Effect of reddening-ripening on the antioxidant activity of polyphenol extracts from cv. 'Annurca' apple fruits.

J Agric Food Chem. 2007 Nov 28;55(24):9977-85. Epub 2007 Oct 26
D'Angelo S, Cimmino A, Raimo M, Salvatore A, Zappia V, Galletti P.
Faculty of Motor Sciences, Parthenope University, Naples, Italy.
sdangelo@uniparthenope.it

Apple is among the most consumed fruits worldwide, and several studies suggest that apple polyphenols could play a role in the prevention of degenerative diseases. 'Annurca' apple fruit undergoes, after harvest, a typical reddening treatment to turn the apples' skin red, and it is noted for its high firmness. This paper reports the effect of reddening-ripening treatment on polyphenol concentration and antioxidant activity of both peel and flesh extracts. The in vitro antioxidant properties have been compared with the protective effect against the cytotoxic effects of reactive oxygen species using Caco-2 cells as model system. Pretreatment of cells with different polyphenolic apple extracts provides a remarkable protection against oxidative damage. This effect seems to be associated with the antioxidant activity of 'Annurca' apple polyphenolic compounds. The flesh has antioxidant properties comparable to those possessed by the peel. Neither the reddening nor the fruit conservation causes changes in the antioxidant properties possessed by this apple variety. The data indicate that polyphenolic compounds in 'Annurca' apples are relatively stable in the peel and also in the flesh; therefore, the health benefits of polyphenols should be maintained during long-term storage. Finally, a diet rich in apple antioxidants could exert a beneficial effect in the prevention of intestinal pathologies related to the production of reactive oxygen species.