



Tropentag, September 14-16, 2022, hybrid conference

“Can agroecological farming feed the world?
Farmers’ and academia’s views”

Potential of bacterial and fungal endophytes in promoting growth in finger millet genotypes, Kenya

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Abstract

Finger millet (*Eleusine coracana*) is an important crop to subsistence farmers commonly grown in arid and semiarid areas. The crop is highly nutritious making it an excellent crop for infants, elderly, diabetic, AIDs patients as well as poor people who live mainly on starchy foods. In the present study, three fungal (*Trichoderma asperellum*, *Trichoderma hamatum* and *Purpureocillium lilacinum*) and bacteria (*Bacillus subtilis* and *Paenibacillus polymyxa*) endophytes were used to determine growth promotion potential in four genotypes of finger millet (U-15, P-224, Okhale-1 and Ikhulule) in the greenhouse. Finger millet seeds were surface sterilized with 70 % ethanol for 5 mins followed by 3 % sodium hypochlorite for 20 mins and later germinated in the lab. After six days, finger millet seeds were planted in plastic pots (18 cm diameter and 21 cm depth) filled with 3 kg of sterilised soil. Each pot was drenched with 10^6 spores/ml after two weeks and boosted with similar inoculum on the third week. Eight replicates were maintained in each finger millet variety and endophytes treatments. Plant shoot height, number of tillers and number of leaves were recorded on weekly basis while fresh & dry shoots weight, fresh and dry root weights, panicle weight and grain yield were measured after four months. *Trichoderma asperellum*, *Purpureocillium lilacinum* and *Paenibacillus polymyxa* increased dry yield weight in U-15 (P value=0.002), P-224 (P value=0.0001) and Okhale-1 (P value=0.018). There was no significant yield increase in Ikhulule variety (P-value=.0.425). Wet yield weight, number of tillers and shoot & root dry weight increased significantly in all finger millet genotypes apart from Ikhulule.

Keywords: Arid and semiarid areas, endophytes, finger millet, growth promotion