The Italian Group of Wine Microbiology (GMV): validation of a synthetic medium for the characterization of wine strains of *Saccharomyces cerevisiae*

**INTRODUCTION**
- The Italian Group of Wine Microbiology (GMV) was reconstituted in 2014 with a mission to collect all the skills concerning wine making.
- The partners of the group GMV are 19 Universities and 2 Research Centers.
- The main purpose is to build a benchmark for science and wine industry, able to offer appropriate solutions and disseminate the numerous activities carried out by different Italian research centers on issues of “Wine Microbiology”.

**MATERIALS AND METHODS**
- Two commercial A. cerevisiae strains, AWRI796 and EC1118, were rehydrated according to the resolution OIV/OECD 369/2010 and stored at 30°C, inoculated in wine must in aseptic conditions in the resolution OIV/OECD 370/2012 (Appendix 1, Table 1).
- Fermentations at laboratory scale were carried out at 28°C and at the end of the fermentation process the following analyses were performed: HPLC and GC analysis of fermentative yeast (SOVIR s.a., Poggibonsi, Siena), HPLC analysis of volatile aromatic compounds (HPLC/SMED/GC-MS analysis of volatile aromatic compounds, FTIR spectrophotometric analysis of yeast).
- HPLC data were subjected to Principal Component Analysis using Statistica software, Version 10 (StatSoft, Tulsa, OK).
- FTIR data were subjected to hierarchical cluster analysis using GEPAS software Version 6.3 (Biorad Optical GmbH). The distance method used was the Euclidean distance. The cluster analysis was performed considering first the whole spectra and then the five different spectral regions individuated by Kessouroc et al., 1998.

**RESULTS**
- The experiment with *S. cerevisiae* strain AWRI796 and EC1118 was carried out in triplicate (A, B, C) and replicated in three different laboratories (1, 2, 3).
- PCA analysis of fermentation products (averages of three replicates) showed that the two yeast strain (AW and EC) grouped preferentially on the basis of the laboratory (1, 2, 3) where the experiment was carried out (Fig. 1).

**CONCLUSIONS**
- Statistical analysis of data obtained from fermentations carried out with *S. cerevisiae* strains AWRI796 and EC1118 showed that the experiment was scarcely reproducible, being significant differences among results from the three laboratories.
- Therefore, a higher standardization of the experimental conditions is required in order to obtain a shared protocol for the characterization of wine yeast strains.
polyunsaturated fatty acids, bio-plastics, glucans, chitosan, chitin etc.) (1). In order to find good microbial producers, to design suitable substrates and to perform process optimization, rapid analytical techniques for quantifying target bio-products in microbial cells are needed. We have developed a high-throughput approach based on microcultivation and FTIR spectroscopy that facilitates the screening of microorganisms, substrates and process conditions for the optimization of the production of different high-value metabolites. Currently, the developed approach is in use for screening of filamentous fungi in order to find oleaginous strains with the ability to produce polyunsaturated fatty acids (2) and monitoring of substrate utilization.

References

THE ITALIAN GROUP OF WINE MICROBIOLOGY (GMV): VALIDATION OF A SYNTHETIC MEDIUM FOR THE CHARACTERIZATION OF WINE STRAINS OF SACCHAROMYCES CEREVISIAE

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The Italian group of wine microbiology (GMV) was reconstituted in 2014 with a mission to collect all the skills concerning wine making. The partners of the group GMV are 19 universities and two research centers. The main purpose is to build a benchmark for science and wine industry, able to offer applicable solutions and disseminate the numerous activities carried out by different Italian research centers on issues of "Wine Microbiology". At present, the group is working both for research dissemination, with the publication of joint articles in the journal Frontiers in Microbiology, and for a common experiment involving 17 partners. The purpose of this experiment is to validate a synthetic medium, similar to grape must, for the characterization of wine strains belonging to Saccharomyces cerevisiae species. For this reason, a common protocol has been developed in order to assess its effectiveness to obtain reproducible and statistically valid results. Furthermore, this multicenter experiment will assess the extent of experimental differences due to the fermentation in different laboratories with the same strain. The development of a validated medium and of the
confidential limits for fermentation data are expected to improve the comparison of experimental data obtained in different centers and to obtain a shared protocol for wine strain evaluation. The first preliminary results will be elucidated and discussed.

\[ \text{PS7-15} \]

**MICROBIAL TECHNOLOGY IN YOUR HAND. LIGHTER ORGANIC HYDROGEN GAS**

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In the present work we describe an innovative lighter organic hydrogen gas working by microbial activities and the fermentation of organic substrates (1). The lighter comprising a container having a refill valve, a release valve of the gas to be turned on and a button that controls the release valve, and ignition means suitable to trigger the combustion of hydrogen with oxygen outside air; it is characterized in that the container has a partition wall permeable to only gas which divides said container into two sections, a first section containing a support on which adheres a biomass consisting of fermenting liquids mixed in microorganisms (heterotrophic bacteria or anaerobic non-photosynthetic bacteria/photosynthetic algae), which is positioned in the first section of the refill valve and a second section that contains the hydrogen gas produced by said microorganisms and the drain valve of the gas that is opened by the manual device. More, the lighter organic hydrogen gas is characterized in an inert and non-biodegradable support with cross-linked structure on which adheres the microbial biomass. When lighter organic hydrogen gas works by phototropic microorganisms the container is made of transparent material; otherwise, if lighter organic hydrogen gas works in dark fermentation, the container is made of non-transparent material and heterotrophic bacteria are used.

References

\[ \text{PS7-16} \]

**DIVERSITY OF SPOILAGE FUNGI IN DAIRY PRODUCTS AND THEIR ENVIRONMENT**

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In the dairy industry, significant economic losses result from the spoilage of dairy-products by yeasts and filamentous fungi. In order to develop efficient means to prevent and control