

Effect of fungal endophyte *Arthrographis* on growth of rice varieties Herath Banda and Bg352

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Numerous chemical fertilizers are used in rice cultivations in order to increase yield. As these chemicals have deleterious effects on the environment as well as human health, the use of beneficial microorganisms as biofertilizers is a viable alternative. Endophytic fungi which reside inside the plants intercellularly or intracellularly have the potential to be used as biofertilizers as they are known to promote plant growth. With this in view, the effect of *Arthrographis*- an endophyte of rice plants, on plants of rice varieties Herath Banda and Bg 352 was determined by developing a hydroponic system and the results compared with those of pot experiments. Surface sterilized healthy seeds of rice varieties Herath Banda and Bg 352 were inoculated with the rice endophyte *Arthrographis* spp isolated previously from field grown plants of the two varieties. The soaked seeds of each variety were placed on the fungal culture grown in potato dextrose agar (PDA). After 5 days of incubation, the inoculated and germinated seeds were transferred to hydroponic systems and soil in pots to observe the effect of the fungal endophyte on the growth of Herath Banda and Bg 352 rice varieties. The hydroponic system was designed by floating rigid foam boards with 30 perforations in each board in 1.5l Hoagland solution placed in plastic trays. One inoculated rice seedling was placed in one perforation and 30 inoculated rice seedlings of each variety were placed in 30 perforations in rigid foam boards. There were 5 replicate trays for each variety. For the pot assay, soil from a paddy field was added to pots with 7cm diameter and 10cm height. 5 rice seedlings of each variety inoculated with the fungus were planted in each pot. Hydroponic trays and pots were placed in a greenhouse according to complete randomized block design at average temperature 30C⁰ day and 20C⁰ at night for 5 weeks. For the controls, seeds placed on PDA plates without the fungus were used for both pot and for hydroponics experiments. Dry weight, shoot length and root length of 10 rice plants selected randomly from hydroponic systems and 10 rice plants selected randomly from pots were measured at 2 week intervals. Results were analyzed using ANOVA and the pairwise comparisons using T test. Shoot length, root length and dry weight of two week old plants of both Bg 352 and Herath Banda varieties inoculated with the rice endophyte *Arthrographis* showed a significant increase in shoot length, root length and dry weight ($P \leq 0.05$) when compared with non-inoculated plants grown in pots and in hydroponic systems. All growth parameters of Herath Banda and Bg 352 rice plants grown using the hydroponic system were significantly higher ($P \leq 0.05$) than those grown in pots indicating that the effect of endophyte inoculation was significantly better manifested when the plants were grown using the hydroponic system.