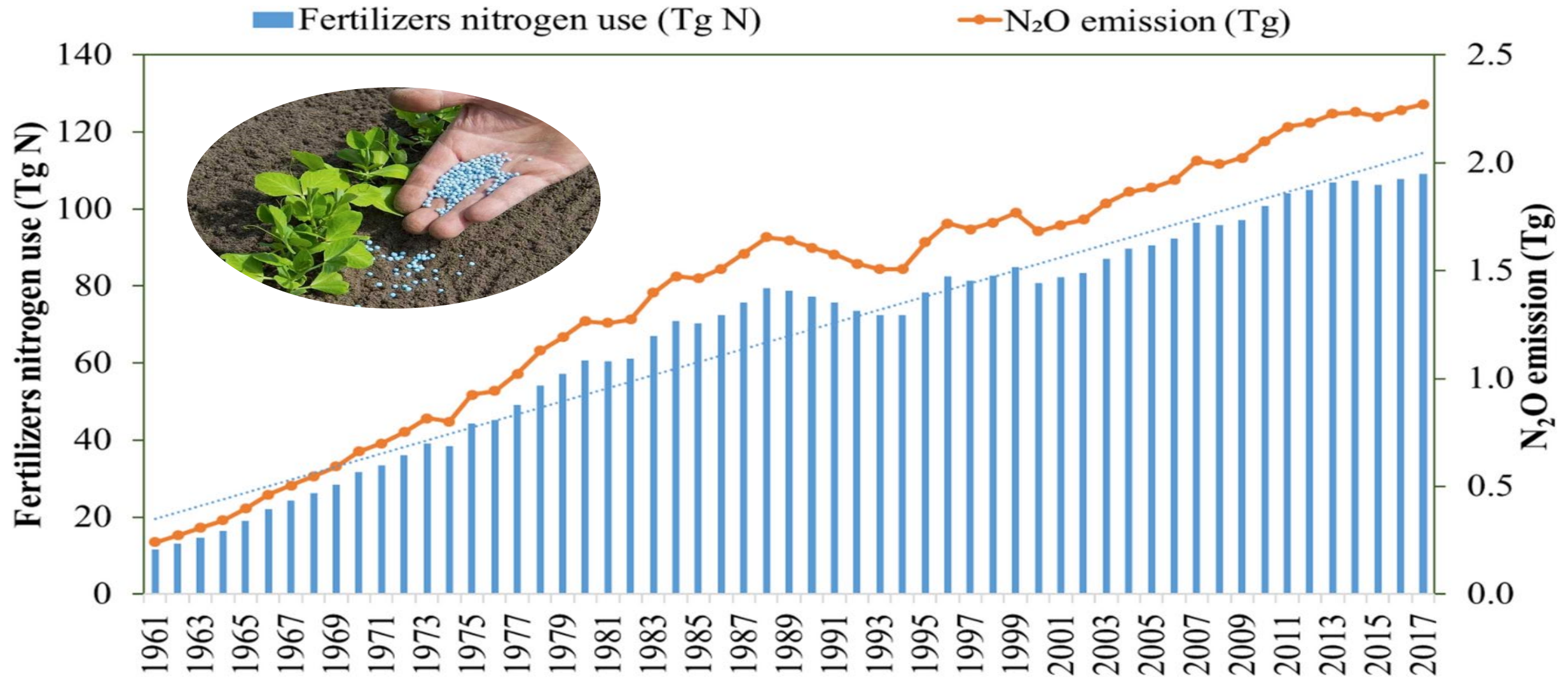


Linking microbial guild abundance with soil N₂O emission: Dilemmas in bridging lab and field studies

