

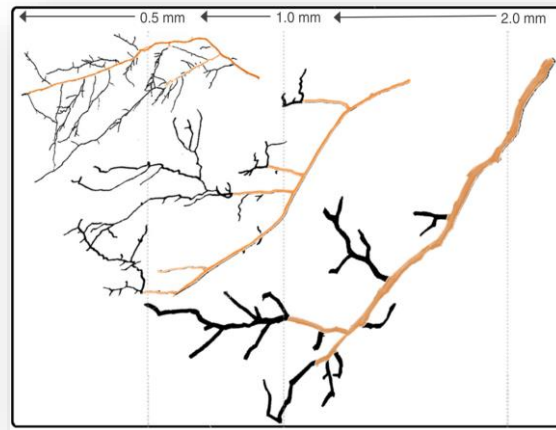
Long-term soil warming alters fine root dynamics and morphology, and their ectomycorrhizal fungal community in a temperate forest soil

Steve Kwatcho Kengdo, Derek Peršoh, Andreas Schindlbacher, Jakob Heinzle, Ye Tian, Wolfgang Wanek, Werner Borken



Motivation

Fine roots: $\varnothing < 2 \text{ mm}$



Mc Cormack et al. 2015

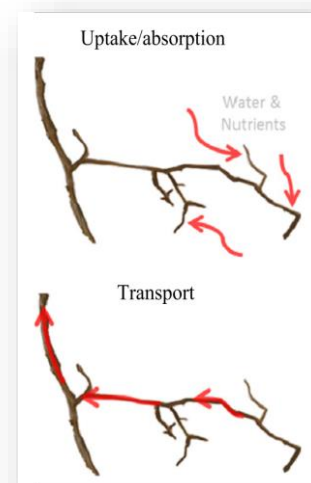


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Weiss M. (1988)

Water and nutrients uptake



Mc Cormack et al. 2015

Does soil warming affect the fine root system of forest trees?

Hypotheses

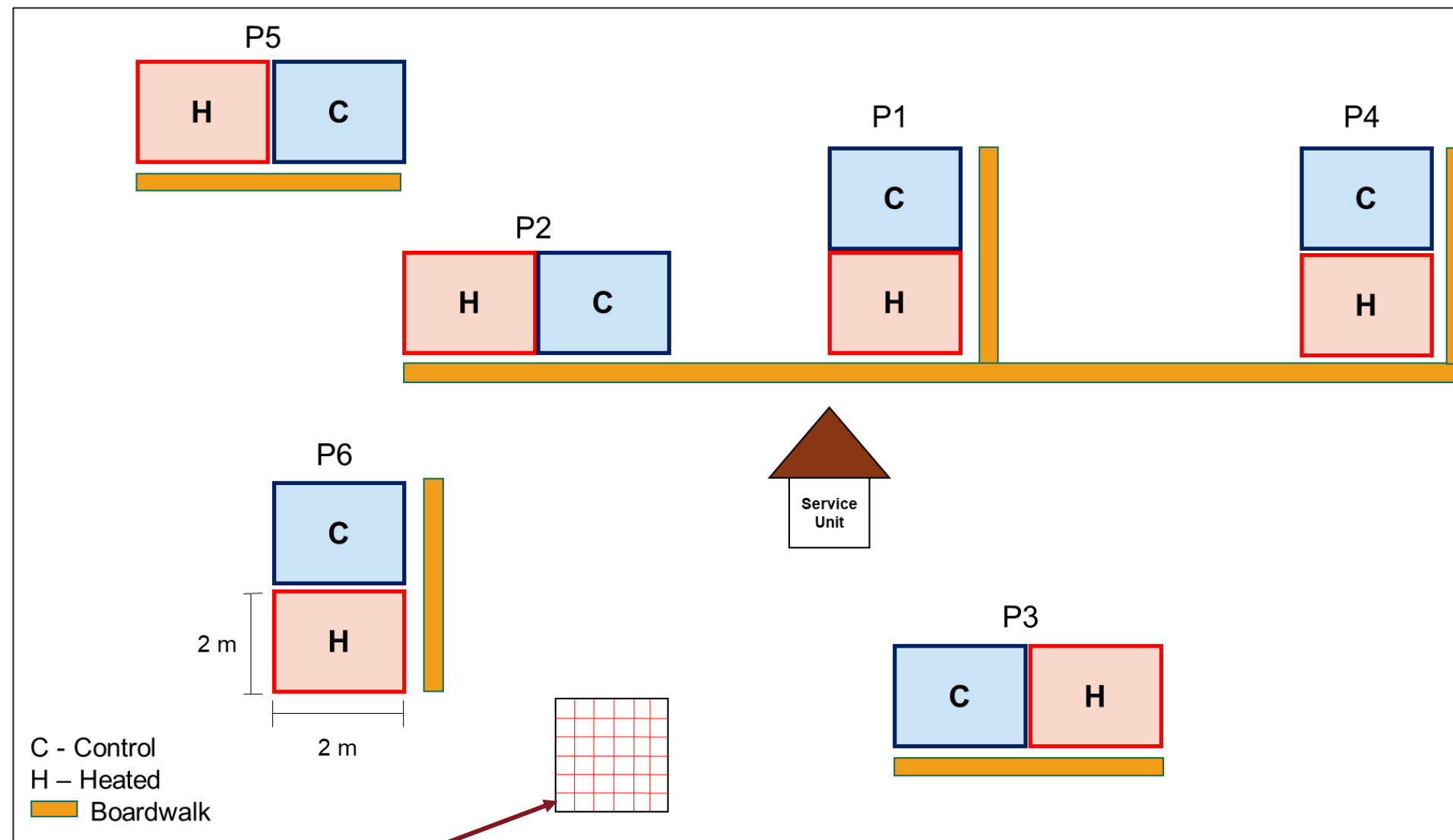
Soil warming:

