Effect of pre-fermentative strategies on the polysaccharide composition of must and white wines

Among the macromolecules of enological interest in white wines, much attention has been paid to polysaccharides. They have their origin in grape skin and pulp cell walls and includes polysaccharides rich in arabinose and galactose (PRAG), rhamnogalacturonans type II (RG-II) and homogalacturonans (HG); and cell walls from yeasts, constituted by mannoproteins (MP) and glucans. Polysaccharide content and composition change during fermentation and bottle aging. Polysaccharide composition of white wines will depend, among other factors, on the prefermentative treatment applied to the grapes. Direct pressing or pre-fermentation maceration of crushed and destemmed grapes are usually applied. There are few studies analyzing the effect these treatments on the content of polysaccharides. Recently, the International Organization of Vine and Wine has approved the use of sonication of crushed grapes to promote the extraction of their compounds. However, there are no studies on the effect of sonication on crushed and white grapes on the content of polysaccharides in the musts and during the aging in bottle. The aim of this study was to study the effect of direct pressing of white grapes, prefermentative maceration and prefermentative sonication of crushed and destemmed grapes on the polysaccharide composition in musts from Vitis vinifera L. cv. Airén. It was also studied the effect during the bottle aging.

Airén white grapes were destemmed and crushed. One batch was directly pressed into a pneumatic press; other was pressed after 4 hours of-fermentative maceration; and other was treated with power ultrasound at 30 kHz before pressing. Samples were taken of the raked musts, when bottling and after 6 months of bottle aging. Glycosyl residue composition was analyzed as previously described (Guadalupe et al., 2012; Ayestarán et al., 2004).

All the musts showed contents of glucosyl monosaccharides significantly higher than pectic monosaccharides. Sonication treatment improved the release of RG-II and mannans in musts and the pre-fermentative maceration favored the extraction of PRAG. Musts from direct pressing had the lowest content of total monosaccharides and RG-II. From the must to the time of bottling, there was an increase in the content of RG-II and MP and a decrease of PRAG in all wines evaluated. At the time of bottling, wines from sonicated grapes showed the highest content of pectic monosaccharides and RG-II, while wines from pre-fermentative maceration showed the highest content of glucosyl monosaccharides. After 6 months of bottle aging, all wines showed a decrease in the content of MP and PRAG. Wines made with pre-fermentative maceration showed the

highest content of total polysaccharides families, PRAG and MP.

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Authors: Canalejo Diego¹, Zhao Feng¹, Martínez-Lapuente Leticia¹, Guadalupe Zenaida¹, Ayestarán Belén¹, Pérez-Porras Paula², Bautista-Ortín Ana Belén² and Gómez-Plaza Encarna²

¹Institute of Vine and Wine Sciences, ICVV (University of La Rioja, Government of La Rioja and CSIC)

²Department of Food Science and Technology, Faculty of Veterinary Science, University of Murcia

*corresponding author: diego.canalejo@unirioja.es (mailto:diego.canalejo@unirioja.es)

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