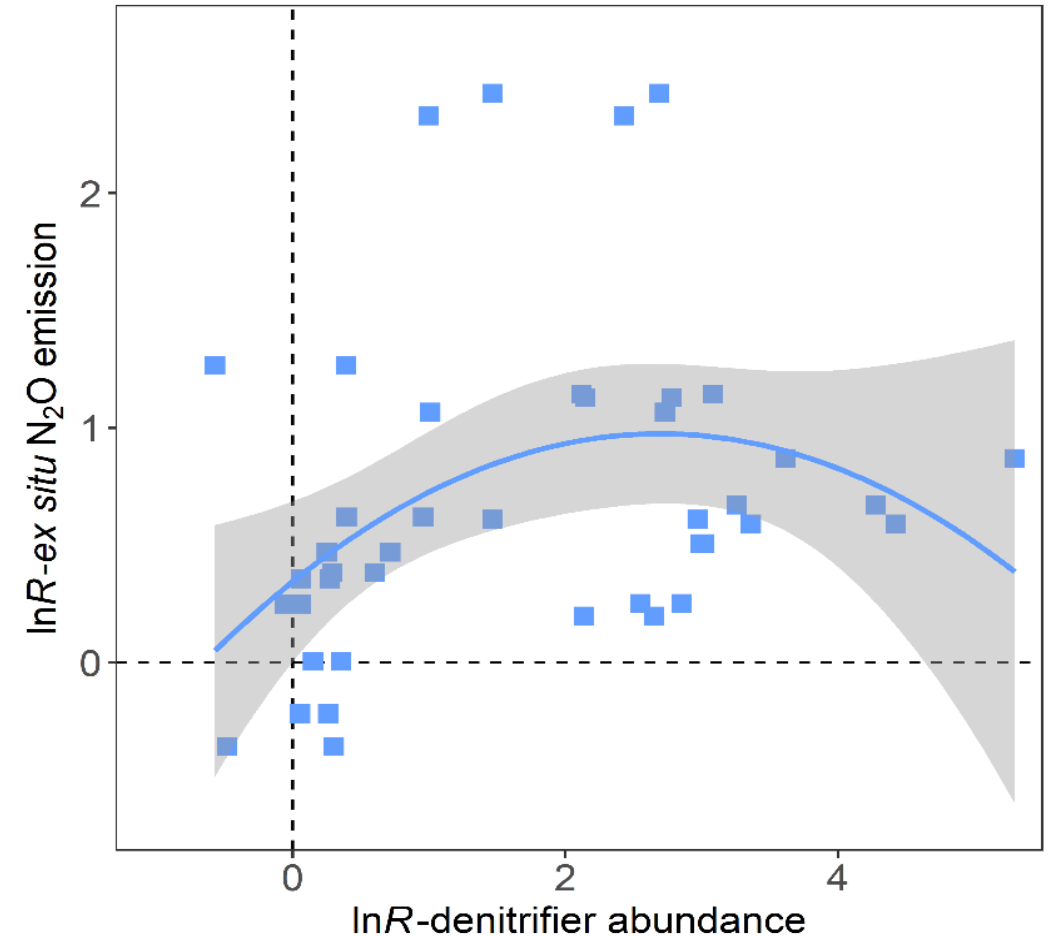
Ji Chen, Tenure Track, Aarhus University
Marie Sklodowska Curie Fellow

