TWIG AND LOOPER CATERPILLAR OUTBREAKS

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Two species of Geometrid Caterpillars (Lepidoptera ; Geometridae) commonly known as the Twig Caterpillar (*Ectropis bhurmitra* Warr.) and the Looper Caterpillar (*Buzura strigaria* Moore=*Biston suppressaria* Green) have appeared on a number of estates in the Kandy, Kelani Valley, Kotmale-Dolosbage, and Uva districts and in a few estates in the Low Country where dieldrin spraying has been done during the past three years for Shot-hole Borer control.

As these two pests are potentially more dangerous than the Tea Tortrix, the Institute is greatly concerned about their appearance and wishes to be informed as soon as the caterpillars are noticed. It will be best to send specimens, in strong cardboard boxes, for proper identification. Descriptions of the moths and the caterpillars are given below.

The Institute is aware of the seriousness of a generalized outbreak and precautions are being taken to prevent one. The situation is being tackled from a number of directions. A project began in October 1965 to study the biology of the two pests. Secondly, insecticidal experiments were started to find the most suitable insecticide to control these caterpillars. Thirdly, officers from the Institute have been visiting estates where the two pests have appeared, to give advice and to experiment on control measures. Fourthly, attention is being paid to the question of alternatives to dieldrin spraying for Shot-hole Borer control with particular reference to side-effects. The Institute has revised its recommendations for Shot-hole Borer control (see preceding article) so as to greatly restrict the acreage sprayed with dieldrin. The new recommendations should result in the prevention of the further spread of these caterpillars.

The Twig Caterpillar (*Ectropis bhurmitra* Warr.)

The Twig Caterpillar is not new to Ceylon. The moth was first recorded in 1884 (Moore 1884-7) from an unknown host plant. It appeared as a minor pest on tea in 1900 on an estate in the Kandy district (see Green 1900) and since then it has occasionally been recorded on tea but it was not considered a pest. In 1935 the Twig Caterpillar is reported to have caused some damage to tea in South Travancore (Rau 1936). It was, however, known to be a pest on forest trees (Beeson 1941) and was reported to feed on *Aleurites montana*, *Artemisia vulgaris* (Mugwort), *Bombax malabaricum*, *Lantana aculeata*, *Phoebe lanceolata*, *Shorea robusta* (Sal) and *Tectona grandis* (Teak). Of the shade trees on tea estates, in Ceylon they attack full-grown *Acacia*, *Albizia*, *Gliricidia* and *Grevillea* trees and show particular preference for *Grevillea* where the infestations are known to originate.

The Twig Caterpillar Moth

The moth (Figure 1) is very pale brown in colour, speckled and spotted with darker markings which form indistinct wavy lines across the wings. They are smaller than the Looper Caterpillar Moth, and have a wing expanse of $1\frac{1}{2}$ to 2 inches.

The habits of the moths of both the Twig and Looper Caterpillars are similar. They are generally sluggish and rest during the day, flattened against tree trunks or rocks with wings expanded. The colour harmonizes with the background so

