



Carbon monoxide and non-methane hydrocarbons emissions by phytoplankton: preliminary results from laboratory experiments

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Carbon monoxide (CO) and non-methane hydrocarbons (NMHC) are naturally produced from the ocean surface and this oceanic source, which can have an impact on the remote atmospheric chemistry must be better quantified. Particularly, recent atmospheric measurements over the open ocean have suggested a very large spatial variability of alkenes mixing ratios due to plankton emissions. Detailed studies based on relationship between emission rates and biological parameters are consequently needed.

For this aim, in the framework of the European project OOMPH, laboratory experiments have been conducted in Kiel (Germany) in January 2006. One objective of this experiment was to characterize CO and NMHC emitted by selected monocultures of phytoplankton and to evaluate their corresponding emitted amounts. Ten monocultures, including diatoms, coccolithophorids, chlorophyceae and cyanobacteria have been characterized. This was done by following the CO and VOCs variations from monoculture aliquots during one or two complete diurnal cycles. For control purposes culture medium were as well monitored. In the experimental set up, compressed zero air filtered for CO and NMHC was used to flush the headspace of the flask; the corre-

sponding mixing ratios of CO and NMHC were monitored in-situ. CO measurements were performed every five minutes with an adapted chromatograph equipped with a mercuric oxide reduction detector. Hydrocarbons (from C₂ to C₁₂) were measured every 30 minutes with two gas chromatographs equipped with ion-flame detectors.

Preliminary results of this experiment are presented here, detailing, for each studied plankton species, the emitted compounds, the amplitude of these emissions (normalized to the chlorophyll concentration) and the light dependency of these emissions.