Increased soil N₂O emission due to N loading



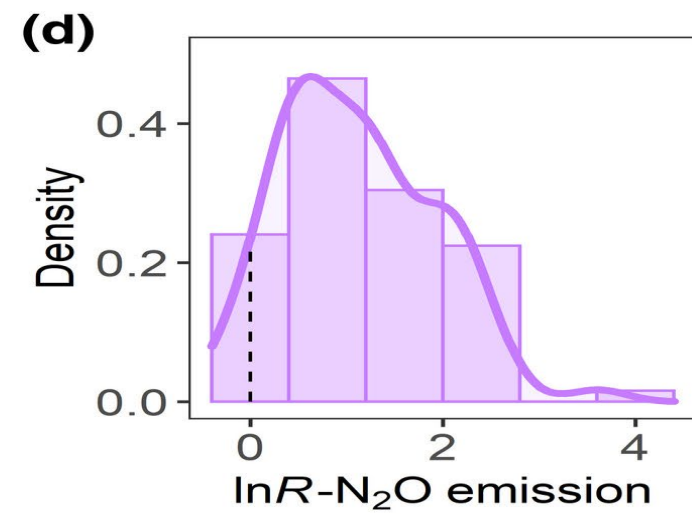
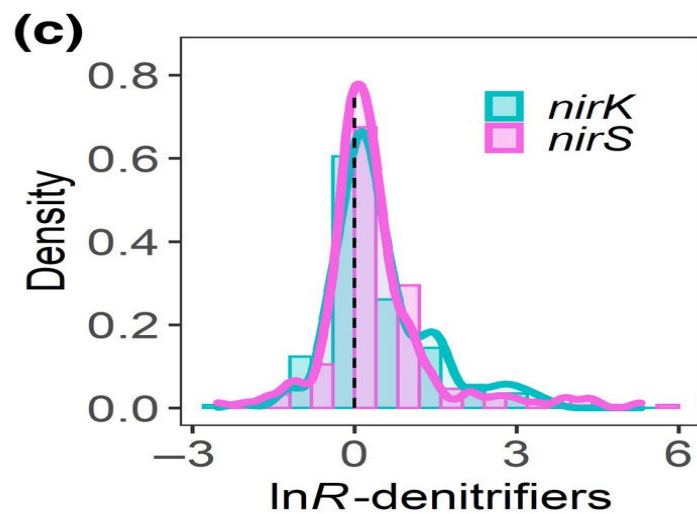
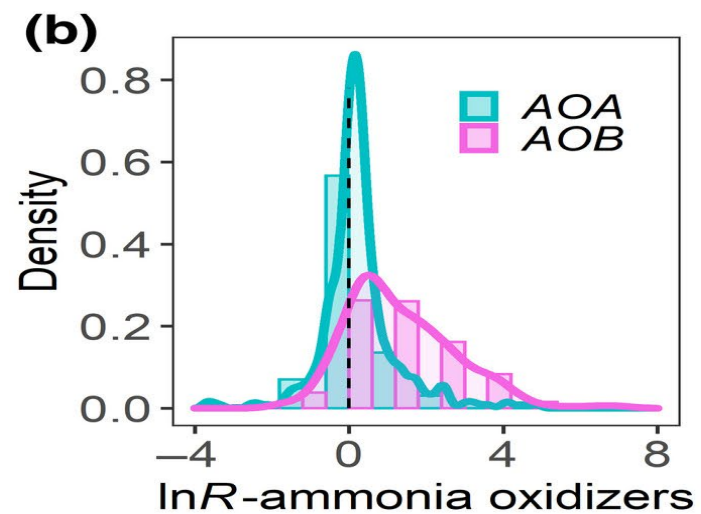
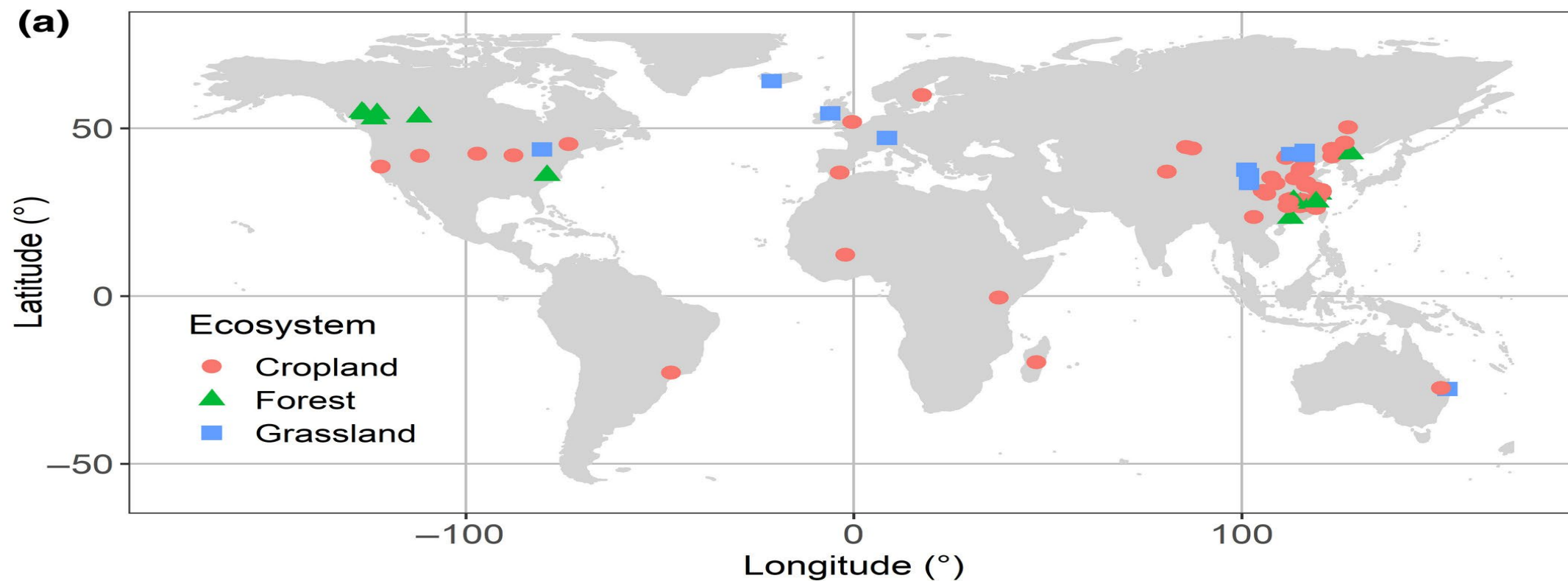
Ammonia oxidizers and denitrifiers are the main producers of N_2O emission

Direct relationships between them are observed from laboratory-based studies.

