



# Comparative effect of *Rhizophagus irregularis* strain on cassava root development and Phosphorus uptake under acidic soils conditions of Walungu territory, Eastern DR Congo.

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## ABSTRACT

**Objective:** In the highlands of South-Kivu province of DR Congo, cassava is grown on marginal land not suitable for other crops. Walungu territory for instance is dominated by acidic soils and has the highest nutrient depletion rate in the country. On such types of soil, nutrient depletion is accompanied by a decrease in the availability of phosphorus and many other nutrients. The use of Arbuscular mycorrhizal fungi (AMF) would therefore be an alternative to improve the phosphate nutrition of cassava under different soil conditions.

**Methodology and results:** The experiment reported in the current study was conducted in pots under semi-controlled conditions. Ferrallitic soil from Walungu was used. Soil was sterilized or not and then inoculated with the AMF *Rhizophagus irregularis* (RI) strain. Results showed that inoculation with an exotic AMF strain (*Rhizophagus iregularis*) has significantly increased root abundance (number of roots) in both sterilized and unsterilized soil and root dry weight in sterilized soil only. However, in unsterilized soil, root dry weight decreased with AMF inoculation. In Walungu acidic soils, P supply could significantly influence the effect of mycorrhizal inoculation on root development and root abundance. AMF inoculation has significantly increased the shoot P concentration when P was supplied. In sterilized soil, mycorrhizal inoculation had a depressant effect on soil phosphorus concentration, especially when P was not supplied.

**Conclusion and application of results:** Our results suggest that the introduced *Rhizophagus iregularis* strain increases P uptake in the rhizospheric soil, especially when phosphorus is not applied to the sterilized or unsterilized soil. The use of the *Rhizophagus irregularis* strain as a biofertilizer could improve phosphorus nutrition and root development in cassava.

**Keywords:** Arbuscular mycorrhizae, *Rhizophagus irregularis*, P uptake, Cassava, Ferrallitic soil