INFLUENCE OF PREDATORS AND PARISITOIDS ON BARK BEETLE PRODUCTIVITY

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In an earlier field experiment, natural enemies of the bark beetle, *Ips typographus* (L.) were estimated to have reduced bark beetle productivity by more than 80 percent. To test this hypothesis, spruce logs (*Picea abies*) were placed in the forest in the spring, prior to commencement of flight by *I. typographus*. The logs were screened at different times following onset of bark beetle attack. The screens prevented further colonization by bark beetles and associated insects. The insects were subsequently collected as they emerged from the logs the following autumn or the following spring. The treatments used were as follows:

C = Control, screening prior to attack, bark beetles released on logs under the screen
E.S. = Early screening, 1 week after first bark beetle attack
I.S. = Intermediate screening, 4 weeks after first attack
L.S. = Late screening, 8 weeks after first attack.

The earlier the screening was done, the more bark beetles emerged from the logs. The mean number of juvenile imagos of *I. typographus* emerging was 2800/m^2 from the control logs, 2300/m^2 from the E.S. logs, 1200/m^2 from the I.S. logs, and only 460/m^2 from the L.S. logs. Mean attack densities were similar for all treatments: 230-240 nuptial chambers/m^2. Therefore, the differences in bark beetle emergence between the treatments cannot be explained by varying degrees of intraspecific competition.

Virtually no predators and parasitoids emerged from the control logs and very few from the E.S. logs. Overall, the later the screening was done, the more predators and parasitoids emerged.

The most important predator was *Medetera* spp. (Diptera: Dolichopodidae), which emerged at a mean rate of about 170 imagos/m^2 from both I.S. and L.S. logs. The most important parasitoids were *Roptrocerus* spp. and *Rhopalicus* spp. (Hymenoptera: Pteromalidae), which together emerged at a mean rate of about 50 imagos/m^2 from the I.S. logs and about 340 imagos/m^2 from the L.S. logs.

Other insects which emerged were *Thanasimus* spp. (Coleoptera: Cleridae), eight larvae/m^2 emerging from I.S. logs and 18 larvae/m^2 from L.S. logs; small staphilinid larvae--mostly *Phloeonomus* spp. and *Placusa* spp.--(Coleoptera: Staphilinidae)--60 larvae/m^2 emerging from I.S. logs and 150 larvae/m^2 from L.S. logs; and *Lonchaea* spp. (Diptera: Lonchaeidae), 55 imagos/m^2 emerging from L.S. logs.

In contrast to other insects emerging, *Epuraea* spp. (Coleoptera: Nitidulidae) were abundant in E.S. logs, about 380 larvae/m^2, but scarce in logs screened later. This may indicate that late-arriving insects preyed also on *Epuraea* larvae.

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