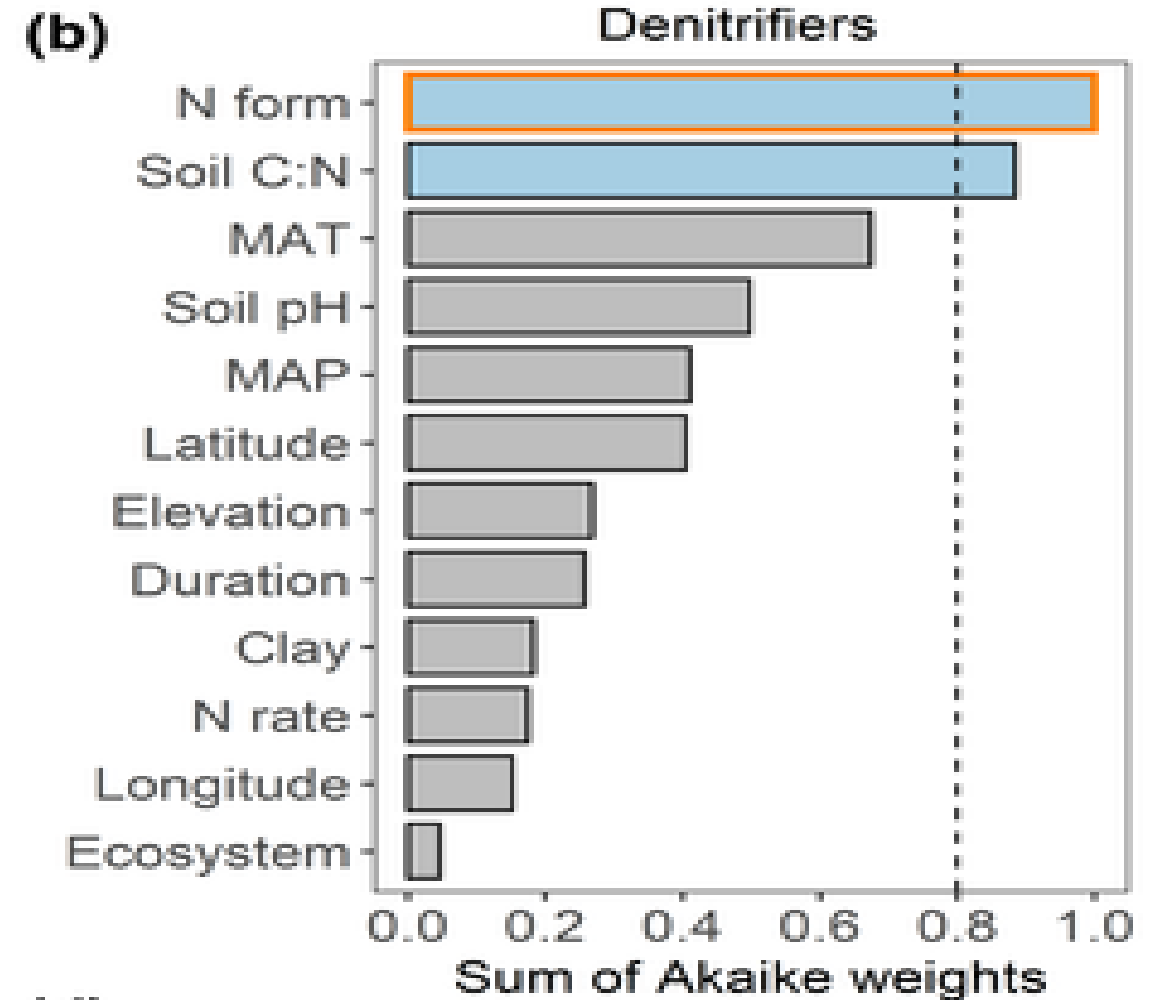
