It has been shown that rotundone - the aroma compound responsible for peppery aroma in red wines - was impacted by temperature and water status within a vineyard (1,2). A study was conducted to determine the key environmental and viticultural variables affecting the rotundone concentration in Duras wines grown in the South West of France (IPDO Gaillac) and made from 10 different vineyard blocks in 2013 and 2014.

**RESULTS AND DISCUSSION**

The 2013 vintage was characterized by a cold spring, regular and large rainfall events over the vine vegetative cycle which induced a delay of almost 3 weeks at harvest and ripening difficulties. In 2014, winter was rainy and warm; summer was extremely rainy with 160 mm of rain recorded between mid-July and the end of August and conditions during ripening were dry and hot. Severe bunch rot (Botrytis cinerea) was recorded on bunches on bunches in 2013. Mean air temperatures over the VER-HAR period were lower in 2013 (18.5°C ± 0.6°C) than in 2014 (19.5 ± 0.4°C). For the same period, levels of water deficit reflected by measurements of $\delta^{18}$O were equivalent for the two vintages (−26.4 ± 1.1 in 2013; −26.7 ± 0.6 in 2014).

**Multisite PLSR models for rotundone in wine**

For 2013, precocity of veraison, gluconic acid - a secondary metabolite of B. cinerea - and cumulative rainfalls over the VER-HAR period had negative regression coefficients to model rotundone. B. cinerea has the ability to withstand the toxic effects of plant such as sesquiterpenes by its laccase through oxidation and detoxification (5). Therefore, our results suggest that the fungi can induce the degradation of rotundone. For the 2014 and 2013-2014 models, rotundone was best predicted by cumulative rainfalls over the 1st of April-30th of September and by stem water potentials 15 days before veraison in 2014, which is in agreement with previous results (6,2).

**CONCLUSIONS**

Important variables identified for modelling rotundone in wine were those associated with cumulative rainfalls and B. cinerea damages. Our results show that mesoclimatic is one of the key factors to explain the differences in rotundone observed among the sites.

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