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Transcript and metabolite analysis of *Vitis vinifera* cv. Trincadeira berries infected with *Botrytis cinerea* reveals an activation of a non sustained plant defense response

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Vitis vinifera berries are sensitive towards infection by the necrothopic pathogen *Botrytis cinerea* leading to important economic losses worldwide and it causes an excessive fungicide use. Understanding the interaction plant/pathogen leads to an improvement in chemicals management what may have a positive impact on biodiversity. Here, we reported a combined analysis of the transcriptome and metabolome associated with the infection of grapes berries. In an attempt to identify the molecular and metabolic mechanisms associated with the infection, pepper-corn size fruits were infected in-field and green berries and veraison berries were collected for microarray analysis complemented with metabolic profiling using GC-EI-TOF/MS and headspace GC-EI-MS platforms. The results provide evidence of a reprogramming of carbohydrate and lipid metabolisms towards increased synthesis of secondary metabolites involved in plant defense such as trans-resveratrol and gallic acid. The response is mainly activated in green berries with the putative involvement of jasmonic acid, ethylene, polyamines and auxins. At veraison, however, genes encoding protein kinases, MYB and WRKY transcription factors, pathogenesis-related proteins, glutathione S-transferase, stilbene synthase and phenylalanine ammonia-lyase are no longer up-regulated or even down-regulated suggesting that the basal defense response is not active with the onset of ripening. This non-sustained defense response has not been previously reported for necrotrophic, biotrophic, or hemibiotrophic pathogens, and highlights the importance of conducting studies in fruits and not solely in vegetative tissues. Furthermore, this study provided with metabolic biomarkers of infection namely azelaic acid, arabitol and gluconic acid that can be used to monitor infection early in the vineyard.

Biography

Patricia Agudelo-Romero has completed her PhD in Biotechnology at the Polytechnic University of Valencia (Spain) in 2009. Due to her thesis she was awarded with the extraordinary doctorate award. Currently, she is working as a Postdoctoral Researcher at the University of Lisbon (Portugal), in the frame of two Postdoctoral fellowships from the Portuguese Foundation of Science and Technology (FCT). During this time, she has been involved in four research projects, has participated in fourteen congresses and has published twelve papers in reputed journals.

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