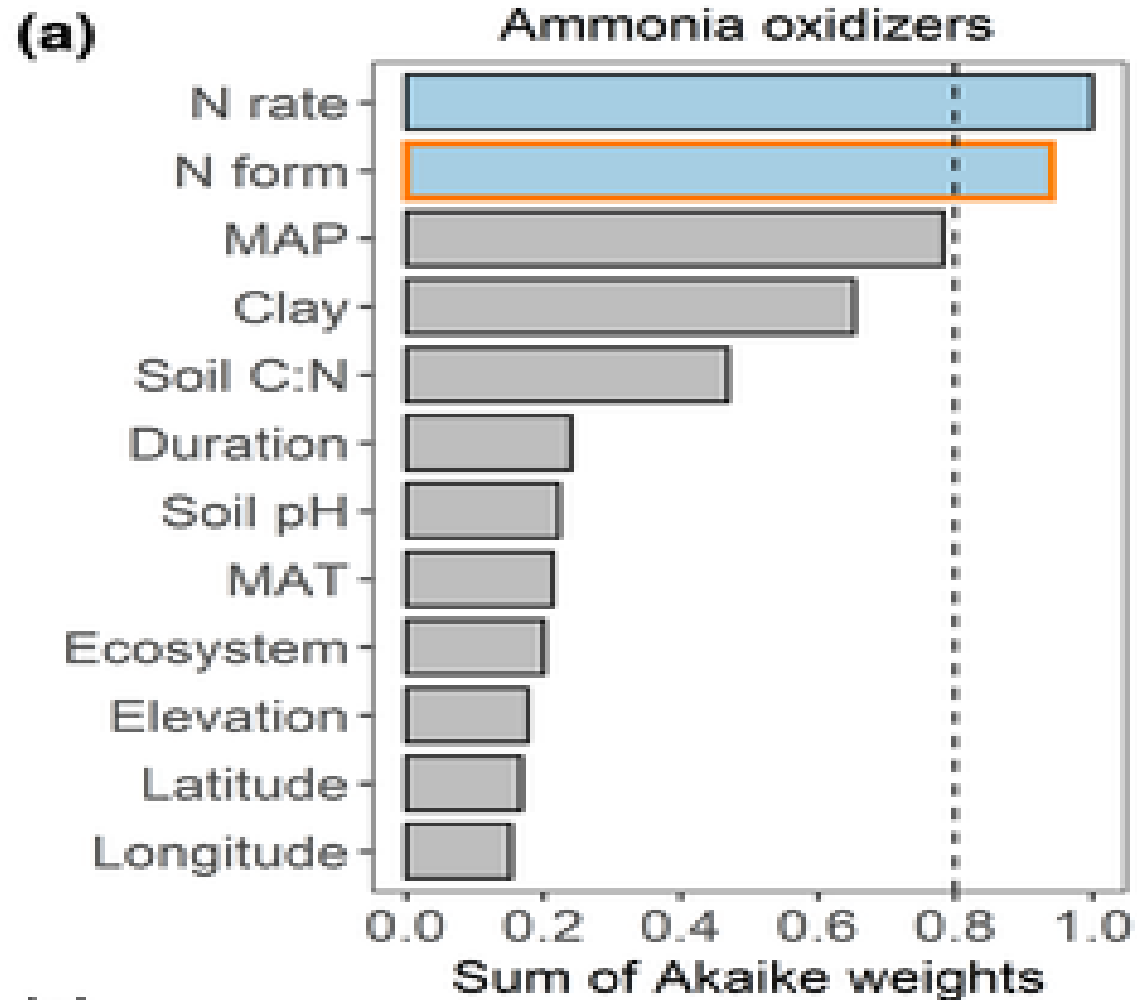


