A NOTE ON THE CARDAMOM WEEVIL (PRODIOCTES HAEMATICUS CHEV. VAR.)

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TOWARDS the end of August, 1939, the superintendent of an estate in the Dolosbage district brought in some cardamom plants badly attacked by stem-boring insects, with the report that several acres of older cardamom plants were being seriously damaged and many plants had been killed; in the specimens submitted the stems had been riddled, thus producing dead hearts, and the rhizomes had been extensively tunnelled. This damage is similar to that caused by *Dichocrocis punctiferalis*, the common stem-boring caterpillar of cardamoms, ginger and turmeric, and, while traces of this pest were found, it soon became evident that most of the injury was being done by weevil grubs; not they are somewhat of the type of the plantain stem and root borer grubs. At that time no other stages of the pest were found, but within a few days the superintendent kindly submitted some live cardamom weevils, some of which had been found hiding in rolled leaves on the plants or on the ground at the bases of the plants, while others had been removed from tunnelled stems within which they had emerged. These weevils were found to be *Prodioctes haematicus* Chev. var., after comparison with a named specimen in the Peradeniya collection determined several years ago by the Imperial Institute (formerly the Imperial Bureau) of Entomology. Since none of the previous records of this weevil listed later have indicated that it has ever been a pest of cardamoms or of any other cultivated plant until recently, it became necessary to investigate the outbreak in Dolosbage, and the following notes are the result of this preliminary investigation.

Prodioctes haematicus, seen from above, is a slender brown weevil (Fig.1) about ½ in. long with a distinct snout or proboscis, with three black lines on the pronotum, or that part of the body just behind the snout, and with six small black spots on the elytra or wing-covers; there are also small black markings on the underside of the body. The two sexes are similar in appearance, except that the proboscis of the male is roughened on top, while that of the female is smooth and shiny.

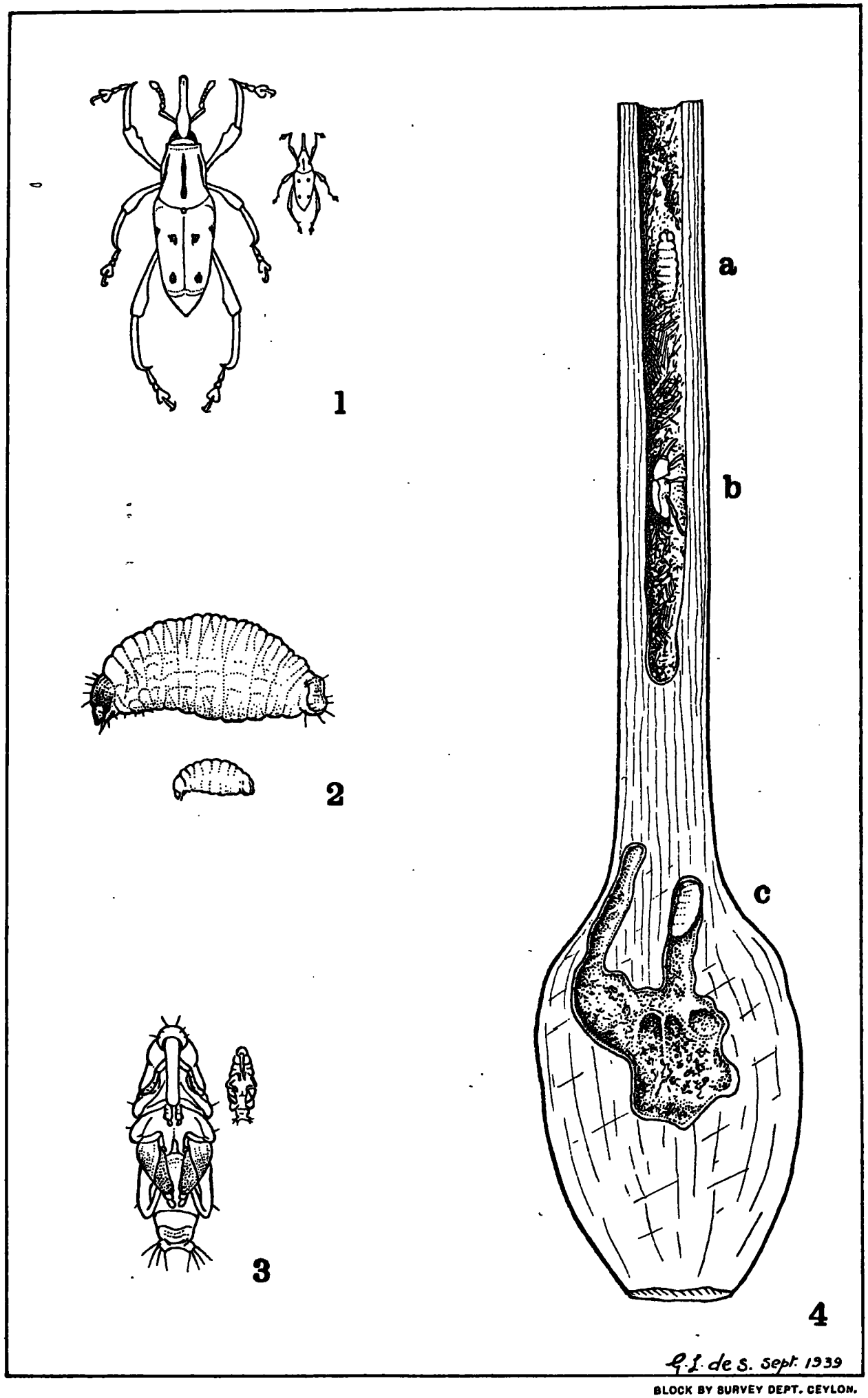
Habits and nature of damage.—So far as is known at present, no appreciable damage is done to cardamom plants by the weevil stage except the making of small feeding punctures and egg-pits with the proboscis. Eggs have not been found so far under field conditions, but the presence of grubs in separate tunnels in different parts of plants from the growing shoots down to the rhizomes indicates that the eggs may be laid almost anywhere in the softer tissues of the plants. Judging by the egg-laying habits of related weevils, such as the red weevil of coconuts and the black plantain weevils, it is probable that the small, soft, whitish, elongate eggs are deposited by the female in cleverly concealed pits previously excavated with her proboscis. The weevils usually hide in sheltered places on the plants and on the ground during the day and are active at night. When disturbed on a plant they draw in their legs close to the body, drop to the ground and pretend to be dead for a short time, after which they take shelter, moving forwards with a characteristic jerky gait.

