Some Observations on *Lasiorhynchus barbicornis* (Brentidae: Coleoptera)

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One of New Zealand's most striking beetles is *Lasiorhynchus barbicornis*, commonly known as the giraffe "weevil", though not a member of the weevil family (Curculionidae) but our only representative of the family Brentidae. Hudson (1934) mentioned that the beetle is "usually taken singly, but on

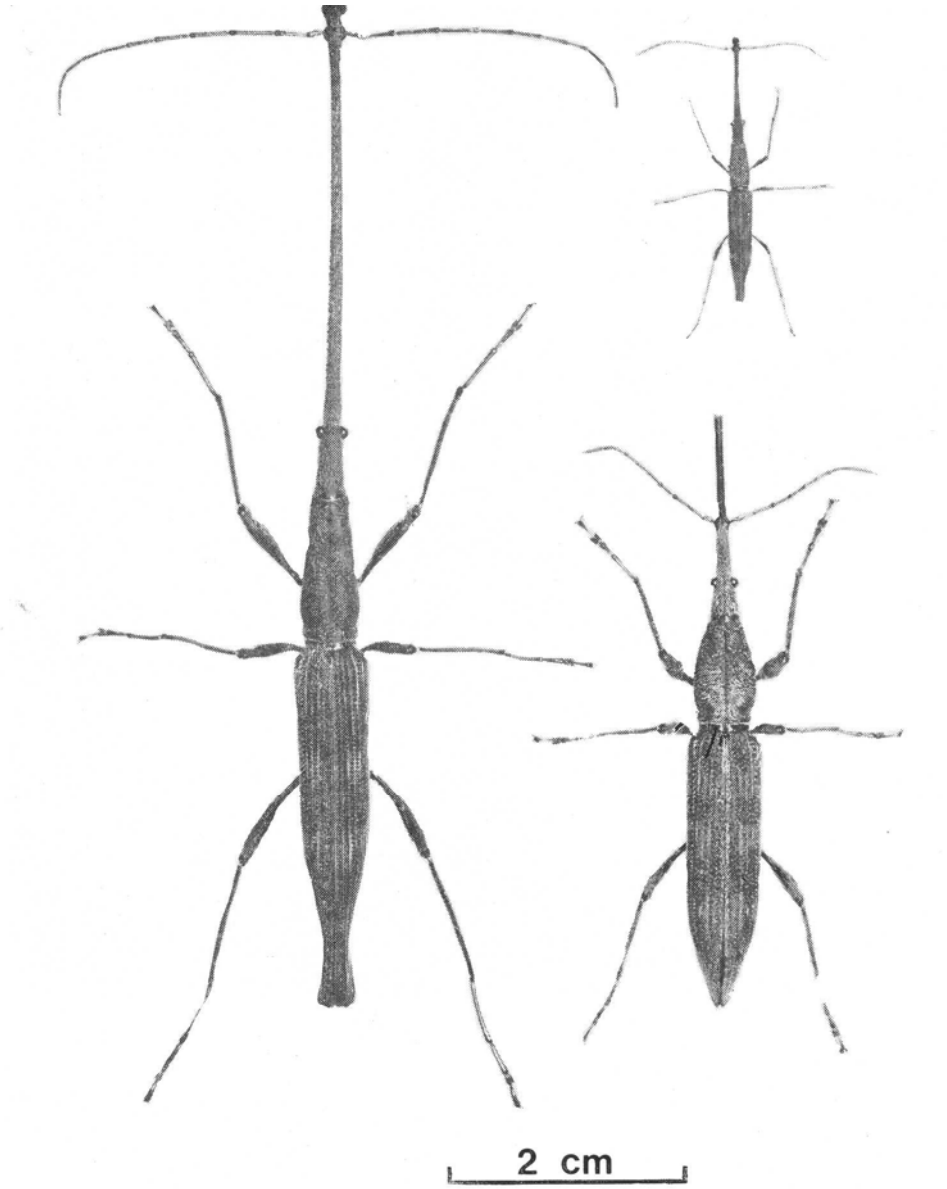

Fig. 1 Sexual dimorphism in the giraffe beetle *(Lasiorhynchus barbicornis).* Males, left and top right, female, bottom right.

