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THE PROTECTIVE ROLE OF *Pseudomonas* sp. PCI2 ON POST-HARVEST DETERIORATION OF TOMATO CAUSED BY *Alternaria alternata*

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The high moisture content and water-soluble nutrients in tomato fruits make them perishable and susceptible to a number of fungal pathogens that cause postharvest rots. The *Alternaria* genus, widely distributed in nature, includes pathogenic species that can infect field crops or cause significant post-harvest damage, behaving as a facultative pathogen that is favored by stress, maturity, and senescence of the host. In the tomato fruit, the conidia of the fungus germinate and penetrate through wounds and the infection remains latent until maturity when tissues weaken. *A. alternata* infection is visualized as dark brown to black, smooth, slightly sunken, firm-textured lesions that can reach several centimeters in diameter. The application of fungicides is a common strategy used in an attempt to minimize post-harvest losses; however, this practice has caused environmental problems due to its residual toxicity, stimulated the appearance of strains resistant to active principles, and generated concern for human and animal safety. A sustainable alternative is the development of products based on biological control agents. Among them, bacteria of the *Pseudomonas* genus have been reported as efficient against various fungi. In this work, the effectiveness of *Pseudomonas* sp. PCI2 in suppressing diseases caused by *A. alternata* in tomato fruits was evaluated. To establish the antagonistic activity of the bacterial strain against the fungal strain, commercially ripe tomato fruits were superficially disinfected by immersion in a suspension of 2% sodium hypochlorite for 2 min, rinsed with sterile distilled water, and then they were dried by a stream of sterile air in a laminar flow chamber. Incision wounds were made on the fruits, 3 mm deep and 3 mm in diameter in the equatorial region. Immediately, 20 µL of an aqueous suspension of *Pseudomonas* sp. PCI2 were applied to each of the wounds, evaluating different concentrations (10^9, 10^7, and 10^5 CFU/mL). Three hours later, 15 µL of a suspension containing 10^4 conidia/mL of *A. alternata* was applied to each wound. The fruits were kept in a chamber at 20ºC and 95% humidity for 7 days in plastic containers protected with plastic wrap. Inoculation with the *Pseudomonas* sp. PCI2 strain showed a significant decrease in the symptoms of the disease, with an average reduction of 50% in the area of the lesions, a result that was observed with all bacterial concentrations, suggesting the use of the lowest. Therefore, this microorganism can be considered a promising tool in the biological control of *A. alternata* and suitable for the design of an effective strategy for the conservation of fruits.

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SECRETED PROTEINS BY *Candida albicans* SHOW ANTIGENIC SIMILARITY WITH PROTEIN FRACTIONS OF *Larrea divaricata* Cav. (JARILLA)

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Heterologous immunity or cross-reactivity are fundamental attributes of adaptive immunity. *Candida albicans* presents virulence factors that favor adhesion or penetration and consequently, modify its role as a commensal to become a pathogenic microorganism. In our laboratory, it has been shown that proteins from *Larrea divaricata* Cav. ("jarilla") are inducers of cross-reactive antibodies against cellular proteins of *C. albicans*. However, there are no studies on cross-reaction against the exoproducts (EP) of this yeast, which have significant proteolytic activity. The objective of this work was to demonstrate the molecular mimicry between jarilla proteins and EP of *C. albicans*, through specific antibodies against *L. divaricata* proteins. For this work, proteins from a crude jarilla extract obtained by different purification methods were used. Balb/c mice were subcutaneously immunized. In the first dose, antigens obtained from protein extracts precipitated with ethanol or ammonium sulfate were used. In a second dose, antigens obtained from the extract with or without prior washing treatment of jarilla leaves with acetone were used. Two doses of the antigen were applied, separated from each other by 21 days. Mice were bled 15 days after the last dose. *C. albicans* was cultured in MMO medium (modified MacDonald/Odds) to induce EP with proteolytic capacity. The supernatants were obtained at different culture times, 72 and 96 h. The cross-reaction of anti-jarilla antibodies against *C. albicans* EP was tested by ELISA assays. For these assays, the following sensitizing antigens were used: jarilla proteins and *C. albicans* culture supernatants concentrated and partially purified with 10 kDa cut-off membrane concentrators (Amicon Ultra – 0.5 mL 10 K). Our results demonstrated the importance of choosing the methodology used to obtain jarilla proteins as immunogens. On the other hand, it was observed that heterologous anti-jarilla protein antibodies recognized *C. albicans* EP in a proteolytic activity-inducing medium, thus demonstrating that antigenic similarity exists between both proteins, at different growth times. Our findings encourage further study on the ability of specific antibodies to neutralize some *C. albicans* virulence factors involved in host-pathogen interaction. These antibodies are obtained from plant proteins. Because this methodology is considered friendly to the environment, it is intended to collaborate from this study with promising pharmacological targets through a possible prophylactic and/or protective action of *L. divaricata* proteins. From the point of view of human health, this approach could contribute to possible future biotechnological developments.