Questions

1. What are the **key factors** regulating the *in situ* effects of N loading on microbial guild abundance and soil N₂O emission?
2. Are there some **links** between them?

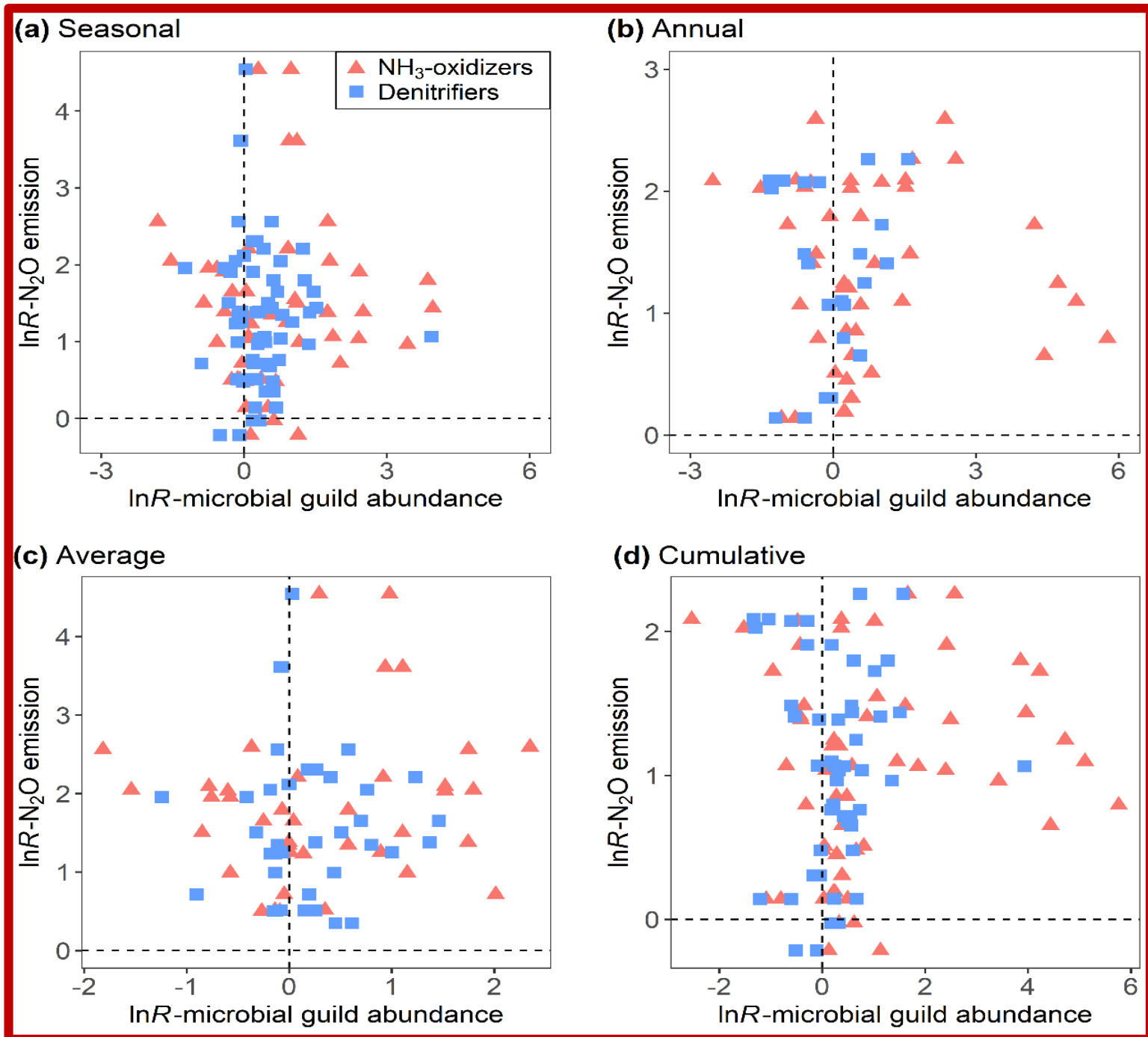