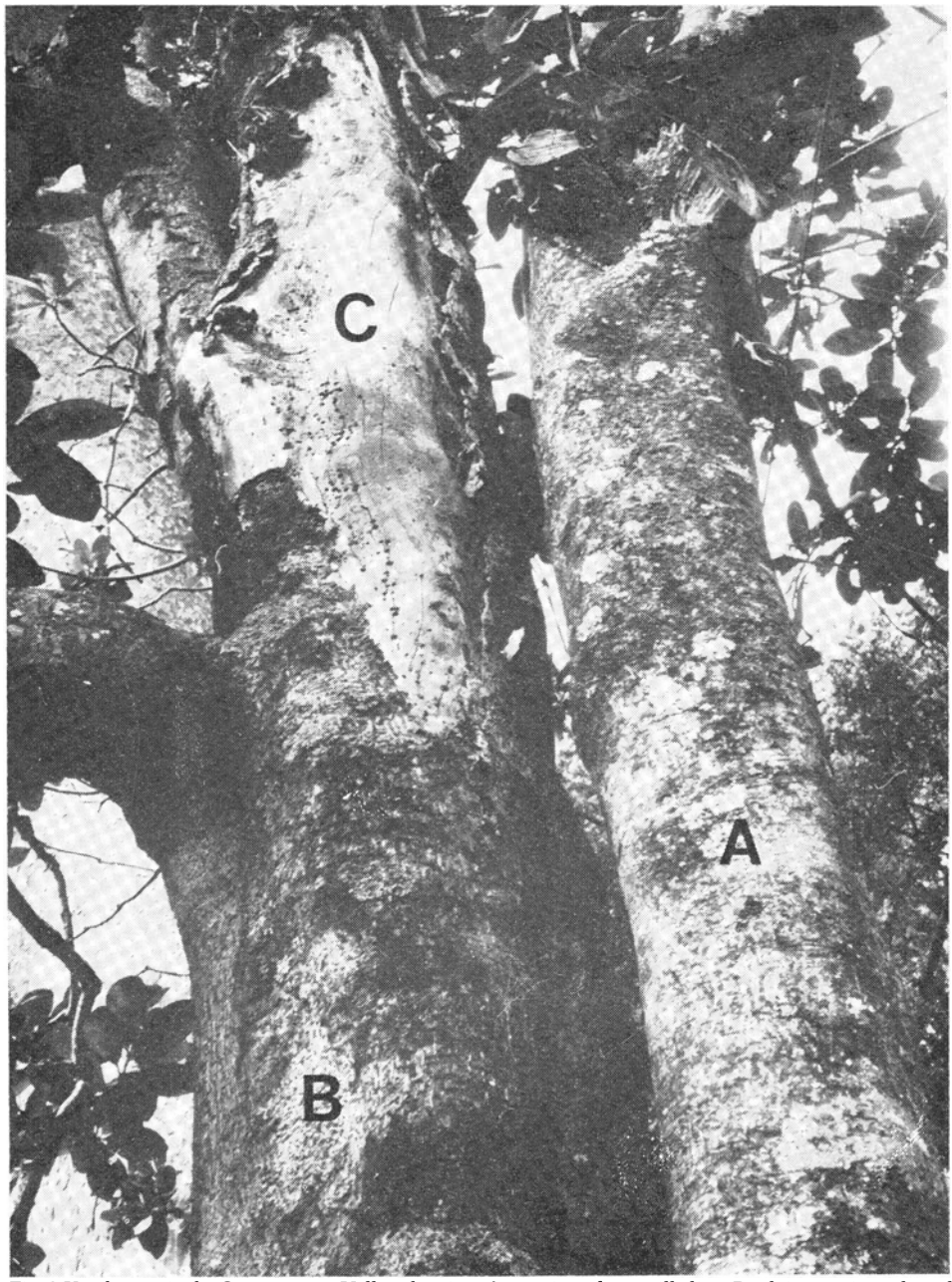

Fig. 2 Karaka tree in the Orongorongo Valley showing: A - section of tree still alive; B - dying section selected by giraffe beetles for egg-laying; C - dead wood riddled by previous season's larvae.

