Multiplication and valorization of Abuscular mycorrhizal fungi in Tafilalet region

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Abstract

Arbuscular mycorrhiza fungi are the most widespread symbiosis in terrestrial ecosystems. This organism is the keystone that forms an interface between soils and plant roots. The root system of a single host plant can be colonized simultaneously with different Arbuscular mycorrhizal fungal species. The beneficial effects of Arbuscular mycorrhiza are used as bio-fertilizer for plant growth, especially in soils of low fertility and as bio-protection against some diseases. This essay was done to isolate and to propagate 3 strains of Arbuscular mycorrhizal fungi. Strains were isolated from date palm soil in the Tafilalet region in Morocco using different in vivo techniques such as trap culture and single spore culture. Three strains were selected, identified molecularly and multiplied during 3 cycles (one year) under greenhouse (30±2°C, 40% moisture) using Sorghum bicolor and Zea mays as host plants. Frequencies and intensities varied between 65.1% and 98.2% and between 10.2 and 57 respectively. Similarly, the spore density was 56 spores/100g, 92 spores/ 100g and 61 spores/ 100 g for strains Myc 112, Myc 127 and Myc 128 respectively.

Introduction

Arbuscular mycorrhiza fungi partner with many plant species by colonizing roots and producing hyphae in the rhizosphere to facilitate uptake of nutrients (mostly immobile phosphorus) and to provide other benefits, both directly and indirectly. This mutually beneficial symbiosis is called an "arbuscular mycorrhizal" association with " arbuscular " referring to specialized fungal structures interfacing with the contents of root cortical cells and " mycorrhizal " referring to the fungus (myco) – root (rhizo) interaction. The symbiosis has a sustainable net benefit to both partners. This benefit can be physiological, nutritional, ecological or any combination of these processes.

This essay was done to isolate and to propagate 3 strains of Arbuscular mycorrhizal fungi fom Tafilalet region.

Methodology

To isolate different species of Arbuscular mycorrhizal fungi (AMF), Several samples were taken from Tafilalet area.

For this reason, many techniques have been used:

- ✔ **Trap culture**
- ✔ **Single species culture**
- ✔ **Multiplication in pots during 3 cycles (1 year)**

The evaluation methods of AMF 112, AMF 127 and AMF 128 strains are:

- **Staining roots of *Sorghum bicolor* and *Zea mays* used during three cycles (Trouvelot et al., 1986)**
- **Density of spores in soil**
- **Molecular identification**

These *in vivo* techniques have been done under green house conditions with a temperature of 30±2°C and a relative humidity of 40°C during 6 months.

Single species culture

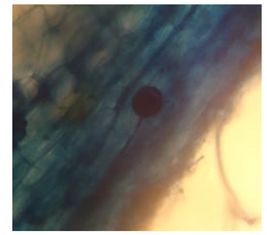
In vivo multiplication of AMF

Staining roots

Results

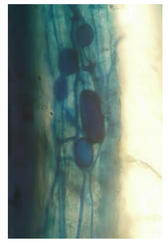
Frequencies and intensities varied between 65.1% and 98.2% and between 10.2 and 57 respectively.

Spore density was 56 spores/100g, 92 spores/ 100g and 61 spores/ 100 g for strains Myc 112, Myc 127 and Myc 128 respectively.



Myc 127

Myc 128



Myc 112

Conclusion

These strains could help us to study their abilities to be multiplied by in vitro systems using Root-Organ Cultures (ROC) in order to produce a pure uncontaminated inoculum and to introduce to develop other *in vitro* essay.

Acknowledgements

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References

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