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NOTES ON *NEOTERMES CASTANEUS* BURM.

W. L. THOMPSON[1]

Neotermes castaneus Burm. is one of a few different species of termites that work in live wood, or, rather in growing trees. It is known as a dry wood termite, differing from the subterranean termites in that it is larger and does not require so much moisture or direct connection with the ground.

The writer has observed this termite only in Polk County, Florida, but Dr. T. E. Snyder[2] has collected it in different localities in Dade County and he states that dead winged adults were found in Mediterranean fruit fly traps in Osceola, Orange, and Seminole counties.

The host plants observed are citrus trees—including grapefruit, orange, tangerine and lime—the live-oak and mangrove[2] trees. There are probably many other hosts not listed, as experiments conducted in the laboratory for the past twelve months show that these termites are thriving on various kinds of lumber; such as cypress, oak, white-pine, and pitch pine. Bequeart (*1*) states that guava trees in Brazil are attacked by these insects.

Termites attack limbs, trunk, and roots of trees, and in the majority of the ones examined all three of the sections mentioned were attacked. Galleries nine feet in length have been found in the roots. However, such lengths are exceptional, from three to six feet being the rule. In many cases some of the main roots, as well as the smaller ones (some being only three-sixteenths of an inch in diameter) are reduced to mere shells. The galleries often come to the surface, allowing fungi to get a foot-hold. The tap root on some of the badly infested trees was entirely gone, but whether that was due wholly to the work of termites or partly to fungi was not determined. As a rule there is only one gallery per root, especially in the smaller ones. Often the gallery from the main root into the lateral ones is quite small,

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but farther out it is much enlarged, giving the appearance that the termites first make a passageway and then enlarge it as they work back. This in time kills that root, since there is nothing but a shell left.

Fig. 1.—A wound in a citrus tree through which the Dry Wood Termites entered.

The trunk of the tree is usually attacked rather severely. The main position of the colony appears to be about ground level or in the crown. It is in this section that the galleries are the largest, especially in a heavily infested tree. They vary in size from many small ones to those of three to five inches in diameter. Sometimes there are many small ones around one larger gallery, with only very thin layers of wood between. The galleries may or may not follow the grain of the wood; sometimes they run directly across it.

The limbs, too, may be hollowed out. In citrus trees termites have been found in limbs eight feet from the ground and in live oaks up to eighteen feet. In several cases the limbs of citrus were hollowed out to such an extent that they were only shells, yet bearing a heavy crop of fruit. Normally it takes a very strong wind to break grapefruit limbs even though they are heavily loaded with fruit. After the hurricane of September, 1933, broken limbs were observed on trees infested with termites, while there were very few broken ones on normal trees in the same block. It is interesting to note here that one of the infested

trees was along the edge of the grove, adjacent to uncleared land that was wooded with oak trees. Two termite infested oaks within fifty feet of this tree were blown down during the hurricane.

Many of the termite infested citrus trees have been discovered more or less by chance. Grove workers found the majority of them while they were treating trees that had diseased bark or wood. In treating the affected part of the tree the diseased portion is chiselled away. In cutting away the diseased wood the galleries are sometimes reached. When they come near the surface of a limb, they cause an exudation of gum, giving the appearance of gummosis, a common citrus disease. The bark sometimes splits and after healing makes a kerous scar—Figure 1. Watson (*4*). Since a number of grove workers have become acquainted with indications of termites, more infested trees have been reported. All except three of the infested citrus trees under twelve years of age were stunted, and so were some of those over twenty years. The three that were not stunted had just recently been attacked and the termite colony in each had no more than fifty individuals. Four trees over twenty years old, and within an area of one hundred feet square, appeared to be in as good condition as adjacent ones although the trunk and limbs had been badly hollowed out. The roots were not examined. Younger trees that were heavily infested were in a condition of decline, while others, although stunted and sparse of foliage, had green, healthy leaves.

DESCRIPTION: The winged sexual forms are nine to ten sixteenths of an inch in length (with the wings) and reddish brown in color. The mature workers are about seven sixteenths of an inch long, the color varying from a dirty white to mottled colors of very dark brown to a light reddish brown. The soldiers are about the same length as the workers, except they have large brownish colored heads with black toothed mandibles; the abdomen is dirty white to mottled. The eggs are bean-shaped and white to pale reddish color.