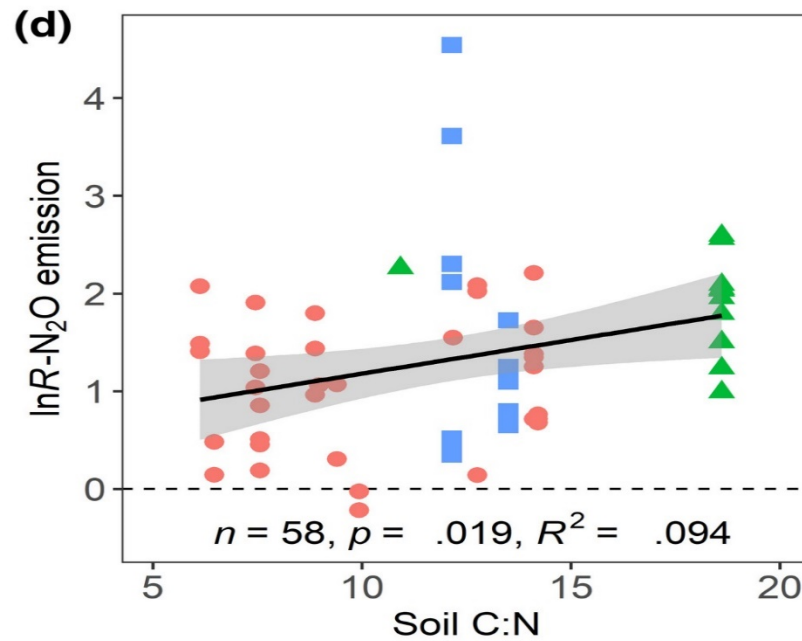
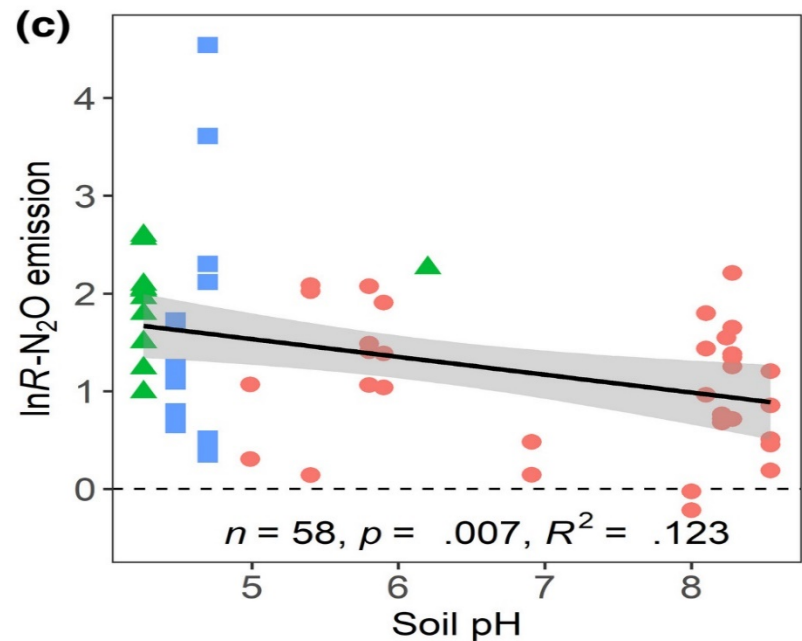
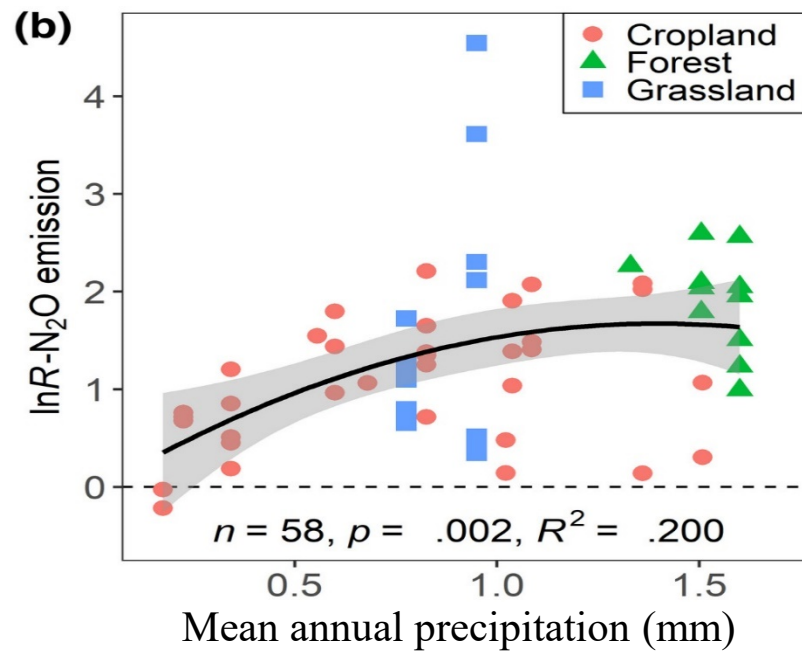
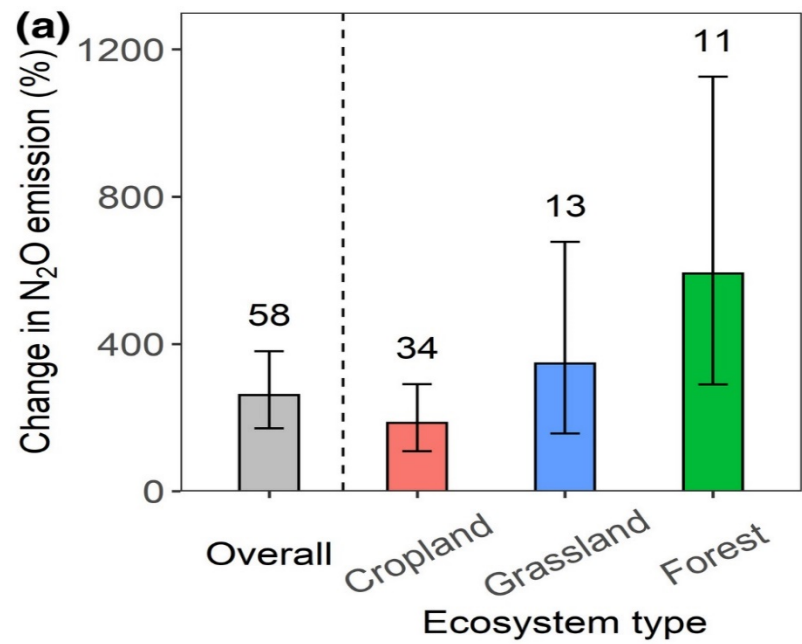
Key factors



Unexpected...

No relationship for
globally field-based
studies.

