Click www.researchjournal.co.in/online/subdetail.html to purchase.

Research Paper :

Influence of temperature and pH on antagonistic potential of *Trichoderma viride in vitro*

N.B. BAGWAN

International Journal of Plant Protection (October, 2010), Vol. 3 No. 2 : 165-169

SUMMARY

Effects of temperature and pH were determined on antagonistic potential of *Trichoerma viride* against *Sclerotium rolfsii* and *Rhizoctonia solani in vitro*. *T. viride* showed maximum antagonistic potential against *S. rolfsii* and *R. solani* at 25 to 30^{0}C which was indicated by greater colonization and growth of *T. viride* over *S. rolfsii* and *R. solani*. At 25 to 30^{0}C *T. viride* significantly checked the growth of *S. rolfsii* and *R. solani* and inhibited the growth of the pathogen and lost antagonistic potential at high temperature (35 to 45^{0}C). On the other hand, *S. rolfsii* and *R. solani* inhibited the growth of *T. viride* at high temperature (35 to 40^{0}C). Similarly, the most favourable pH for maximum antagonistic potential of *T. viride* against *S. rolfsii* and *R. solani* ranged between 5.5 to 6.5. *T. viride* showed maximum antagonistic potential against these two pathogens at 6.0 pH. Antagonistic potential of *T. viride* declined with decreasing in pH (below 4.5) as well as at high pH (above 7.5). This study revealed that 25 to 30^{0}C temperature and 5.5 to 6.0 pH were found to be optimal for antagonistic potential of *T. viride*. It can be concluded that many soils borne and seed borne fungal diseases can be controlled by using *Trichoderma* spp., especially in the *Kharif* and *Rabi* seasons when soil temperature ranges between 25 to 30^{0}C.

Correspondence to :
N.B. BAGWAN
Department of Plant Pathology, Directorate of Groundnut Research (ICAR), JUNAGADH (GUJARAT) INDIA

Key words : *Trichoderma viride,* Temperature, pH, Antagonistic Potential, *S. rolfsii*, *R.. solani*

Accepted : ***April, 2010***

Trichoderma species are known mycoparasites on several plant pathogens especially against soil-borne plant pathogens, (Papavizas, 1985). Köhl and Schlosser (1989) observed that only selected strains could tolerate extreme temperatures. Biocontrol agents may respond differentially to varied soil conditions. For example a soil-moisture-deficit beyond – 4.54 bars affected sporulation of *T. viride,* but not *T. harzianum* (Cole and Zvenyika, 1988). The antagonistic potential of *Trichoderma* spp. against *Fusarium udum* was not much altered by changing the environmental conditions. However, it was maximum at 35^{0}C ± 2 and pH 6.5 over a wide range of C/N ratios, (Spiegel *et al.,* 1991). The effectiveness of biocontrol agents depends on several parameters, that includes soil texture, water content, pH and crop history (Hagn *et al*., 2003; Berg *et al*., 2005); therefore their application should consider the environmental stress that could affect not only their survival in the soil, but also their ability to maintain their biocontrol capacity. A series of abiotic and biotic environmental parameters has an influence on the biocontrol efficacy of *Trichoderma*. Some important parameters to be considered are the effects of temperature, pH, water potential, the presence of pesticides, metal ions and antagonistic bacteria in the soil. The pH characteristics of the soil also belong to the most important environmental parameters affecting the activities of mycoparasitic *Trichoderma* strains. The agricultural importance of the genus is that some *Trichoderma* species possess good antagonistic abilities against plant pathogenic fungi, *e.g. Fusarium* (Sivan and Chet, 1986), *Pythium* (Naseby *et al.,* 2000) *Rhizoctonia* (Lewis and Papavizas, 1987*)*. Studies are available on the effects of temperature on the spore germination and germ-tube growth (Magan, 1988), mycelial growth (Samuels, 1996), competitive saprophytic abilities (Naar and Kecskes, 1998) of *Trichoderma* strains. The optimum temperature for growth differs among the *Trichoderma* species (Samuels, 1996). One of the most important limitations of the use of *Trichoderma* strains as biofungicides is their low osmotolerance level. Biocontrol *Trichoderma* strains are applied in agricultural soils with certain pH-characteristics. Therefore, it is important to collect information about the effects of pH on mycelial growth and sporulation of *Trichoderma* strains with biocontrol potential. pH can also play a role in the regulation of extracellular enzyme