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# Yield Performance of Wheat Genotypes (*Triticum Aestivum* L.) and Occurrence of Native Arbuscular Mycorrhiza Fungi in Contrasted Conditions of the Bimodal Humid Forest Zone of Cameroon

**Mam Charly Emmanuel[2*], Ngonkeu Mangaptche Eddy Leonard[1,2], Tsimi Mmala Patrick[2], Tekeu Honore[2], Wada Arielle[2], Boyomo Bolomigui[2], Kamko Doriane[2], Foko Arlette[2], Damdjo Tonkale[2], Ngo Ngom Adrienne[2], Chamedjeu Rostand Romeo[2, 3], Mahbou Somo Toukam Gabriel[1]**

[1]Institute of Agricultural Research for Development, University of Yaoundé, Cameroon
[2]Department of Plant Biology, Faculty of Science, University of Yaoundé, Cameroon
[3]Department of Molecular Biology and Biotechnology, Pan-African University, Kenya

**Background and Methods:** Wheat is a strategic crop for most African countries food security and stability. As one of the main consumed commodity in Cameroon, its demand has increased along the years with increase in wheat consumption of 98% in urban strata and 90-91% in non-urban strata. However, 100% of the total domestic consumption is satisfied by import translating Cameroon vulnerability to food security risk. Wheat production in Cameroon is estimated at 66 tons/ha. Highly inferior to the national importation estimated at 725,000 tons in 2015. To satisfy this population demand, the government allocated an amount of 103 billion of FCFA to import approximately 518, 000 tons in 2012. Facing this situation, the Cameroon government is urge to implement appropriate strategies to reduce the wheat dependency, to minimize price fluctuation and attain a minimum threshold for self-sufficiency for this commodity. Increased temperature and degradation of soil fertility are the principal constraints affecting wheat production in Cameroon. As such, a study was conducted to determine the potential of native Carbuncular Mycorrhiza (AM) fungi in yield performance and variability of wheat genotypes cultivated in contrasted conditions of the bimodal humid forest zone of Cameroon. For this, 34 wheat genotypes were sown following an incomplete alpha-lattice design. The genotypes were evaluated on the basis of their yield potential (grain weight) and their affinity to Mycorrhiza symbiosis. The efficiency of the occurred Mycorrhiza was verified on two wheat genotypes cultivated on sterilized sand after purification of the latter. Wheat grain weight and biomass (root dry mass) were collected for this purpose.

**Results:** Biplot analysis revealed positive significant correlations ($r=0.83$ $P<0.01$; $r=0.77$, $P<0.01$) between the grain weight of wheat genotypes and Mycorrhiza parameters (percentage of AM colonization and number of AM spores respectively) in Mbankolo (high altitude) and positive significant correlations ($r=0.56$, $P<0.01$; $r=0.57$, $P<0.01$) between the same parameters in Nkolbisson (low altitude). The grain weight and Mycorrhiza parameters explained 90.1% and 71.3% of variance among all the wheat genotypes in high and low altitudes respectively. The following genotypes SST015, SST087, SST866 and SST88 in high altitude and the following genotypes Nd643-5, Kenya2, Babax8 and SST895 in low altitude were identified to have the highest Mycorrhiza symbiotic affinity and yield performances. The Mycorrhiza spores isolation and morphological identification revealed the presence of three species in wheat rhizosphere in both study sites: Scutellospora sp, Gigaspora sp, and Septoglomus sp. The species Scutellospora sp, was identified to be present and dominant in both study sites. The efficiency of this occurred Mycorrhiza species revealed that Scutellospora sp, had the highest positive enhancing ability on wheat yield and biomass. Thus this targeted wheat genotypes can be used to promote large scale production in both sites and vulgarize to local farmers. Also, the determination of the mechanism underpinning their symbiotic preferences will be essential in targeting the genes implicated to be used for breeding purposes. Also, this dominant Mycorrhiza species could deeply be studied and multiplied for bio-fertilizer specific to wheat production in Cameroon.