H1: increases fine root biomass

H2: increases the absorptive capacity of fine roots

H3: changes the ectomycorrhizal fungal community

Soil warming experiment at Achenkirch, Tyrol, Austria (2004 - present)

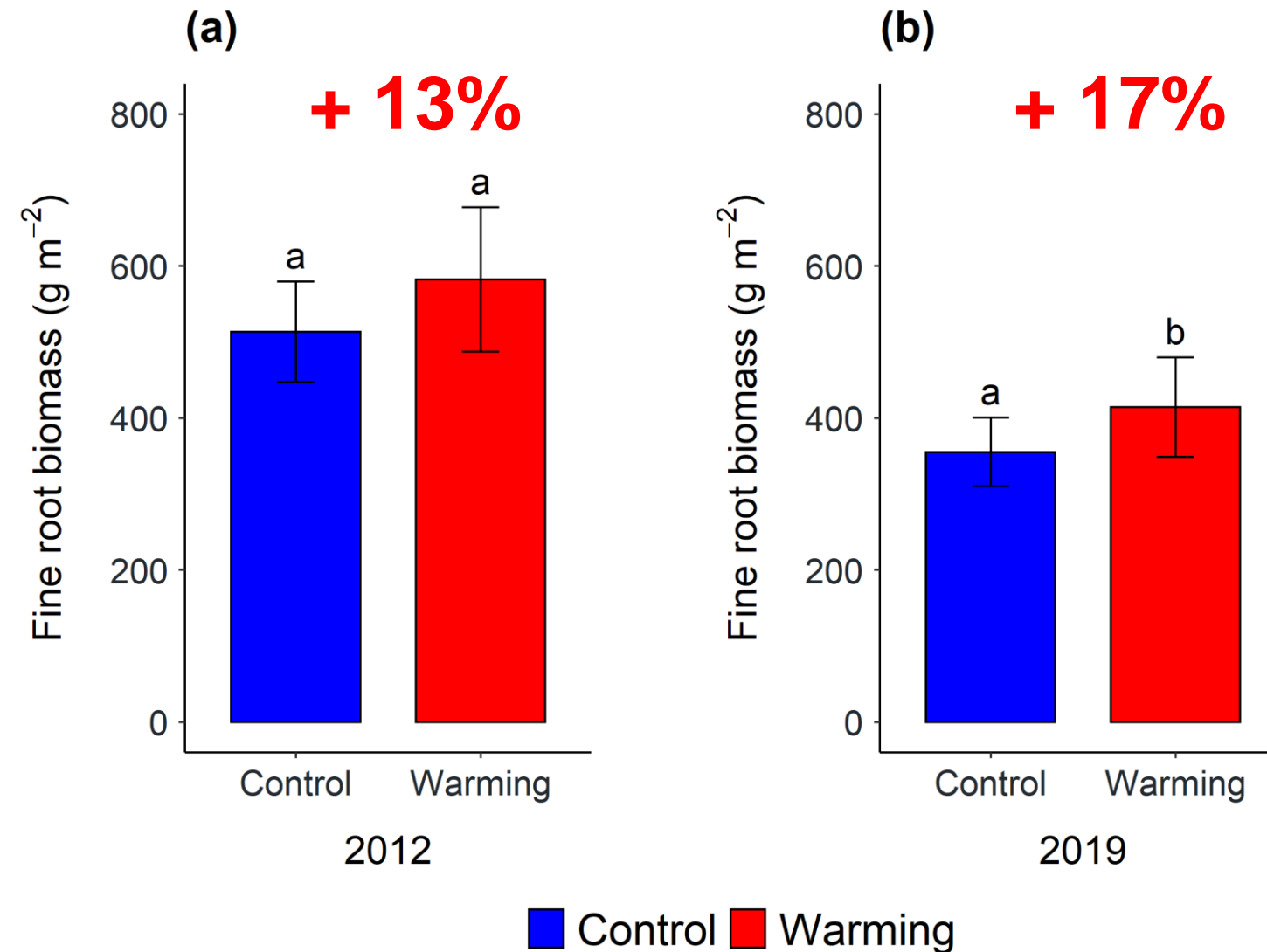


+ 4°C at 5cm soil depth during the snow-free season

- Mixed forest stand
- Rendzic Leptosol on dolomitic bedrock; 20 cm thickness

