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**A BIG-EYED BUG PREDATOR OF THE POTATO PSYLLID<sup>1</sup>**

GEORGE F. KNOWLTON<sup>2</sup>

The big-eyed bug, *Geocoris decoratus* Uhler, is generally distributed throughout Utah and commonly occurs upon potatoes in all parts of this state. This bug had previously been found to be an important enemy of the beet leafhopper<sup>3</sup> and in addition had been observed feeding upon small flies and nymphal false chinch bugs as well as upon several other kinds of small insects.

Four adult *G. decoratus* were placed in an 8-dram shell vial with 15 adult *Paratrioza cockerelli* (Sulc). Within a few minutes a male *Geocoris* had inserted its stylets into a psyllid, upon which it fed for 12 minutes. During most of the feeding process, the predator dangled the victim from the end of its rostrum, which was held outstretched in front. At the end of 12 minutes, a second *Geocoris* approached and started feeding upon the same psyllid. The first predator released its mouthparts and walked off; the second fed upon the psyllid for 15 minutes. Within an hour all four *Geocoris* fed upon adult potato psyllids.

Three adult *Geocoris* were placed in a 2-dram vial with several adult potato psyllids. One *Geocoris* thrust its stylets into the thorax of a psyllid and began feeding. One minute later the still active psyllid gave a vigorous jump, which carried it for about half an inch, moving the predator to a new position

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<sup>1</sup> Contribution from the Department of Entomology, Utah Agricultural Experiment Station.

<sup>2</sup> Associate Entomologist.

<sup>3</sup> "The Beet Leafhopper in Northern Utah". By G. F. Knowlton. Utah Agr. Exp. Sta. Bul. 234 (Tech.): 43-45. 1932.

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and turned about  $50^{\circ}$  from its original position. After 4 minutes of feeding, the only movements shown by the psyllid were slight movements of the antennae and head, which were discernible under the microscope. The *Geocoris* held the psyllid at the end of its horizontally outstretched beak most of the time for 30

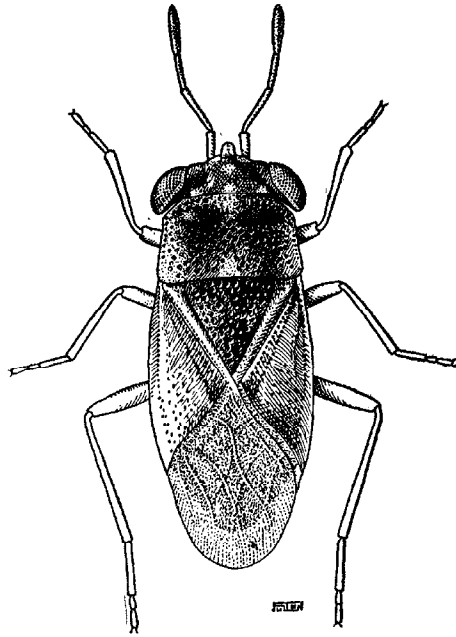


Fig. 1.—Adult *Geocoris decoratus* Uhler.

minutes; then using its pro-thoracic tarsi, it withdrew its stylets, inserting them again in the same puncture and feeding for another 6 minutes. The stylets were then withdrawn and inserted through the suture between the head and pro-thorax. At this stage a second *Geocoris* attempted to feed upon this psyllid; after a brief struggle, the trespasser left. After 45 minutes of feeding a second *Geocoris* began feeding upon the dead psyllid; a struggle again ensued, in which the original possessor backed up for about 1 inch. After the second aggressor was repulsed, the stylets of the first predator were re-inserted through the wings and into the abdomen. After feeding in this position for 6 minutes, the abdomen became much shriveled. After 57 minutes of feeding, a third attempt to feed upon this dead psyllid was made; this new *Geocoris* fed in the head of the psyllid for 3 minutes and then walked off. The original possessor then removed its stylets and inserted them more dorsally, again in the suture between the head and pro-thorax. After feeding

for 1 hour and 10 minutes, the shriveled body of the potato psyllid was dropped, and the big-eyed bug walked away.

A number of feeding *Geocoris* were watched carefully under the binocular microscope. Some used only their rostrum in securing and holding their prey, except when the stylets were to be withdrawn or re-inserted. At such times the predator usually manipulated its prey with the pro- and meso-thoracic tarsi. Most of the predators withdrew the stylets every little while, re-inserting them in the same or in a different place. Most insertions were made at sutures of the thorax, abdomen, legs, or around the margin of the compound eyes. It was quite a common practice for a *Geocoris* to drop its own prey and attempt to feed upon a victim held by another predator. If repulsed, the big-eyed bug would often return to its last victim and resume feeding or wander away, often securing a new victim. Sometimes a part of the rostrum was folded down and back, bringing the psyllid near to the head of the predator, the stylets apparently being inserted deeply into the adult psyllid.

