



Pyrazine contents in four red grape varieties cultivated in a warm climate

By: R. Romero, J. Chacón, E. García, and J. Martínez

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In this paper the authors measure pyrazines –the compounds responsible for bell pepper aroma- in four well-known varieties.

- In a previous summary (http://wineserver.ucdavis.edu/trellissummary_categories.php, Summary 9) we saw how easily pyrazines are extracted from the skins of Cabernet Sauvignon during fermentation, and how their concentrations are not affected by the number or the length of pump-overs, or any other typical red wine production practices. In other words, the most important factor in determining the final level of pyrazines in a wine is simply their initial concentration in the grapes.
- So these authors measured the initial concentration of 2 types of pyrazines (2-methoxy-3-ethylpyrazine, MEP, and 2-methoxy-3-isobutylpyrazine, IBP) in 4 varieties (Cabernet Sauvignon, Merlot, Syrah, and the Spanish variety Cencibel), trained to a double cordon Royat (similar to a bilateral cordon with spurs but smaller), and grown in the warm area of Castilla-La Mancha, Spain. The technique they used to measure the pyrazines was gas chromatography coupled with mass spectrophotometer. They picked the grapes at technological ripeness (defined as 12.5-13.5 potential alcohol) from several locations for each variety, for a total of 23 locations.
- **Results.** 1) The authors didn't see any differences in MEP across the varieties studied, but they did find differences in MIBP. Cabernet Sauvignon showed the largest concentrations, followed by Merlot, then Syrah, and finally Cencibel, which had the lowest levels. 2) MIBP levels were lower in these varieties grown in a warm area than published data on the same varieties that had been grown in cooler climates. This confirms the influence of vineyard temperature on pyrazine concentrations. 3) When asked to evaluate wine "bell pepper aroma" intensity from 0 to 10, a trained panel of 7 found the intensity of that attribute across varieties to be in the same order as was shown by chemical analyses, that is, Cab > Merlot > Syrah > Cencibel. 4) By analyzing the grape pyrazine content associated with those samples that received the very lowest bell pepper intensity scores, the authors were able to show that the recognition threshold for 2-methoxy-3-isobutylpyrazine (in young red, unoaked wines) corresponded to a concentration of **3 ng/kg** (3 ppb) in the grapes.

In summary, sensory differences in green pepper aroma of wines seem to be more quantitative than qualitative, as both types of pyrazines studied were present in all varieties, only differing in their concentrations. For the same variety, warm climates display lower concentrations of pyrazines than cool climates, with the corresponding sensory impact in the resulting wines.

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