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Discussions

Interactive comment on "Potential relevance of Mortierella alpina as a source of ice nucleating particles in soil" *by* Franz Conen and Mikhail V. Yakutin

C. Morris (Referee)

cindy.morris@avignon.inra.fr

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GENERAL REMARKS

This concise manuscript cuts to the chase with regard to the question of what organisms contribute to the INPs active at temperatures above -10°C in the soil. The methods are based on the recently described chemical and heat sensitivities of the INPs produced by the fungus Mortierella alpina. The authors evaluate the part of the INPs of biological origin in various soils that correspond to these traits.

As the authors explain, INPs produced by M. alpina can be washed away from

mycelium and nevertheless maintain ice catalyzing activity. Therefore, the INPs could move around independently from the fungal tissues (spores or mycelium). This raises the possibility that soils could contain INPs produced by M. alpina without any other traces (e.g. DNA) of the fungus that could be used to validate co-occurrence of the fungus and its INPs.

The weakness of the approach used here is the lack of knowledge of the diversity of microorganisms that can produce INPs in soil. This is not the fault of the authors. Nevertheless, in light of the unexpected discoveries that can happen in this growing field, I think that it is short-sighted to assign this activity to any particular microorganism without some other type of validation.

I think that the authors could choose several strategies to valorize their results. On the one hand they could present this work as a sort of opinion-paper on how this question could be approached. In that case they should change the title to indicate that this is a manuscript about methods, they should change the name of the INPs that they are detecting (do not use the "M. alpina-like" subscript) and then add on discussion about the complementary experimental approaches that would provide additional corroborative data on the importance of M. alpina as the sources of these INPs. On the other hand, they could do additional experiments to provide these supplementary corroborative data and include them in a more comprehensive analysis of the underlying question. Other experimental approaches could include seeding soil with increasing quantities of M. alpina and testing for the presence of the fungus with DNA technologies in addition to characterizing the INPs in the soil. It would be strange for the fungus to be universally absent in soils where there are INPs with the traits the authors have targeted if this fungus is, indeed, at the origin of the INPs.

SPECIFIC REMARKS Please use italics when writing the latin name of the fungus.

p. 2, L 30 : Put "The" at the beginning of the sentence ("The latter. . . ")

p. 2, L 32: Add "the" to make the phrase "below the detection limit ".

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