Title Some oxylipins can regulate toxin synthesis and conidiogenesis in *Aspergillus parasiticus* and *Aspergillus ochraceus*

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Abstract

In *Aspergillus parasiticus* and *Aspergillus ochraceus*, producers of aflatoxin and ochratoxin A (OTA) respectively, modulation of oxidative stress drives toxin biosynthesis and affects fungal growth and differentiation. Contamination by these fungi induces the formation of 9- and 13-hydroperoxyoctadecadienoic acid (HODE) in maize and wheat seeds; 9-HODE, from maize seeds, triggers conidiogenesis and toxin synthesis in *A. parasiticus* whereas 13-HODE inhibits both events. During seed colonisation, oxidative stress occurs in *A. parasiticus* mycelium and is sensed by the oxidative stress transcription factor Apyap1 which promotes the activation of antioxidant defences. The disrupted mutant DApyap1promotes the release of peroxides on the seed surface, with respect to WT, and the are seeds also induced early to form lipoperoxides on their coat. This event induces earlier formation of aflatoxin in DApyap1 in comparison with WT. Also in wheat seeds infected by *A. ochraceus*, OTA synthesis and conidiogenesis seem to be modulated by the relative percentage of 9-and 13-HODE. In *A. ochraceus* several lipoxygenases (lox) form oxylipins which are secreted partially outside the mycelium. The knock-out mutant Dlox presents a quantitative alteration of some oxylipins and Dlox-contaminated wheat seeds produce more 13-than 9-HODE. Further OTA synthesis and conidiogenesis are both inhibited. In conclusion some oxylipins produced by mycotoxigenic fungi can affect lipoperoxidation pathways in infected seeds, which, in turn, produce lipoperoxides affecting toxin synthesis and conidiogenesis of *A. parasiticus* and *A. ochraceus*.