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ADDITIONAL STUDIES / OBSERVATIONS ON THE HEATHER BEETLE,
LOCHMAEA SUTURALIS

(Short Answers in Conservation Science)

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Additional studies / observations on the heather beetle, *Lochmaea suturalis*

Bourner, T.C.

1 Microsporidian Infection

Previous consignments of *L. suturalis* from the UK had contained a microsporidian disease, identified by Peter Wigley (HortResearch, Mount Albert, Auckland). To check for the presence of microsporidia in the current shipment, smears were prepared from larvae which died before reaching pupation, and from second generation adults which died within a few days of emergence. The air-dried smears were sent to Peter Wigley, who found that the microsporidian was again present. This means that the beetle consignment intended for release (a) should be collected from a different location where the incidence of microsporidia is lower, and (b) should be line-reared in quarantine to eliminate the disease prior to release. Peter Wigley has agreed to help devise a method of line-rearing the beetles.

2 Incidence of Parasitism

In all, 76 beetles of the 558 in the shipment (i.e. 13.6%) were seen to be parasitised. The beetles had been sent in individual sample tubes, and a single parasitoid pupa appeared in each tube containing a parasitized beetle. Parasitoids which emerged successfully were frozen for later identification. There appeared to be one or two species of tachinid fly, probably *Degeeria collaris* Fall., which has been reported to parasitize 20% of heather beetles collected in Scotland (Cameron *et al.*, 1944). There was considerable variation in the size of the tachinid pupae and adults, but it was not known whether this was due to natural variation or sexual dimorphism in the species, or to the presence of a second species of tachinid.

A small number of hymenopteran parasitoids were also collected. These emerged from pupal cases which were identical to those of the tachinids, and so were probably hyperparasitoids.

All the parasitoids collected are at Lincoln, awaiting identification.

3 Nature of Feeding Damage caused by Heather Beetle Adults and Larvae

This was not studied quantitatively, but the following observations were made in the course of the moss oviposition tests and the host-range testing.

3.1 Adults

Adult beetles confined to individual plants showed a clear preference for the tender new growth at the tips of the heather shoots. The new growth was usually, but not always, completely consumed before feeding began on the previous season's growth. Feeding was often wasteful, with leaves and severed pieces of shoot found on the soil beneath feeding sites. Between periods of feeding, the beetles concealed themselves in the moss or litter below the plants, retreating into cracks in the soil when pursued. Any disturbance during feeding, such as lifting of the plant pot, usually resulted in the beetles dropping onto the soil and hiding. Females seemed to be more elusive than males, being more likely to hide deeper in the soil when disturbed, whereas males tended to try to run away. Males were markedly more active at low temperatures (10°C) than females.

3.2 Larvae

Larvae proved to be voracious feeders. On whole plants, first instar larvae were usually found high up on the new growth. In Petri dishes, feeding on bouquets of heather, they would eat all the new growth available then move off the bouquet and wander around the dish, being very reluctant to eat the older growth, even when this appeared to be quite soft. On the whole plants, first instar larvae were found high up on the muslin sleeving if no new growth was available, implying that they were trying to search upwards for more new shoots in preference to eating the older growth which was readily available. Even small first instar larvae were capable of severing new shoots, so the amount of defoliation that larvae can cause is greater than the amount of foliage consumed.

Third instar larvae were usually found feeding lower on the heather plants, on new or one-year-old growth close to the base of the plants.

Overall, larvae appeared to consume more foliage than adults on a per capita basis, but this is based on observation rather than measurement.

4 Location of Food by Neonate Larvae

There was some concern that neonate larvae may have difficulty in locating new growth on the older, very woody *Calluna* plants in Tongariro National Park (TNP).

However, from the above observations, it seemed that neonate larvae were very robust, and would be capable of moving quite long distances to locate suitable food. In addition, having now had time to look at the older *Calluna* plants in TNP, it seems that there is usually plenty of new growth close to the ground, some of it sprouting from old stems, so it is unlikely that neonate larvae would have to travel far from the oviposition site to find food.

In retrospect, it would have been very difficult to study this in the quarantine facility at Lincoln, but would be worthwhile attempting in open plots of heather when permission has been obtained to release the beetle.

T.C. Bournier, Massey University, Private Bag 11222, Palmerston North.