Fruit quality of Italian pomegranate (*Punica granatum* L.) autochthonous varieties

Valerio Cristofori · Donatella Caruso ·
Gabriele Latini · Mario Dell'Agli · Corrado Cammilli ·
Eddo Rugini · Cristina Bignami · Rosario Muleo

Received: 21 July 2010 / Revised: 2 November 2010 / Accepted: 6 November 2010 / Published online: 24 December 2010
© Springer-Verlag 2010

Abstract Pomegranate is getting an increasing attention for its health-promoting effects. Collection and characterization of plants of local sources has been performed, and five accessions have been propagated and cultivated in a collection field for extra situ investigations. Accessions differ for pomological traits and chemical composition. Three of them, MG1, MG2, and MG3, belong to typology with low-medium acidity and high sugar content, while the other two, Tordimonte A and B, belong to typology with high acidity. In the juice and in the peels' extract of Tordimonte A accession a high level of punicalin has been found through chromatographic determinations, while the presence of punicalagin was found in the juice of accession MG1. The accessions MG1, MG2, and MG3 seem particularly suitable for direct commercialization of fruits due to

the fruit traits and quality (sweet varieties), while Tordimonte A and B could be valuable for juice processing (sour varieties).

Keywords *Punica granatum* L. · Organoleptic traits · Phenols · Ellagic acid · Punicalagin

Introduction

Pomegranate (PG), *Punica granatum* L., is a temperate climate species, mainly cultivated in the Mediterranean area, Southern Asia, and in several countries of North and South America [24]. Although PG is one of the oldest known edible fruit, there is an increasing interest because it is considered to be a functional product of great benefit in the human diet as it contains several groups of substances that are useful in disease risk reduction, such as risk of coronary heart disease, vascular diseases, and cancer mortality [4, 6, 15, 16, 21, 25]. Pomegranate juice is an important source of phenols and tannins, such as punicalin, punicalagin, and ellagic acid, and in genotypes with red arils a large amount of anthocyanins, such as cyanidin, delphinidin, and pelargonidin and the corresponding glycosides have been found [2, 12, 22]. The fruit juice of PG was found to have an exceptionally high antioxidative capacity [21].

Nowadays, consumers are demanding high-quality products. The aril, the edible portion of PG, can be consumed fresh, but it is also used in the preparation of juices, jellies, jams, and colorings for drinks [11]. Although, in Italy, pomegranate is getting an increasing attention from the market, its cultivation is confined in a few areas of Sicily and Sardinia; therefore, the fruits are mainly supplied by import from Spain, Turkey, and Iran. In Italy,

V. Cristofori · G. Latini · C. Cammilli · E. Rugini ·
R. Muleo (✉)

Department of Crop Production, University of Tuscia,
Via San Camillo de' Lellis, 01100 Viterbo, Italy
e-mail: muleo@unitus.it

D. Caruso · M. Dell'Agli
Department of Pharmacological Science, University of Milan,
Via Balzaretti 9, 20133 Milan, Italy

D. Caruso · M. Dell'Agli
Research Centre for the Characterization and Safe use of Natural
Compounds "Giovanni Galli", University of Milan, Via
Balzaretti 9, 20133 Milan, Italy

C. Bignami
Department of Agricultural and Food Sciences,
University of Modena and Reggio Emilia,
Via Amendola 2, Pad. Besta, 42100 Reggio Emilia, Italy