Circadian Dynamics of Locomotor Activity and Deltamethrin Susceptibility in the Pine Weevil, *Hylobius abietis*

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Rhythmic locomotor activity and daily susceptibility to deltamethrin were tested in the pine weevil, *Hylobius abietis* (L.) (Coleoptera, Curculionidae), a pest of young conifer plants. In constant darkness, beetles revealed a free-running circadian pattern of locomotor activity (average period 22h : 20min). Under long photoperiod, L:D 18:6, entrainment of motor activity was observed. In the entrained population of the weevils, a peak of locomotor activity occurred at about the beginning of the dark phase, and the minimum occurred in the middle of the light phase. Fluctuations of susceptibility to a standard dose of deltamethrin (0.5 μg/g body weight) varied across the day, and were inversely correlated to the changes in locomotor activity. The importance of considering the daily organization of insect biology in studying insect resistance to pesticides is re-emphasized.

KEY WORDS: *Hylobius abietis*; circadian rhythmicity; chronotoxicology; pyrethroids; video-digitizing system OXALIS.

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