

Interactive comment on “Microbiology and atmospheric processes: an upcoming era of research on bio-meteorology” by C. E. Morris et al.

Anonymous Referee #2

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This status/perspective article addresses a number of issues and future research needs relating to the role that airborne micro-organisms play in atmospheric processes, i.e., atmospheric chemistry, cloud formation and radiative forcing. As the authors state, it will indeed be a challenge to make progress in defining this role and require multidisciplinary efforts. Atmospheric scientists are already fully convinced that the vegetation plays an important role in atmospheric processes and start to become aware that micro-organisms are also important in biosphere-atmosphere interactions. The article provides an up-to-date account of research activities in the field of aerobiology. It reads fluently and will definitely be of interest to a wide readership of the biogeosciences community.

Specific comments/thoughts:

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Page 194-line 14: Additional thought: On the other hand, condensation of polar oxygenated organic compounds formed by photooxidation of biogenic plant emissions onto the surface of biological particles can render these particles hydrophilic and enhance their capacity to act as cloud condensation nuclei.

Page 202-line 27: In addition, there is also evidence that fungal material can be present as small fragments, likely disrupted spores, in atmospheric aerosol. Analysis of mannitol, a marker of fungal spores, in size-segregated aerosol samples collected from the Amazon during a 2002 biomass burning experiment, indicates that fungal material peaks in the coarse size mode, as expected, but also has a tail into the fine size fraction, especially during the wet season (Fuzzi et al., 2007). Fuzzi S et al., Overview of the inorganic and organic composition of size-segregated aerosol in Rondonia, Brazil, from the biomass-burning period to the onset of the wet season, *J. Geophys. Res.* 112(D1), D01201 (2007); doi:10.1029/2005JD006741.

Page 203-line 25: As stated by the authors, a better understanding is needed on the physico-chemical properties of airborne micro-organisms. Another unresolved question, for example, is their capacity to act as cloud condensation nuclei. Physico-chemical approaches are now available to test cloud condensation nuclei properties of airborne aerosol (e.g., Roberts and Nenes, 2005). It would be worthwhile to test airborne micro-organisms with this approach and confirm their potential cloud condensation nuclei effects. Roberts GC and Nenes A, A continuous-flow stream-like thermal gradient CCN chamber for atmospheric measurements, *Aerosol Sci. Technol.* 39, 206-221 (2005).

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