RESOLUTION OIV-OENO 594B-2020

ELIMINATION OF WILD MICROORGANISMS IN MUSTS BY CONTINUOUS HIGH PRESSURE PROCESSES (ULTRA HIGH PRESSURE HOMOGENIZATION – UHPH)

THE GENERAL ASSEMBLY,

IN VIEW OF THE ARTICLE 2, paragraph 2 b) iv of the Agreement of 3rd April 2001 establishing the International Organisation of Vine and Wine,

AT THE PROPOSAL of the "Microbiology" Expert Group,

CONSIDERING the importance of new physical preservation technologies able to protect the sensory properties of musts and also allowing for a reduction in □SO□_2 doses,

CONSIDERING that new fermentation biotechnologies like the use of non-Saccharomyces yeasts or the application of co-inoculations with LABs and yeasts to perform simultaneous malolactic and alcoholic fermentations can be favored by the reduction of initial counts of wild microorganisms in musts,

CONSIDERING the work of the of "Technology" and "Microbiology" Expert Groups,

CONSIDERING that ultra high pressure homogenization (UHPH) can be applied to strongly decrease or eliminate wild yeast and bacteria populations in musts,

CONSIDERING that this technique (UHPH) is a non-thermal processes with low repercussion on sensory properties of musts. In the UHPH treatment, a fluid is pumped through a narrow valve. As a result, a combination of shear forces, impact, cavitation, turbulence and high pressures cause the destruction of microorganisms (spores included) and a reduction in the size of the particles (between 300 and 100 nm). During the treatment there is an increase in the temperature of the sample, with peaks that can reach 98°C but only during a very short time (0,014 seconds). The treatment speed is 3 times higher than the speed of sound in the air. This temperature increase dissipates during the expansion phase and can be controlled by complementary refrigeration. In less than 1 second, the treated must reaches 20°C. This technology can be applied by equipment operating from 40 L / h to 40,000 L / h,

CONSIDERING the UHPH consists in the application of pressures between 200 and 400 MPa (2000-4000 bar) in continuous, by pumping at high pressure. The UHPH eliminates microorganisms (including spores) mainly through total destruction by impact. In the UHPH, the effect of the forces of impact and shear is decisive,

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CONSIDERING that it has been demonstrated that the energy produced by UHPH is not enough to break covalent bonds, therefore, most pigments, aromatic compounds and flavoring molecules remain unaffected. UHPH produces a gentle elimination of wild microorganisms, preserving sensory quality,

CONSIDERING that it has been reported that UHPH can eliminate yeasts at pressure levels of 200-400 MPa in foods. This technique is also a way to minimize the dose of SO_2 used in wines,

CONSIDERING that by means of this technology the reduction or total inactivation of the activity of oxidative enzymes is possible,

DECIDES, at the proposal of Commission II "Oenology", to introduce the following oenological practices and treatments into part II, chapter 2 of the International Code of Oenological Practices

Part II

Chapter 2: Musts

Treatment by continuous high pressure processes

Definition:

Operation for the elimination of wild microorganisms in musts by high pressure processing (above 200 MPa or 2000 bar) in continuous. In UHPH, the pressure is usually ranging 300-400 MPa.

Objectives:

- To reduce or eliminate the load of wild microorganisms, mainly yeasts, preserving the organoleptic quality.
- To reduce the amount of SO_2used in winemaking.
- To reduce or inactivate the activity of oxidative enzymes.
- To get grape must stable from the microbiological point of view.
- To obtain partially fermented musts.

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Prescriptions:

a. The ultra high pressure homogenization technique (UHPH) consists in the application of pressures higher than 200 Mpa (2000 bar) by continuous pumping.

- UHPH: continuous process that could be better integrated in the pretreatment of musts.

b. To eliminate the yeasts of the musts, pressures of 200-400 Mpa are needed.

c. To eliminate bacteria, pressures of 200-400 Mpa are needed.

d. The treatment speed can range from 40 L / h to 40,000 L / h.

e. If necessary, the increase in temperature can be controlled with additional refrigeration.

f. Neither the increase in temperature nor the techniques used should produce significant alterations in the appearance, color, smell or taste of the wine.

g. The procedures must conform to the specifications of the International Oenological Codex.

OIV Recommendation:

Admitted.

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