

Efficacy of Different Soil-Applied Fungicides to Manage Phytophthora Root Rot of Chili (*Solanum annuum*) in Pakistan

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Abstract : Chili (*Solanum annuum* L.) attacks by many fungal pathogens, including members of Oomycetes which are responsible for root rot in different chili growing areas of the world. Oomycetes pathogens cause economic losses in different regions of the Pakistan. Most of the plant tissues, including roots, crowns, fruit, and leaves, are vulnerable to *Phytophthora capsici*. It is very difficult to manage the *Phytophthora* root rot of chili as many commercial varieties are tremendously vulnerable to *P. capsici*. The causal agent of the disease was isolated on corn meal agar (CMA) and identified on a morphological basis by using available taxonomic keys. The pathogen was also confirmed on the molecular basis through internal transcribed spacer region and with other molecular markers. The Blastn results showed 100% homology with already reported sequences of *P. capsici* in NCBI database. Most of the farmers have conventionally relied on foliar fungicide applications to control *Phytophthora* root rot in spite of their incomplete effectiveness. In this study, in vitro plate assay, seed soaking and foliar applications of 6 fungicides were evaluated against root rot of chili. In vitro assay revealed that significant inhibition of linear growth was obtained with Triflumizole at 7.0%, followed by Thiophanate methyl (8.9%), Etridiazole (6.0%), Propamocarb (5.9%) and 7.5% with Mefenoxam and Iprodione for *P. capsici*. The promising treatments of in vitro plate bioassay were evaluated in pot experiments under controlled conditions in the greenhouse. All fungicides were applied after at 6-day intervals. Results of pot experiment showed that all treatments considerably inhibited the percentage of *P. capsici* root rot incidence. In addition, application of seed soaking with all six fungicides combined with the foliar spray of the same components showed the significant reduction in root rot incidence. The combine treatments of all fungicides as in vitro bioassay, seed soaking followed by foliar spray is considered non-harmful control methods which have advantages and limitation. Hence, these applications proved effective and harmless for the management of soil-borne plant pathogens.

Keywords : blastn, bioassay, corn meal agar (CMA), oomycetes

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