

Antifungal Efficacy of Cordyceps militaris-Mycometabolites against major fungal diseases of Withania somnifera

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Abstract

Withania somnifera (Ashwagandha), a vital medicinal plant, faces significant losses due to fungal diseases such as root rot, wilt, and leaf spot caused by *Fusarium annulatum* and *Alternaria alstroemeriae*. To manage these pathogens, metabolites of *Cordyceps militaris* were extracted following methods from Vinale et al. (2006) and others, with modifications. These metabolites were tested for antifungal efficacy using the poison food technique. Results showed the minimum inhibitory concentrations (MIC) against *F. annulatum* and *A. alstroemeriae* were 15 mg/mL and 20 mg/mL, respectively, with cidal effects observed at 20 mg/mL and 30 mg/mL. In-silico investigations revealed that Cordycepin, a metabolite, exhibited strong binding affinity to the fungal chitin synthetase protein. These findings suggest that *C. militaris* metabolites could serve as a potential alternative to synthetic fungicides, pending further research.

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