

LIFE HISTORY NOTES ON APION NIGRUM.

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The genus *Apion*, family *Curculionidae*, contains several serious pests among which are two or three that do considerable damage to the clover plant. Two members of the genus *A. nigrum* and *A. rostrum* belong to the fauna of the black locust (*Robinia pseudacacia*). Our knowledge of the habits and life history of these two species is incomplete. It has long been known that the adults of *A. nigrum* feed upon the black locust, eating holes in the leaves and it has been supposed that the larvae, as the larvae of nearly related species, "develop within the seeds of this tree" (*Insect Life*, 5:338). However, the seeds of the black locust are but little larger than the adult curculio so that this could hardly be true, and some observations made during the past summer disprove this supposition.

While engaged as Assistant Nursery and Orchard Inspector the writer visited Marietta on May 22, 1904, and found many adults of *A. nigrum* working upon the unopened flower buds of the black locust trees west of that town. On closer observation it was noted that the females were puncturing the buds and ovipositing in the holes thus made. On a second visit to this locality, on May 26, the insects were as numerous as before and it was noted that many of the buds had ceased to develop and were falling to the ground where they remained fresh for some time. Many of the fallen buds had the pedicle still attached, but a larger part did not. An examination showed that nearly all of the prematurely falling buds had been punctured in one or more places, and upon opening them, all stages of the insect were found, i. e., eggs, larvae, pupae and adults. Usually only one stage of the insect was found in a single bud and normally but one develops in a given bud yet there may be two or more. From some of these buds the adults had emerged by eating a round hole, generally through the base of the bud but some ate their way out at about two-thirds of the distance to the tip.

One raceme upon which twelve adults were observed feeding and ovipositing, was found to contain thirty buds, twenty-five of which had been punctured in sixty-three separate places. The highest number of punctures in any one bud was seven. From thirty of these wounds a viscid, gummy substance was exuding. About fifty of these buds were collected from the ground and placed in a glass jar, on May 26th, and on June 5th, twenty adult curculios, one pupa and four larvae were taken out, and on June 11th, seven more adults were removed.

Specimens reared in this jar were identified as *A. nigrum* by Mr. E. A. Schwarz, of the Bureau of Entomology, Washington, D. C.

The trees were again visited on September 18th and although they had been full of bloom in May, diligent searching failed to reveal a single seed pod that had matured, so thorough had been the work of the insects.

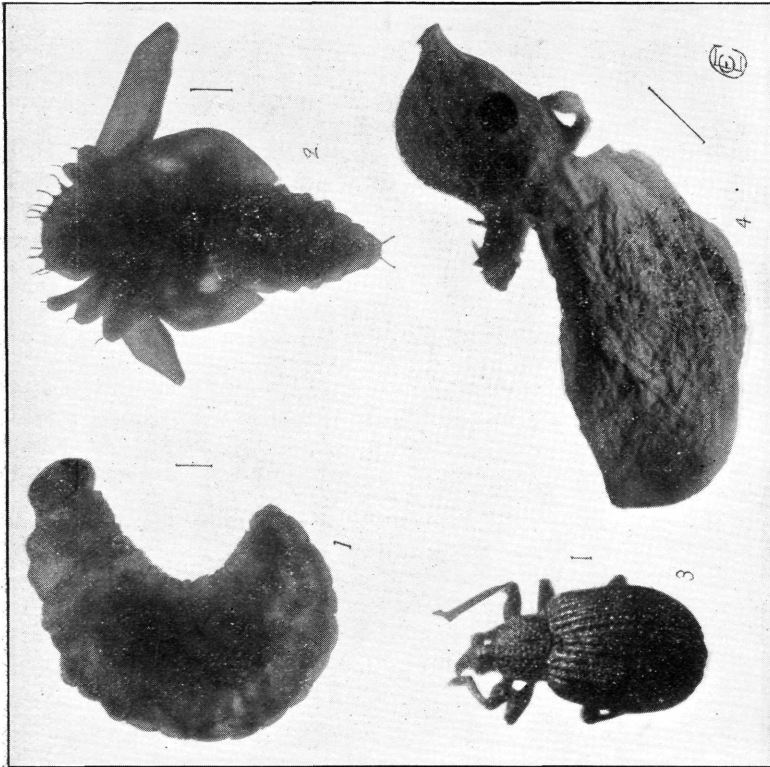


Fig. 1. Larva, full-grown.
 Fig. 2. Pupa, ventral view.
 Fig. 3. Adult.
 Fig. 4. Unopened bud showing opening through which adult emerged.

At McArthur, Vinton County, the curculio while not as plentiful as at Marietta was found on nearly every black locust tree, generally but one or two in a place, however. On June 2d a female was observed busily engaged drilling a hole in the gall-like, rolled up edge of a locust leaf, probably produced by the

yellow locust midge (*Cecidomyia robiniae*), and after a little waiting the writer was rewarded by witnessing the oviposition of an egg in the hole thus made. This leaf was collected and preserved but the egg failed to hatch.

Mr. O. H. Sweezy* reports having found the nearly full grown larva of this beetle in similarly rolled up leaves of the black locust at East Cleveland, and further says "they were in a sort of a cocoon." which was not the case with those developing in the locust buds at Marietta. He collected a few leaves containing the larvae and "on July 6, two adult beetles appeared." It is hardly probable that this is a second brood of this insect, because the seasonal differences between the southern and northern portions of the state should account for about one-half of the month's time between the appearance of the adults at Marietta and East Cleveland. The other two weeks may easily be accounted for in the straggling of the brood, which is often noticed even in insects that appear distinctly in broods. It will require at least another season's observations to make sure of this point.

This curculio occupies a position between those, the larva of which, feed wholly upon the leaves, and those which develop in the seeds. This adaptation to a bud feeding larva is peculiar in that it shows a very remarkable acceleration in the larval development, and one that is somewhat unusual. The entire development, from egg to adult, must be accomplished within three weeks and possibly in a shorter time. This may mean a corresponding long life period for the adult insects as they may be found at any time from early in May until the middle of September, and must pass the winter in this stage.

In the same buds were also found a large number, of sometimes as high as forty or fifty, small yellow larvae, probably dipterous, which did not develop to adults and which are still undetermined.

Description of larva: The larva is a small white footless grub, about one-fifth inch in length as it lies in a curved position in the bud; head about one-third of the diameter of the body, brownish in color with a few scattered spines or hairs; body thick, tapering abruptly to a blunt point at the posterior end; a few scattered hairs on the three thoracic segments.

Pupa. White or yellowish-white, one-fourth inch long, slenderer than larva; head slightly darker in color than body, and with ten spines on top and front; snout folded along under side of body; two pairs of spines on dorsal side of the third thoracic segment, and two spines on posterior end of abdomen, also one at the end of the femur of each leg.

NOTE—This work was undertaken as part of a thesis for graduation in the College of Agriculture, on the "Insects of the black locust," and is under the direction of Prof. Herbert Osborn.

* Unpublished notes made during summer of 1904.