

SHIFT 02-181 - EFFECTS OF ALTERNATIVE SUBSTRATE ON THE MICROBIAL BIODIVERSITY OF THE CHESTNUT SEEDLINGS' RHIZOSPHERE (ID 442)

Topic

AS25. Microbial communities and microbiomes

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Background and Aims

Production of chestnut seedlings is generally carried out in pots with standard peat-based soil. However, this method does not always yield healthy and high-quality plants, leading to considerable difficulties in the rooting phase, which may result in insufficient development of the root system or root symbiosis.

Methods

Seeds were planted into three different types of pots (Large Air-pot - AG, Small Air-pot -AP and Frustum of cone-shaped pot V), each filled with two different substrates: one with the highest percentage of peat (VG), and the other with the highest percentage of chestnut fiber (SFC). After one season growth rhizosphere soil was collected and sieved through a 2 mm sieve to eliminate debris and fine roots before DNA extraction. Metabarcoding sequencing of the fungal internal transcribed spacer (ITS2) and the bacterial V4 region of 16S rDNA was conducted to analyse the difference between the microbial communities in the rhizosphere of plants grown in different conditions.

Results

The fungal communities were significantly influenced by the substrates. Specifically, the alpha-diversity was significantly higher in substrate SFC than in VG. In addition, the beta-diversity was significantly different between the substrates, with a predominance of Agaricomycetes in substrate VG. The composition of bacterial communities, too, varied significantly in the two different substrates, but the richness and evenness remained comparable. Furthermore, pot design did not appear to influence the microbiota on plants' rhizosphere.

Conclusions

Alternative substrates combined with pots designed has been identified as a potential approach to improve root system development and biodiversity in the rhizosphere of chestnut seedlings.