Geophysical Research Abstracts
Vol. 19, EGU2017-19599, 2017
EGU General Assembly 2017

Effects of temperature on growth and lipid synthesis of diatom Chaetoceros Curvisetus and the Northern Adriatic (Mediteranean) plankton community

Tihana Novak (1), Blaženka Gašparović (1), Jelena Godrijan (1), Daniela Maric (2), Tamara Djakovac (2), and Marina Mlakar (1)

(1) Division for Marine and Environmental Research, Ruđer Bošković Institute, POB 180, HR–10002 Zagreb, Croatia, (2) Center for Marine Research (CMR), Ruđer Bošković Institute, G. Paliaga 5, 52210 Rovinj, Croatia

Phytoplankton is the major primary producer in the world. Marine phytoplankton lives in a rather changing environment, with variations in temperature, light, salinity, nutrient availability, etc. In such changing environment phytoplankton should live, grow and reproduce, and, in order to achieve that, they fix carbon and nutrients to produce biomolecules (lipids, proteins and carbohydrates). Lipids are a good indicator of organic matter (OM) processes in the seas and oceans, also good bioindicators for OM origin, and phytoplankton adaptations to environmental stress. Marine lipids are produced by organisms, mostly in phototrophic part of the seas and oceans, and their crucial producer is phytoplankton.
We were interested to see how the increasing temperature and different nutrient availability affect quantitative and qualitative lipid and lipid classes production by plankton community. To test how marine phytoplankton would respond to predicted increasing temperature we conducted monoculture batch experiments in laboratory on model diatom Chaetoceros curvisetus at five different temperatures from 10 to 30[U+F0B0]C. Also we conducted experiments in phosphorous replete and deplete conditions mimicking eutrophic and oligotrophic marine conditions. We have chosen Chaetoceros curvisetus as a model culture since it is a major component of Northern Adriatic (NA) phytoplankton, but also Chaetoceros genus of diatoms is most abundant in wide range of marine ecosystems. We also conducted annual sampling of the NA particulate matter that covers the same temperature range as for the batch experiments. NA samples were taken on two stations with different nutrient supply that were characterized as oligotrophic and mesotrophic stations. Samples were taken from 2013 to 2014 on a monthly basis. Lipid classes were characterized with thin–layer chromatography–flame ionization detection. Data are supported by particulate organic carbon (POC), chlorophyll a (Chl a) concentrations and phytoplankton taxonomy and cell abundances.