The use of cold liquid stabulation as an oenological technique in white winemaking: the effects on phenolic, aromatic and sensorial composition.

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Abstract

The application of different winemaking techniques helps to modify the basic parameters, phenolic profile, and aroma components influencing the final wine quality. In particular, pre-fermentative processes aim to increase the extraction and preservation of grape native compounds. Among them, cold liquid stabulation (*macération sur bourbes*) consists in maintaining the grape juice on its lees, in suspended condition at low temperature (0-8 °C) for a variable time (generally from 7 to 21 days). The aim of this work is to apply the cold liquid stabulation on two Italian white grape varieties, Arneis and Cortese, to evaluate the impact on basic parameters, color, polyphenolic compounds (TPI), antioxidant power (DPPH), total polysaccharides, and free and glycosylated volatile compounds (GC-MS analysis) during and after the process. Cortese and Arneis grape juices were kept at 4 °C on their lees (manually suspended twice a day) during three different periods (7, 14, 21 days) and then compared to a control without stabulation. After the stabulation period, the lees were discarded and the juices fermented, cold stabilized, and bottled. The analyses were carried out at the end of stabulation, of the alcoholic fermentation and after one month from bottling. The chemical data obtained were supported with sensory analysis done by a trained panel on the wines after fermentation and bottling. The results showed that the cold liquid stabulation has an impact on the acidic composition of the produced wines for both varieties. The low temperature affected tartaric acid content, being it found lower already after 7 days of stabulation. Nevertheless, pH decreased in the samples stabulated for the longest time (21 days). Differences have been found on TPI of wines, even if in a different extent depending on the grape variety. In fact, on Arneis samples an increasing trend of TPI alongside antioxidant capacity was found, meanwhile in Cortese the stabulation led to a decrease in TPI, without differences in the antioxidant capacity among stabulated samples. This behaviour may be connected to the grape phenolic composition. After bottling, the produced wines were not sensory perceived different in terms of bitterness, astringency, and body. Nevertheless, Cortese stabulated wines at 14 and 21 days were preferred in terms of overall judgement with respect to control, in agreement with the higher content of volatile compounds. An increasing liking trend was found also for Arneis, whereas the highest content of volatile compounds corresponded to 7 days stabulation.