IDENTIFICATION OF KEY ODORANTS ON MADEIRA WINE, THEIR IMPACT ON TYPICITY AND ELUCIDATION ABOUT FORMATION MECHANISMS

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The production of Madeira wine involves a heating step (baking) where the wines are heated up to 55 ºC during about 3 months. This process plays a key role in the sensory quality of these fortified wines (1). In this study attempts were made in order to measure the impact of the some technological parameters on the "tipicity" of Madeira wine, namely fermentation extent, temperature and time of the baking process using two categories Malvasia (M) and Sercial (S) traditionally high (~ 120 g/L) (H) and low (~ 2 g/L) (L) residual sugar content respectively. In this work the two varietals were fermented to dryness (M-L, S-L) and non-fermented (M-H, S-H) originating four sets of samples. Samples were submitted to an isotherm baking process of 50 ºC during 120 days and were collected each 15 days. The M-H and S-L samples were simultaneously presented to a sensory panel at the end of the experiment and it was requested to rank the samples according to "tipicity", perceived uniquely by orthonasal routes. The rank order attributed by each assessor was compared, correlations were calculated by the Spearman method (2). Ranks were converted to scores (3), and it was observed a linear trend ($r > 0.95$) between the time of "baking" process and the average of the "tipicity" scores. The "tipicity" rate, calculated by the slope of the linear models, increases with time being two times higher for the M-H than to the S-L.

GC-O-AEDA was used as a screening technique to correlate the sensory data obtained by Quantitative Descriptive Analysis (QDA) procedure (4) with chemical data, Sotolon was the molecule with higest FD. It was observed that the "typicity" scores were positively correlated with the concentration of Sotolon and sugar, baking time and negatively with the fermentation length. In order to assess the contribution of Amadori, Strecker and oxidative desamination reactions compounds in Madeira wine flavour manly into Sotolon formation, aminoacid, dicarbonyl and ketoacid contents were quantified by LC-MS/MS in the four sets (5). Strecker aldehyde contents increased during the baking process. Ketoacid and dicarbonylic compounds are present at highest concentrations after longer baking periods and less fermented samples, 1 and 3-Deoxyosone, a key intermediate in Amadori mechanism are well correlated both with Ketobutyric acid and Sotolon in wines. These results reinforce the role of Maillard related mechanism in typical flavour of Madeira wines.

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