

Publication

Soils rich in biological ice-nucleating particles abound in ice-nucleating macromolecules likely produced by fungi

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Soil organic matter carries ice-nucleating particles (INPs) the origin of which is hard to define and that are active at slight supercooling. The discovery and characterization of INPs produced by the widespread soil fungus *Mortierella alpina* permits a more targeted investigation of the likely origin of INPs in soils. We searched for INPs with characteristics similar to those reported for *M. alpina* in 20 soil samples from four areas in the northern midlatitudes and one area in the tropics. In the 15 samples where we could detect such INPs, they constituted between 1 and 94% (median 11 %) of all INPs active at - 10 degrees C or warmer (INP 10) associated with soil particles <5 μ m. Their concentration increased overproportionately with the concentration of INP 10 in soil and seems to be greater in colder climates. Large regional differences and prevalently high concentrations allow us to make inferences regarding their potential role in the atmosphere and the soil.

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