HABITS: Although *Neotermes castaneous* is classed as a dry wood termite, it evidently requires more moisture than those belonging to the family Kalotermes. Light (*3*) states "—it is confined to the desert area (in California) and is found chiefly at or below ground level and thus in damper wood, than Kalotermes." In Florida they go above ground level in live trees, but the larger galleries above and below ground are filled with a dark brown residue, resembling wet clay, thus keeping a con-

stant damp condition near where they are working. A few tests were carried out to determine the length of time termites would live when no appreciable amount of moisture was present. Small pieces of various kinds of wood were placed in glass jars with twenty termites of various sizes in each one. The bottom of each jar was covered with dry sand to enable the termites to crawl around. All the containers were placed in a dark cage. The results showed that the difference in time of death between those that received no food and the ones that had available food and lived the longest was only twenty days.

FEEDING EXPERIMENT WITH MINIMUM AMOUNT OF MOISTURE

Food Material	No. of Living Termites After Time Indicated								Approximate Number of Days Until All Were Dead
	10 Days	13 Days	18 Days	24 Days	31 Days	38 Days	43 Days	52 Days	
No food	18	14	13	5	0	.....	.....	.....	25 to 31
Dry white pine	18	13	13	2	0	.....	.....	.....	25 to 31
Dry citrus roots	16	16	13	6	0	.....	.....	.....	25 to 31
Green citrus roots	20	19	19	9	2	0	.....	.....	38 to 43
Dry cypress	19	16	12	9	6	2	0	.....	43 to 52
Dry pitch pine	16	11	10	6	4	3	2	0	43 to 52
Dry filter paper	.....	.....	.....	.....	4	4	3	0	43 to 52

Termites feeding on filter paper were in a glass tube and were not exposed to the air as much as those in jars.

In another test two pieces of dry cypress, five inches long and half an inch thick, were placed on end in a glass jar. Twenty termites were placed between the pieces of wood and just enough damp sand was used to make a mold around the wood so that when dry sand was poured into the jar the space between the wood would not be filled. The jar was filled about half full of dry sand so that one fourth of the wood was exposed to the air. After seventy-six days the termites were all dead, and a very small amount of wood had been eaten. The insects lived much longer when the wood was entirely covered by sand. Dry citrus roots along with twenty termites were placed in a jar covered with a mold of damp sand, and then covered with dry sand that had been in the laboratory for more than a year. After six months one termite was still alive. The moisture was, no doubt, retained longer in this jar than in those in which part of the

wood was exposed to the air, but nevertheless the termites were able to live quite a long time with a very small amount of moisture. Several pieces of the wood were hollowed out.

Another series of tests is being run in which oak, cypress, pine, and citrus wood, respectively, are covered with damp sand. In another test damp filter paper is used. After twelve months, at the time this paper is being written, each colony appears to be thriving. In a glass cylinder where the termites are feeding on the filter paper sexual forms have developed, eggs were deposited, and young nymphs hatched. Young nymphs were also observed in the jar containing cypress wood. The eggs were noted four months after the experiment was started.

The termites that are feeding on damp filter paper can be studied to a certain extent, since they are in a glass cylinder which is closed at each end with corks and is twelve inches long and over an inch in diameter. When eggs were first observed, they were scattered over one small area and a few were on the side of the cylinder. One of the workers was seen picking up an egg and disappearing with it into a gallery. The following day no eggs were seen. Several days later it was noted that a number of workers were eating away part of one of the cork stoppers. Upon closer examination twenty-two eggs were counted on the cork in the area where they had been working. It occurred to the writer that the termites may prefer for the eggs a drier condition than that which existed in one of the galleries. The filter paper is merely kept damp but the passage ways have the appearance of being almost wet.

Six months after the first nymphs were observed the whole colony was taken out of the tube. Sixty-three nymphs and twenty-seven unhatched eggs were counted. The nymphs were placed in another tube to determine the length of time for sexual forms to develop. The eggs were put in a separate tube to determine whether the very young nymphs could live without being fed. After thirty-seven days the eggs had all hatched but the nymphs soon died. During the ten months the colony was left undisturbed, the number of the original termites had decreased from twenty-five to seventeen. They were not observed daily, but no dead individuals were ever noticed.

