Natural magnetic levitation for the storage of wine bottles

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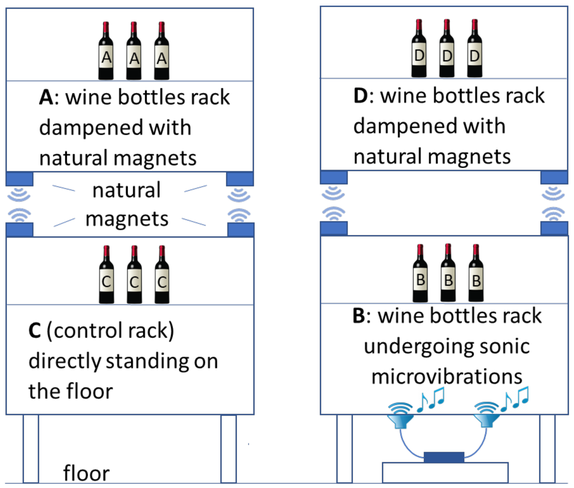
- Microvibrations accelerate the ageing process of wine bottles
- Natural repelling magnets used to damp vibrations may improve the overall sensory quality of a red wine

BACKGROUND:

Ensuring the quality and correct aging is an issue that wineries, wine traders and consumers encounter after wine bottling. For this reason, it's necessary to keep temperature, humidity and vibrations under control during all the storage, transportation or sales phases. We tested the quality of red wine stored in bottles on repelling magnets to reduce the vibrations occurring after six months.

METHODS

Bottles of Pinot noir (one batch) were placed on 4 different standing wine racks (ABCD) (Wineleven, I) to obtain 4 different effects over time: T0, T1 (after 30 days), T3 (after 3 months), T6 (6 months) as described below:

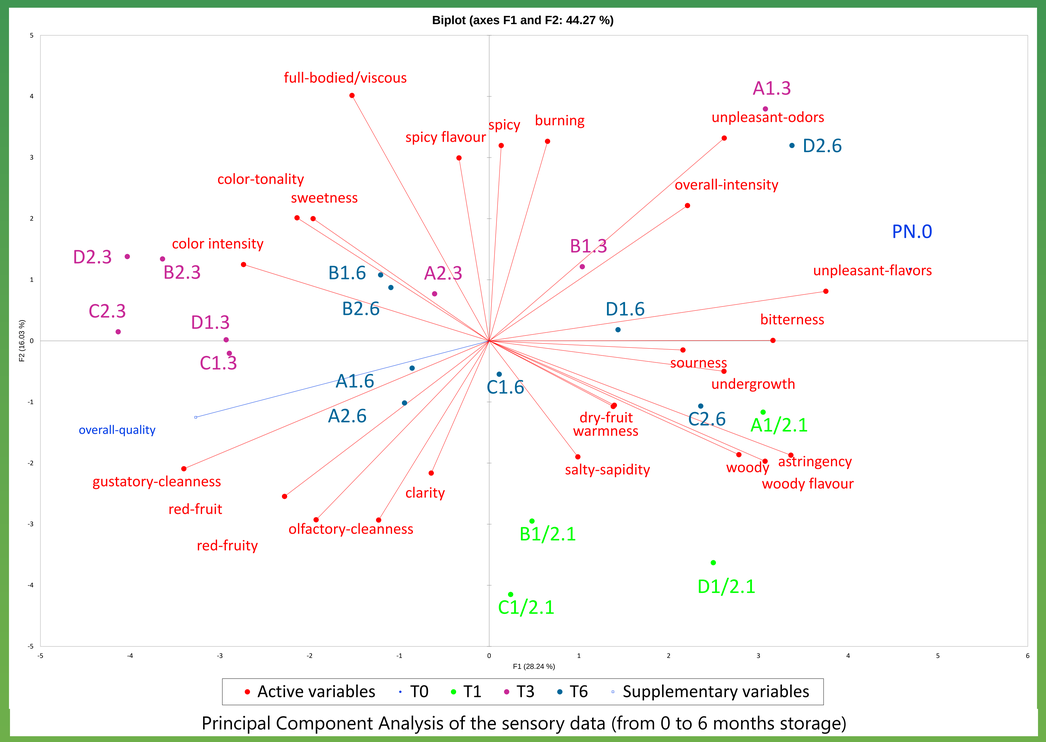


The wine quality was profiled with:

1. HS-SPME GCxGC-ToF/MS (volatile compounds)
2. HPLC DAD/FLD, offline LC-QqQ-MS (phenolics)
3. Quantitative Descriptive Analysis (QDA®) with a trained panel (using the Cysensy webapp developed by UNIBZ)

RESULTS (from the two PCA models)

- bottles A1.6+A2.6 (6 months) damped with repelling magnets are the most correlated with *overall quality* and *clarity* and inversely related to *unpleasant odors*
- bottles B1.6+B2.6 subjected to sonic vibrations were correlated with browning (*color tonality* and *intensity*)
- Phenolics differentiated wines only according to the storage time

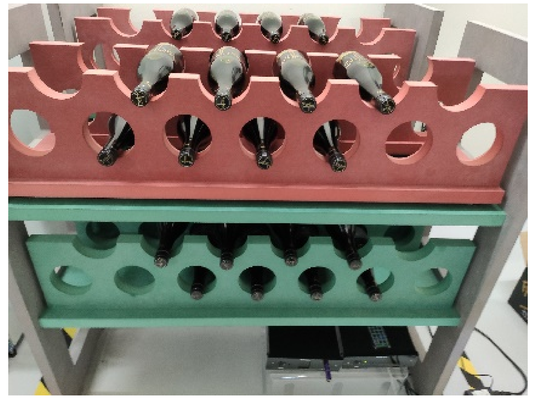


Principal Component Analysis of the sensory data (from 0 to 6 months storage)

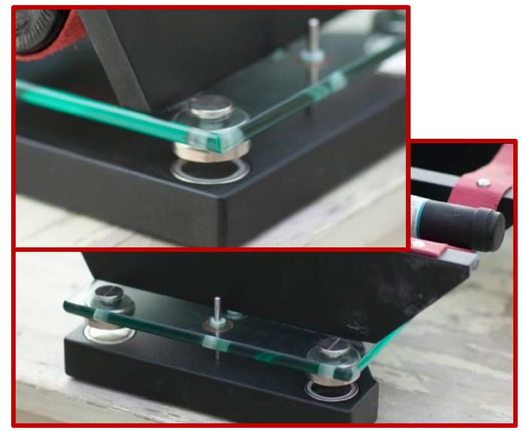
wineleven

Take a picture to watch the video

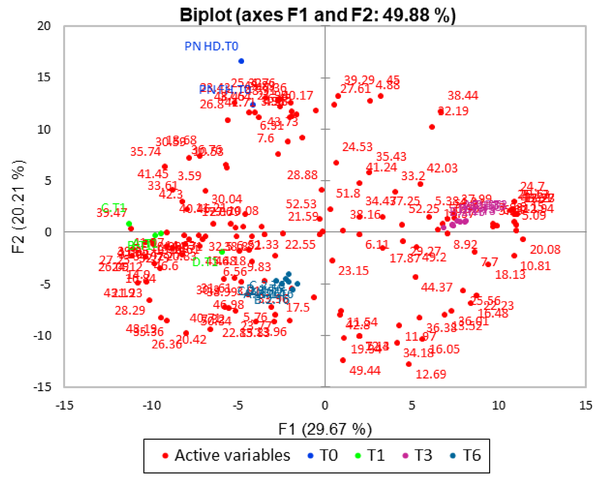
cysensy



The prototype: red shelf (B) separated with natural magnets from the green shelf (D), which is equipped with the micro-vibration producer



Pentium (Wineleven, I) is the magnetic levitation shelf similar to the one used in this project.



Principal Component Analysis of the phenolic profiles (HPLC Rt of phenolics are reported in red): samples form clusters mostly related to the storage time (in colors), not to the type of rack (ABCD)

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