The larva or immature stage is a soft, creamy, legless grub with a brown head and powerful biting jaws and a rather stout, much wrinkled body (fig. 2). The grubs feed entirely inside the plants, which may be riddled from top to bottom, including the rhizomes (fig. 4) when some half-a-dozen grubs are found in the same plant. Individual plants in a clump may be killed, and during a heavy infestation, such as was observed recently on a Dolosbage estate, every plant in a clump may be killed gradually, so that there is a complete failure of young shoots, racemes and subsequent crop. The damage caused by these grubs is far more serious than that done by the caterpillar stem-borer, which usually confines its activities to the shoots and stems and rarely penetrates the rhizomes.

The full-grown grubs change into the pupal stage (fig. 3) inside the hollow stem or in enlarged cells in the rhizomes. Apparently no special cocoon is made by the grub, as in the case of the red weevil and the plantain stem-borer, but individual pupae may be loosely surrounded by frass and fibres. The weevils emerge later, but remain inside the cell (fig. 4b) until the body-covering has attained its final colour and hardness; then they bore their way out and begin their active life of feeding and reproduction. At present, nothing is known about the length of the life-cycle, but it probably occupies at least 4–6 weeks.

RECORDED CEYLON DISTRIBUTION OF WEEVIL.

Galagedera, October, 1900 (cardamoms)*; *Kandy*, August, '03, January '11*, August and September '14, November '30, May '33; *Urugala*, September '22, April '23, April '24 (cardamoms); *Gammaduwa*, November '29, September '32,



THE CARDAMOM WEEVIL (*Prodioctes hæmaticus* Chev. var.).

Figure 1.—Weevil. Figure 2.—Full-grown grub. Figure 3.—Pupa. Figure 4.—Section of portion of cardamom stem and rhizome showing grubs at *a* and *c* and freshly emerged weevil at *b*, natural size.
Outlines at sides of Figures 1–3 show natural size.

May '33, November '33 ; *Nitre Cave*, April '30 ; *Kitulgala*, April '27 ; Ratnapura, September '12*, *Rakwana*, May '29 ; *Dolosbage*, August '39 (cardamoms)*.

The four records in the Peradeniya collection are marked with an asterisk (*) ; for the remaining locality records we are much indebted to the Director, Colombo Museum, who has kindly supplied the information from the specimens in the Museum collection, with notes on the host plant where available. It will be seen that the insect now to be known as the cardamom weevil was recorded nearly 40 years ago from the Galagedera district where it was said to damage cardamoms, but there is no evidence that it was a pest at that time. Apart from the recent outbreak in the Dolosbage district, the only other record from cardamoms is from the Urugala district in April, 1924. Estates which are known to grow cardamoms are being circularised with a request for any available information on this weevil, and field officers of the Department are being requested to be on the look out for it in village areas of cardamoms and related crops. Inquiries are also being made in India and at the Imperial Institute of Entomology, London.

Food plants.—The locality records are nearly all from districts in which cardamoms are grown and it is probable that this crop is normally used by the weevil as a food and breeding plant. Further investigations may indicate that the related wild and cultivated species of ginger, turmeric, plantain, &c., are possible alternate food plants, if not actually breeding plants.

Suggested control measures.—The withering and death of the growing shoot is usually an indication of attack by this weevil or by the caterpillar borer. All attacked plants including the rhizomes, where necessary, should be removed and burnt or otherwise effectively destroyed, so as to prevent the further development of the immature stages of the pest and kill any weevils sheltering inside the plants prior to emergence. In badly attacked patches whole clumps may have to be treated in this way, care being taken to remove from the soil all pieces of rhizomes and roots. While clearing up any heavily infested patches, small heaps of this refuse material can be used as traps to attract the weevils which should be collected and destroyed wherever found. For replanting, only sound rhizomes from a non-infested area should be used.