In vitro evaluation of plant extracts as antifungal agents against *Botrytis cinerea*

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Abstract: Grapevine bunch rot, caused by *Botrytis cinerea*, causes important economic losses every year in grape production [1]. However, indiscriminate use of pesticides to control this disease leads to serious problems such as consumer intoxication and the emergence of populations of pathogens resistant to fungicides. In this sense, the development of new natural ingredients against *B. cinerea* is of paramount relevance. Plant extracts are a valuable source of a wide variety of biologically active chemical defense constituents. Several plant bioactive compounds have been identified as possible antifungal agents, also associated with their antioxidant properties [2]. The objective of this work was to evaluate the effect of plant extracts rich in phenolic compounds (concentration of 10 mg/mL, each) on mycelial growth of *B. cinerea in vitro.* In this study, three formulations of plant extracts were evaluated (PreVine 1, PreVine 2 and PreVine 3). Potato Dextrose Broth (PDB) medium was prepared with agar and enriched with the three formulations of plant extracts. Negative control (CTR -) was treated only with water, and the positive control (CTR +) was treated with the conventional fungicide Teldor® (active substance fenhexamid), concentration of 0.075 mg/mL. The obtained results demonstrated that all plant extracts formulations revealed the capacity to inhibit the growth of *B. cinerea*. The inhibitory potential was greater for PreVine 1, being responsible for inhibiting the growth of *B. cinerea* by 64% at 9 days of incubation, when compared to the control samples. As regards to the growth rate, plant extracts were able to reduce this parameter from 1.8391 (CTR -) to 1.2051 cm/day (PreVine 1). The positive antifungal activity of the plant extracts assessed, especially for the PreVine 1, could be attributed to their varied bioactive composition, such as several classes of phenolic compounds (i.e., flavonoids, phenolic acids, and tannins). In fact, these plant extracts have been described as source of compounds with biological activity against grape pathogens, by promoting a disruption of fungal cell membranes, inhibiting fungal enzymes and/ or inducing oxidative stress in fungal cells [3,4]. Considering the potential antifungal properties of these plant extracts formulations, these natural formulations could be candidates for application grape and wine industries as biofungicides, acting against grape pathogens, such as *B. cinerea*, decreasing, or avoiding the use of chemical fungicides.

Keywords: Bunch rot; Grape pathogens; Plant extracts; Biofungicide

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