Coastal waters in the study region in the SW Portugal have high primary productivity because of the upwelling, bringing high potential for the economic expansion of bivalve aquaculture.

Harmful algal blooms (HABs) threaten aquaculture because of collection closures aimed to protect public health.

This study couples traditional microscopy with 18S/28S rRNA microarray to improve the detection of HAB species and investigates the relation between HABs and the specific oceanographic conditions in the region.

Microarray and microscopic methods allowed to detect toxic diatoms Pseudo-nitzschia and the important HAB dinoflagellates Dinophysis spp., Prorocentrum spp., Gymnodinium catenatum, Alexandrium and Azadinium and flagellates Heterosigma akashiwo, Prymnesium spp., Pseudochattonella spp., and Chloromorum toxicum.

Pseudo-nitzschia spp. caused the risk of ASP during spring and summer upwelling season, and dinoflagellates caused the risk of DSP and PSP during upwelling relaxation periods in late summer and autumn.

Abstract

Coastal waters in the study region in the SW Portugal have high primary productivity because of the upwelling, bringing high potential for the economic expansion of bivalve aquaculture

Harmful algal blooms (HABs) threaten aquaculture because of collection closures aimed to protect public health

This study couples traditional microscopy with 18S/28S rRNA microarray to improve the detection of HAB species and investigates the relation between HABs and the specific oceanographic conditions in the region

Microarray and microscopic methods allowed to detect toxic diatoms Pseudo-nitzschia and the important HAB dinoflagellates Dinophysis spp., Prorocentrum spp., Gymnodinium catenatum, Alexandrium and Azadinium and flagellates Heterosigma akashiwo, Prymnesium spp., Pseudochattonella spp., and Chloromorum toxicum

Pseudo-nitzschia spp. caused the risk of ASP during spring and summer upwelling season, and dinoflagellates caused the risk of DSP and PSP during upwelling relaxation periods in late summer and autumn.

Results and conclusions

Oceanographic conditions in which HABs tend to develop in the study area occur in two situations: first, usually during spring and summer, blooms of diatoms are associated with upwelling, these blooms often contain by Pseudo-nitzschia and bring ASP risk; second, during upwelling relaxation, high diversity of HAB dinoflagellates responsible for DSP and PSP can develop, even over relatively short breaks of 5 – 10 days that often interrupt the upwelling during the warm period of the year (May – October).

Acknowledgements

Authors acknowledge the financial support by: FCT Grant UIDP00330/2020 CIMA, EC Erasmus Mundus MACOMA, EU FP7 DEVOTES project (n\°308392), EU FP7 AquaUsers (n\°607325), Horizon 2020 AquaSpace (n\°633476), Horizon 2020 Ceres (n\°678193), and Horizon 2020 GAIN (n\°773335), Future Earth Coasts.

Reference

Danenko, S., 1,2, Fragoso, B.D.D., 1,2,3, Icely, J.D., 3,1, Guillebault, D., 4, Berzano, M., 5, Newton, A., 1,6

Harmful phytoplankton diversity and dynamics in an upwelling region (Sagres, SW Portugal) revealed by ribosomal RNA microarray combined with microscopy

Danchenko, S., Fragoso, B.D.D., Icely, J.D., Guillebault, D., Berzano, M., Newton, A.

1. CIMA, FCT, University of Algarve, ed. 7, Campus de Gambelas, Faro 8005–139, Portugal
2. Facultad de Ciencias del Mar y Ambientales, University of Cádiz, Polígono San Pedro, Puerto Real, 11519, Cádiz, Spain
3. Sagresmarço - Vivenres de Marisco Lda, Apartado 21, 8650-999 Vila do Bispo, Portugal
4. Microbia Environnement, Laboratoire Oceanographique de Banyuls-sur-Mer, France
5. Politecnico University of Marche, P. Roma 22, 60121 Ancona, Italy
6. NILU-IPECOM PO Box 100, 2027 KJELLER, Norway

© Fundação para a Ciência e a Tecnologia - 2020

Santos do Mar e do Arco