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## **Plant-soil interactions determine ecosystem aboveground and belowground processes in primary dune ecosystems**

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## **Propositions**

*Accompanying the thesis*

**“Plant-soil interactions determine ecosystem aboveground and belowground processes in primary dune ecosystems” by Chenguang Gao**

1. The establishment of arbuscular mycorrhizal fungi is controlled by the structure and composition of the soil community and of the roots of host plants (this thesis).
2. Impacts of the complexity of soil biota on the stability of plant communities are highly context-dependent (this thesis).
3. At the plant community level, the dynamics of plant aboveground traits are not necessarily informative of the dynamics of belowground traits (this thesis).
4. Soil microorganisms are “passengers”, following the development of the plant community in early successional ecosystems, rather than driving these developments (this thesis).
5. The ubiquitous and hidden soil diversity plays distinct roles in driving ecosystem functions at different successional stages of terrestrial ecosystems (Wardle *et al.* 2004; Wagg *et al.* 2019).
6. Soil inoculation techniques is a useful tool to empirically examine the short-term effects of the entire soil community on plant growth and composition (Middleton & Bever 2012; Wubs *et al.* 2016). However, soil abiotic properties are also required to be considered for holistic understanding of the effects of soil inoculation, especially in nutrient-limited sites.

7. The interactions between plant and soil communities affect plant functional trait expressions to environmental stresses and resource acquisition (Lau & Lennon 2012; Baxendale *et al.* 2014).
8. Understanding the functioning of soil biodiversity is essential for soil sustainability, and ultimately, the sustainability of human society (Bender *et al.* 2016; Geisen *et al.* 2019).
9. Every cloud has a silver lining.

Chenguang Gao

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