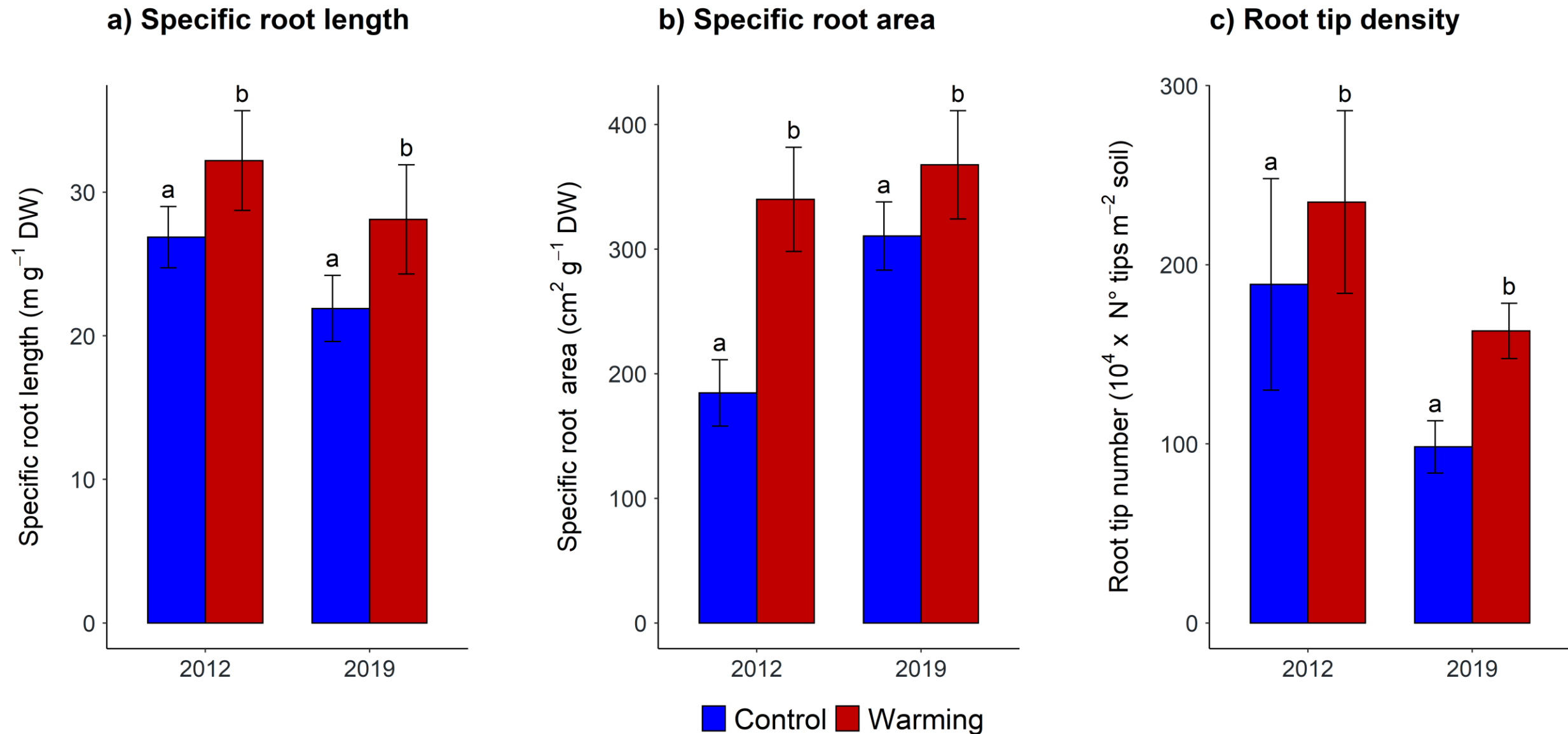
Results

1) Fine root biomass at 0 – 20 cm soil depth



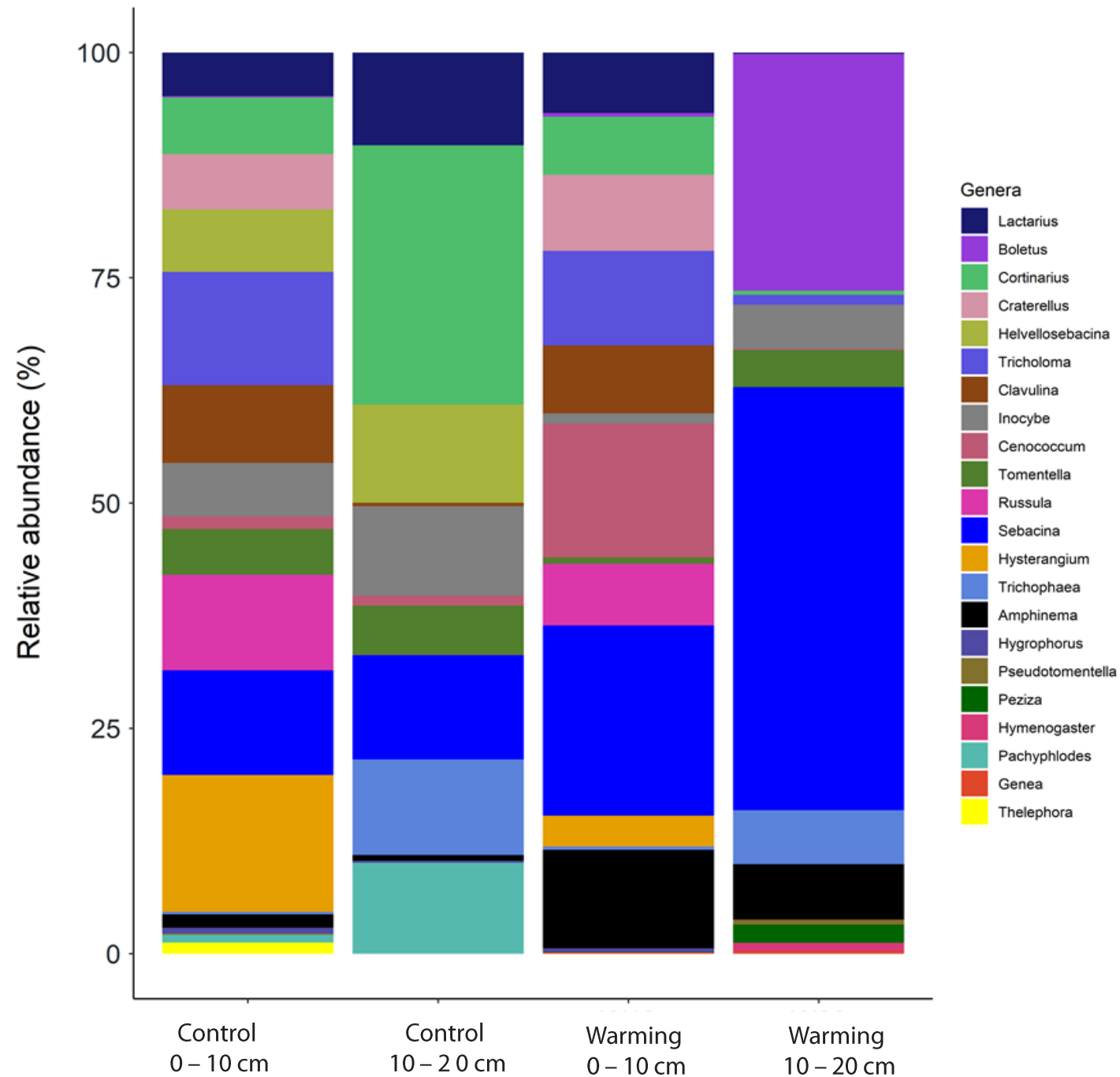
➤ **Increasing fine root biomass indicates greater plant below-ground C allocation**

2) Fine root morphological traits at 0 – 20 cm soil depth



➤ Increase in absorptive surface of root systems

3) EcM community at 0 – 10 and 10 – 20 cm soil depth



➤ Soil warming changed the EcM community composition

➤ No effects on EcM exploration types and diversity

Conclusion

Global warming:

- increases soil carbon input due to increased fine root production**
- improves nutrient foraging through changes in fine root morphology**

More details...

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RESEARCH ARTICLE



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