



Terroir influence on quality of ‘Crimson’ table grapes

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ABSTRACT

The *terroir* concept can be defined as the effect on food sensory features of the uniqueness of the place, which gives food products a particular taste, mainly due to soil and climate characteristics. The aim of the present study was to understand the relationship between the physiological behaviour of vineyards, soil characteristics and final quality of ‘Crimson’ table grapes. Soluble Solids Content (SSC) and texture properties of berries varied significantly between the two vineyards. Unexpectedly, the vineyard which had the lower leaf chlorophyll content ($9.99 \text{ mg m}^{-2} \pm 2.73$), produced the heavier berries ($5.82 \text{ g} \pm 0.21$) with higher SSC values ($22.03^\circ\text{Brix} \pm 0.23$). Only slight differences for phenolic compounds and antioxidant capacity were observed between grapes from the two vineyards ($p > 0.05$). As previously reported by other authors, the balance between soil and berry mineral content seems to indicate that mineral nutrient uptake by the vine or soil ability to provide nutrients, did not step in significantly on grape quality. Regarding sensory evaluation, consumers found differences between grapes from the same cultivar growing in the same region but from two distinct vineyards ($p < 0.05$), which was corroborated by the differences found in some instrumental measurements.

1. Introduction

Terroir is an old wine concept, nowadays largely used in other food products. References on *terroir* for coffee, tea, chocolate, milk and cheese are commercially useful and are easily found (Lambot et al., 2017; Lee et al., 2015; Ogden, 2014; Turbes et al., 2016). This generalization of the *terroir* concept allows to define it as the effect on food sensory features of the uniqueness of the place, which gives food products a particular taste, mainly due to soil and climate characteristics (Lenglet, 2014).

On the other hand, the European Union (EU) schemes of geographical indications and traditional specialities, namely *Protected Designation of Origin* (PDO), *Protected Geographical Indication* (PGI) and *Traditional Specialities Guaranteed* (TSG), cover food characterisation all over the world, promoting and protecting quality agricultural products and foods. These ideas and concepts are supported by the *terroir* effect, including soil and climate characteristics, but also by agronomical practices, varieties and even cultural aspects. Therefore *terroir* is

present and deeply underlying modern, global food systems. Wine *terroir* is a usual and highlighted concept often used by wine makers for marketing proposes. Numerous studies about wine *terroir* have been done (Morlat and Bodin, 2006; Roullier-Gall et al., 2014; Seguin, 1986; Tarr et al., 2013; Van Leeuwen et al., 2010, 2004), some of them considering the role of grapes on the final flavour of the wine. Grape berries contain the major compounds contributing to wine flavour, due to metabolic changes in the berries during growth until harvest (Lund and Bohlmann, 2006) and their chemical composition is influenced by various environmental conditions, which can be considered to be representative of a *terroir* (Roullier-Gall et al., 2014).

The study of the influence of *terroir* on table grapes has not been addressed before. One exception is the work by Gallo et al. (2014), about the effect of farming practices on grape composition considering three case studies with three different varieties and distinct vineyards. These studies confirmed that agronomical practices affected the composition of table grapes in terms of primary metabolites, mainly glucose, fructose, arginine and ethanol. They also concluded that inter-

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