REARING BARK BEETLES FOR USE IN DISINFESTATION TRIALS DEVELOPING EFFICACY DATA SETS FOR FUMIGANTS

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Abstract Research is under way in New Zealand to find alternatives for and to reduce the quantity of methyl bromide (MB) used to fumigate export logs. Two forest beetle species that are potential fumigation targets for export of *Pinus radiata* logs are the golden-haired bark beetle *Hylurgus ligniperda* (Fabricius) (Coleoptera: Scolytidae) (GBB), and the black pine bark beetle *Hylastes ater* (Paykull) (Coleoptera: Scolytidae) (BPBB). Research programmes aimed at identifying alternative fumigants and determining the lowest effective rates of MB require adequate numbers of insects of a known age and of standard quality. To achieve secure supply of physiologically synchronised beetles of all life stages throughout the year, we undertook studies to develop rearing methods for GBB and BPBB, aiming to establish breeding laboratory colonies of both species.

Adults of both GBB and BPBB were collected from the field. The first requirement was to develop a system for oviposition and egg retrieval. Eggs are normally laid by adults that have burrowed under the bark of *P. radiata*, making the retrieval of the number required for fumigation trials extremely difficult and time-consuming. After testing a wide range of substrates and methods, an oviposition device using fresh phloem tissue was developed and eggs are now reliably obtained. The second requirement was to develop an artificial diet on which newly hatched larvae would establish, feed and develop successfully. A range of diets were trialled leading to the selection of an agar-based artificial diet incorporating *Pinus radiata* bark powder that enables successful development of larvae through to fertile adults. All rearing was carried out in controlled environment rooms maintained at 20±1°C and 24 h dark. Breeding laboratory colonies of both species have now been successfully maintained across three generations. To date 10,000 eggs, 4,000 larvae 2,000 pupae and 4,000 adults of *H. ligniperda* have been supplied to the disinfestation laboratory. Life stages of *H. ater* are currently being supplied for ongoing trials.

Further studies are continuing to optimise all stages of the rearing system and to determine key life-cycle parameters including life stage development times, survival and fecundity.

Keywords golden-haired bark beetle, *Hylurgus ligniperda* (F.), rearing methods, disinfestation research, *Hylastes ater* (Paykull)