Determination of organic matter in oceanic water samples and the corresponding marine aerosol

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Marine aerosols contain, besides sea salt, a significant amount of organic material. Recent investigations suggest that the organic content of marine aerosols is strongly connected to the biological activities of the ocean. To study the interaction processes a detailed chemical investigation regarding organic material of the oceanic water and atmospheric phase above the ocean is mandatory.

Our first chemical analyses included the determination of organic sum parameters (dissolved organic carbon and total dissolved nitrogen) in seawater samples and marine aerosol from the Cape Verdes at a time of expected high biological activity in spring 2011. Concentrations of organic sum parameters in the sea surface microlayer – the direct boundary layer between ocean and atmosphere were on average 1.5 mg L^{-1} (DOC) and 0.3 mg L^{-1} (TDN) showing a 2-3 fold enrichment compared to the corresponding bulk water. The average concentration of DOC in marine aerosols was 0.2 µg m^{-3} (DOC) and 0.04 µg m^{-3} (TDN) and accounted for 4% of the particle mass.

Further combinations of the organic compounds in seawater and marine aerosols as well as the determination of single organic species in both compartments will help to reveal the connection of organic matter between the oceans and the atmosphere.