REPRODUCTIVE SUCCESS OF *CYBOCEPHALUS* SP. NR. *NIPPONICUS* ENRODY-YOUNGA ON ELONGATE HEMLOCK SCALE, *FIORINIA EXTERNA* FERRIS

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ABSTRACT

A field study was carried out to evaluate the survival and reproductive success of the established predator *Cybocephalus* sp.nr. *nipponicus* Enrody-Younga (Coleoptera: Cybocephalidae) on elongate hemlock scale (EHS), *Fiorinia externa* Ferris (Homoptera: Diaspididae). A sleeve-cage method with the following four treatment combinations was used to examine the impact of *C*. sp.nr. *nipponicus* on EHS: 1) sleeve-caged branches containing hemlock scales at the test density and a mated pair of *C*. sp.nr. *nipponicus*, 2) sleeve-caged branches containing hemlock scale at the test density and without *C*. sp.nr. *nipponicus*, 3) open branch with test scale density, and 4) open uninfested branches. We found that *C*. sp.nr. *nipponicus* can survive and reproduce successfully on EHS and has a significant impact on EHS populations. Overall, reproduction by *C*. sp.nr. *nipponicus* was observed in 75 percent of the treatment combinations. A total of 45 *C*. sp.nr. *nipponicus* males, 75 females and 30 larvae were recovered from the 'sleeve-cage with predators' treatment. We observed 30.18 percent survival of released *C*. sp.nr. *nipponicus* males and 26.41 percent survival of females. A significant difference in the mean number of surviving scales between sleeve-cage with predators and sleeve-cage without predators was observed. We also examined levels of parasitism of EHS by the adventive parasitoid, *Encarsia citrina* Craw (Hymenoptera: Aphelinidae). Significant differences in percent parasitism of EHS were also observed between sleeve-cage with predators and without predator treatments and between open infested branch and uninfested branch treatments. The highest level of parasitism (47.5 percent) was observed in the 'open infested branch' treatment.

KEYWORDS

Elongate hemlock scale, *Cybocephalus* sp.nr. *nipponicus*, reproductive success, *Encarsia citrina*, parasitism.