

HOT NEWS

***Geosmithia morbida*, the Causal Agent of Thousand Cankers Disease, Found in Indiana**

Matthew Ginzel, Forest Entomologist - Departments of Entomology and Forestry & Natural Resources, Purdue University
Jennifer Juzwik, Forest Pathologist - U.S. Forest Service, Northern Research Station

Thousand Cankers Disease (TCD) is caused by a fungus (*Geosmithia morbida*) that is vectored by a bark beetle, the walnut twig beetle (WTB), *Pityophthorus juglandis* (Coleoptera: Curculionidae: Scolytinae). The disease was first recognized in 2008 and has caused the widespread death of walnut trees (*Juglans* sp.) throughout eight western states. As the beetle bores into a walnut tree to feed and reproduce, it infects the bark tissue with the fungal pathogen. *G. morbida* is considered a weak plant pathogen and requires a vector to become established. It appears that only mass attack by the beetle is sufficient to introduce enough pathogen to kill a tree. In the early stages of TCD, small cankers develop around the galleries of colonizing beetles (Fig. 1). As the disease progresses, cankers become more diffuse and coalesce, interrupting the nutrient-conducting tissues of the tree and eventually killing the inner bark of affected branches and stems. In fact, trees often succumb to the disease only after thousands of beetles have colonized them. Trees infected with TCD show signs of general decline including yellowing, wilted or tufted leaves and crown dieback as a result of the slow starvation effect of the fungus. Affected trees typically die within three years after visual symptoms of the disease first appear in the tree crown.

In August 2010, TCD was found in Knoxville, Tennessee – the first discovery of the disease within the native range of black walnut (*Juglans nigra*). Since that time, the pest complex has been confirmed in Virginia, Pennsylvania, North Carolina, Maryland and Butler Co., Ohio. Detection efforts for TCD in the eastern U.S. primarily rely on visual surveys of symptomatic trees and trapping for WTB using a commercially available pheromone lure. In 2011, the U.S. Forest Service, in cooperation with scientists from the University of Missouri and Purdue University, conducted a trap tree survey in Missouri and Indiana. The lower main stems of four black walnuts at 15 sites throughout Indiana were girdled in late May or early June. After three months, the trees were felled and insects were reared from portions of the main stem and branches of the crown. After identifying all bark and ambrosia



Figure 1. Canker caused by *Geosmithia morbida* on black walnut. (Photo by J. Juzwik)

beetles and weevils reared from these tree sections, subsets of individuals from each of six predominant insect taxa were assayed for *G. morbida*.

No WTB were recovered from Indiana. However, 435 adults of the weevil *Stenomimus pallidus* (Coleoptera: Curculionidae: Cossoninae; Fig. 2) were obtained from main stem samples from 12 sites in Indiana. The causal agent of TCD, *G. morbida*, was recovered from three individual *S. pallidus* that emerged from two trees growing in a black walnut plantation in the Yellowwood State Forest in Brown Co., Indiana. The fungus was not detected on any other wood-boring beetles reared from this site or on any beetles from other sites in Indiana. This is the first report of *G. morbida* from Indiana, and the first report of the fungus from an insect other than *P. juglandis*. Nevertheless, the low frequency of occurrence of *G. morbida* on *S. pallidus* suggests at least a very casual relationship between the fungus and this beetle. Moreover, the

low population density of *S. pallidus* suggests that it may not be capable of vectoring enough of the pathogen to adversely affect tree health.

In response to this find, the DNR Division of Entomology & Plant Pathology, DNR Division of Forestry, U.S. Forest Service and Purdue University are conducting additional studies in the plantation to better understand the disease and potential insect vectors. Surveillance for WTB and *G. morbida* has also intensified in Brown Co. and in counties bordering Butler Co., Ohio, where TCD has been recently detected. Also, forest land-owners should not harvest their black walnut trees as a result of this detection. Rather, if you notice a suspicious decline in black walnut trees or otherwise suspect an infestation of TCD, call the DNR toll-free at 1-866-NO EXOTIC (1-866-663-9684). If approached by someone offering to remove black walnut trees because of the disease, notify a DNR district forester or consulting forester to have the tree evaluated.



Figure 2: The weevil species, *Stenomimus pallidus* (Boheman) from which *G. morbida* was recovered. Length: 1.5 mm. (Photos kindly provided by J. C. Ciegler, West Columbia, SC).