rare occasions quite a number may be found closely associated", and that he once found "sixty specimens on a tree in the Orongorongo Valley, a whole brood having presumably just emerged from the wood". Observations recorded in this paper were made in the Orongorongo Valley at the Ecology Division field station, Wellington (41°21'S, 174°58'E) after counting 68 giraffe beetles on a karaka (C*orynocarpus laevigatus)* tree early in November 1972.

Most brentids show pronounced sexual dimorphism. The rostrum of the male giraffe beetles, with antennae and mandibles at the extremity, is equal to the length of the body; while that of the female is about one third as long as the body with the antennae placed about halfway back on the rostrum but slightly closer to the head (Fig. 1). Both sexes vary considerably in size; males range from 18 mm to 86 mm, females from 18 mm to 50 mm. Both sexes are similarly coloured with mainly dark brown and black markings, which blend well with their surroundings. Fragments of beetles were found in the faeces of feral cats in the Orongorongo Valley (B. J. Karl, pers. comm.). No predation by other animals has been recorded.

Monthly counts were made from November 1972 until the tree was destroyed during a storm in December 1973. The beetles were present in all months. Between October and March inclusive numbers varied from 10 to 68 with only one or two recorded in the other months. To establish movement, sex ratio, and longevity of adult beetles, all those seen on any day were individually marked with typists' correcting fluid (white, spirit based). Altogether 125 beetles (72 ♂ ♂, 53 ♀ ♀) were marked on the 14 days that the tree was visited between 13 November 1973 and 7 December 1973, the maximum number marked on a single day was 28 with an average of 9 per day. Of the 72 males marked, 42 (58 percent) reappeared on a total of 88 days; and of the 53 females marked 13 (25 percent) reappeared on 17 days. Beetles reappeared intermittently. One male reappeared on 8 occasions and was seen for the last time 29 days after marking, but most were not seen again after the seventh or eighth day from marking. Females did not recur as frequently as males and although one was seen 4 times after marking the others were seen again only once. The mean duration spent on the tree (8.6 days) was not significantly different for males (8.4) and females (10.2 days).

The female selects a variety of plant species for egg-laying. These include kauri (*Agathis australis*) (White 1846); lacebark (*Hoheria* spp.) and pigeonwood (*Hedycarya arborea*) (Hudson 1934); rewarewa (*Knightia excelsa*) and rimu (*Dacrydium cupressinum*) (Miller 1925). Egg-laying has been observed in the Orongorongo Valley on karaka (*Corynocarpus laevigatus*), tawa (*Beilschmiedia tawa*) and pukatea (*Laurelia novae-zelandiae*) from October to March. Hudson (1934) states that the larvae bore solid wood of dead trees; but from my observations on karaka and pukatea, the female selects only dying wood for egg-laying. A karaka in the Orongoronga Valley (Fig. 2) shows: (A) section of the tree still alive; (B) a dying section selected by giraffe beetles for egg-laying which had heart wood and bark still moist with sap; and (C) old dead wood riddled by previous season's larvae. This tree provided food, egg-laying sites and shelter for adults and larvae, which probably accounts for the large numbers of beetles on it.

Egg-laying and mating behaviour of giraffe beetles were often observed. The female bores a hole 0.5 mm wide through the bark by inclining her rostrum at approximately 45° to the body line and twisting her head from side to side (Fig. 3). She withdraws her rostrum after boring about 0.3 mm and ejects the debris collected inside the rostrum and between the mandibles, rather in the way a cork borer is used. This procedure is continued until a hole 3-4 mm deep is made 45° to the surface of the tree. The antennae are laid along the rostrum with the extremities touching the tree while boring (Fig. 3). When the hole is completed the female reverses her position and lays into the hole. She then tamps the hole with bark scraped with her valvifer from around the hole. The entire process takes approximately 30 minutes. Copulation normally takes place when the female is boring and precedes oviposition (Fig. 4). The enormous size variation between and within sexes does not deter a pair of contrasting size from copulating (Fig. 5).

