

The Effect of *Rhizopus Microsporus* on Seed Germination and Seedling Growth of Seven Crop Species in Sri Lanka

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Abstract

Pathogenic fungal infections on seeds can reduce seed germination and seedling growth, resulting in heavy economic losses. The objective of this study was to determine the effect of soil borne plant pathogenic fungus *Rhizopus microsporus* on seed germination and early seedling growth of seven crop varieties, viz. brinjal (*SM-164*), capsicum (*CA-8*), cucumber (*Kalpitiya white*), okra (*Haritha*), snake gourd (*TA-2*), spinach (*Yoda*) and tomato (*Rajitha*). The effect on each crop species was observed by inoculating 2 mL of the *R. microsporus* fungal spore suspension (10^5 CFU/mL) into 100 surface-sterilized seeds (20 μ L droplet on each seed) placed on a sterilized clear plastic box (approximately 20 \times 10 \times 6 cm³) filled with 1.5 cm of autoclaved silica sand. This setup was replicated four times per each species. The same volume of sterilized distilled water was used as the control. The seeds were incubated in a plant growth chamber at 25 °C and 12/12 hour light/dark cycles for 14 days. Time to reach 50% seed germination (G_{50}), final germination percentage after 14 days and shoot and root lengths of seedlings were measured. Germination percentage data were statistically analyzed using Kruskal-Wallis test, whereas G_{50} , root and shoot length data were analyzed using two sample t-tests. The seed germination percentages of capsicum and brinjal treated with the *R. microsporus* spore inoculation were significantly reduced by 35% and 5%, respectively. The G_{50} was significantly affected in tomato and okra ($P<0.05$). The most prominent effect of *R. microsporus* was evident in shoot and root lengths of the study species. Rotting stems and roots with watery appearance was common in seedlings of all crop species treated with the spore inoculum. The shoot lengths of all the study species were significantly affected by 0.78-4.69 cm ($P<0.05$). The root length of all species except in okra was affected by 0.50-4.29 cm ($P<0.05$). Thus, all the study species were susceptible to *R. microsporus* at seed germination and early seedling establishment stages. Therefore, *R. microsporus* infections can affect the survival and early seedling growth of the tested crop species.

Keywords: Fungal pathogen, Germination, Seedling growth

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