Geophysical Research Abstracts
Vol. 18, EGU2016-14209, 2016
EGU General Assembly 2016

The contribution of bioaerosols to the organic carbon mass of the atmosphere

Stelios Myriokefalitakis, George Fanourgakis, and Maria Kanakidou

University of Crete, Environmental Chemical Processes Laboratory, Department of Chemistry, Heraklion, Greece (stelios@uoc.gr ; mariak@uoc.gr)

The atmospheric cycle of Primary Biogenic Aerosol Particles (PBAPs) is here parameterized in a state-of-the-art global 3-D chemistry-transport model (TM4-ECPL) by taking into account their primary emissions as well as their chemical aging during the long-range transport in the atmosphere. PBAPs, commonly known also as bioaerosols, are airborne particles that can carry micro-organisms and they dominate the aerosol mass over remote forest regions. Bioaerosols include mainly bacteria, fungi spores and pollen, as well as viruses, other microorganisms, or even leaf debris. For the present study, we explicitly account for emissions of bacteria, fungi spores and pollen to the atmosphere, using different ecosystems to parameterize their respective flux rates as well as meteorological parameters to account for their seasonal variation. Changes in the solubility of bioaerosols via atmospheric oxidation during their atmospheric cycle as parameterized in the model affect their physical properties and substantially their atmospheric lifetime. Model results are compared with available observations to constrain the PBAPs contribution to the aerosol organic mass. Uncertainties are further discussed based on model simulations. This work has been supported by the European FP7 collaborative project BACCHUS (Impact of Biogenic versus Anthropogenic emissions on Clouds and Climate: towards a Holistic UnderStanding).