

Fruit Composition and Quality of Apple, Apricot, and Pear Cultivars Organically and Conventionally Grown in the Veneto region (Northern Italy)

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Abstract

Many consumers prefer organic products because of the better taste. Nevertheless, sometimes taste differences between organic and conventional food could not be detected by panel tests. Furthermore, differences of fruit quality did not clearly emerge from experiments where the standard indicators were used, and the results of comparative trials were contradictory, suggesting the need for more reliable indicators. Sweetness and sourness are major determinants of taste sensory attributes that humans perceive, and are largely dependent on soluble sugars and organic acid content. Astringency gives a positive or a negative contribution to fruit taste depending on concentration and type of phenolics.

Organic fruit growing has found a good application in Veneto region. The local interest of wide groups of consumers towards environmental and food quality, with special regard to nutritional and health properties, has stimulated the Rovigo Province to introduce the evaluation of composition and quality of organic fruits among the activities of the project 'Biorovigo.' The present trial was aimed at analyzing the chemical composition of organic fruits of commercially, including well-known apple, apricot, and pear cultivars in comparison with conventional fruits in order to individualize differences that can justify the perception of better taste by consumers.

The main pomological traits are the quantitative and qualitative analysis of sugars, organic acids, and the content of starch, total polyphenols, and ascorbic acid of organic and conventional fruits. Portici apricots, Golden Delicious apples, Abate Fétel, Kaiser, and William pears were compared in 2002 and 2003. Fruits were sampled in organic and conventional farms located in the province of Rovigo. The farms were very close; the plants were adult, with similar crop load. The rootstock and training systems were the same.

The growing system did not induce clear differences of fruit weight. Dry matter was significantly lower in conventional fruits. Differences in total soluble sugar content and profile were observed. Organic fruits frequently showed higher contents of monosaccharides and a higher ratio of mono/disaccharides than conventional ones. Starch level did not differ in apricots, whereas it was generally lower in conventional apples and pears.

Significantly higher content of total polyphenols was observed in apricots and pears organically produced. All organic samples showed higher ascorbic acid levels than the conventional ones. Since the sugars are dissimilar for their sweetening power and have different interaction capacity with taste originated by other chemical substances, differences of sugar profile can justify the possible different taste of organic and conventional fruits and the appreciation for organically produced fruits.

Many of the compositional differences observed between organic and conventional fruit reflect differences caused by nitrogen availability. Organic farms have often a lower availability of nitrogen, and this lower nutritional support can affect fruit composition.

Better nutraceutical properties of organic fruits are suggested by our analyses, since they were characterized by higher ascorbic acid and phenolic content than conventional fruits.

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