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## Sensory profiling of apple cultivars

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Sensory quality of apples, recognised as a key factor driving consumer choice, is frequently indirectly measured using basic instrumental or pomological descriptors. Several studies so far investigated the correlations between instrumental measurements and sensory properties, these latter not always analysed by trained panel according to proper sensory science principles.

Here, we present the setting up and the application of a trained panel sensory evaluation tool for the characterization of apple. Fruit physical and chemical parameters related to sensory descriptors of flavour and texture (basic composition, volatile metabolite profiling and texture profiling) were instrumentally measured as well.

The proposed methodology, validated on a wide selection of apple cultivars (more than 20 commercial varieties and 11 new FEM accessions) over 2 years of production, allows to discriminate among different cultivars and highlights the perceivable changes developed during postharvest. Multivariate regression models show that it is possible to predict by instrumental measurements most of the textural sensory properties together with some flavour attributes.

The opportunity to monitor several important sensory attributes makes the proposed sensory/instrumental approach a valuable tool for cultivar evaluation in breeding programs to assist the genetic improvement of new apple accession characterised by a better fruit quality, oriented towards the consumer preferences.

## **Agrimoniin the most important ellagitannin in human diet: elucidation of its identity in strawberry fruits and the influence of fruit ripening on its concentration**

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Of the most commonly consumed berries, strawberries (*Fragaria ananassa* Duch.) are the most popular choice with consumers, being eaten both fresh and frozen, as well as in different processed products. Although the composition of strawberry fruit has been extensively studied, especially for the most abundant phenolic compounds, agrimoniin

has been only recently univocally identified as one of the most abundant phenolic compounds in the fruit (Vrhovsek et al. 2012). In this study agrimoniin was isolated in the fruit of *Fragaria vesca* and its structure fully characterized, reporting for the first time the full NMR assignments for this dimeric ellagitannin. Agrimoniin is a known bioactive compound, which has been used for treatment of diarrhea and haemorrhaging and reported to have antitumor properties. Its presence as the main ellagitannin in both *F. vesca* and *Fragaria ananassa* D. fruit is therefore noticeable.

The establishment of a new HPLC protocol for the separation of the strawberry ellagitannins, and the isolation and characterisation of other ellagic acid derivatives, allowed us to produce an accurate quantification of the main ellagitannins and ellagic acid conjugates in 6 different varieties of strawberry and in 2 woodland strawberry at four different ripening stages from the green stage up to overripe fruit.

Of fruit containing ellagitannins, strawberries are the most widely consumed, and agrimoniin is suggested to be one of the most widely present ellagitannins in the human diet. Agrimoniin, together with the other strawberry ellagitannins and ellagic acid derivatives characterised in this study, deserve further attention since they are expected to play an important, yet still largely unexplored, role in the beneficial health effects associated with the consumption of strawberries by humans.

Literature:

Vrhovsek u., Guella G., Gasperotti M., Pojer E., Zancato M., Mattivi F. Clarifying the identity of the main ellagitannin in the fruit of the strawberry, *Fragaria vesca* and *Fragaria ananassa* Duch. *Journal of agricultural and food chemistry* volume, 60, 10, 2507-2516.

### **The 'Knotted'-like '*Knope1*' gene regulates stem elongation and lignification during primary growth of peach stem**

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The 'KNOTTED'-like genes ('KNOX') encode homeodomain transcription factors and regulate several processes of plant organ development. The peach ('*Prunus persica*' L. Batsch) '*KNOPE1*' was assessed to link to a QTL for the internode length in the Peach x *Ferganensis* population. The '*KNOPE1*' expression decreased progressively from stem primary (elongation) to secondary growth (radial expansion) of adult shoots. During primary growth, the '*KNOPE1*' mRNA was localised in the cortex and in the procambium/metaphloem zones, whereas it was undetected in incipient phloem and xylem fibres. '*KNOPE1*' over-expression in the arabidopsis '*bp4*' loss-of-function background ('35S:*KNOPE1*/*bp*' genotype) restored the rachis length, suggesting, together with the QTL association, a role for '*KNOPE1*' in peach shoot elongation. Several lignin biosynthesis genes were up-regulated in the '*bp4*' internodes but