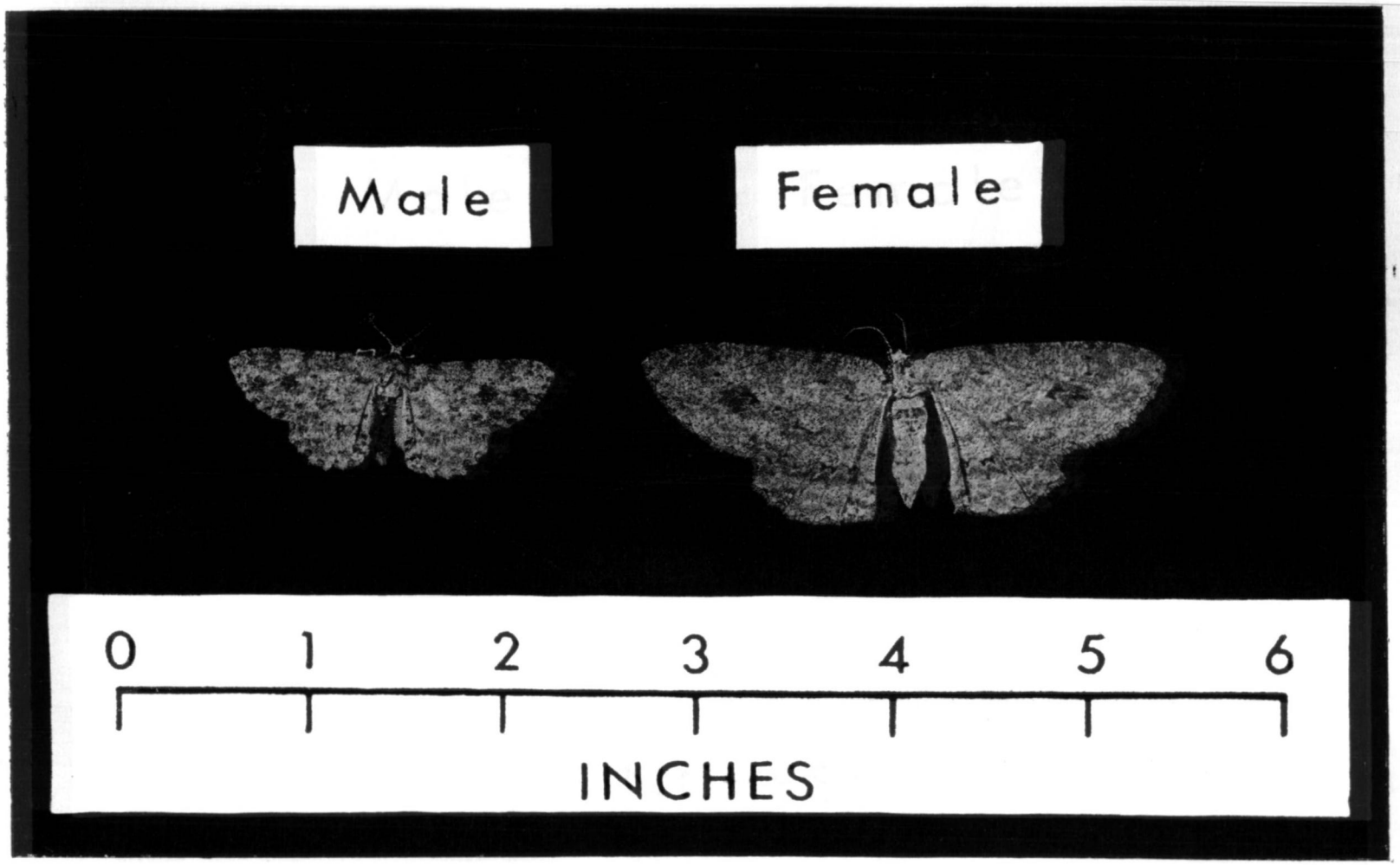

FIGURE 1—*The moths of the Twig Caterpillar*

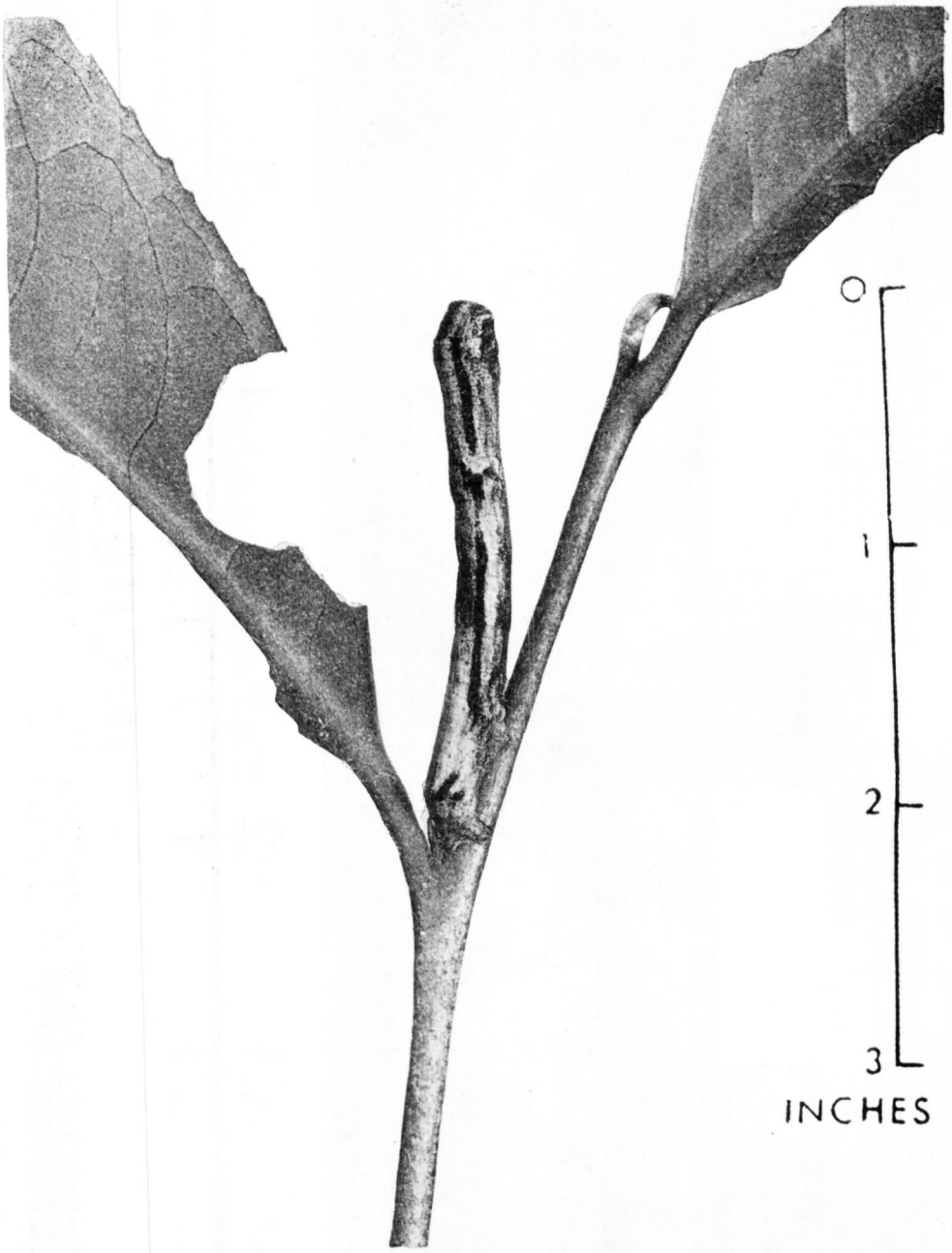

FIGURE 2— *The mature larva of the Twig Caterpillar in its typical posture*

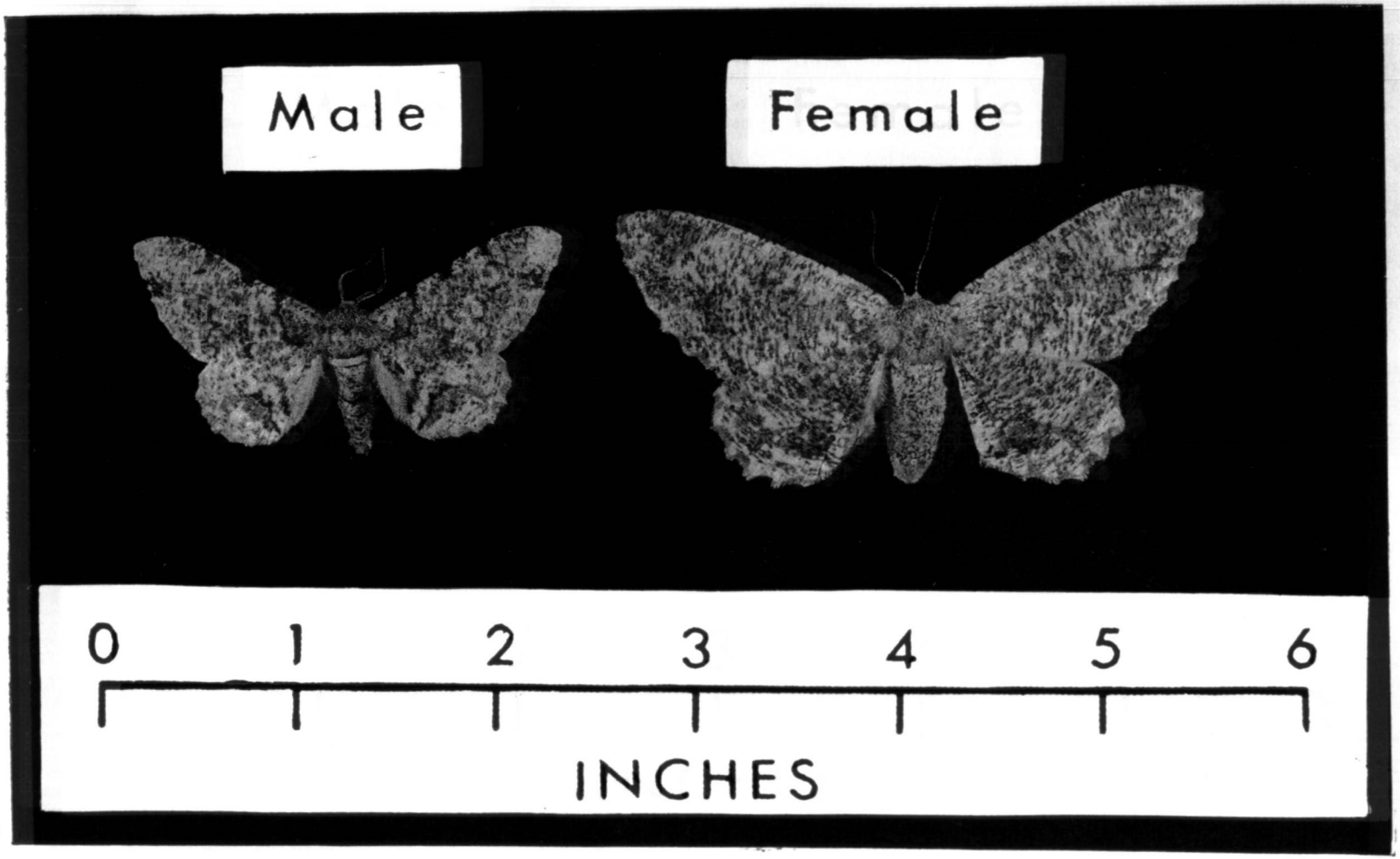

FIGURE 3—*The moths of the Looper Caterpillar*

FIGURE 4—*The mature Looper Caterpillar feeding on tea leaves*

that the moths are well camouflaged. The males usually die soon after mating and the females after depositing the last batch of eggs. Pairing takes place usually on the day of emergence from the pupae and egg-laying commences on the second or third day after copulation and is continued for three to five days. Eggs are laid in batches of one to several hundred in crevices in the bark of shade trees and then covered with buff coloured fluff. Eggs are small, round or oval and bluish-green in colour measuring $\frac{1}{2}$ to $\frac{3}{4}$ mm in diameter. Before hatching, the eggs become dark-grey or black. The first stage larvae of both species measures 1.5 to 2 mm in length. Soon after hatching the primary larvae suspend themselves by silken threads and expose themselves to be dispersed by wind.

The Twig Caterpillar Larva

The first stage (instar) larva of the Twig Caterpillar is blackish in colour with a row of white triangular markings on each side of the body. After the first moult, the larvae become brownish in colour and during the succeeding moults their protective resemblance to tea stalks becomes very striking. The full-grown caterpillar (Figure 2) measures between $1\frac{1}{2}$ to 2 inches in length and has a ground colour of brown with markings of various shades of black and grey on the surface of the body. Two ear-like knobs are situated on the first thoracic segment and at about one third the length of body from its head appear two yellowish lateral patches.

