

Resistance response enhancement and reduction of *Botrytis cinerea* infection in strawberry fruit by *Morchella conica* mycelial extract

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Abstract

Over 200 crops worldwide are susceptible to gray mold infection, caused by the phytopathogenic fungus *Botrytis cinerea*, including strawberry fruit, both in the field and after harvest. The disease is normally controlled by chemical fungicides. However, increasing public and environmental concern over pesticide applications has prompted the exploration of ecofriendly approaches to combatting pathogens. Morel mushrooms are edible mushrooms with a broad range of bioactive metabolites. We studied the inhibitory effect of *Morchella conica* Pers. mycelial water extract (MWE) on *B. cinerea* infection of strawberry fruit for the first time. In-vivo assay showed reduction of gray mold infection, measured by disease index on MWE-treated fruit compared to controls. Enhancement of a range of biochemical and molecular characteristics related to the fruit's defense system was detected by RNA-Seq analysis, quantitative PCR and quantification of total phenols, flavonoids, antioxidant capacity by DPPH, and enzymatic activities in the fruit. *In-vitro* tests showed no inhibition of *B. cinerea* compared to a control fungicide fludioxonil. The findings demonstrate the beneficial effect of *Morchella conica* metabolites in enhancing fruit resistance to pathogenic fungal attack and improving quality of postharvest strawberry fruit.