**V22**

**Lactobacillus plantarum**

*A new generation of malolactic starter culture to secure MLF in high pH wines*

Bacteria species found in the wine and involved in the malolactic fermentation belong to the genera *Oenococcus, Leuconostoc, Lactobacillus* and *Pediococcus*. During the alcoholic fermentation, a natural selection of different LAB (lactic acid bacteria) progressively happens. *Oenococcus oeni* is the most resistant specie to extreme low pH wine conditions, while above pH 3.5, species of *Lactobacillus* and *Pediococcus* could grow up. Among these species, some selected *Lactobacillus plantarum* strains show interesting results.

The *Lb plantarum* V22 strain was selected during a selection program of Malolactic starter culture capable of degrading Ochratoxin A in wine, driven by the *Sacro Cuore University of Piacenza*. Beside its capacity to dominate the media in high alcohol and Ph conditions, this strain proved to be suitable for induction of Malolactic Fermentation with good organoleptic impact on red wines.

### Application

As Homo-fermentative lactic acid bacteria, the metabolism of *Lb plantarum* V22 strain will not contribute to increase Volatile Acidity. Therefore, the choice of this product to control malolactic fermentation is an interesting solution to limit the development of the indigenous flora that can cause the production of undesirable compounds or organoleptic deviations.

Moreover the strain possesses a wide range of enzymes interesting for winemaking.

**PCR-screening of commercial strains for the presence of wine-related enzymes for wine flavor development (Stellenbosch University)**

<table>
<thead>
<tr>
<th>Strains</th>
<th>Esterase</th>
<th>Protease</th>
<th>Glucosidase</th>
<th>Malolactic enzyme a</th>
<th>Malolactic enzyme b</th>
<th>Citrate lyase synthase c</th>
<th>Methionine</th>
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<tbody>
<tr>
<td>O. Oeni 1</td>
<td>×</td>
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</tbody>
</table>

a. Primers were designed from malolactic enzyme gene sequence of *Lactobacillus plantarum* WCFS1.

b. Degenerate primers were designed from malolactic enzyme gene sequences of different bacterial species belonging to Lactobacillus, Oenococcus and Pediococcus.

c. PCR conditions for this enzyme still need further troubleshooting (non-specific bands).

✓: positive for the presence of the gene - ×: negative for the presence of the gene.
Microbiological Oenological Properties

- Good implantation
- Alcohol Tolerance: max. 15.5% vol.
- Total SO₂ should be < 50 ppm
- Moderate nutrient demand, however under difficult stress factors, the addition of ACTI-ML will encourage fermentation success
- Moderate MLF Kinetics
- pH > 3.5 (sensitive to low pH)
- Temperature > 17°C (64°F)
- Homo-fermentative
- No volatile acidity production from sugar metabolism
- Low diacetyl production
- No biogenic amines production
- Potential to produce bacteriocines
- Complex enzymatic profile interesting for winemaking

Usage

- Simply rehydrate contents of one 25 g sachet for 25 hL into 500 mL of clean chlorine-free water at 20°C (68°F) for maximum 15 minutes.
- Distribute the suspension carefully in the must/wine and gently mix in order to get a homogenous distribution of the bacteria.

Suitable for:

- Co-inoculation (addition of the bacteria starter culture 24 hrs. after yeast inoculation).
- Early inoculation during end of alcoholic fermentation (30 g/L res. sugar) and inoculation post-alcoholic fermentation.

Storage

- This product can be stored for up to 18 months at 4°C and 30 months at -18°C. Once package is opened, use immediately.
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Packaging

Available in sachets for inoculating 25 hL (660 US gal) of wine.

The patent named « Alcohol-tolerant malolactic strains for the maturation of wines with average or high pH » is granted in France, Australia, United States and South Africa (pending in Europe).

REFERENCES


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