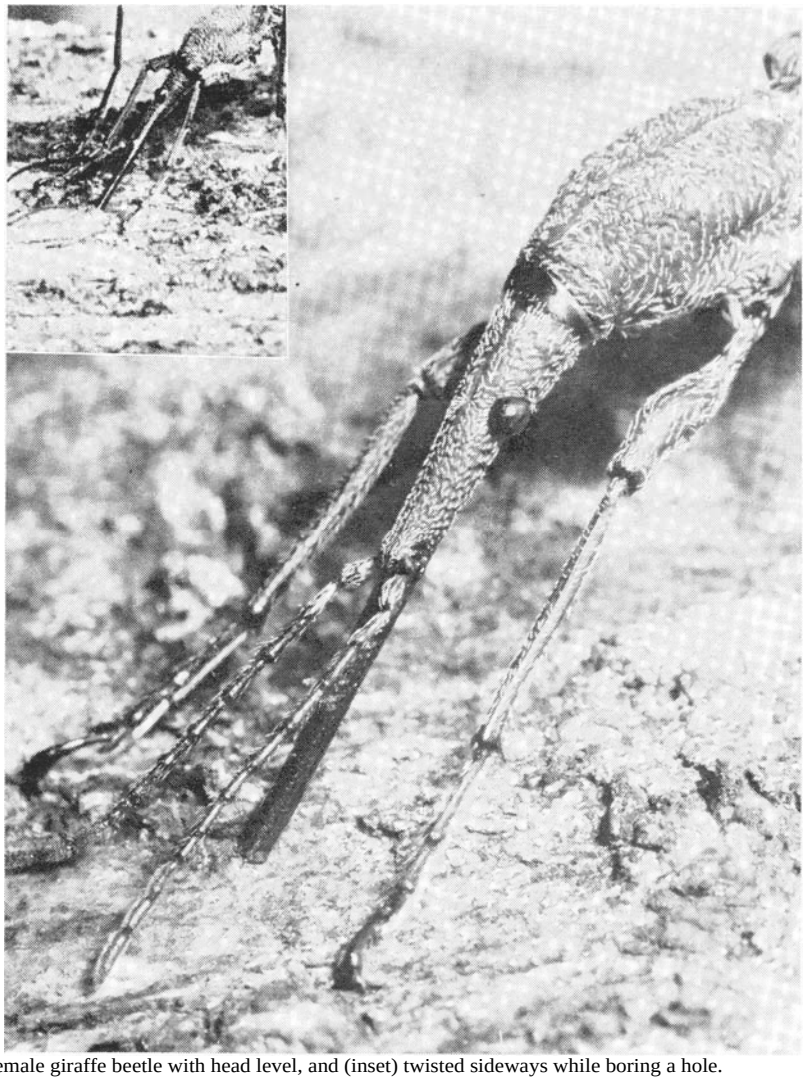

Fig. 3 Female giraffe beetle with head level, and (inset) twisted sideways while boring a hole.

Fighting occurs frequently when an extra male or males finds a copulating pair. An attacking male first uses his downwardly curved mandibles and long rostrum with a raking action across the back of the copulating male in order to dislodge him. If this is not successful both contestants endeavour, rather awkwardly, to secure any part of their opponent's leg with their mandibles. If this difficult manoeuvre is accomplished and a firm hold is achieved, the defeated male immediately becomes submissive and is lifted bodily off the tree and dropped. Some beetles have legs missing (mainly tibia or tarsi) and this may be attributed to such fights. Smaller males tend to retreat quickly when challenged and do not fight. The defeated males spend long periods hiding in crevices, holes or under loose bark.

