A NOTE ON THE HABITS OF MATURE CODLING MOTH LARVAE

Observations made in an apple orchard throughout the day and night have shown that, in the majority of cases, codling moth larvae, seeking places to spin up, leave the fruit only during the hours of darkness. This habit must greatly diminish the possible effectiveness of diurnal parasites and predators.

It was noted also that a high proportion of first and a low proportion of second brood mature larvae left the fruit before it fell to the ground.

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THE MIGRATION OF CODLING MOTH LARVAE FROM ONE APPLE TO ANOTHER

The writer has suspected for some time that codling moth larvae will sometimes leave one apple to enter another. Lately it has been clearly proved that this happens much more frequently than was at first supposed and involves larvae in all stages of growth. Beyond the well known case of apples which are touching one another the writer is not aware that this migration has been reported by other observers. Its importance lies mainly in the fact that partly grown larvae are not likely to be poisoned on entering a fresh fruit no matter how much spray may be on the latter, thus two or more fruits may be ruined by a single larva. Moreover, since the migration almost always takes place under cover of darkness, there is less danger to the exposed larva from predators.

The first detailed observation was made in 1935 when, on a dull misty day, a nearly full grown larva was noted on a branch and its movements followed. It entered a hitherto uninfested apple and fed there for six days before coming out to pupate. In that time it penetrated the apple to the core and did extensive feeding. During the last two years the writer has been examining fruit on trees at regular intervals and marking new entries as observed. In this time no larvae have been seen migrating but the evidences of its having taken place were unmistakable. Migration began quite early in the season and was usually first noted where infested apples failed to develop (as in the case of 'June drops'). Larvae left such fruits before they fell and moved to fresh fruits, often several feet away. Cases have been noted where the larvae came out only to re-enter the same fruit, perhaps because the first tunnel became filled with sap.

It would be interesting to know to what extent this migration has been observed by other workers or whether it is a new annoying habit which the codling moth is developing.

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ADDITIONAL FULGORIDAE TAKEN IN ALBERTA

Prior to 1937, when a list (Can. Ent., LXIX, 94-95) of twelve species of Fulgoridae which had been taken in Alberta was published, two species only had been recorded from this province.

Somewhat extensive sweeping of low growing vegetation in recent years has produced nine additional named species. This brings the total for the province to twenty-one named species. In addition to these Dr. Metcalf, to whom part of the collection has been submitted, finds that at least one new species is represented.

The following are the new records, all of which have been determined by Dr. Metcalf unless otherwise stated.

Scolops grossus Uhl. Medicine Hat, VIII. Common on sweet clover by roadsides.

Olarius fransiscanus Stal. Edmonton, VI-VII. Nymphs and adults fairly common on *Artemisia* (sage) growing on cutbanks by rivers. None could be found on sage growing on the level prairie.

Apache degeeri Kby. Edmonton, VIII. A single specimen of this remarkable species was taken by Mr. W. R. Mason on a road.

Stenocranus arundineus Met. Tilley, Medicine Hat, VI-VIII. A single male of what I take to be this species was included in a collection of Chermidae which had been swept by Dr. R. W. Salt from alfalfa, and a female which probably belongs here was taken from *Grindelia* (Gumweed).

Pissonotus basalis V. D. Lethbridge, VIII. Nymphs and adults common on *Grindelia squarosa*.

Pissonotus aphidoides V. D. Donnelly, VII. Two adults on *Castilleja coccinea* (Indian paintbrush).

Phyllodinus nervatus V. D. Edmonton, Wabamun, VI-VII. Several specimens swept from grass growing under willows.

Delphacodes kilmani V. D. Edmonton, Wabamun, Dapp, High Prairie, VI-VII. This species is common on *Equisetum* spp. (Horsetail) which is growing in the shade of trees.

Achorotile albosignata Dahl. Beaverlodge. This species, which was taken without further data, was recorded in 1937 as *Criomorphus* (?). Dr. E. D. Ball has subsequently given us the correct determination.

The only other changes which should be made in the former list are that Dr. Metcalf places *pellucida* and *campestris* in the genus *Delphacodes* in preference to *Liburnia* and that he has confirmed the determinations which I then credited to myself.

By far the commonest Fulgorid in Alberta appears to be *Delphacodes pellucida* Fab. The species can be swept, almost universally, from the extreme south to the Peace River District, from vegetation growing in low, damp places. Nymphs are frequently abundant in the spring on *Potentilla*, slough grass, and reeds.

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