Journal of Applied Biosciences 98:9270 – 9283

ISSN 1997–5902

Composition of arbuscular mycorrhizal fungi associated with cassava (*Manihot esculenta* Crantz) cultivars as influenced by chemical fertilization and tillage in Cameroon

Didier Aime Boyogueno BEGOUDE[2], Papa Saliou SARR[1*], Tatiana Laure Yondi MPON[3], Didier Alexis OWONA[2], Miraine Ndacknou KAPEUA[2], Shigeru ARAKI[1]

[1] Center for African Area Studies, Graduate School of Asian and African Area Studies, Kyoto University, 46 Shimoadachi-cho, Yoshida, Sakyo-ku, Kyoto 606-8501, Japan

[2] Regional Biocontrol and Applied Microbiology Laboratory, Institute of Agricultural Research for Development (IRAD), P.B. 2067, Yaoundé, Cameroon

[3] Department of Crop Production, Faculty of Agronomy and Agricultural Science, University of Dschang, P.O. Box 221 Dschang, Cameroon

*Email of corresponding author: pesseus77@yahoo.fr

Original submitted in on 18th December 2015. Published online at www.m.elewa.org on 29th February 2016 http://dx.doi.org/10.4314/jab.v98i1.4

ABSTRACT

Objectives: Arbuscular mycorrhizal fungi (AMF) form root symbiotic relationships with higher plants, but their abundance and symbiotic effectiveness may be influenced by agricultural practices. This study investigated the effect of N-K fertilization and tillage on soil's AMF composition and root colonization of some selected cassava varieties in Eastern and Southern Cameroon.

Methodology and results: Three cassava varieties were grown in Eastern Cameroon in tilled and non-tilled plots. In Southern Cameroon, five varieties were grown in non-tilled plots, with half of them receiving NPK (10-10-20) fertilization. Collected soil and root samples were analyzed to quantify and describe the AMF communities. AMF root colonization was 35% regardless to the variety and farming system in Eastern region, while it reached 45% in Southern Cameroon. Root colonization varied among varieties within and between locations. Fertilized plots displayed lesser microbial density than non-fertilized plots and the tillage highly reduced the root colonization as well as the density of spores.

Conclusions and application of findings: In Eastern and Southern parts of Cameroon, the identified AMF communities in a symbiotic relationship with cassava were ascribed to the three genera *Glomus, Gigaspora* and *Acaulospora*. Among these three genera, *Glomus* was predominant in all the sites; indicating its wide geographical distribution in Cameroon and affinity with cassava. Species of the genus *Glomus* may therefore be used during mycorrhizal inoculations of cassava. However, AMF root colonization varies in relation to the variety type and the environment; with the southern region of Cameroon showing the higher colonization levels. This study revealed that to obtain higher AMF spores densities in soil and maximize root colonization, cultivation systems with a lesser soil disturbance and fertilization is recommendable in cassava cultivation.

Key words: Arbuscular mycorrhiza funji (AMF), Cameroon, Cassava cultivation, Chemical fertilization, Tillage