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Interactive comment on "Spores of most common airborne fungi reveal no ice nucleation activity" *by* B. G. Pummer et al.

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We expanded the introductory part (see p.2/L.25 – 31): "Jayaweera and Flanagan (1982) found appreciable IN activity in Penicillium digitatum and Cladosporium herbarum. Only very recently, ice nuclei were found in other fungal species, namely Isaria farinosa and Acremonium implicatum (Huffman et al., 2013), as well as in some rust and smut fungi (Morris et al., 2013, Haga et al., 2013). First tests showed that they strongly differ from the bacterial and Fusarium ones. For example, the rust fungi show properties of polysaccharide compounds (Morris et al., 2013)."

We added two more paragraphs to indicate the importance of further investigation of fungi (p.9/L.29 – p.10/L.5 and p.10/L.13 – 21).

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"According to our results, fungal ice nucleation seems to be an exclusive property restricted to only a few species. As stated in chapter 3.2., the found results have to be taken with care for a general statement. Therefore, further investigations with a broad spectrum of species, as well as studies with different methods, are necessary to confirm this hypothesis. Nevertheless, this study shows that the ice nucleus present in the F. avenaceum strain is unique among our samples. This makes sense, if we consider the assumed reasons for the existence of biological ice nuclei"

"Although it seems that the vast majoritiy of fungal strains and species that exist reveal no or only very poor IN activity, findings of new IN-active fungi do occur (Huffman et al., 2013, Morris et al., 2013, Haga et al., 2013). The broad spectrum of uninvestigated and unknown species – according to current estimations, there might be more than a million fungal species on the planet – harbors a vast potential for IN activity, even if only a tiny fraction of them can express ice nuclei. Therefore further investigations of fungi will be necessary in the future. Morris et al. (2013) followed the approach of focussing on species with a lifecycle in which ice formation might be advantageous for the fungus. This approach is consistent with what is known about the IN-active bacteria, lichen and Fusarium species."

We added "mycobionts" on p.2/L.17 to clarify that it is the fungus which is active.

We rewrote the sentence: "According to recent studies, about 56% of the species present among the fungal spores in the atmosphere are Agaricomycetes (Fröhlich-Nowoisky et al., 2009)."

It was important to us to demonstrate that the IN activity is also present on the spores. The mycelium samples in past studies surely contained spores, however, it was not clear from these measurements, if the IN were present only in the mycelium, or also on the spores. Our intention was to determine a potential IN activity of spores alone (e.g. due to their surface chemistry and topology). Since the known fungal IN molecules are highly mobile, it is clear that they will be distributed across the whole fungal tissue, so it

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makes no difference, if we measure spores or mycelium. However, it is still of interest, if the spores can be indeed IN carriers, or – if these molecules are absent – the spore surface itself shows some IN activity.

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