Study of the changes in volatile compounds, aroma and sensory attributes during the production process of sparkling wine by traditional method

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One of the strongest factors that affects the volatile profile of sparkling wine is the winemaking process. Here we focus on determining the effects of the second fermentation and aging on lees of sparkling wine from País grape variety combining different analysis techniques for the first time in sparkling wine: gas chromatography/mass spectrometry/olfactometry and sensorial analysis. During the second fermentation and aging, there was a significant loss of esters that might be related to the adsorption on lees and ester volatility and chemical hydrolysis. The concentration of several compounds such as some esters (diethyl succinate, ethyl lactate, and ethyl isovalerate) increased during aging and could be used as aging markers. Vitispiranes were identified as the best norisoprenoids aging markers for young sparkling wines (12 months of aging). Also, PCA showed that time of aging on lees affected mostly esters and terpenes. On the other hand, the diminution of fruity/floral impact odorants during aging was not perceived in sensorial trials. Our results suggest that the responsibility for fruity/floral nuances in sparkling wine might reside in a few high-impact aromatic compounds, such as ethyl isobutyrate, isoamyl acetate, ethyl hexanoate, ?-phenylethanol and diethyl succinate.

Aging

Impact aroma compounds

Olfactometry

País grape variety

Sensory analysis

sparkling wine

Volatile compounds

Aging of materials

Esters

Ethanol

Fermentation

Gas chromatography

Odors

Volatile organic compounds

Wine

Aroma compounds

Grape variety

Olfactometry

Sparkling wines

Volatile compounds

Sensory analysis

diethyl succinate

ester

ethyl 2-methylpropanoate

ethyl hexanoate

fragrance

hexanoic acid derivative

isopentyl acetate

pentanol

phenethyl alcohol

propionic acid derivative

succinic acid derivative

terpene

volatile organic compound

classification

female

fermentation

human

male

mass fragmentography

olfactometry

taste

time factor

Vitis

wine

Caproates

Esters

Female

Fermentation

Gas Chromatography-Mass Spectrometry

Humans

Male

Odorants

Olfactometry

Pentanols

Phenylethyl Alcohol

Propionates

Succinates

Taste

Terpenes

Time Factors

Vitis

Volatile Organic Compounds

Wine