



Effect of Cryo-Maceration of Sauvignon Blanc Whole Grapes Prior to Winemaking on the Fermentation Potential of Yeast Strains

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Abstract

Sauvignon blanc, a white grape cultivar generally associated with exceptional Bordeaux white wines, has locally grown in popularity. It accounts for no less than 10% of all locally planted vines, hence it can be considered as one of the best-selling varietal white wines. This cultivar's popularity to some extent can be attributed to typical varietal aromas and flavours *i.e.*, "herbaceous" (*e.g.*, asparagus, green pepper, capsicum, and tomato leaf, etc.) and/or or "tropical fruit" (*e.g.* gooseberry, grapefruit, passion fruit, guava, etc.), due to the presence of aroma compound precursors *i.e.* methoxy-pyrazines and thiols, respectively.

As yeast strains are instrumental in the synthesis and/or release of the aforementioned aroma compounds (metabolites) from *i.a.* the bound aroma-inactive precursors, but differ in this ability, the choice of yeast starter culture used for winemaking is very important. Moreover, yeast-derived enzymes (proteins) are involved in the release of these wine quality-enhancing metabolites during fermentation. However, yeast protein expression is affected by the grape matrix. This trial, therefore, aimed to evaluate the effect of cryo-maceration of Sauvignon Blanc whole grapes before winemaking on the fermentation potential of two *Saccharomyces cerevisiae* yeast strains *i.e.* VIN7 and CKS102, and one *S. cerevisiae/bayanus* hybrid yeast strain *i.e.* NH84. The CHEF DNA Karyotypes of yeast isolates at end of the respective fermentations matched that of the respective starter cultures (inoculums), which confirms that all inoculums completed the fermentation.

Chemical analyses of final wines produced with different yeast strains had different chemical parameters, especially concerning volatile acidity (imparts undesirable vinegar-like aroma) and fructose. Sensorially, noticeable differences were observed, as the same yeast starter culture produced wines with different aroma profiles when the cryogenic treatment was the only variable. Proteomic analyses using SDS PAGE showed differential protein expression between yeast strains following fermentation of grapes that was subjected to cryo-maceration prior to winemaking, which confirms that yeasts react differently to the grape must and wine matrix. It can be envisaged that this observation will be trialed on a larger scale, and in different cultivars.

Biography: Rodney Hart

Dr Rodney Hart is currently a researcher, at the ARC Infruitec-Nietvoorbij within the Post-Harvest and Agro-Processing Technologies. He has 16 year's research experience in Microbiology, and Fermentation and Agro-Processing Technologies. He has been the principal investigator of the ARC's yeast development project since 2004, which saw the commercialisation of one red wine yeast under a license agreement with an international yeast manufacturer. Dr. Hart has a membership with various scientific societies viz. South African Society for Enology and Viticulture (SASEV), South African Association for Food Science & Technology (SAAFoST), and South African Society for Microbiology (SASM), and partakes in national and/or international congresses hosted by the societies mentioned above, either as speaker of oral presentations or main and/or co-author of poster presentations.