

**Radical scavenging activities of peels and pulps from cv. Golden Delicious apples as related to their phenolic composition.**

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The relationship between phenolic composition and radical scavenging activity of apple peel and pulp was investigated in fruit produced according to both organic and integrated agricultural methods. Apple tissue extracts were subjected to high-performance liquid chromatography separation, which showed that as compared with pulps, peels are richer in almost all of the quantified phenolics. Flavonols, flavanols, procyanidins, dihydrochalcones, and hydroxycinnamates were the identified phenolic classes in peel tissue, and the most abundant compounds were epicatechin, procyanidin B2, and phloridzin. Pulps were poorer in phytochemicals. Their major phenolics were procyanidins and hydroxycinnamates. Flavonols in amounts  $<20$  mg  $\text{kg}^{-1}$  fresh weight (fw) were also found. In both peels and pulps, integrated production samples were richer in polyphenols. Among the 14 compounds identified, only phloridzin had a tendency to appear higher in organic peels. The total antioxidant capacities (TAC) of extracts were evaluated using the 1,1-diphenyl-2-picrylhydrazyl radical assay and were expressed as Trolox equivalents. Integrated peels gave the highest TAC (18.56 mM  $\text{kg}^{-1}$  fw), followed by organic peels (TAC = 14.96), integrated pulps (TAC = 7.12), and organic pulps (TAC = 6.28). In peels, the top contributors to the antioxidant activity were found to be flavonols, flavanols, and procyanidins, which accounted for about 90% of the total calculated activity whereas in pulps, the TAC was primarily derived from flavanols (monomers and polymers) together with hydroxycinnamates. A good correlation between the sum of polyphenols and the radical scavenging activities was found. Among the single classes of compounds, procyanidins (in peels and pulps) and flavonols (in peels) were statistically correlated to the TAC