EXTRACTS OF AGRITO (*RHUS MICROPHYLLA ENGELM. EX A. GRAY)* FOR THE CONTROL OF PLANT PATHOGENIC FUNGI

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The greatest losses in crops in the field and postharvest stage are mostly produced by the attack of fungi. *Fusarium oxysporum* and *Corynespora cassiicola* are two devastating plant pathogenic fungi that infect several crops (e.g. tomato and cucumber). The conventional agriculture uses chemical pesticides; however, a large majority of crops are generating resistance, in addition to having a negative impact on health and the environment. The use of plant extracts has emerged as a natural alternative within the framework of organic agriculture, highlighting the plants of the Mexican Semidesert. In this context, the properties of agrito (*Rhus microphylla*), a plant used in the traditional medicine, have not been studied. Thus, the objectives of this work were: to evaluate the antifungal activity *in vitro* of aqueous (AE), ethanol (EE), and hydro-alcohol (HAE) extracts of berries of *R. microphylla* on *F. oxysporum* and *C. cassiicola;* and to characterize the extracts in the terms of total phenolic compounds (TPC) by Folin Ciocalteu and ultra-high-performance liquid chromatography (UHPLC) methods, and antioxidant activity expressed as the concentration required to obtain a 50% of inhibition of radical scavenging activity (IC_{50}). The EE showed the highest ($p<0.05$) content of TPC (201.6± 3.3 mg gallic acid (GA) g^{-1} extract), characterized by the presence of gallic acid (321.9± 4.0 mg L^{-1}) and *p*-cumaric acid + epicatechin (42.2± 2.9 mg L^{-1});followed by HAE (151.0± 3.9 mg GA g^{-1} extract), which mainly contains gallic acid and *p*-cumaric acid + epicatechin (98.6± 4.4 and 78.2± 1.5 mg L^{-1}, respectively); and AE (146.8± 0.1 mg GA g^{-1} extract), in which gallic acid was detected at a concentration of 203.2 ± 0.7 mg L^{-1}. However, EE and AE did not present significant differences in the antioxidant activity, as both showed an IC_{50} of 0.1± 0.0 mg mL^{-1}, while for HAE the IC_{50} value was 0.2± 0.0 mg mL^{-1}.These results are interesting and support the antifungal behavior of the extracts. For both fungi, the antifungal activity was concentration-dependent and varied according to the fungus genera, being the EE that had a significant inhibition of 100% growth of both fungi from the concentration of 2500 mg L^{-1}.The HAE allowed an inhibition about 60% also at 2500 mg L^{-1} for both fungi, and 100% of inhibition of *C. cassiicola* at 3000 mg L^{-1}. The AE exhibited the lowest ($p<0.05$) antifungal effect with inhibition values of 20.8% ± 3.4 and 62.8% ± 1.5 at 3000 mg L^{-1} for *F. oxysporum* and *C. cassiicola*, respectively. The EE and HAE of berries of *R. microphylla* are promising as a natural alternative to control phytopathogenic fungi in crops of commercial importance.

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