



***In vitro* and *in vivo* antifungal activity of the essential oil of *Lippia alba* against *Alternaria tenuissima*, a postharvest pathogens of blueberries.**

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Protection from physical damage and inhibition of infection by pathogenic fungi on fruit are crucial aspects that must be considered in postharvest. This consideration is particularly important for fruits requiring long periods of transport and storage up to final consumption. *Alternaria* spp. is one of the most important pathogens involved in the deterioration of the fruit and it appears infecting the fruit through the stem scar produced during harvest (1). For the control of pathogens in fragile fruits, like blueberries, the use of volatile compounds is considered an advantageous option. The use of essential oils has the advantage of bioactivity in the vapor phase, which makes them particularly attractive for preserving fruit without direct contact during transport in closed containers (2). *Lippia alba* (Verbenaceae) produces an essential oil characterized by presenting a wide variability in their chemical composition depending on the state of development of the plant and environmental growth conditions (3). In this work, we evaluated *the in vitro* and *in vivo* activity of *L. alba* essential oil used as biological insecticide to control *A. tenuissima* in blueberries. For this purpose, fresh leaves and flowers of *L. alba* were hydrodistilled in a Clevenger-type apparatus for 2 h. Analysis of the essential oils was performed using a Shimadzu GC 2010 Plus equipped with a Shimadzu GCMS-QP 2010 Ultra; HP-5 MS capillary column (30 m X 0.25 mm, film thickness 0.25 μ m); column temperature 40 °C (4 min); rising to 180 °C at 5 °C min⁻¹, then to 280 °C at 10 °C min⁻¹, 280°C (8 min). Helium was used as carrier gas with a flow rate of 1.04 mL min⁻¹. Mass detector was operated in electronic ionization mode at 70 eV. Two different *in vitro* assays were performed, in triplicate, in which *A. tenuissima* growth inhibition was calculated as the percentage of inhibition of radial growth relative to the control. In the first assay, the essential oil was incorporated into the culture medium, while in the second one the oil was placed on the opposite side of the Petri dish in order to evaluate its activity in volatile state. The *in vivo* antifungal activity was performed using fresh blueberries inoculated with a suspension of *A. tenuissima* where, after an incubation period, the presence or absence of the disease in the wound was evaluated. For all tests, positive growth controls were performed without essential oils. The main oil components were: 2-octanol, 1,8-cineol, linalool, (*Z*) and (*E*)-dihydrocarvone, (*E*)-caryophyllene, germacrene B and germacrene D. The *in vitro* test showed high efficacy against *A. tenuissima* (70 and 100 % inhibition). *In vitro* tests also fungicidal activity of the essential oil is observed, due to an inhibition of fungal growth was seen in all fruits. From the *in vitro* tests it can be seen an inhibition of fungal growth in all the fruits, due to the application of the essential oil.

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