

Phenolic Compounds in Leaves and Fruits of Scab (*Venturia Inaequalis*) Resistant and Susceptible Apple, with and without Pathogen Elicitation

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Abstract

*One of the linchpin concepts in sustainable organic fruit production, in apple as well as other species, is the potential genotypes have of activating self-defense mechanisms that rely on synthesizing phenolic compounds to combat the development of fungi and other pathogens a given cultivar is susceptible to. We investigated both quantitatively and qualitatively phenolic compounds in apple resistant and/or susceptible to scab (*Venturia inaequalis*). A novel chromatograph-diode array detection (HPLC/DAD) approach was used first for the simultaneous determination of four classes of individual phenolic compounds (hydroxycinnamic acids, flavanols, flavonols, and dihydrocalcons) in leaves and fruit of the resistant cultivars Topaz and Florina and the susceptible cultivars Gala, Golden Delicious, and Red Delicious). It was then employed to determine whether the pathogen-induced resistance response is associated or depends on the amount of constitutive phenols and whether it elicits synthesis and the accumulation of phenolic compounds different from the constitutive ones naturally found in the various plant organs. Our analyses showed that flavanols and proanthocyanidin are mostly found in the leaves of the scab-resistant cultivar Topaz (Vf), and that the inoculum induces further synthesis of chlorogenic acid, proanthocyanidin, and florizine. The latter compounds were found mostly in fruit of Golden Delicious, a cultivar that is less susceptible to scab than Red Delicious, which synthesizes lower amounts.*

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