Berry shrivel significantly alters Shiraz grape and wine composition

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INTRODUCTION

Irreversible Water Loss - Before and After Veraison - Wide Range of Varieties

Berry Shrivelling

Grape: Morphology & Histology Wine Composition ??

RESULTS

Figure 1. A) Berry fresh weight (g); B) Juice FAN (free amino nitrogen) (mg N/L); C) Juice TSS (total soluble solids) (%) (Brix); D) Grape sugar accumulation (mg/L); E) Harvest date; F) first harvest date; H2: second harvest date; H3: third harvest date; S: shrivelled treatment; NS: non-shrivelled treatment.

Table 1. Basic juice and wine parameters. Univariate ANOVA was used to compare data. Means followed by different letters in a row are significantly different at p<0.05 (Fischer’s LSD). All stated uncertainty is the standard deviation of three replicates per treatment. H1: first harvest date; H2: second harvest date; H3: third harvest date; S: shrivelled treatment; NS: non-shrivelled treatment.

<table>
<thead>
<tr>
<th>Parameter</th>
<th>H1</th>
<th>H1S</th>
<th>H2</th>
<th>H2S</th>
<th>H3</th>
<th>H3S</th>
<th>Mean ± SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ethanol (g/L)</td>
<td>10.3±0.2</td>
<td>11.6±0.1</td>
<td>12.6±0.1</td>
<td>11.6±0.1</td>
<td>12.4±0.2</td>
<td>12.8±0.4</td>
<td>12.7±0.6</td>
</tr>
<tr>
<td>Glycerol (g/L)</td>
<td>6.9±0.5</td>
<td>8.6±0.7</td>
<td>8.4±0.2</td>
<td>9.0±0.0</td>
<td>9.2±0.7</td>
<td>9.3±0.4</td>
<td>8.8±0.4</td>
</tr>
<tr>
<td>Total anthocyanins</td>
<td>207±59</td>
<td>318±65</td>
<td>260±5</td>
<td>353±10</td>
<td>351±5</td>
<td>416±20</td>
<td>334±12</td>
</tr>
<tr>
<td>Total phenolics</td>
<td>22.5±0.0</td>
<td>24.8±0.3</td>
<td>25.1±2.1</td>
<td>27.0±0.6</td>
<td>29.3±1.5</td>
<td>30.8±1.9</td>
<td>28.5±1.4</td>
</tr>
</tbody>
</table>

The differences became smaller or diminished by the H3.

CONSEQUENCES OF SHRIVELLING

Grape & Juice

- significantly reduced berry fresh mass
- lower free amino nitrogen (FAN)
- lower total soluble solids (TSS)
- S: incremental increase of solutes from H1 to H3
- NS: increased from H1 to H2 only

The differences became smaller or diminished by the H3.

Wine

- lower ethanol & glycerol: similar to sugar variation in grape berry
- lower total anthocyanins
- lower total phenolics

Table 2. Ethyl esters of branched acids (EEBAs) and fatty acids (EFAAs) in wines. H1: first harvest date; H2: second harvest date; H3: third harvest date; S: shrivelled treatment; NS: non-shrivelled treatment.

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<th>H3</th>
<th>H3S</th>
<th>Mean ± SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ethyl esters of branched acids (EEBAs)</td>
<td>0.10±0.01</td>
<td>0.11±0.02</td>
<td>0.12±0.03</td>
<td>0.11±0.02</td>
<td>0.12±0.03</td>
<td>0.12±0.03</td>
<td>0.11±0.02</td>
</tr>
<tr>
<td>Ethyl esters of fatty acids (EFAAs)</td>
<td>0.10±0.01</td>
<td>0.11±0.02</td>
<td>0.12±0.03</td>
<td>0.11±0.02</td>
<td>0.12±0.03</td>
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The differences became smaller or diminished by the H3.

Conclusion

- ‘Harvest date’ and ‘berry shrivel’ influenced grape and wine composition significantly and independently.

ACKNOWLEDGEMENT

The authors thank Australia’s grape growers and winemakers for their financial support through their investment body, Wine Australia and Australian Federal Government. Xinyi Zhang thanks Vinifera Euromaster program. The authors also thank Florian Imbert (Bordeaux University) for his help.

REFERENCE