The Looper Caterpillar (*Buzura strigaria* Moore)

The Looper Caterpillar had until January 1965 not been recorded on tea in Ceylon. Moore (1884-7) reported it to feed on *Cassia auricuata* but, as far as we are aware, this *species* has not been used as a source of green manure or as a shade tree in tea estates. In India the Looper Caterpillar is considered to be a serious pest of tea and is said to be responsible for considerable losses of crop, particularly in Upper Assam, North Bank and Eastern Dooars. Since 1944, it has persisted in a more or less severe form in many estates in these districts (Das 1965). Beeson (1941) recorded the Looper Caterpillar on *Acacia modesta, A. catechu, Aleurites montana, Bauhinia variegata, Cassia auriculata, Cassia diffusa, Dodonaea viscosa,* and *Lagerstroemia indica.* Other hosts are *Dalbergia assamica, Derris robusta, Albizia chinensis, A. odoratissima, Cajanus indicus,* and *Priotropis cytisoides* of which *D. assamica* is a primary host (Das 1965).

The Looper Caterpillar Moth

The moths (Figure 3) are generally greyish white and finely speckled with black, with a wing expanse of $2\frac{1}{2}$ to 3 inches. The larger specimens are generally the females which can be distinguished by the antennae which are filamentous, but which are feathery in the males. The head is pale brownish yellow and the thorax and the abdomen have orange-yellow stripes. Both fore and hind wings bear three indeterminate wavy, yellowish, darkish bands and a marginal series of yellow spots. There is considerable variation between individuals so that there may be darker and lighter forms.

The Looper Caterpillar Larva

The first stage (instar) larva of the Looper Caterpillar is similar in size to that of the Twig Caterpillar, but differs in colouration. It is dark brown with three greenish white lines along the back and sides. In the succeeding moults the whole caterpillar soon turns light green and as it matures, the colouration tends to become darker. After the fourth stage the caterpillar begins to bear a distinct resemblance to the full grown Looper (Figure 4) which attains the brownish-grey-green colour

of a hardened tea shoot. The colouration of the fully grown caterpillar, however, may vary from the typical form with shades ranging from green to dark brown or dark green. The mature caterpillar has a rough surface with a warty appearance and grows upto about three inches in length.

Nature of the damage

The young caterpillars of both species at first nibble out very small irregular holes along the margins of young leaves causing the leaves to appear as if holes have been punched in them. As the larvae grow in size, small pieces are bitten off at the leaf margins and later the leaves are more or less completely eaten away. The caterpillars of later stages (instars) develop a preference for the older maintenance leaves and in severe attacks, the bushes are completely stripped of foliage. A severe attack, especially in tea recovering from pruning, could result in the death of some tea bushes.

The caterpillars progress by curving the body in a verticle loop (so that the hinder part of the abdomen is brought near the thorax) and then again extending forwards to full length. When at rest, the caterpillar holds onto a twig with its claspers and the body is held out stiffly at an angle. The damage is mainly done during the night and early morning and during the day, the caterpillars rest on the twigs and branches of the tea bush in the manner described so that they are not seen when bushes are examined superficially. **This fact should be borne in mind when control measures are taken with chemical sprays : the spray should reach not only the foliage but the twigs beneath as well.**

Control Measures

The present recommendation for the chemical control of Twig and Looper Caterpillars is to spray DDT emulsion at the rate of 6 pints in 60 gallons of water per acre using knapsack sprayers or in 15 gallons of water per acre using mist-blowers. All stages of the Twig Caterpillar are susceptible to DDT, but in the case of the Looper Caterpillar, the mature larvae are not much affected by it. It is, therefore, advantageous to carry out the spraying during the early stages of the attack and the best time for the DDT application is when the majority of the caterpillars are in the second and third stages (less than one inch long). The bushes should be thoroughly drenched from above and also from the sides to ensure proper coverage. Two applications at an interval of a week may be necessary to achieve satisfactory control. Spraying should be done immediately after a plucking round and the next plucking should be after a safety period of **seven** days. *The tea made from sprayed areas must be bulked with ten times as much tea made from unsprayed areas.* If such bulking is not possible, allow a safety period of **fourteen** days, either by discarding one plucking round or by resting the tea. If Red Spider Mite attacks are anticipated after DDT spraying, the incorporation of ½ pint Kelthane MF or 1 pint of Tedion V-18 will prevent these. If the attack is only a minor one, it may be more economical to collect the caterpillars by hand.

So far, our experiments have indicated that DDT is the most promising insecticide to control these caterpillars. A full account of the insecticidal experiments now in progress will be published in due course. **For the present, the Institute does not recommend the use of any insecticide other than DDT for the control of these pests.**

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