



Timber Talks



Department of Fisheries and Forestry

Prepared by V. H. Phelps, Forest Research Laboratory, 506 W. Burnside Road, Victoria, B.C.

AMBROSIA BEETLE ATTRACTANTS

No. 74

Insect development is dependent upon the availability and adequacy of suitable food and shelter. There are various means of directing or attracting insects to desirable habitats, some being primary and others secondary. Logs exposed to the weather may be primary attractants, and insect attacks that increase the attractiveness of the logs can be secondary attractants. Ambrosia beetles cause a great deal of damage to logs, the extent of which is directly related to the size of the population. Initial attacks by this beetle increase the attractiveness of the log to individuals of the same genus due to production of a chemical compound or pheromone by the females. The role of mating on the pheromone production and the influence of the male beetle on secondary attraction was investigated on Vancouver Island.

Douglas-fir logs were placed in plastic cages, to which insect traps were attached, and distributed in a second growth Douglas-fir stand. Ambrosia beetles were collected at a hibernation site and after processing and testing in the laboratory, groups of 25 virgin females were placed on five logs and groups of 25 mated females on another five. Six days later, male beetles were added to two logs with virgin females and to two logs with mated females. Insects caught in the traps were counted daily and the numbers compared with those collected at logs where insects had not been installed. At the completion of the study, ovarian development was investigated and the condition of galleries and presence of eggs, larvae, pupae and adults recorded.

Confirmatory evidence of the production of a secondary attractant by ambrosia beetles was the much larger number of beetles caught on baited logs. The numbers attracted to logs with mated females were not significantly different from those to logs with virgin females, indicating that mating is neither a prerequisite nor an inhibition for the production of the secondary attractant. Evidence of the effect of this attractant was not apparent after the introduction of males, but the reason for the decline is not clearly understood. Further mating would be improbable as the males were not introduced until most of the females were inside well-developed galleries where copulation is unlikely to occur. Most mated females had well-developed ovaries and there were larvae, pupae and young adults in their galleries; virgin females usually had some ovarian development but no evidence of mating.

The reason that the effectiveness of the secondary attractant is reduced in the presence of males is not known. Perhaps pheromones are not produced in the presence of males, or a masking or repellent effect may be created by either or both sexes. The excretion of a chemical substance by the male that masks the female pheromone seems a reasonable assumption. This suggests that protection of logs from ambrosia beetle attack by use of a masking compound could be an acceptable alternative to insecticide applications.

REPORT: The effect of mating and the presence of the male ambrosia beetle, Trypodendron lineatum (Oliv.) on "secondary" attraction. W. W. Nijholt. Forest Research Laboratory, Victoria, B. C.