

Is *Brettanomyces bruxellensis* becoming more SO₂ tolerant in industry?



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Background

- *Brettanomyces bruxellensis* is the major wine spoilage yeast.
- Winemakers add SO₂ to wine to control the growth of undesirable microbes including *Brettanomyces*.
- The current winemaking trend of minimising SO₂ additions, in conjunction with increasing wine pH, leads to sub-lethal concentrations of molecular SO₂ (active form) and may allow for the development of SO₂ tolerance in microbes.

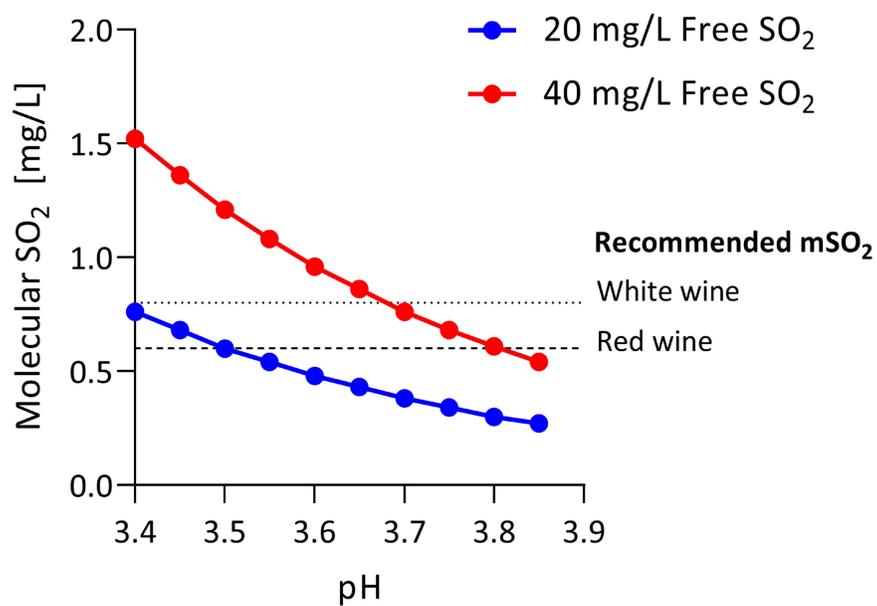


Figure 1. The concentration of molecular SO₂ (mSO₂) in wine is highly dependent on wine pH. As wine pH increases, the level of free SO₂ addition must also increase in order to deliver the same level of mSO₂.

Method

More than 200 *B. bruxellensis* isolates were collected from the Australian wine industry over three time periods (2000-04, 2010-14 and 2016-18) and assessed for their SO₂ tolerance in a laboratory media.

Results

- There was no significant difference in mean SO₂ tolerance between isolates from 2000-04 and those from 2010-14.
- The mean SO₂ tolerance of isolates from 2016-18 had increased significantly compared to 2000-04 and 2010-14.
- The range of SO₂ tolerance was wider in isolates from 2016-18.
- Compared to the first two periods, more isolates from 2016-18 were found to cluster above the mean value for SO₂ tolerance.

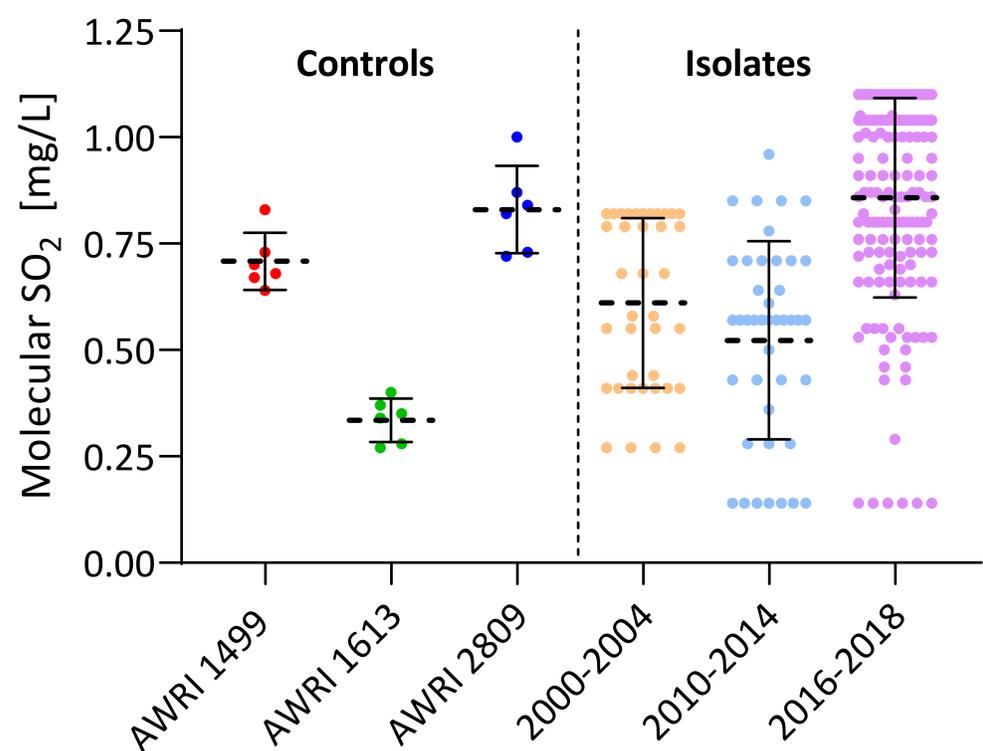


Figure 2. The SO₂ tolerance of industry isolates of *B. bruxellensis* collected over three time periods. Three strains with varying degrees of SO₂ tolerance were used as controls: AWRI 1499 (medium), AWRI 1613 (low) and AWRI 2809 (high).

How can you help?

Do you have any *Brettanomyces*-affected wine?

Email

caroline.bartel@awri.com.au if you have samples to share!

Conclusions

- Results suggest that the SO₂ tolerance of *B. bruxellensis* has increased over the last 15-20 years. However, a recent survey of bottled wine (data not shown) found that the increase in SO₂ tolerance is not currently reflected by any increase in spoiled wine in the marketplace.
- Careful consideration of wine pH is required when adding SO₂ to wine, to ensure sufficient mSO₂ is present.
- Further collection of isolates from a wide geographical area is required to verify this work.



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