

The Canadian Entomologist.

VOL. XLVIII. LONDON, DECEMBER, 1916

No. 12

POPULAR AND PRACTICAL ENTOMOLOGY.

THE PLUM CURCULIO IN ONTARIO, NATURE AND EXTENT OF THE INJURIES, CONDITIONS FAVORING THE INSECT, AND MEANS OF CONTROL.

PART I—NATURE OF THE INJURIES.

BY L. CAESAR, GUELPH.

The Plum Curculio is found practically all over the fruit-growing portions of Ontario, and is one of our most destructive and, under some circumstances, difficult insects to control. The name "Plum Curculio" is misleading because the insect attacks not only plums but apples, pears, cherries, peaches, apricots, quinces and, on rare occasions, gooseberries. In our experience apricots are worst attacked, then plums and sweet cherries; after these sour cherries, apples, pears, peaches and quinces in the order named. We have only in one locality seen gooseberries attacked.

Kinds of Injuries.—There are several kinds of injuries: First, there is the injury due to egg laying and the accompanying crescent-shaped scar made by the female almost immediately after the act. There may be anywhere from one to a dozen or more eggs, each with its crescent, to a single fruit. If such fruit does not drop prematurely, it is usually either disfigured by the enlargement of the crescent into a brown scar or calloused area, which by its nearly semi-circular shape still shows its origin, or is deformed by a depression caused by the growth being checked at the point of oviposition but being continued all around it. There may be several of these depressed areas, some of them quite deep, on a single fruit. This type of deformity is very common on apples and pears but much more rare on other fruits. Some of the apples and pears are so much misshapen that they are totally unfit for market. Such fruit is often spoken of as being "knobby." The pear has the habit of producing stone cells at the injured places.

These spots become so hard and gritty that they are likely to break one's teeth if an attempt is made to bite through them.

The second injury is caused by the early feeding habits of the first generation of beetles, that is the over-wintered beetles. Both males and females during the egg-laying season feed upon the fruit, eating out little holes of about 1-24th of an inch or a little more in diameter. In our observations these feeding punctures were not nearly so numerous as the crescent-shaped cuts, but several investigators have found them quite as numerous. These punctures, too, seem to lead to the same kind of deformities in apples and pears as we have described above.

The third injury is the dropping of most of the infested fruit. If the larva, or grub, that hatches from the egg lives, practically all kinds of fruit except cherries drop prematurely. Fortunately not only does a very large percentage of the eggs fail to hatch, but also a great many of the larvæ themselves die in the fruit soon after hatching, so that these two things lessen the total amount of dropping. Premature falling of fruit extends over a period of more than a month, but most of it takes place before the apples are more than about one inch in diameter. On some trees sprayed for Codling Moth we found over 90% of all the early drops were due to the Curculio. When the fallen fruit was cut through, it was seen that the grubs by the time they were mature had eaten large areas inside, as large and as unsightly in many cases as those caused by the Codling Moth larvæ. The infested cherries, which, as has been said, remain on the trees, usually become sunken and darkened on one side, thereby clearly revealing the work of the insect. Cherries containing the Cherry Fruit-fly larvæ do not always have some outward manifestation of the presence of an insect.

A fourth injury is caused by the late summer and autumn feeding of the new generation of beetles. This injury is common on apples and peaches, but rare on other fruits. On the apple the beetle eats a small, round hole through the skin, and then inserts its long proboscis and excavates the flesh as far as it can reach. The result is a small, circular, brown area on the surface with a hole in the centre and a cavity beneath. Sometimes the beetles work

their way through the skin and enlarge the cavity until it is nearly quarter of an inch in depth and about the same in breadth. Not infrequently, if this hole is on the sunny side of the apple, its borders for some distance out will be reddened by the sun and thus the injury rendered very conspicuous. Many fruit-growers mistake such injuries for the side work of the Codling Moth, but the distinction between the two is easy to make, because the Codling Moth goes right into the core, while this injury is seldom more than quarter of an inch deep. There are often many of these injuries in a single fruit; for instance, I have counted as many as forty on one apple. In such cases several injuries usually coalesce and make a much disfigured fruit. In the writer's experience, rough-skinned varieties seem to be more subject to attack than very smooth or glossy ones, possibly because the former afford a firmer foothold for the beetles when feeding.

Peaches are also sometimes quite severely marred by this fall feeding. A peach that lies on my desk as I write has eighty curculioscars on it, all made by the new generation of beetles during August and September. From half of these, including all the larger and deeper ones, gum is exuding. The appearance of the injuries on the peach and apple differs in that on the peach the beetles usually remove all of the skin above the cavity which they excavate; the injured area, too, is often quite irregular in outline, and seldom goes so deep as in the apple. In the apples the skin, as we have stated, usually covers the excavation except for the small hole in the centre where the beak is inserted, and the injured area is usually uniformly circular in outline.

A fifth injury is brought about by the wounds made by the beetles, both in the earlier and later parts of the season, in plums, cherries and peaches affording exposed areas for the introduction of the spores of the Brown Rot disease. The skin of fruits ordinarily serves to a very great extent as a protection against the introduction of disease, but, if the skin be ruptured, the spores, which are carried by the wind everywhere through the orchard, have a good chance to light on the moist surface and germinate before a callous can be formed by the fruit over the wound to protect it.

EXPLANATION OF PLATE XI.

- Fig. 1. a. a. a. Small lumps of earth showing the pupæ in their little oval chambers; b. a dark circular area in the lump showing the empty chamber after the pupa has been removed; c. an adult beetle after transforming and still in the pupal chamber; d. d. d. d. adult beetles—all natural size.
- Fig. 2.—Apple showing the crescent-shaped cuts made by the females after laying eggs—natural size.
- Fig. 3.—Full grown larvæ and their work in a fallen apple—natural size.
- Fig. 4.—Fall or late summer injuries on apple made by the feeding of the new generation of beetles. These injuries though natural size are larger than the average.
- Fig. 5.—Fall or late summer injuries made on peach by the feeding of the new generation of beetles—natural size.
(To be continued.)

NEW INDIAN GALL MIDGES.

BY E. P. FELT, ALBANY, N. Y.

Below are characterized some exceptionally interesting new species and genera occurring in a small collection recently submitted for study by Prof. T. Bainbrigge Fletcher, Imperial Entomologist, Agricultural Research Institute, Pusa, Bihar, India.

***Colpodia fletcheri*, n. sp.**

The midge described below is provisionally referred to this genus because the sum total of the characters would suggest this group rather than another, though the cross-vein is almost parallel with costa, and there is an approach to a condition found in the genus *Didactylomyia* Felt. The specimen was labeled "Pusa, Bihar, India, U. Bahadur, January 1, 1916." It is easily distinguished by the peculiar, foliate, curved production of the terminal clasp segment and the tri-lobed, foliate apex of the harpes.

Male.—Length 1.25 mm. Antennæ one-half longer than the
December, 1916