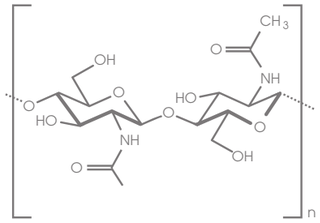
Vegetals biopolymers:
new preventive and curative bio-tools for natural wine-making

Vegetals polysaccharides as new biotechnologies:

Among the polysaccharides beneficial to Man, chitin and its main derivatives chitosan and chitin-glucan are becoming increasingly important. A great many studies have been carried out on these biopolymers over the last twenty years. Practically all fields of industrial applications are affected, from pharmaceuticals to food-processing, including the environment, agriculture, textiles, papermaking and cosmetics.



The use of these biopolymers in oenology is recent. They are finding diverse applications such as fining in the broader sense of the term (pre-clarification, reducing unstable colloids, etc.)[1-3], reducing undesirable micro-organisms such as Brettanomyces[6-7] and capturing heavy metals[8-9].

Permitted as oenological practice by OIV [International Organisation of Vine and Wine] in 2009 and by the European Union in December 2010, these new biotechnologies are covered by several patent applications by the company KitoZyme.

Vegetals polysaccharides are friendly to health and the environment:

These biopolymers are biodegradable and bio-resorbable, two essential properties in these times when protecting the environment and human health play an important role.

Furthermore, these products offered for oenology are plant-based, ensuring they are completely non-allergenic.

PK Sol M - PK Sol M2

PK Sol M and **PK Sol M2** contain no known allergens; using them allows winemakers to achieve their desired results without having to declare anything on the product labels, under the terms of 2003/89/EC and 2007/68/EC.

What's more, **PK Sol M2** may also be used for certified vegan-friendly wines.

allergen FREE

PK Sol M

allergen FREE vegan

PK Sol M2

LIME SOLUTIONS / VR

allergen FREE vegan

PK Sol M - PK Sol M2

Chitin derivatives for a complete wine clarification

Perdomini
See differently

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PK Sol M - PK Sol M2

Perdomini has developed a range of chitosan-based products obtained from a unique strain of Aspergillus niger. These products have been specially designed to provide clarification and protection against oxidation spoiling in musts and wines. The two formulas have been given the names **PK Sol M** and **PK Sol M2**, and are both excellent options when looking for a clarifying and stabilizing treatment that will avoid oxidation problems, colour loss and the development of bitter tastes, and at the same time restore the wealth of aromas present in the original product before it was affected.

PK Sol M – mixed in a synergetic formula with PVPP and isinglass – and **PK Sol M2** – acting synergistically with PVPP and pea protein – provide fast and effective action to combat both the already-oxidized polyphenolic compounds and those in danger of oxidation (catechins) and simultaneously lead to rapid clarification.

Oxidation of wine remains one of the major problems in oenology this century. It is estimated that nearly 50% of wine faults are associated with this phenomenon[1].

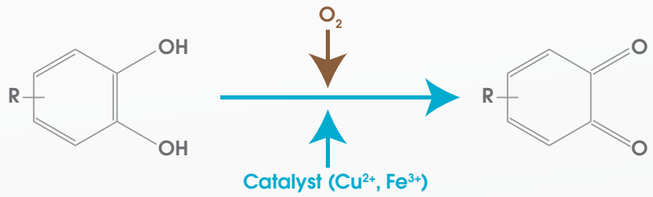
The table below summarises the situation:

	2006	2007	2008
Total faults %	7,1	NA	5,9
Corked	27,8	29,7	31,1
Brettanomyces	10,6	12,8	16,8
Oxidation	24,3	22,9	19,1
Sulphuretted	29,2	26,5	28,9

Oxidation of wine always results in a loss of cleanness and fruitiness (‘faded’ wines, ‘lacking freshness’, etc.) with the appearance of bitter notes and browning of wines (see photo opposite). This goes against the expectations of today’s consumers: fresh, crisp, clean wines with a floral or fruity expression, true to the original product.

The mechanisms explaining oxidation are well described in the literature[2]. Whether in the must or the wine, the mechanisms as well as the molecules involved are similar.

Three entities contribute to oxidative deterioration: **polyphenols** (and more particularly ortho-diphenols that are linked with the appearance of browning[3]), **oxygen** and **catalysts**.



All these reactions contribute to the formation of derivatives participating in reducing fruity or floral notes and the appearance of heavier notes (honeyed, preserves, etc.).

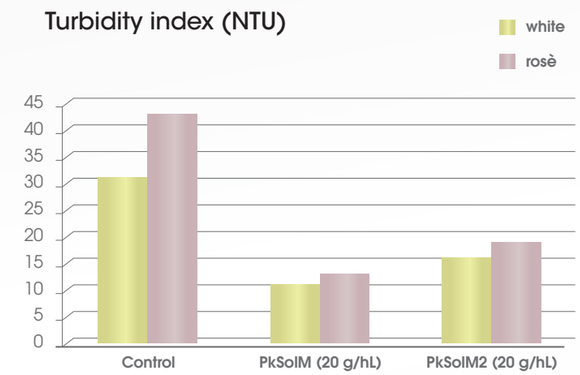
Anti-oxidant properties in the broader sense can be associated with any activity reducing the factors listed above and particularly the transition metals **copper** and iron as well as **polyphenols**.

PkSolM/PkSolM2 for a complete wine’s clarification

The fining effect of PkSolM and PkSolM2 allows to obtain limpid wines in a short time, demonstrating the efficacy of the components they contain: the curative effect of the chitin derivatives on the color of oxidized wines and the presence of an high power clarifying compounds, allows to obtain very clean and stable wines.

Moreover, the presence of an high quality gelatin in PkSolM gives a very brilliant wines.

The formulation of PkSolM2 meets the vegans requirements.



Turbidity of a white and rosè wine trated with 20 g/hL of PkSolM and 20 g/hL of PkSolM2

PkSolM/PkSolM2 combats organoleptic faults due to oxidation of wine

PkSolM/PkSolM2 softens the bitter taste and oxidation notes in wine while preserving the sensory properties of the initial product.

Here is an example: on a blend of pinot noir and chardonnay particularly affected by oxidation. We compared the action of PkSolM/PkSolM2 against an ‘allergen-free alternative’ based on PVPP, plant protein and bentonite.

Before treatment, the wine had distinctive oxidation notes to both the nose and the mouth accompanied by a bitterness typical of intense oxidation and a lack of fruity/floral character.

Sulphur dioxide treatment (control + SO2) markedly reduced the fault although not annihilating it completely.

Each of the 2 formulations tested (PkSolM/PkSolM2 and ‘allergen-free alternative’) was able to change the quality of the wine from very mediocre to one appreciated by the panel.

However, wines treated using the ‘allergen-free alternative’ formulation were scored as being too weak, too hollow and unbalanced, unlike treatment with PkSolM/PkSolM2 which fully preserved the sensory characteristics of the wine.

Blind tasting performed by a panel of 8 experts. **7 out of 8 panellists identified PkSolM/PkSolM2 are the better formulation.**