

Eco-yeast: pilot project for the production of ecological yeast to elaborate sparkling wines

Summary

This project aims to produce ecological yeast for wines and sparkling wines in order to allow companies to differentiate their product through the biodiversity of microorganisms that exist on their plot of land. At present, the ability of each cellar to isolate and use its own autochthonous yeast is extremely limited in the wine production sector, due to the high costs of obtaining concentrated microbiological cultures produced under optimum conditions. Therefore, the majority of yeast strains used to create wines and sparkling wines (cava) are commercial strains, prepared on a large-scale by oenological product providers. This creates uniform final products, as many producers use the same yeasts. Furthermore, very few of these commercial yeasts are certified as ecological products. Currently, fewer than 5 yeast strains in the market are ecological, all produced outside of Catalonia.

There is, therefore, a need for local ecological yeast. Companies who wish to create ecological wines and cava – in order to improve the qualitative competitiveness in the sector–, cannot create them from autochthonous yeast from their own plot of land expanded using ecological raw materials.

This innovative pilot project aims to cover this need.

Objectives

The main objectives of the project are:

- To differentiate and personalise high-end wines and cava from different cellars through the use of autochthonous yeasts.
- To obtain ecological yeasts of known performance to create biological / ecological wines and cava.
- To increase control over fermentation.
- To improve the concentration of active yeasts to be provided to cellars, in order to allow their immediate industrial application.

Description of project activities

The following activities are planned for this project:

1. Pilot testing on a laboratory scale, optimisation of the culture environment and the growing parameters for each of the yeast strains to be tested.

This process will take place in 2L bioreactors under temperature, pH, oxygen flow and agitation controls. Different nutrient substrates of an ecological origin will be tested: pasteurised must, rectified concentrated must, molasses, etc.

Combinations of different variables will be evaluated by following the growth kinetics over time, through the analysis of total and viable yeast population by microscopy and the count of viable yeast cells in the culture environment, as well as other oenological fermentation parameters (fermentation power, volatile acidity production, SO₂ production, etc.). The most appropriate conditions will be chosen to reflect the optimum balance between population yield and production time.

2. Study of the culture conservation in liquid. Experiments of the shelf-life of the yeast strains will be carried out in different environments and under different conservation temperatures, in order to establish the optimum margin between the production period and the use of the culture in cellars.

The state of the population will be studied (viability) as well as its purity over time, in order to establish the maximum number of days in which the culture will be 100% active. The conditions that provide the maximum shelf-life will be chosen.

3. Scaling up production to 50L. The optimum conditions, established in activities 1 and 2, will be applied on a larger scale, in 50L bioreactors, in order to obtain sufficient yeast to perform testing on a cellar scale.

The oenological and microbiological results obtained in the production of these yeasts will be controlled, in order to verify that they are the same as those obtained previously on the laboratory scale.

4. Implementation of ecological yeasts in cellars. Use and monitoring of the previously obtained yeast in each of the participating cellars. Wines and sparkling wines will be created using the ecological yeast strains produced through the oenological itinerary of this project, from representative musts and still wines of each region of the participant cellars.

Exhaustive monitoring of the fermentations will be carried out and the obtained wines and cava will be analysed both from an ecological and a sensory point of view.

5. Final assessment of the timelines of the ecological yeast production. This will include a technical validation of the infrastructure and method used, as well as a study of its economic sustainability.

Expected results and practical recommendations

The expected benefits or results of the project are:

- The incorporation of one or more yeast strains with possible ecological certification: P29 (owned by the Catalan Institute of Vines and Wines, INCAVI) and other yeast strains to be decided throughout the project.
- Strengthening of the individuality of wines.
- Incorporation of sustainability and authenticity as differentiating characteristics of the products.

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Keyword-category

Food quality / processing and nutrition

Territorial scope

Province

Barcelona

County

Alt Penedès

Project dissemination (publications, seminars, multimedia...)

Project website

Other project information

Project period

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End date (month-year):

Project status: *Ongoing*

Approved budget

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