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**Impact of Organic Amendments and the Microbial Inoculants on the Population of Soil Microorganisms and Their Influence on the Growth of *Manilkara hexandra* (Roxb)****Jayakody A.P.L.N.S. and Yapa P.N.\***

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**Abstract**

Soils containing a high microbial diversity are characteristic of a healthy ecosystem. Because soil microbial communities are the driving force behind regulating soil processes it is imperative to have a better understanding of the impacts of organic amendment and microbial inoculant addition on the population of soil microorganisms and also their influence of plant growth. A pot experiment was carried out in the greenhouse at the Rajarata University, Mihinthale, Sri Lanka. The 2.5 kg of surface soils (0-15 cm in depth) of the field in Mihinthale was collected into each pot. Water content was set to 75% of total water capacity. Ten treatments were applied in randomized complete block design with four replicates and the control. Treatments included applications of field soil only as control, arbuscularmycorrhizal fungi (AMF), "Jeewamurthum", biochar, compost and inorganic fertilizer, combinations with AMF and all microbial inoculants together.

Five seeds of *Manilkara hexandra* were sown per pot and three seedlings were removed after three weeks. Seed germination rate and relative growth rate of *Manilkara hexandra* were estimated. Total bacterial and fungal counts (CFUs) in 1 g of dry soil samples were calculated by following standard total plate counts. Seedlings were uprooted after 21 weeks and percentage AMF colonization of roots was estimated and shoot dry biomass was measured. According to Generalized test result ( $P < 0.05$ ), statistically significant treatment effect was established for total bacterial counts ( $P = 0.01$ ) and there was no significant treatment effect for fungal counts ( $P = 0.086$ ) of the soil. Further mean comparison results showed that compost with AMF added treatment had the highest bacterial population. Significantly different treatment effect of percentage AMF colonization ( $P = 0.022$ ) was observed, further mean comparison results revealed that AMF added treatment had the highest performance in this category. Generalized test result revealed that there was a significant treatment effect ( $P < 0.05$ ) from treatments to the percentage seed germination rate of *Manilkara hexandra* and AMF and compost addition treatments showed the highest performance. However, AMF and compost together treatment showed significantly high ( $P < 0.05$ ) relative growth rate. AMF added treatment established significantly high ( $P < 0.05$ ) shoot dry biomass after 21 weeks of seedling growth. Organic amendments and microbial inoculants enhance soil microbial communities and also have positive impact on the seed germination and seedling establishment of *Manilkara hexandra*.

**Keywords:** Organic amendments, Microbial inoculants, *Manilkara hexandra*, Microbial counts, Seed germination rate