

Antifungal effect of polygodial on *Botrytis cinerea*, a fungal pathogen affecting table grapes

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The antifungal activity of polygodial, a secondary metabolite extracted from Canelo, on mycelial growth of different *Botrytis cinerea* isolates has been evaluated. The results show that polygodial affects growth of normal and resistant isolates of *B. cinerea* with EC50 values ranging between 117 and 175 ppm. In addition, polygodial markedly decreases the germination of *B. cinerea*, i.e., after six hours of incubation the percentage of germination decreases from 92% (control) to 25% and 5% in the presence of 20 ppm and 80 ppm of polygodial, respectively. Morphological studies indicate that conidia treated with polygodial are smaller, with irregular membrane border, and a lot of cell debris, as compared to conidia in the control. The existence of polygodial-induced membrane damage was confirmed by SYTOX® Green uptake assay. Gene expression studies confirm that the effect of polygodial on *B. cinerea* is mainly attributed to inhibition of germination and appears at early stages of *B. cinerea* development. On the other hand, drimenol, a drimane with chemical structure quite similar to polygodial, inhibits the mycelial growth efficiently. Thus, both compounds inhibit mycelial growth by different mechanisms. The different antifungal activities of these compounds are discussed in terms of the electronic density on the double bond. © 2017 by the authors. Licensee MDPI, Basel, Switzerland.

Antifungal activity

Botrytis cinerea

Polygodial

antifungal agent

fungicide

iprodione

polygodial

reactive oxygen metabolite

sytox

antifungal agent

fungicide

polygodial

sesquiterpene

antifungal activity

Article

Botrytis cinerea

column chromatography

conidium

controlled study

EC50

extraction

fungus isolation

gene expression

germination

grape

infectious agent

microphotography

morphology

mycelial growth

nonhuman

purification

Botrytis

chemistry

drug effect

gene expression regulation

microbial sensitivity test

microbiology

Vitis

Antifungal Agents

Botrytis

Fungicides, Industrial

Gene Expression Regulation, Fungal

Microbial Sensitivity Tests

Sesquiterpenes

Vitis