

## VARIATION OF *XYLELLA FASTIDIOSA* COLONIZATION IN TOLERANT AND SUSCEPTIBLE GRAPE CULTIVARS

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### ABSTRACT

Pierce's disease in grapevines is a major factor hindering the Texas wine industry and is responsible for thousands of dollars worth of crop loss nationwide. The disease, caused by *Xylella fastidiosa* (*Xf*), a gram-negative bacterium, invades the plant's water conducting vessels leading to severe water stress. Disease mechanisms are not clearly understood; however, several studies have pointed to differences in disease susceptibility between grape cultivars. This study investigated whether levels of bacterial colonization were responsible for differences in disease susceptibility and whether those levels were influenced by anatomical differences between varieties. Three grape cultivars, Cabernet Sauvignon, Chardonnay and Blanc du Bois, were inoculated with isolates of *Xf* and monitored using ELISA, immunofluorescence microscopy and PCR to measure bacterial levels with disease progression. We expected Chardonnay to have the highest bacterial levels due to observations that this cultivar dies most quickly in vineyards followed by Cabernet Sauvignon. We also hypothesized that Blanc du Bois would have little or no bacterial invasion of the xylem based on the fact that it is a hybrid of the cultivated *Vitis vinifera* and the wild grapevine *Vitis aestivalis*. After an eighteen-week period, our results showed the levels of bacterial colonization were highest for Chardonnay, then Blanc du Bois and lowest for Cabernet Sauvignon. Furthermore, Chardonnay varieties developed symptoms at 8 weeks, followed by cabernet sauvignon at 10 weeks and Blanc du Bois, which showed few symptoms. Our results indicate that the ability of a variety to harbor *Xf* does not affect its susceptibility to Pierce's disease. As Blanc du Bois is able to harbor high bacterial levels and show little symptoms, it must have some mechanism for tolerating bacterial levels with out xylem blockage. We are currently investigating differences xylem anatomy as a mechanism by which the Blanc du Bois hybrid might tolerate high levels of the *Xf*.



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# ***Section 2:***

## ***Vector Biology and Ecology***



