

Influence of pine wilt damage on bark boring insects species.

Ai Shimizu^a, Ryusei Tanaka^b, Mitsuteru Akiba^b, Hayato Masuya^b, Ryûtarô Iwata^c,
Kenji Fukuda^a and Natsumi Kanzaki^b

^a University of Tokyo, JAPAN

^b Forestry and Forest Product Research Institute (FFPRI), JAPAN

^c Nihon University, JAPAN

Pine wilt disease is the most serious forest pest in Japan. Although the disease mechanism and control methods have been studied extensively, ecological impacts of the disease, especially on other insects and microfauna have not been studied sufficiently. In the pine wilt-affected forests, the population densities of pine wood nematode (*Bursaphelenchus xylophilus*) and its vector beetle, *Monochamus alternatus*, increase, and the excess densities of *B. xylophilus* and the beetle possibly affect the other insects and its associated animalcules. In the present study, to examine the effects of *M. alternatus* on other bark boring insects, a field experiment was conducted. Sixteen insect trap logs (diameter 6-8cm, length 1m) were set in a pine stand in Chiyoda Experiment Nursery of FFPRI, Kasumigaura, Ibaraki, Japan. The half (eight) of logs were enclosed in wire mesh cage to exclude *M. alternatus*, and the others were not. The logs were placed in the experimental site from July to December 2010, then recovered and kept in isolation chamber by April 2011. During the experimental period, three species of insects, *M. alternatus*, *Dryocoetes uniseriatus* and *Shirahoshizo* sp. were recovered from the trap logs. The population density of *D. uniseriatus* (number of emerged insect per 100cm² of bark) was lower in the logs with *M. alternatus* (2.64 ± 0.42) compared to the logs without *M. alternatus* (5.37 ± 2.54), i.e., the bark beetle population is probably affected by feeding activity of *M. alternatus* larvae. The number of *Shirahoshizo* sp. was rather small, and the interaction between the weevil the other insects was not clearly detected. The emergence of *D. uniseriatus* started in mid March, and lasted until the end of April. The beetle emergence from the logs with *M. alternatus* significantly decreased after April 2011, but this decrease did not occur on that from the other logs. The bark beetle and *M. alternatus* larvae inhabit the inner bark of dead pines, and larval feeding of *M. alternatus* starts in April. This feeding activity may have affected bark beetle population, e.g., the *M. alternatus* larvae feed and destroy the tunnel and larvae of bark beetles.

Corresponding Author:

Ai Shimizu

Department of Natural Environmental Studies

Graduate School of Frontier Sciences, The University of Tokyo

5-1-5 Kashiwanoha, Kashiwa-city, Chiba 277-8653, JAPAN

e-mail: shimizu_1219i @nenv.k.u-tokyo.ac.jp