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## **Unwelcomed stowaways and their role in thousand cankers disease spread**

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ABSTRACTS – Posters

**Unwelcomed stowaways and their role in thousand cankers disease spread**

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*Geosmithia morbida* is a plant pathogenic fungus primarily vectored by the walnut twig beetle, *Pityophthorus juglandis* (WTB). Together, these species cause thousand cankers disease (TCD) in walnut (*Juglans* spp.) and wingnut (*Pterocarya* spp.) trees. TCD was originally described in the western United States and later detected in 2010 in the eastern U.S. within the native distribution of black walnut (*J. nigra*). In 2013, TCD was discovered in Italy on both black and English walnut (*J. regia*). Due to regional and global movement of TCD, there is a critical need to understand the basic biology and genetics of both the pathogen and vector(s) of TCD, including genetic diversity and population structure of disease complex members. Using traditional and molecular tools, our group has provided an insight into biology, life cycle, and population genetics of TCD members. Current research supports two overlapping WTB generations per season in the U.S. and Italy and potential alternative disease vectors, which could help sustain localized disease presence once the pathogen is introduced. We have also detected high genetic diversity among *G. morbida* subpopulations in the U.S. with spatial clustering and evidence of gene flow providing support for multiple anthropogenic introductions of *G. morbida* from multiple sources. Additionally, we have developed rapid molecular detection methods for both *G. morbida* and *P. juglandis*, significantly reducing disease confirmation time. Future TCD research plans are focused on identifying pathogenicity genes, as well as developing a potential biocontrol for TCD, and understanding how these potential biocontrol methods impact the host microbiome.