Impact of electrolyzed water applied as an alternative treatment in vineyard on grape and wine quality

The main issues in viticulture are to highly decrease the use of phytochemicals. Electrolyzed water (EW) is one of the possible alternative when illness pressure is not too high. The objective of that work was to characterize the impacts on grape and wine quality when using EW compared to those obtained from organic and conventional production. Trials were performed in real vintner parcels of Cabernet franc and Chenin blanc in the Loire Valley. The control treatment (VITI) was the usual practices of the vintners and the EW treatment was 50% of VITI treatment and 50% of EW for logistic reasons. Grapes were harvested at the date selected by the vintners. Microvinifications (about 40L each) were realized with a standardized. Grapes and wines were analyzed with usual analyses in addition with hyperspectral imaging for grapes and TCA analyses for wines. The results showed that the total polyphenol content and in particular the total anthocyanin content were higher when the grapes were treated by the electrolyzed water. The most important change in the composition was linked to the concentration of peonidine-3-O-glucoside. The oenological ripeness was slightly or not modified depending on the vintage. If the differences between the modalities were not easy to comprehend with classical methods, hyperspectral imaging and Raman spectroscopy allowed a very good classification of berries depending on the vineyard treatments. However, after vinification, differences observed in grapes about sugar content were also found in wine just after the alcoholic fermentation. But differences were reduced in wines after malolactic fermentation or after bottling suggesting that wine quality was not really impacted by the EW treatment. Moreover, analyses showed that the use of electrolyzed water in the vineyard did not add a risk of developing trichloroanisoles in wine during fermentation. Thus, the use of electrolyzed water is possible in light of impact of grape and wine quality. Its use has now to be validated by its efficency at a moderate level of illness pressure in vineyards.

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Keywords: electrolyzed water, alternative vine treatment, phenolics, grape, wine, tca, technological ripeness

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