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book of abstract

Understanding of grapevine communication mediated by volatile organic compounds against downy mildew using a metabolomics approach

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Plants can produce a wide variety of volatile organic compounds (VOCs), which play a crucial role in the interaction with other organisms and the regulation of plant responses against stresses. Different modes of action against phytopathogens have been attributed to VOCs, such as induction of plant resistance and direct inhibition of pathogen growth. In particular, the amount of some VOCs was higher in resistant than in susceptible grapevine genotypes upon *Plasmopara viticola* inoculation, indicating their possible involvement in resistance mechanisms against this pathogen. This work aims at identifying the metabolic response of VOC-treated grapevine leaves and the potential activation VOC-mediated resistance mechanisms. Susceptible grapevine leaf disks were treated with pure VOCs produced by resistant genotypes, or with water as control. Functional analyses confirmed that two VOCs (one C_{13}-norisoprenoid and one pyrone) reduced the disease severity on downy mildew on susceptible leaf disks and leaf disks were collected at two time points (one and six days after inoculation) from VOC-treated and control samples. transcriptional analyses revealed an increased expression level of defence-related gene, such as hypersensitivity-related, osmotin, chitinase and pathogenesis-related genes. Metabolomic analyses will be applied to clarify the mechanisms of action of VOCs and the response of VOC-treated leaves using ultra-high pressure liquid chromatography-high resolution-quadrupole-time of flight-mass spectrometry (UHPLC-Q-TOF-MS) analysis.