

Introduction

The Pinot blanc is one of the most important grape varieties cultivated in South Tyrol, Italy. Wines from Pinot blanc berries are characterized by a fresh-fruity aroma which depends to a large extent on the temperature to which the grapes are exposed during ripening. However, the increasing temperature in the Alps negatively influences the volatile composition of South Tyrolean Pinot blanc wines and forces the winegrowers to harvest their grapes earlier along the season.

A possible way to ensure the typical aroma of Pinot blanc wines would be to move into higher and thus cooler vineyard locations.



Two bunches of Pinot blanc.

Aim of the project

The main goal of this project is to characterize the volatile composition of South Tyrolean Pinot blanc musts and wines from vintage 2017 to deeply understand the influence of altitude in the Pinot blanc aroma.

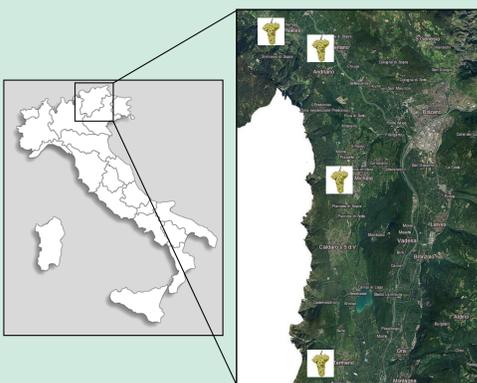


A Pinot blanc vineyard at high altitude located in South Tyrol.

Materials & Methods

1 Sampling

- ✓ Four sites
- ✓ Two altitudes per site
- ✓ Two sampling dates



Trial fields in South Tyrol used in the project. Each growing area (bunch) consists of two vineyards at high and low altitudes.

2 Vinification

45 trial musts and wines (same microvinification)



Trial wines.

3 Sample preparation and SPME



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- ✓ 1 mL (wine) or 5 mL (must) of sample
- ✓ 30% NaCl
- ✓ Internal standards
- ✓ Temperature 45°C
- ✓ Equilibration 10 min
- ✓ Extraction 45 min

4 VOCs analysis (GC-HRT-TOF-MS)

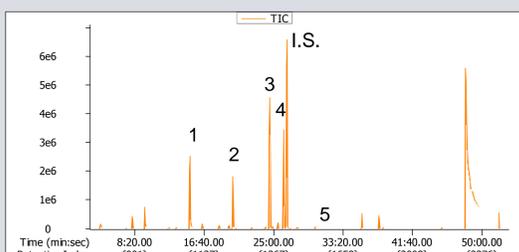


Pegasus GC-HRT-TOF-MS instrument (LECO).

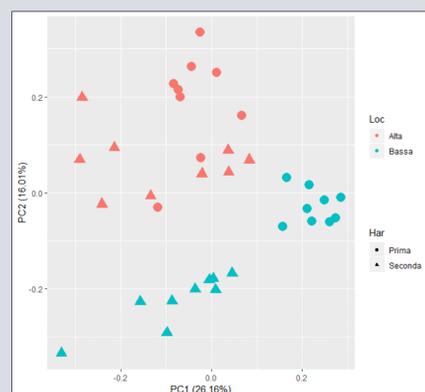
- ✓ Mass Range (40 – 510 mu)
- ✓ Ion Source and Transferline at 250°C
- ✓ Electron energy 70 eV
- ✓ ChromaTOF® software for data processing
- ✓ Statistical analysis of raw data (R® software)

Results and Discussion

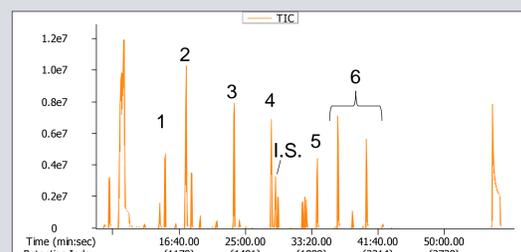
A total of 40 and 60 VOCs were detected in Pinot blanc musts and wines, respectively. Differences in terms of VOCs abundance were detected among all wines and musts from the different sites under investigation.



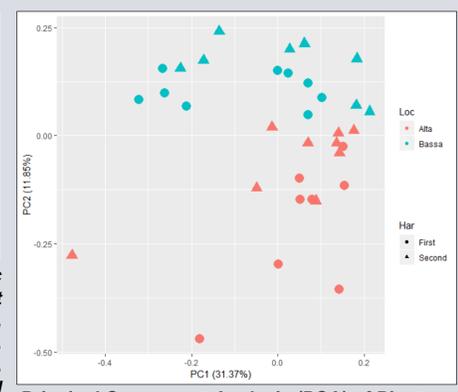
Total Ion Current (TIC) chromatogram of a Pinot blanc must obtained from a vineyard located in Terlano at 280 m a.s.l. 1. Hexanal; 2. 2-Hexenal; 3. 1-Hexanol 4. 2-Hexen-1-ol; 5. Hotrienol; I.S. Internal Standard (2-Octanol).



Principal Component Analysis (PCA) of Pinot blanc musts from Terlano vineyards.



Total Ion Current (TIC) chromatogram of a Pinot blanc wine obtained from a vineyard located in Appiano at 570 m a.s.l. 1. 1-butanol, 3-methyl acetate; 2. 1-butanol, 3-methyl; 3. Octanoic acid, ethyl ester; 4. Decanoic acid, ethyl ester; 5. Ethanol, 2-phenyl; 6. Octanoic acid, Nonanoic acid and Decanoic acid; I.S. Internal Standard (2-Aminoacetophenone-D8).



Principal Component Analysis (PCA) of Pinot blanc wines from Appiano vineyards.

Acknowledgments

Dr. Nikola Dordevic (Project "Incoming Researcher" at Laboratory for Flavour and Metabolites, Laimburg Research Centre) performed the statistical analyses of the raw data obtained in this study. The Project "Incoming Researcher" is funded by the Autonomous Province of Bolzano, Department of Innovation, Research and University.