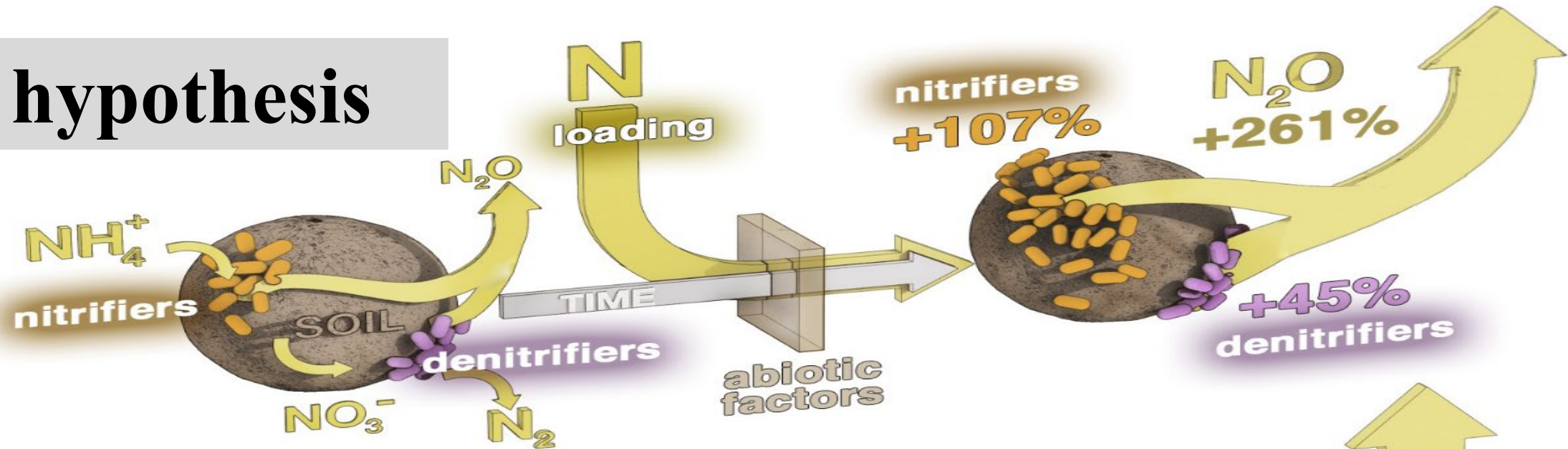




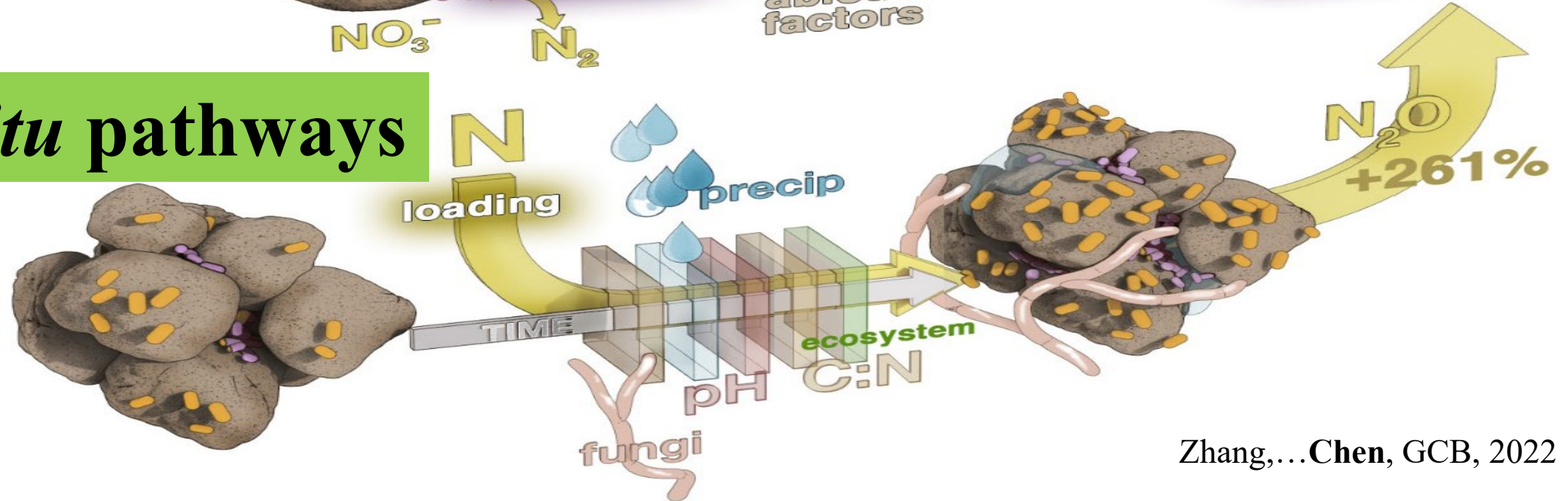
Several key abiotic factors can help explain the N-induced changes in *in situ* soil N₂O emission

Hypothesis on the environmental filters






Lab hypothesis



In situ pathways





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Stimulation of ammonia oxidizer and denitrifier abundances by nitrogen loading: Poor predictability for increased soil N₂O emission

Yong Zhang, Feng Zhang✉, Diego Abalos, Yiqi Luo, Dafeng Hui, Bruce A. Hungate, Pablo García-Palacios, Yakov Kuzyakov, Jørgen Eivind Olesen, Uffe Jørgensen, Ji Chen✉

1 Institute of Agricultural and Fisheries Science, University of Aberdeen, Aberdeen, UK

Caution is required when scaling up results from laboratory and field studies to modelling predictions

Challenges in upscaling laboratory studies in soil microbiology to ecosystems

Chen et al., under revision



Global Change Biology

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Thank you very much!