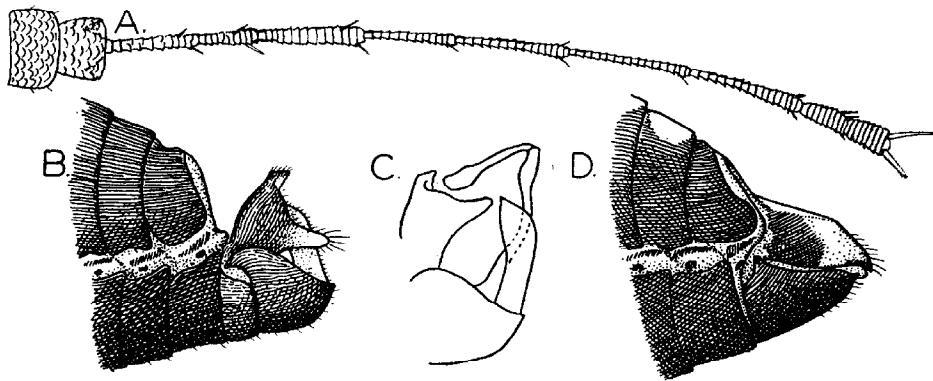


Fig. 2—Adult *Paratrionia cockerelli* (Sulc): A—antennae; B—external genitalia of male; C—male genitalia extended; D—external female genitalia.

Ten *Geocoris* were placed in a vial with 20 *P. cockerelli* adults; in 5 minutes, four *Geocoris* were feeding; in 15 minutes, six were feeding upon psyllids. A pair of *Geocoris* copulated while the female fed upon a psyllid.

Four Big-eyed bugs were then caged with nymphs of *P. cockerelli*. Four *Geocoris* were placed in a vial containing a piece of potato leaf and stem, upon which potato psyllid nymphs were feeding. Several of the big-eyed bugs began feeding on the petiole of the potato leaf. After 15 minutes one *Geocoris*, which had not fed upon the plant, started feeding upon a fifth instar psyllid nymph, feeding for 16 minutes. It then discarded

this nymph and fed upon a third instar nymph for 13 minutes. A second instar nymph was next selected by the same predator; upon this it fed for 3 minutes. The predator then seized a fifth instar nymph and fed upon it for 14 minutes. Another fifth instar psyllid was attacked and fed upon for 9 minutes. This *Geocoris* fed upon and killed five *P. cockerelli* nymphs in 1 hour and 15 minutes. During this time, only one of the other three *Geocoris*, which had fed upon the potato plant, killed a psyllid; this one fed on a third instar nymph.

Six *Geocoris* were caged in vials with 100 *P. cockerelli* nymphs on potato leaves. Within 2 minutes, four *Geocoris* had begun to feed on four psyllid nymphs. At the end of the first hour, all *Geocoris* had fed upon nymphs, killing a total of 13 *P. cockerelli*. At the end of 2 hours, 22 nymphs had been killed. One *Geocoris* fed for 54 minutes upon a fifth instar nymph, feeding during the entire interval through the original puncture. Under the binocular, the flexible stylets of the predators were seen to search out the various regions of the body, being seen under magnification through the rather transparent body wall. The ability of the bug to actively move these stylets (or piercing lancets) around, quickly thrust them out, draw them back, and even flex them near the end, was of surprising interest to the writer.

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#### NOTES ON *NEZARA VIRIDULA* (L)

Prolific breeding of the southern green stink bug usually ceases in Florida in early fall. There is usually a large brood of nymphs in September, but the adults of this brood commonly do not produce many nymphs until the following spring. But this year there were numerous nymphs all through October and most of November. This production of an extra generation is correlated with unusually warm (and dry) weather during October and November. October averaged at Gainesville more than a degree above normal and November more than three degrees.

There was also a sharp rise in the percentage of parasitization of this bug by the Tachinid *Trichopoda pennipes*. Mr. H. E. Bratley at Gainesville found from 85 to 93% parasitized and Mr. W. L. Thompson at Lake Alfred in late October from 50 to 60% where in August but half of one percent were parasitized.

J. R. WATSON.