

## ***Interactive comment on “Microbiology and atmospheric processes: chemical interactions of Primary Biological Aerosols” by L. Deguillaume et al.***

**L. Deguillaume et al.**

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We would like to thank you very much for your critical notes, useful remarks and advices with respect to the contents of our paper. Some of our responses here are redundant with our responses to the other review of referees 1 and 2 but are repeated for completeness.

*“Section 2 provides a somewhat confusing description of the contribution of PBA to aerosol chemistry and to aerosol-cloud interactions. The confusion comes from an unclear distinction between A) viable organisms capable of metabolic reactions which can involve atmospheric organic compounds and oxidants, B) biological particles including alive or dead cells and cell fragments, capable of nucleating cloud droplets and*

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*ice particles via physical processes, C) any kind of organic substances deriving from biomolecules, and contributing to aerosol mass."*

For more clarity, the introduction has been completed following the above distinction. The following paragraph has been added in Section 1:

"PBA are ubiquitous in the atmosphere (Gregory, 1961). They can be viable organisms capable of metabolic reactions which can involve atmospheric organic compounds and oxidants (airborne micro-organisms) (Ariya and Amyot, 2004; Sun and Ariya, 2006). They also comprise either biological particles including alive, dead cells and cell fragments, capable of nucleating cloud droplets and ice particles via physical processes (Möhler et al., 2007; this issue) or any kind of organic substances deriving from biomolecules and contributing to aerosol masses."

*"All discussion in section 2 should refocus on the processes for which a specific role of PBA has been proved (e.g., as ice nuclei), as well as on processes less-known but plausible based on some background information."*

Section 2 is devoted to the description of sources and abundance of PBA in aerosols and clouds while Section 4 focuses on processes and more particularly INA activity with regards to chemical interactions of PBA. PBA physical properties are rather described in a complementary article from Möhler et al., this special issue. We also agree that the Section 2 provided a confusing description of PBA to aerosol chemistry and this has been totally rewritten in order to improve its clarity.

*"The sentence in Section 5 about how PBA would alter the CCN properties of (small) particles upon contact/collision is obscure to me, because the products of coagulation of any particles with PBA will be good CCN just because of their size."*

Following the above comment, the previous question "Does the modification of chemical composition of organic aerosols due to contact/collision with bioaerosols along with particle size and density significantly influence their CCN efficiency?" has been

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replaced by: "How much does the modification of chemical composition of organic aerosols due to contact/collision with PBA along with particle size and density significantly increase their CCN efficiency ?"

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Interactive comment on Biogeosciences Discuss., 5, 841, 2008.

**BGD**

5, S313–S315, 2008

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