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SEED MYCOBIOTA IS INFLUENCED BY MATERNAL AND ENVIRONMENTAL EFFECTS IN SESSILE OAK

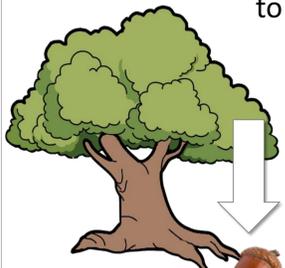
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Abstract

Plant-associated microorganisms can be transmitted from one generation to the next through the seeds.



Effect on seed survival?

- 1 What fungal species are associated with acorns?
- 2 Does the fungal community change after seed fall?
- 3 Does the fungal community differ among mother trees?
- 4 Does the fungal community differ among sites?

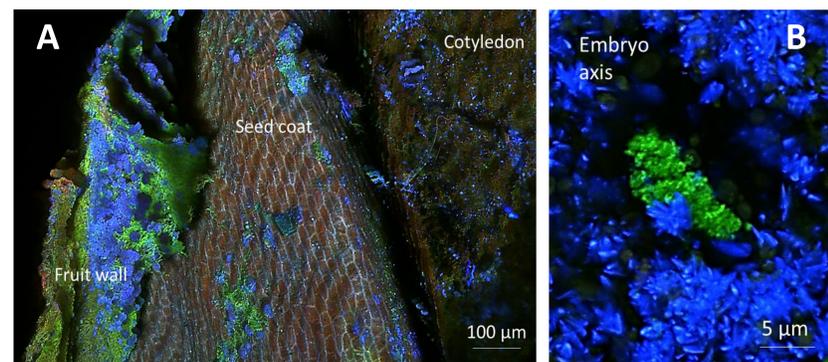
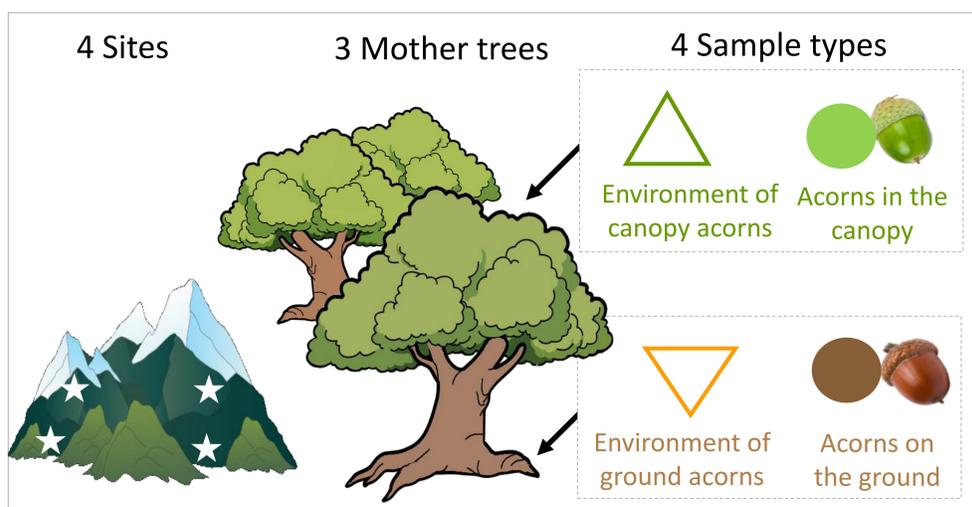
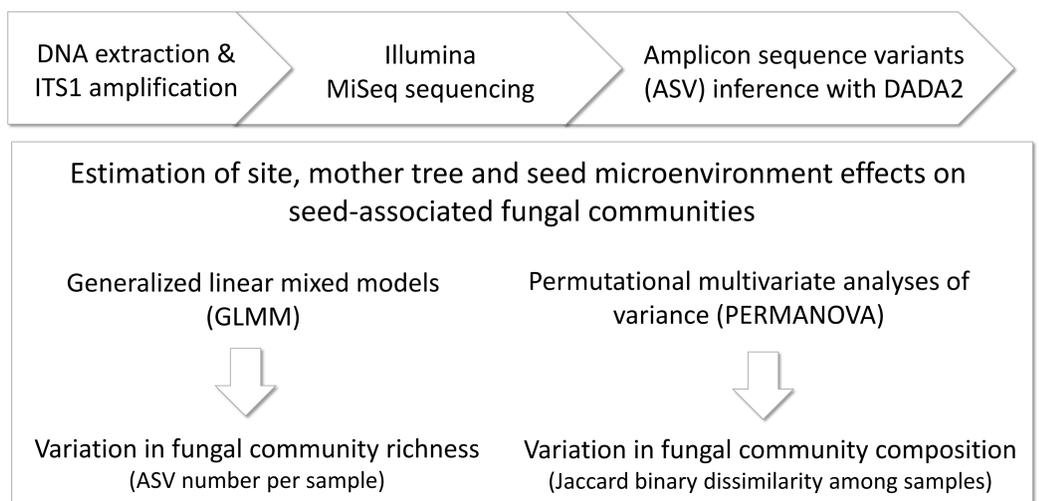


Figure 1 Fungi (green fluorescent) in cross sections of seeds of sessile oak (*Q. petraea*) revealed by confocal microscopy and WGA-ALEXA fluor488 staining. Fungal colonization is dense in the fruit wall and lower in the internal.

