

Chitinase by *Bacillus* spp. isolates and its efficacy against *Fusarium moniliforme* in maize

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Six isolates of *Bacillus* spp. (BM1, BM2, BM3, BM4, BM5 and BM6) were evaluated to determine its antagonistic activity to *Fusarium moniliforme* in maize seeds. Previously survey detected *Fusarium moniliforme* (*Giberella fujikuroi*) in all subsamples of maize seeds apparently free from disease. The fungus incidence in the seeds ranged from 26.7% to 61.4%. The suppression of the growth of *Fusarium moniliforme in vitro* and in seed trials were detected for all *Bacillus* spp. isolates. The highest disease control in seeds was obtained by isolate BM2 (79.6%) and the lowest by isolate BM5 (54.2%). Chitinase production was detected by all *Bacillus* spp. isolates and the production of chitinase did not differ significantly ($p \leq 0.05$) among the isolates. The total protein and chitinase activity varied among the isolates. Isolates BM2 and BM3 showed highest total protein and chitinase activity. The results indicate that *Bacillus* spp. isolates have antagonist activity to *Fusarium moniliforme* and a potential to be used as a biocontrol agent by significantly reducing the incidence of *Fusarium moniliforme* in maize seeds. It is suggested that chitinase secreted by *Bacillus* spp. isolates should be involved in the suppression of the fungal growth.

Keywords: *Bacillus*, *Fusarium*, Chitinase, Biocontrol