Effect of potassium polyaspartate on the tartaric stability of white and red wines as a function of their physico-chemical composition

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The precipitation of potassium bitartrate (KHT) is the main cause for the formation of deposits in bottled wines. Various subtractive techniques, aimed at removing part of the excess KHT from wines, are employed to prevent the tartaric precipitations. A different approach is the use of additives that allow to limit the KHT crystal growth. The use of additives can limit and, in some cases, substitute the use of the subtractive techniques, thus saving energy still preserving wine quality.

The authorized additives are metatartaric acid (MTA), mannoproteins (MP) and cellulose gums (CMC). All these additives have limits for their applicability: low stability over time, destabilizing effect for red wines color (CMC), variability of effectiveness as a function of wine composition (mannoproteins).

New products based on polyaspartates have recently been studied in order to verify their effect on the tartaric stabilization of wines.

This research concerned the study of the stabilizing effectiveness of a potassium polyaspartate (PASPK), at a dose of 100 mg/L, when varying wines composition. Three wines were employed, two white and one red. The red wine and one of the white wines were used to study the effect of PASPK when varying on 3 levels the factors pH and ethanol content (pH: 3.00, 3.35 and 3.70; alcohol: 12, 13.5 and 15%). The second white wine was used to study the effect of PASPK when varying on 2 levels the factors pH and polyphenols content (pH: 3.00 and 3.70; polyphenols: 0 and 2800 mg/L). The tartaric stability was evaluated with the cold test (drop of tartaric acid content after 6 days at -4°C) and the mini-contact test (drop of conductivity after the addition of 1 g/L of KHT, under continuous stirring at 0°C for 4’). All analyses were performed in duplicate.

The modification of pH affected by itself the instability degree of wines, which increased with the increase of pH. Also the ethanol and polyphenols contents affected the instability degree of wines, though less markedly than pH: the ethanol effect was mainly detectable with the cold test (ethanol decreases the solubility of potassium bitartrate, and therefore affects the primary nucleation phenomena), while the effect of the polyphenols content was mainly detectable with the mini-contact test (growth of KHT crystals). Regardless of the initial instability degree of wines and of their composition, the addition of PASPK always allowed to stabilize wines against tartaric precipitations.

Presentazione come poster.
Argomento: Wine stabilization and macromolecules oppure Pratiche enologiche e loro impatto sulla qualità dei vini.