NOTES ON THE BIOLOGY OF *SCYMNUS* (*PULLUS*) *CONIFERARUM*: AN ADELGID PREDATOR

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ABSTRACT

The conifer lady beetle, *Scymnus* (*Pullus*) *coniferarum* Crotch 1874, was previously collected from five states in the western U.S. and from British Columbia. Whitehead, in his 1967 thesis, noted that all collection records of *S. coniferarum* were from pine and that he collected large numbers from lodgepole pine and Monterey pine infested with adelgids. In 2008-2009, we collected 303 *S. coniferarum* adults from several locations in the Seattle, WA, metropolitan area from western hemlock, *Tsuga heterophylla*, infested with the hemlock woolly adelgid, *Adelges tsugae* Annand. Sampling was done during the fall and winter in conjunction with sampling for the beetle *Laricobius nigrinus* Fender. We also sampled fir and western white pine infested with adelgid, but did not recover the lady beetle from these species.

We have reared *S. coniferarum* through two complete generations in the laboratory on *A. tsugae*. Adults fed on all stages of *A. tsugae*, eating a mean of 8.6 eggs, 2.8 nymphs, and 1.0 adult in 48 hours. Survival and development time of the immature stages are similar to those of *Scymnus (Neopullus)* beetles collected in China and reared on *A. tsugae* in the laboratory. However, *S. coniferarum* oviposits and develops best at a temperature range that is 5°C higher than the Chinese lady beetles.

Although *S. coniferarum* can be successfully reared on *A. tsugae*, this adelgid may not be its major host. Feeding preference tests were conducted in which adults were provided a choice between the hemlock woolly adelgid and the pine bark adelgid, *Pineus strobi* (Hartig). An adult ate an average of 2.0 and 0.8 eggs, and 0.7 and 0.1 adults, of *P. strobi* and *A. tsugae*, respectively, during the 20 hours it had access to the prey in a petri dish.

The appearance, biology, and feeding preference of *S. coniferarum* closely resemble another lady beetle in the subgenus, *S. suturalis* Thunberg. The latter is endemic in Europe, but was introduced (apparently both purposely and accidentally) in the eastern U.S. and is now widely established there. Although *S. suturalis* does occur on eastern hemlock as both larva and adults and has been reared on *A. tsugae* in the laboratory, it also favors *Pineus* spp. adelgids as prey and has been frequently recovered from pines infested with adelgids, in both Europe and the United States. While both of these lady beetles prey and reproduce on *A. tsugae* in nature and can be reared on this adelgid in the laboratory, neither would be considered ideal agents for biological control of *A. tsugae*, based on the information now available.