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BOOK of ABSTRACTS

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893 - MONOTERPENES CHARACTERIZATION IN GRAPE SPIRITS USING FAST GAS CHROMATOGRAPHY TANDEM MASS SPECTROMETRY

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Introduction:

Monoterpenes are among the most important aromatic metabolites to be found in a free and bound form in grapes [1]. Aromatic characteristic of grape spirits can therefore be especially attributed to this class of molecules despite the presence of countless volatile compounds produced during alcoholic fermentation [2,3]. The aim of this study was to describe the terpenic profiles responsible for the varietal aroma of a selection of grape spirits produced from 10 different varieties using an innovative fast GC-MS/MS method.

Methods:

20 mL of sample was diluted to 100 mL with Milli-Q water after the addition of 2-octanol as internal standard. Monoterpenes were extracted by adsorption on a SPE cartridge and eluted with dichloromethane [4,5]. The organic phase was analysed using an Agilent Intuvo 9000 GC system coupled with an Agilent 7000 Series Triple Quadrupole MS operating in dynamic MRM mode. Separation was obtained injecting 2 μ L in split mode (1:5) into a DB-Wax UI (20 m \times 0.18 mm \times 0.18 μ m).

Results:

The presented method permitted to qualify and quantify 15 different monoterpenes characteristic of the grape spirits in only 15 minutes. The compounds detected were α -terpineol, β -citronellol, geranic acid, geraniol, HO-diol I, HO-trienol, linalool oxide A, linalool oxide B, linalool oxide C, linalool oxide D, linalool, nerol, rose oxide I, rose oxide II and terpinen-4-ol. All of the measured monoterpenes were found in the 39 grape spirit samples except for HO-diol I and HO-trienol that were detected in only 12 and 30 samples, respectively.

The correlation matrix showed a positive correlation between the amount of linalool oxides, linalool, α -terpineol and HO-diol I. A positive correlation was also observed between β -citronellol, nerol, geraniol and rose oxides.

Principal component analysis (PCA) was used to display the samples in an unsupervised pattern recognition map. The PCA showed that a group of samples was characterised by a high content of linalool oxides and linalool, while another one by a high content of β -citronellol, nerol and rose oxides.

Conclusions:

The proposed method made it possible to obtain a broad monoterpene profile characteristic of grape spirit products in only 15 minutes. 15 monoterpenes were qualified and quantified in 39 grape spirit samples obtained from different grape varieties. The statistical approach highlighted that there was a positive correlation between the different compounds and allowed to discriminate the most aromatic samples on the basis of their different monoterpene profile.

Novel Aspect:

The method developed can be proposed for the fast characterisation of grape spirit samples based on their different monoterpene profile.

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