Same ammo, different weapons: Enzymatic extracts from two apple genotypes with contrasted susceptibilities to fire blight (Erwinia amylovora) differentially convert phloridzin and phloretin in vitro

Titre	Same ammo, different weapons: Enzymatic extracts from two apple genotypes with contrasted susceptibilities to fire blight (Erwinia amylovora) differentially convert phloridzin and phloretin in vitro
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Résumé en anglais	The necrogenic bacterium Erwinia amylovora responsible for the fire blight disease causes cell death in apple tissues to enrich intercellular spaces with nutrients. Apple leaves contain large amounts of dihydrochalcones (DHCs), including phloridzin and its aglycone phloretin. Previous work showed an important decrease in the constitutive DHCs stock in infected leaves, probably caused by transformation reactions during the infection process. At least two flavonoid transformation pathways have been described so far: deglucosylation and oxidation. The aim of the present study was to determine whether DHCs are differentially converted in two apple genotypes displaying contrasted susceptibilities to the disease. Different analyses were performed: i) enzymatic activity assays in infected leaves, ii) identification/quantification of end-products obtained after in vitro enzymatic reactions with DHCs, iii) evaluation of the bactericidal activity of end-products. The results of the enzymatic assays showed that deglucosylation was dominant over oxidation in the susceptible genotype MM106 while the opposite was observed in the resistant genotype Evereste. These data were confirmed by LC–UV/Vis–MS analysis of in vitro reaction mixtures, especially because higher levels of o-quinoid oxidation products of phloretin were measured by using the enzymatic extracts of Evereste infected leaves. Their presence correlated well with a strong bactericidal activity of the reaction mixtures. Thus, our results suggest that a differential transformation of DHCs occur in apple genotypes with a potential involvement in the establishment of the susceptibility or the resistance to fire blight, through the release of glucose or of highly bactericidal compounds respectively.
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