



BEHAVIOUR OF IPS GRANDICOLLIS (EICHHOFF) (COLEOPTERA:SCOLYTIDAE)

by

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SUMMARY

Ips grandicollis (Eichhoff) is an inhabitant of the subcortical tissues of coniferous trees, mainly Pinus species. (1)  
It has been classed as a pest of secondary importance, with the potential to become a primary pest under outbreak situations, both in its native habitat in North America and in South and Western Australia (where it became established in about 1943).

Investigations carried out during this study have been restricted to its major host species in Australia; Pinus radiata D. Don. Factors which contribute to resistance of individual trees to attack by I. grandicollis were investigated. The defense mechanism usually involves the flow of resin from reservoirs and ducts damaged by beetles during initial boring. Failure to encounter any of these resin barriers, cessation of boring and retreat was associated with secondary resin produced by the damaged phloem cells. The absence of such defence mechanisms in declining trees, resulted in continued boring.

During Dispersal, I. grandicollis was found to land randomly (2) on trees within a pine stand, the actual selection being made after boring into the bark of the tree.

Dispersing adult I. grandicollis, either caught on pheromone-baited traps in the field or collected in the laboratory during emergence from field infested logs, included a high percentage of (3) mated females. Mating occurred only within galleries in the bark. Some of the progeny adults, including siblings, mated before emergence and later produced offspring. The number of females

thus mated depended upon the time spent within the bark by mature adults before emergence from the host in which they developed. Virgin and mated females initiate galleries even in the presence of male-initiated galleries. Moreover, males join both virgin and mated females which have produced galleries. Similarly, both virgin and mated females were accepted into nuptial chambers by males.

A technique using GC/MS was developed to determine the concentration of ipsenol in extracts of whole beetles. Production of ipsenol in males began about 9 to 12 hr after boring into suitable host material and this tended to coincide with the appearance of faecal pellets in the frass. Adult males which rejected bore-sites in 'resistant' trees had not produced ipsenol. These data indicate that males do not feed and hence do not produce any ipsenol until the decision to continue boring has been made. This evidence supports the generally accepted concepts of ipsenol production and its dependence on feeding by the male, but it provides a more critical basis for the development of secondary attraction of I. grandicollis than has so far been presented.