

Parallel Session 16: Ecology, Biology and Biogeography

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A year long *in situ* survey of HAB species and their respective metabolic activities in the Northern Adriatic Sea

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The Northern Adriatic (NA) is a highly dynamic marine ecosystem, in which multiple environmental stressors, particularly phosphorus limitation, shape phytoplankton communities.

A metatranscriptomic approach was used to investigate the taxonomic and functional dynamics of the NA phytoplankton community, focusing on toxic and potentially toxic species. Based on observed patterns of ecologically relevant molecular mechanisms and underlying physiological responses to environmental conditions, we unveiled contrasting life strategies and adaptations to ecological conditions. Monthly sampling from April 2021 to March 2022 was conducted at two stations, one coastal and one offshore. Metatranscriptomes were extracted from the collected samples, alongside the measurement of various environmental parameters. Analysis of annual patterns in taxonomic and functional community succession revealed an unexpected year-round dominance of dinoflagellates in terms of metabolic activity. Peaks in the metabolic activity of other studied groups aligned with the typical seasonal succession of species, as previously reported. Notably, the expected spring diatom bloom was not observed, whereas an autumn bloom dominated by *Pseudo-nitzschia* species was consistently detected.

6 *Pseudo-nitzschia* species were recorded by metatranscriptome, more than 30 toxic and potentially toxic dinoflagellates and 6 Haptophyta were found. This study provides critical new insights into the inventory of toxic species and their metabolic activities in the NA. However, the results also underscore the need for further multi-method research to fully understand the ongoing dramatic ecological changes in NA ecosystem, particularly with respect to HAB species.

Keywords: Metatranscriptomics; HABs; Phytoplankton

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