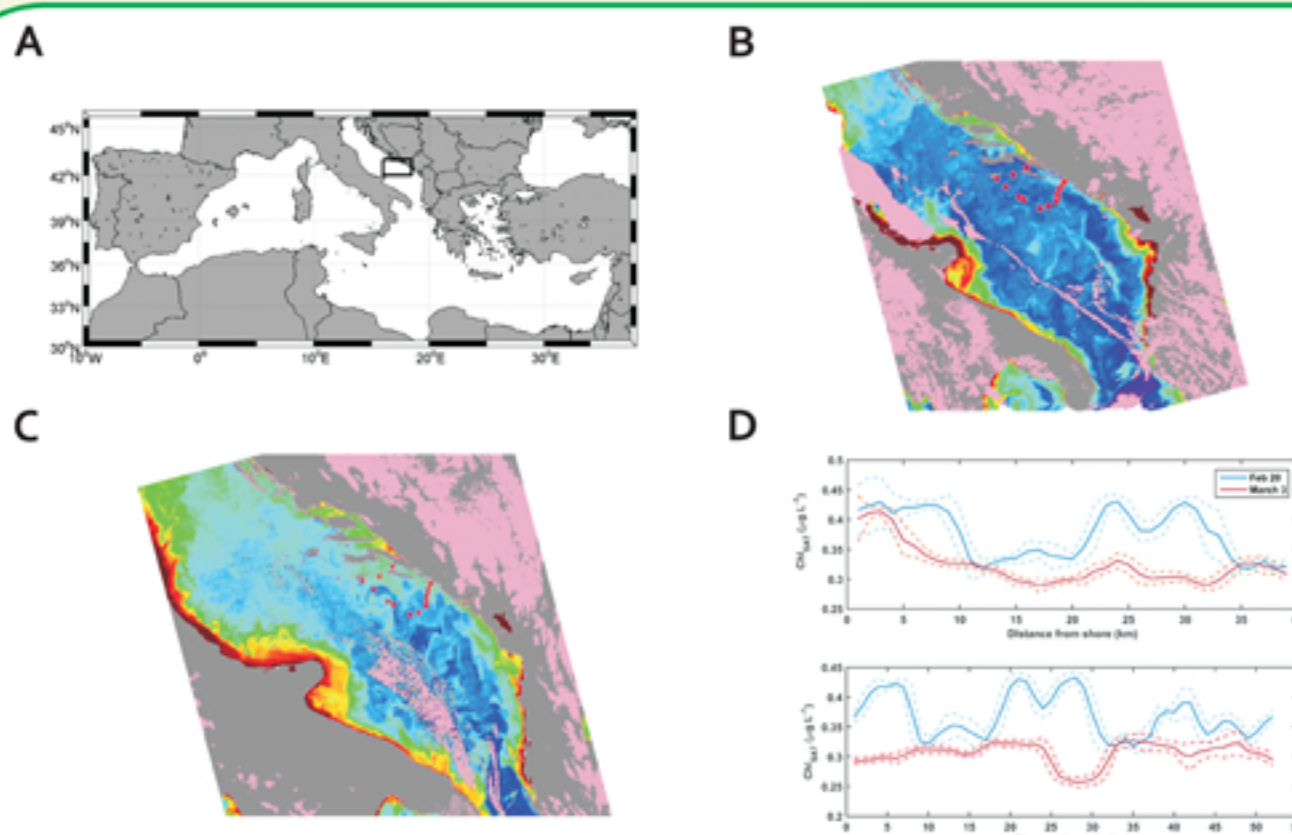


Figure 1. A) Investigated area B) Satellite image of *Chl a* distribution along investigated area on 20. February 2015 C) Satellite image of *Chl a* distribution along investigated area on 3. March 2015 D) surface Chlorophyll *a* distribution along the investigated area. High spatial patchiness can be observed, as well as a decrease in *Chl a* abundance on 3. March.

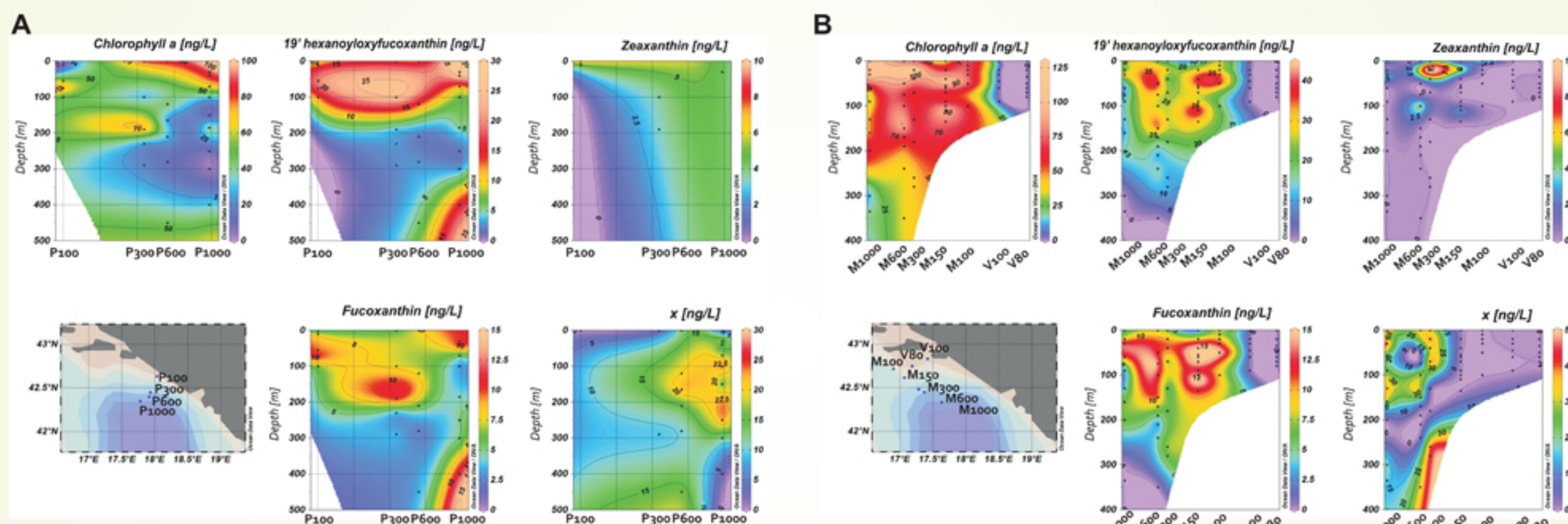


Figure 2. Spatial distribution of *Chl a* and dominant pigments along the investigated transects A) Dubrovnik to 1000 m isobath on February 28<sup>th</sup> - March 1<sup>st</sup> B) 1000 m isobath to Lastovo island on 1<sup>st</sup> - 2<sup>nd</sup> March and C) Dubrovnik to 1000 m isobath on March 3<sup>rd</sup>.

## ACKNOWLEDGMENTS

This work has been fully supported by Croatian Science Foundation under the project 6433. Authors want to thank to the captain and the crew of the RV "Naše more".