Title	Use of honey as a natural antioxidant to prevent enzymatic browning of fresh-cut apples
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Abstract

With increased consumer demand for natural products, efforts to use natural compounds to prevent enzymatic browning in fresh-cut fruits have been emphasized. Honey has been studied for its antioxidant capacity (AOX) contributed by the constituents including phenolic acids, enzymes, ascorbic acids, organic acids, and amino acids. However, limited result was reported about their antienzymatic browning function in fresh-cut fruits. Our objectives were to assess AOX of honey from U.S. Northwest floral sources and to investigate their antibrowning effect on fresh-cut apples, honeys from 10 different Northwest floral sources (alfalfa, blackberry, blueberry, fireweed, raspberry, snowberry, clover thistle, vetch and wild flowers) were tested. AOX was evaluated spectrophotometically against 1,1-diphenyl-2-picryllhydrazyl radicals and superoxide anion radicals. Total phenolic contents were determined by Folin-Ciocalteau method. Color, viscosity, pH, and °Brix of honeys were tested. Apple slices were vacuum impregnated (15 min vacuum at 50 mmHg following 30 min atmospheric restoration) in 10% honey solution to promote entrance of honey into the porous structure of apples. Color of the apples was monitored during ten days of storage at 4 °C and 80% RH. Results showed that AOX of 25% tested honey solutions range from 7 to 37 mg/kg AA, and had 52-98% inhibitory effect against superoxide anion radicals. Total phenolic content was in the rage of 47 and 110 mg/kg GAE. Honeys with darker color had higher AOX. The 10% wildflower and alfalfa honeys significantly inhibited browning discoloration of fresh-cut apples. Honey impregnated apples maintained stable color throughout the storage time although it may cause initial reduction of lightness as a result of the color from honey. A light colored honey may be preferred for its application as an antibrowning agent for fresh-cut apples. These results suggested that honey has the potential bo be used as a natural ingredient to prevent enzymatic browning in fresh-cut fruits.