PHYSICO-CHEMICAL AND SENSORY QUALITY OF POMEGRANATE JUICES FROM DIFFERENT SPANISH CULTIVARS

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INTRODUCTION

SPAIN is the main European pomegranate producer, and its production is mainly located in **Alicante** (Eastern Spain). The edible part of **pomegranate** is consumed fresh but also as juices, canned beverages, jellies, jams, etc.

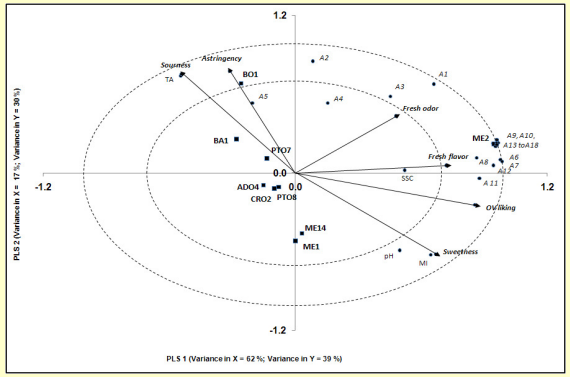
Research on **pomegranate juices** has drastically increased in recent years due to their high antioxidant activity, which is often related to the inhibition of some genes related to prostate and colon cancer development, among other beneficial health effects.

MATERIALS AND METHODS

Plant material. The Universidad Miguel Hernández has a wide **collection of pomegranate cultivars** in their fields. Fruits from nine cultivars, representing the genetic diversity of pomegranates cultivated in Spain, were used for juice preparation; these cultivars can be easily grouped according to their basic taste (sweet, acid or semi-acid) and their potential industrial applications.

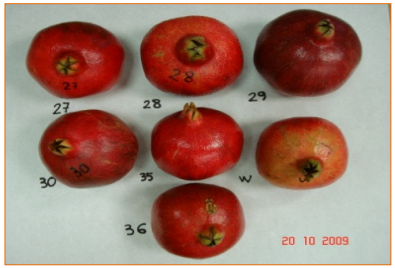
Juice analyses. Volatile compounds were extracted using **hydro-distillation** and analyzed using **GC-MS** and GC-FID. A **consumer panel** was used to evaluate the overall liking and the satisfaction degree on the main attributes of juices, which included color, fresh pomegranate odor, fresh pomegranate flavor, sweetness, sourness and astringency.

PLS regression map, showing the relationships among consumers' satisfaction degree and instrumental data.









RESULTS AND DISCUSSION

Physico-chemical and sensory results proved that **Mollar de Elche 2 (ME2) was the best suited cultivar for juice manufacturing**. ME2 juices were characterized by high satisfaction degree scores for fresh pomegranate odor (2.3) and flavor (3.7) and sweetness (6.2), medium scores for color (5.3) and low scores for sourness (2.0); the overall quality of ME2 juices was 7.0 (in a 0 to 10 scale).

Instrumental results supported sensory data; for instance, ME2 juices had the highest maturity index (64) and the highest total concentration of volatile compounds (10.9 g/kg) compared to a mean value of 2.4 g/kg for the other eight cultivars.

Overall liking seemed to be related with **fresh flavor, fresh odour and sweetness**. The ME2 juice was the most liked one, perhaps due to, among other factors, its high concentration on: i) total volatile compounds, and ii) **terpenes**, such as α-pinene, β-pinene, β-myrcene, limonene and γ-terpinene. On the other hand, sourness and astringency were on the opposite side of the map, which indicated that consumers disliked the pomegranate juices with sour and/or astringent characteristics (BO1 and BA1).

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