



Dihydrochalcones: Implication in resistance to oxidative stress and bioactivities against advanced glycation end-products and vasoconstriction

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Résumé en anglais	<p>Flavonoids are a group of polyphenol compounds with known antioxidant activities. Among them, dihydrochalcones are mainly found in apple leaves (<i>Malus domestica</i>). Glycosylated dihydrochalcones were previously found in large amounts in leaves of two genotypes of <i>Malus</i> with contrasting resistance to fire blight, a bacterial disease caused by <i>Erwinia amylovora</i>. In the present study we demonstrate that soluble polyphenol patterns comprised phloridzin alone or in combination with two additional dihydrochalcones, identified as sieboldin and trilobatin. Presence of sieboldin in young leaves correlated well with a high 1,1-diphenyl-2-picrylhydrazyl (DPPH) free radical scavenging activity. Moreover, these leaves displayed enhanced tolerance to paraquat, a photooxidative-stress generating herbicide. Interestingly, phloridzin had a high activity in the oxygen radical absorbance capacity (ORAC) assay, but its presence alone in leaves did not correlate with tolerance to paraquat. In order to further characterise the activity of these compounds, we tested their ability to prevent oxidative-dependent formation of advanced glycation end-products (AGEs) and phenylephrine-induced contraction of isolated rat mesenteric arteries. The antioxidant capacity of sieboldin was clearly demonstrated by showing that this compound (i) prevented vasoconstriction and (ii) inhibited AGEs formation. Both assays provided interesting information concerning a potential use of sieboldin as a therapeutic. Hence, our results strongly argue for a bioactivity of dihydrochalcones as functional antioxidants in the resistance of <i>Malus</i> leaves to oxidative stress. In addition, we demonstrate for the first time that sieboldin is a powerful multipotent antioxidant, effective in preventing physiopathological processes. Further work should aim at demonstrating the potential use of this compound as a therapeutic in treating free radical-involving diseases.</p>
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