

# Effect of pre-harvest treatments with salicylic and methyl salicylic acid on the chemical profile and activity of some phenylpropanoid pathway related enzymes in apple leaves

Sasa Gacnik, Robert Veberic, Silvija Marinovic, Heidi Halbwirth and Maja Mikulic-Petkovsek

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## Abstract

The effects of single and multiple sprayings with salicylic acid (SA) and methyl-salicylic acid (MeSA) on the composition of phenolic compounds in apple leaves of the 'Topaz' cultivar were investigated by combined analysis of phenolic compounds by HPLC-MS and measurements of the activities of selected enzymes of the phenylpropanoid pathway (phenylalanine ammonia lyase (PAL), chalcone synthase (CHS)/chalcone isomerase (CHI), flavanone-3 $\beta$ -hydroxylase (FHT) and dihydroflavonol 4-reductase (DFR)). The results showed that SA and MeSA in general can stimulate the activity of the above-mentioned enzymes, which led to an increase in certain proven antifungicidal phenolics, such as catechin, chlorogenic acid and phloridzin. MeSA increased the catechin content in apple leaves by up to 48 %, chlorogenic acid by up to 55 % and it also increased the content of phloridzin (1.7-fold higher content in comparison with the control). The content of some phenolic groups, such as hydroxycinnamic acid, flavanones and flavanols, increased with the number of sprayings with MeSA.