SUMMARY

Identification of phytopathogenic fungi in cultures of *Sechium edule* (Jacq.) Sw. and study of oxidative homeostasis during its interaction with Phy*tophthora capsici*

The cultivation of chayote (*Sechium edule* Jack Sw.), has economic and social importance in the state of Veracruz, considered the main producer nationwide. Pests and diseases are the main problems affecting the production and marketing of chayote, and although the various pathogenic microorganisms in this crop are known, the most prevalent are unknown. In this sense, it is imperative to determine how the plant responds to a pathogen, that is basic information for designing mechanisms to activate defense responses. The objective of the study was to identify phytopathogenic fungi of chayote in six producing areas of the state of Veracruz and their response to perceiving a pathogenic microorganism. Two samples were taken: dry season and rainfall; diseased plant tissue was collected, with symptoms of yellowing, wilt, rot and necrosis. The fungi were isolated and the protocol of Koch's postulates was applied. In 36 fruits and 36 chayote plants, reduced glutathione and the expression of seven enzymes regulating oxidative metabolism were evaluated in response to the most virulent pathogen, which was monitored and recorded at 2, 4, 8, 14, 24 and 48 h after inoculation (hdi). Morphological and molecular identification showed that *Phytophthora capsici*, *Fusarium sambucinum* and *F. oxysporum* were isolated from Coscomatepec, Orizaba and Bocanita de la Esperanza, respectively, while in the other areas they were absent. The enzymes Glutathione-S-transferase and Glutathione reductase showed activity dependent on the perception of *P. capsici* in fruit and leaf, at all evaluated stages. Protein oxidation in fruit manifested itself at 2, 4, 24, and 48 hdi. While the carbonation of proteins in leaf was observed at 2, 8 and 48 hdi. The results of this study provide information on the roles or associations of the defense of the crop with the pathogen. This could be a useful tool for improving the sustainable protection of crops through the appropriate use of agrochemicals and for implementing genetic improvement programs.

Key words: Pathogenicity, Glutathione S-transferase, Glutathione reductase, *Phytophthora capsici*, reactive oxygen species, oxidative damage.