Materials



Methods



Results

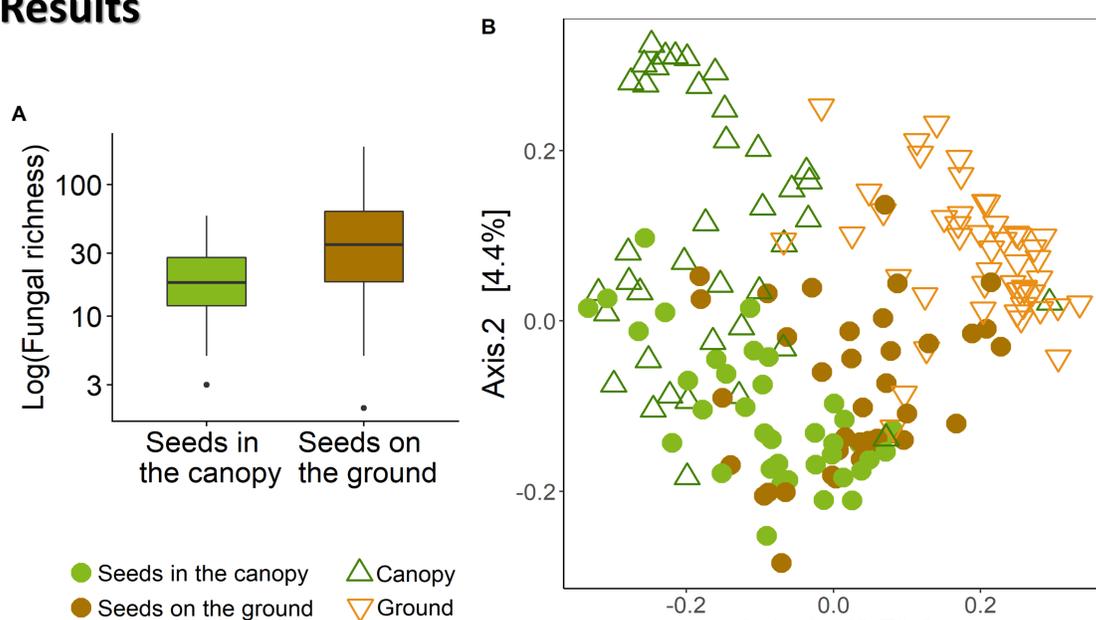


Figure 2. Fungal community composition and richness depending on the seed microenvironment (canopy versus ground).

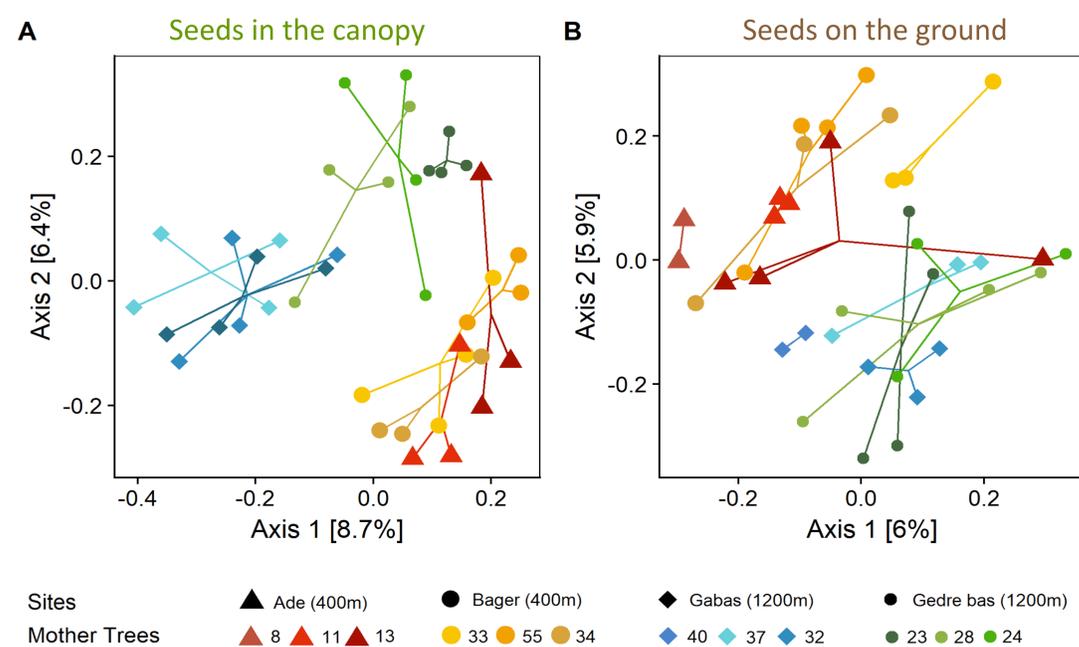


Figure 3. Fungal community composition of seeds collected (A) in the canopy and (B) on the ground depending on mother trees.

1 Which fungal species are associated with acorns?

- Mostly Ascomycota:
 - Most abundant species: *Gnomoniopsis paraclavulata*
 - 91.1% in seeds in the canopy
 - 89.4% in seeds on the ground
- Some pathogens in the embryo:
 - *Taphrina carpini*
 - *Epicoccum nigrum*
 - *Mycosphaerella tassiana*

2 Does the fungal community change after seed fall?

- **Yes!** (PERMANOVA; $F=1.8, p < 0.001$)
- Fungal richness increases (Fig. 2A)
- Fungal community composition shifts (Fig. 2B).

3 Does the fungal community differ among mother trees?

- **Yes!** (Fig. 3A, PERMANOVA; $F=1.4, p = 0.01$)
- These maternal effects remained significant after seed fall (Fig. 3B, PERMANOVA; $F=1.2, p = 0.02$)

4 Does the fungal community differ among sites?

- **Yes!** (PERMANOVA; $F= 2.4, p < 0.001$)
- Fungal community compositions are more similar between sites located at the same elevation (Fig. 3).