Training of a tasting panel for detection of olfactory phenolic defects in wine

Andreia Matos ¹ Fernanda Cosme ², Alice Vilela ³

(1) University of Trás-os-Montes e Alto Douro, 5001-801 Vila Real, Portugal
(2) Chemistry Research Centre of Vila Real (CQ-VR), Dep. of Biology and Environment, Enology building, University of Trás-os-Montes and Alto Douro, Vila Real, Portugal. *avimoura@utad.pt

Abstract

Volatile phenols are a large family of compounds involved in the aroma and flavor of red wine, their presence is known for more than a decade. These compounds appear due to the metabolic activity of microorganisms such as wine yeasts of the genus Saccharomyces and non-Saccharomyces (Brettanomyces / Dekkera) and bacteria of the genus Lactobacillus and Pediococcus. These microorganisms have the capacity to decarboxylate ferulic and p-coumaric acids present in wine leading to the appearance of phenol compounds widely known.

From a sensory point of view, wine phenolic character is reflected, in less severe cases, in a loss of typicity and fineness. In more severe cases, horse, stable, leather and tobacco aromas may appear, much of the consumers dislike.

Given the importance of this sensory defect, the aim of this work was to train a panel of tasters for detection of olfactory phenolic defects in red wines, since the sensory analysis is usually performed by a trained panel of tasters. One of the most used discriminatory tests is triangular test. The results obtained are analyzed statistically allowing to evaluate the panel performance. Therefore, to achieve the goals of this study, several sensory triangular tests were performed in relation to the detection of phenolic compounds: 4-ethyl-phenol, 4-ethyl-guaiacol and 4-ethyl-catecol. At the end of the training sessions, were evaluated, sensorially, five wines with phenolic character. The tests were performed in a sensory analysis laboratory with regulatory requirements (ISO 8589, 2007; NP 4258, 1993), allowing a standard environment, essential conditions for results repeatability and reproducibility.

In triangle tests the compounds easier to identify were 4-ethyl phenol and 4-ethyl-guaiacol. However, when a wine model solution was used, with the three compounds simultaneously, 9 out of 10 panelists agreed in all series, showing that the overall perception threshold decreased due to the addition compounds effect.

Keywords: Red wines, phenolic character, 4-ethyl-phenol, 4-ethyl-guaiacol, 4-ethyl-catecol, sensorial triangle tests.