

Effect of *Trichoderma* species on *Macrophomina phaseolina*

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ABSTRACT

The dual culture test was carried out to determine the antagonistic action of various species of *Trichoderma* and other biocontrol agents. Eight bioagents viz., *Trichoderma viride* isolate I, II, III, IV, *T. harzianum*, *T. koningii*, *T. hamatum* and *Gliocladium virens* were used under *in vitro* conditions. The data make it clear that all bioagents inhibited the growth of *M. phaseolina* ranged from 20.12 to 83.40 per cent. *Trichoderma viride* isolate-I only showed severe (highest) antagonism (83.40 %).

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Management of this soil borne disease with fungicides is not only different but not preferred due to bioefficacy consideration as well. Biological control is a distinct alternate possibility and eco-friendly approach for its management. Different scientist found bioagent inhibit the growth of disease causing fungi. Selvarajan and Jeyarajan (1996) noticed that *Trichoderma viride* reduced sclerotial size and germination and also germ tube numbers of *M. phaseolina*, Hooda *et al.* (2000) tested and investigated that *Trichoderma harzianum* and *T. viride* inhibit the mycelial growth of all fungi tested including *M. phaseolina*. Prashanthi *et al.* (2000) found that *T. viride* completely suppressed *M. phaseolina* under *in vitro*. Keeping in view the importance of the crop and the disease, present study was conducted to see the efficacy of *Trichoderma* species against this pathogen under *in vitro* condition and also to select a suitable bioagent for its effective management in future.

The dual culture test was carried out to determine the antagonistic action of various species of *Trichoderma* and other biocontrol agents. Eight bioagents viz., *Trichoderma viride* isolate I, II, III, IV, *T. harzianum*, *T. koningii*, *T. hamatum* and *Gliocladium virens* were used under *in vitro* conditions. 20ml of media was poured aseptically in each of the Petriplates and allowed to solidify. Mycelial disc of 4mm diameter of both *i.e.* each antagonist and test fungus were placed on solid media in the same Petriplate approximately 4cm away from each other. All the inoculated plates were incubated at 30±1°C and observed after 7 days for the growth of antagonist and test pathogen.

The data presented in Table 1 make it clear that all

bioagents have inhibited the growth of *M. phaseolina* ranged from 20.12 to 83.40 per cent. *Trichoderma viride* isolate-I only showed severe (highest) antagonism (83.40 %). Rest all other isolate of *Trichoderma* spp. and *Gliocladium virens*, provided weak antagonism index. The experiment results during present investigation are in favour of findings of Selvarajan and Jeyarajan (1996) who have also obtained reduction of sclerotial size, germination and germ tube numbers of *M. phaseolina*

Table 1 : Per cent growth reduction of *M. phaseolina* and antagonism index by various bioagent under *in vitro* conditions

| Bioagent | Radial growth of <i>M. phaseolina</i> (mm)* | Growth reduction (%)* | Antagonism index ** |
|--------------------------------|---|-----------------------|---------------------|
| <i>Trichoderma viride</i> -I | 14.94 | 83.40 | ++++ |
| <i>Trichoderma viride</i> -II | 56.59 | 37.16 | ++ |
| <i>Trichoderma viride</i> -III | 71.89 | 20.12 | ++ |
| <i>Trichoderma viride</i> -IV | 70.00 | 22.22 | ++ |
| <i>Trichoderma harzianum</i> | 70.56 | 21.60 | ++ |
| <i>Trichoderma hamatum</i> | 58.89 | 34.57 | ++ |
| <i>Trichoderma koningii</i> | 57.89 | 35.68 | ++ |
| <i>Gliocladium virens</i> | 63.33 | 29.63 | ++ |
| Control | 90.00 | 0.00 | - |
| S.E. ± | - | 2.39 | |
| C.D. (P=0.05) | - | 7.19 | |
| C V % | - | 18.09 | |

* = Average of three replications, ** = Antagonism index where : +++++ = Severe, +++ = Moderate, ++ = Weak, - = No