

MICROSPORIDIAN PATHOGENS IN COLEOPTERAN PREDATORS OF HEMLOCK WOOLLY ADELGID

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ABSTRACT

Although quarantine regulations and practices are in place in the U.S. to avoid releasing natural enemies of non-native biological control agents, latent or cryptic pathogens such as submicroscopic viruses, microsporidia, and protozoans may be undetected in a host species during the quarantine period. After release from quarantine, problems may not be observed until establishment of colonies for one or more generations. These “creeping” diseases can build from low to very high prevalence, resulting in destruction of a colony for which large amounts of time and funding have been expended and compromising field releases. Two microsporidian species have been recovered from two coleopteran predators of the hemlock woolly adelgid, the Asian import *Sasajiscymnus tsugae*, and *Laricobius nigrinus* collected from the western U.S. (Table 1). Screening for one microsporidian species in a laboratory

colony of *S. tsugae* over several years showed a strong increase in prevalence in the colony and strong winter mortality among infected beetles. The several predatory beetle species being reared and released for control of HWA are relatively host specific, increasing the risk that in the field, infected beetles will inoculate the feeding niche of the adelgids, thereby exposing conspecific individuals and other predatory species to the pathogens. We currently do not know if the microsporidia are specific to the hosts from which they were recovered, but one infected *Scymnus sinuanodulus* individual from a facility where infected *S. tsugae* were reared suggests that other coccinellid species may be susceptible to this pathogen. We are currently working to produce phylogenetic information about the microsporidia and plan to study cross-infectivity among predatory beetles being reared for HWA biological control.

Table 1.—Microsporidia in hemlock woolly adelgid predators, 2002-2007

Host species	Year and colony location	Percent infection in colony
<i>Sasajiscymnus tsugae</i>	2002 NJDA	12
	2003 NJDA	50
	2004-2005 NJDA	5
	2006 NJDA	3
<i>Scymnus sinuanodulus</i>	2003-2006 NJDA	0
	2004-2005 CT Ag	0
	2006 NJDA	1
<i>Laricobius nigrinus</i> 2005	Washington, Pt. Defiance	20
	2006 OR & WA sites	0
	2007 Washington, Pt Defiance	0