A survey on the presence of rotundone in “peppery” European wines

F Mattivi¹, S Carlin¹, J Tardaguila ², L Valenti³, I Ghiglieno³, R Eder⁴, L Caputi¹ and U Vrhovsek¹

¹IASMA Research and Innovation Centre, Fondazione Edmund Mach, Via E. Mach 1, 38010 S. Michele all’Adige, Italy; ²Instituto de Ciencias de la Vid y del Vino, University of La Rioja, CSIC, Gobierno de La Rioja, Madre de Dios, 51, 26006 Logrono, Spain; ³DI.PRO.VE. Department of Vegetal Production, University of Milan, Via Celoria 2, 20133 Milano, Italy; ⁴HBLA und Bundesamt für Wein- und Obstbau Klosterneuburg, Klosterneuburg, Austria

Corresponding author: fulvio.mattivi@iasma.it

Rotundone is a sesquiterpenoid ketone identified as responsible for the ‘peppery’ aroma of white and black pepper, herbs and spices but also of grapes and wine [1]. The development of an effective method for its detection and quantification in grapes and wine, based on solid-phase micro-extraction, gas chromatography and tandem mass spectrometry, was effectively applied to discover the origin of the peppery aroma in both red and white European wines [2,3].

A survey of European wines selected on the basis of their ‘peppery’ character revealed that the presence of rotundone is relatively widespread in V. vinifera wines. Particularly high levels of this aroma were found in red varieties such as Schioppettino and Vespolina [2]. For the first time this compound was reported in the white variety Gruener Veltliner, at levels up to 17 times the sensorial threshold, as well in Groppello di Revò, Graciano and a number of other varieties.

Rotundone was shown to accumulate almost exclusively in berry exocarp, and is released in only a low percentage in wine during the fermentation process. Thus, long skin contact would contribute to enriching ‘peppery’ notes in wine. However, a significant amount of the compound is lost during separation and filtration processes, suggesting that attention should be paid to the choice of the wine filtration and fining methods [3].

Both the results of a survey on a large number (>100) of spicy wines and a first controlled experiment on the red variety Vespolina supported the hypothesis that higher levels of rotundone are accumulated in cooler vintages and sites. This is consistent with
the empirical observation that there are ‘peppery’ vineyards that consistently produce ‘peppery’ wines, especially in cooler years.

References