

## COMPARISION OF ANTAGONISTIC EFFECTS OF THE ENDOPHYTIC FUNGI AND *TRICHODERMA* SPECIES AGAINST SOYBEAN CHARCOAL ROT DISEASE UNDER GREENHOUSE CONDITIONS

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### ABSTRACT

The charcoal rot diseases of soybean caused by *Macrophomina phaseolina* consequently reduces the quantity and quality of yield, especially in drought condition which yield losses in sever epidemic years exceeded from 23-100 percent. Antagonistic ability of the entophytic fungi the main groups of symbiotic fungi associated with soybean roots (*Piriformospora indica* and *Sebacina vermifera*) related to Sebacinals from Basidiomycota and two species of *Trichoderma* including *T. harzianum* (T-100) and *T. viride* investigated by orthogonal comparisions by using SPSS software. The experiments were carried out in a completely randomized design with 47 treatments and 3 replicates. Various indices are recorded at the end of 3<sup>th</sup> month of experimentation and data analyzed. Results indicated a significant difference (P= 0.01) among various treatments in root and foliar wet and dry weights. Results of orthogonal comparisions between *P. indica* and *S. vermifera* indicated that antagonistic effects of *S. vermifera* were higher than *P. indica* fungus. Also, the study of orthogonal comparisions between *T. viride* and *T. harzianum* (T-100) revealed that the maximum antagonistic effects was related to *T. viride* fungus. Other results demonstrated that root and foliar wet and dry weights of soybean increased when antagonistic fungi inoculated earlier from pathogen in greenhouse experiments. Also, we found that the entophytic fungi not only good symbiotic relation, but also could be very effective in biological control of soybean charcoal rot disease of soybean.

**KEYWORDS:** Biological Control, *Piriformospora indica*, *Sebacina vermifera*, *Trichoderma harzianum*, *Trichoderma viride* and *Macrophomina phaseolina*



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