1. Procedure da effettuare prima di imbottigliare e commercializzare un vino bianco dell'annata che ha subito un breve periodo di affinamento in serbatoio di acciaio inox.
2. Tecniche di gestione del cappello di vinacce.
4. Analisi dell'ossigeno dischelto nei vini imbottigliati.
5. Creazione di grafici istogrammi a partire da dati excel.

Testo in lingua inglese:
INTRODUCTION

Anthocyanins are natural pigments responsible for the typical vivid red, blue, and purple hues of vegetables, flowers, and fruits, and as such, they play a crucial role in the ecosystem, by attracting insects indispensable for pollination and seed dispersal. Also, they have been broadly employed as safe colorants in the food and textile industries.

The anthocyanin coloration is the result of the extensive conjugation, across the molecule A, and C rings, of 10r electrons that are further cross-conjugated into the aromatic B ring (Figure 1). Hence, any chemical transformations leading to a disruption of the 10r electron conjugation can cause either a color change or a modification of the color intensity. In terms of intensity, and/or hue, it has been demonstrated that anthocyanins undergo substantial structural modifications on the basis of many factors, including the temperature, light, metal ions, enzymes, oxygen, antioxidants, and pH. In particular, pH is of critical importance, because different levels of acidity cause anthocyanins to exist in different equilibrating chemical forms. At pH levels below 3, anthocyanins exist predominantly as the flavylium cation, displaying an intense red color. As the pH increases above 3, the flavylium cation equilibrates with two diastereomeric hemicetals that are colorless compounds, as a consequence of the disruption of the 10r electron conjugation across the condensed rings A and C (Figure 1). The pH of the flavylium pseudo-base (hemicetals) is 2.7. At typical wine pH levels, the anthocyanin pool is present as a colorless carbinol pseudo-base. The two hemicetals, which are the result of a water molecule nucleophilic attack at position 2, undergo ring-opening reactions, thus becoming yellowish cis-chalconones that further isomerize into trans-chalcones (Figure 1). As the pH level of the quinone form, taking place at pH levels above 7, leads to the formation of a blue anionic quinoidal base.2,3

The anthocyanin chemical behavior as a function of pH is the key phenomenon responsible for the typical color of red wines. Thus, from an enological point of view, anthocyanin concentrations and resulting colorations are critically associated with the red wine commercial value and longevity.4-5 Anthocyanins in wines are extracted from black grape skin cells during the first phases of the maceration-fermentation process and undergo numerous reactions with grape phenolics, including themselves, with fermentation-derived secondary metabolites and with compounds produced during wine storage or extracted from barrels.4 The formation of new compounds via covalent binding of anthocyanins with other wine compounds strongly affect wine color. Depend upon the molecular structure of these anthocyanin-derived pigments, color ranges from the orange of pyranoanthocyanins, to the blue of flavanyl-vinylpyranoanthocyanins, to the red of the large polymers, such as the tannin-anthocyanin adducts.5 As expected, the anthocyanin reactivity in wine depends upon the equilibrating forms that exist at the different wine pH levels. Beside reactivity, otheranthocyanin chemical properties clearly correlated to pH are their solubility and capability to be involved in co-pigmentation phenomena. It has been reported that the solubility of anthocyanins depends upon their chemical nature and the solvent.6-8 It but until now, no study has investigated their solubility under wine-like conditions. CO-pigmentation is a phenomenon by which the pigments can self-associate or form complex associations with either other colorless organic compounds or metallic ions, thus generating a change or an increment in the color intensity.12 Anthocyanin co-pigmentation has been widely studied, but data about the...