Up to nine male giraffe beetles fed together on secretions exuding from the karaka tree, but only one female beetle was observed feeding. Most activities were observed in daylight and beetles appeared unconcerned by my presence. At night activity was similar though less intense, but the beetles were disturbed by

Fig. 4 A pair of giraffe beetle, mating while the female bores a hole.

torchlight and "froze", dropped, retreated to hiding places, or moved to upper branches.

From marking and re-sighting it appears that giraffe beetles move about freely and occasionally fly in daylight; but probably move mainly at night. Two males seen flying in daylight held the rostrum straight out with the elytra vertical. Their flight was slow, laboured and almost non-directional, and neither beetle seemed able to avoid large objects.

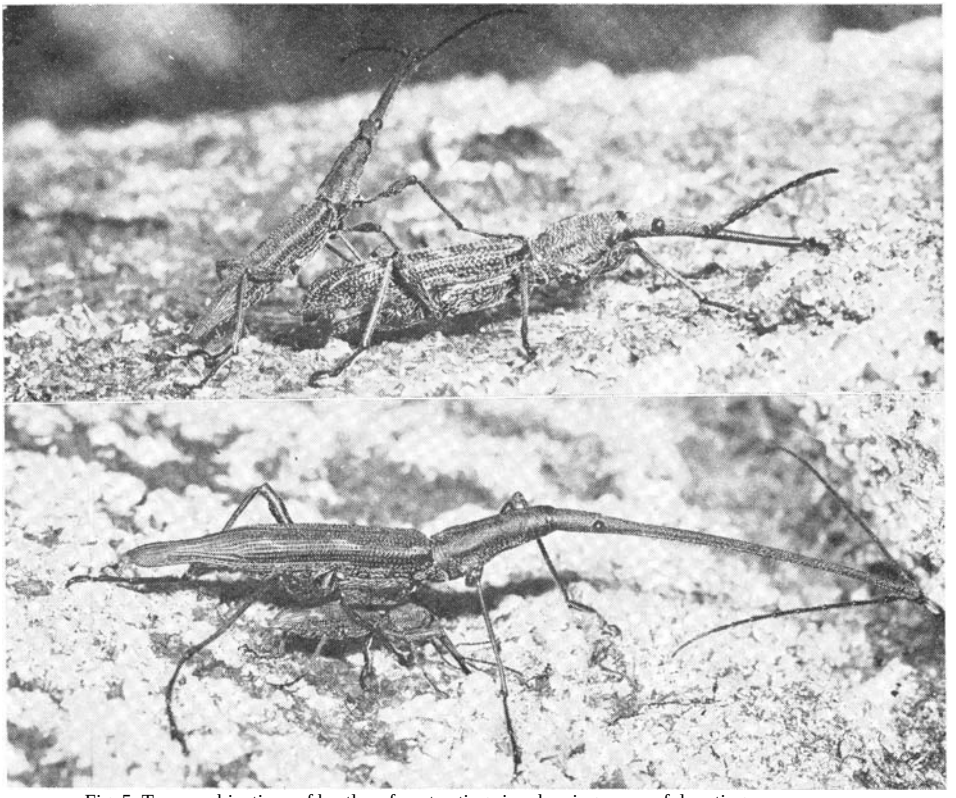

Fig. 5 Two combinations of beetles of contrasting size showing successful mating.

The bizarre shape of giraffe beetles poses several interesting questions. The development of the long rostrum in the female, with the antennae placed towards the head, appears to be an adaptation for drilling a deep hole in which to lay. The mandibles and rostrum of several species of woodboring weevils are used to drill a shallow hole for oviposition, but in other insect groups such as cicadas (Hemiptera) and horntail borers (Hymenoptera) this is carried out by the modified ovipositor. The function of the long rostrum of the male is not so obvious. The mandibles are large and well developed, though they are not used in any special way for feeding. The fighting behaviour of males shows one way in which the rostrum is used to good effect. Small males, with correspondingly short rostrums, are unable to compete successfully with the larger males for females, but occasionally mate when larger males are distracted by fighting.

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