

Effect of microbial inoculation on tuber development of potato (*Solanum tuberosum* L.)

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Last two decades, there has been a general decline in the yields of major crops because of the collapse of beneficial soil microbial communities under conventional agricultural practices. Chemical inputs like fertilizers and agrochemicals have been responsible to this microbial depletion. Use of Plant Growth Promoting Rhizobacteria (PGPR) for the benefits of agriculture is gaining worldwide acceptance and appears to be the trend for the future. Inoculation of crop plants with certain strains of beneficial, free-living bacteria enhance emergence, colonize roots, stimulate growth and enhance yield. A study was conducted to evaluate the beneficial effect of fungal and bacterial monoculture inoculations on yield enhancement of potato under greenhouse conditions. Microbial isolations were done using the top loamy soil samples obtained from abandoned potato crop land in Agriculture Research Center, Bandarawela. The isolated microbial strains (PCM1, PCM4, PCM5, PCM8, PCMr_g, PCMr_y, PCMr_w and PCMB) were applied directly around the root zone of the potato plants grown in pots under the greenhouse conditions. Each pot contained three disease free potato seed tubers with sterilized sand medium. Effect of the microbial monocultures on the growth performance of the potato was measured using number of tuber initiation, dry weights of tubers, shoots and the roots. Potato plants without any microbial treatment were considered as the control experiment. The results of ANOVA revealed that all the bacterial monocultures except PCMr_g and PCM4 significantly enhanced the tuber dry weight of potato ($p=0.001$). Thus, it can be concluded that the bacterial isolations enhance the growth promotion through the development of tuber.

Key words: Microbial monocultures, plant growth promoting rhizobacteria (PGPR), potato

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