



1er CONGRESO ARGENTINO DE SEMILLAS

“germinando nuevas ideas”



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245-G - The mature maize grains exposed to fungal volatile organic compounds, increase their gene expression and enzymatic activity of lipoxygenases

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The oxylipins compounds (lipoxygenase (LOX) activity derivate) play an important role in plant-defenses, like chemical defenses against microorganism infections and herbivore attacks. In plants, the defenses can be induced or priming by volatile organic compounds (VOCs) emitted by other plants, fungi and bacteria, however, little is known about its role on physiological maturity of maize grains. During grain storage, different biological interactions with other microorganisms can occur through VOCs. *Fusarium verticillioides* (Fv) is the predominant *Fusarium* species in maize grains and has been shown that their volatile compounds can affect the performance of neighboring grains. The potential acquired resistance of maize kernel exposed to VOCs could provide great agronomic benefits in order to control the maize diseases. The objective was to study, at genetic and enzymatic level, the oxylipins pathway induction in grains through VOCs. Two atmosphere-connected compartments were used. The inductors were VOCs emitted by Fv growing on maize, 1-octen-3-ol pure and 3-octanol pure. In the other compartment, mature maize grains were placed. In grains exposed to VOCs, the ZmLOX12 (NM_001112527.1) gene showed a significant increase in expression levels. Then, the basal LOX enzymatic activity of grains exposed to fungal VOCs and 1-octen-3-ol showed a significant increase, while 1-octanol exposition did not. These suggest that the mature maize embryo is able to sense small molecules from its environment, and trigger a response. Future studies evaluating the potential acquired resistance of mature maize kernels exposed to fungal VOC against fungi and insects should be performed.

Key words: Oxylipins; *Fusarium verticillioides*; Plant-defenses