Little difference in size between the fertilized queen and the workers was noted. There appeared to be two mature females, and two males. Only one individual had wing stubs.

It was first thought that the termites gained entrance into the tree through the roots, since these were badly hollowed out

on all trees that had been dug out, and in several cases only the trunk and roots were infested. While one citrus tree was being dug out, an oak log about four feet under the ground and just to one side of the tree was uncovered. The log was heavily infested with termites as were the roots and trunk of the citrus tree. At a later date three orange trees, all within an area of one half acre, were found to have a small colony of termites in each. In two of the trees the termites were in a main limb and in the other, the crotch. In one limb the galleries were not more than one foot long and the other, two feet. Where they had entered at the crotch, the galleries were not over six inches long. The infested areas were in limbs three inches in diameter, and about two feet from the ground. In each case the termites had entered through an old wound where a limb had split off. The wood had started to decay to the extent that the outer layer was fairly soft. Figure 1 shows where they entered a tree at the crotch where a limb had split off and the wood had started to decay. During the previous year one heavily infested tree had been found in this grove with many winged adults in the colony.

A small lemon tree two and one half inches in diameter was transplanted to a box in the greenhouse. On the trunk there was an old wound where a sprout had been cut off and the bark had not fully grown over it, thus leaving a small depression. The exposed wood had started to decay, being rather soft on the surface. A pair of winged termites were placed in this depression and confined by wrapping a piece of cloth around the tree. A week after the termites were introduced, they apparently had made no effort to eat into the wood. One had lost its wings. A week later another examination was made. The termites had evidently entered the tree, as the depression was filled with fine wood, like sawdust. Further examinations have not been made to date.

Natural Enemies: Ants, no doubt, are a big factor in hindering these insects from establishing many new colonies. Several experiments have been destroyed because of ants killing the winged adults. In the laboratory if they are not protected the ants will destroy them. The writer has not been fortunate enough to observe the length of time it takes a pair of termites to eat into a tree and conceal themselves, but it is safe to say long enough for ants to find them.

The termites feeding on damp filter paper are covered with very small mites. These mites are on the head, legs, and body of the termites but apparently are doing little harm to their host.

The nymphs are small, colorless individuals that cling to the termites and are hard to remove. Through the courtesy of Dr. T. E. Snyder, the mites were identified as a species of Tyroglyphidae. The species was not determined as only the migratory nymphs were sent. According to Essig (*2*), this family of mites live on cereals, bulbs, and roots of plants. During the most of their lives the mites are free moving, but there is a non-feeding, migrating stage or condition known as hypophus during which they take no food. It is in this stage that these mites attach themselves to other insects for the purpose of being transported to favorable host plants. It has not been determined what these mites live on, but, as stated above, the termite colony is growing in spite of the fact that all of the individuals are literally covered with these mites.

LITERATURE CITED

(1) BEQUEART, J. Entomological News, Vol. 36, December, 1925.

(2) ESSIG, E. O. Insects of Western North America.

(3) LIGHT, S. F. Termites and Termite Damage, Circular 314, California Agricultural Experiment Station.

(4) WATSON, J. R., and BERGER, E. W. Citrus Insects and Their Control, Extension Bulletin 67, Florida Agricultural Experiment Station.

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(*Syntomeida epilais* Walker)

Since the publication of its life history and distribution in THE FLORIDA ENTOMOLOGIST of March 1932, this insect has gradually extended its range northward. In 1933 it was reported as doing considerable damage to oleanders (*Nerium oleander*) at Daytona Beach, Orlando, Groveland and Montverde, Florida.

During the summer of 1934 it made a sudden expansion toward the north, reaching Gainesville in September, where the larvae were noticeably plentiful on the oleander. From Orlando it was reported by Dr. R. L. Miller as feeding on *Carissa grandiflora* and from Montverde by Mr. F. P. Lawrence on *Bougainvillia.*

It seems to be acclimating itself to the cooler weather and the winters of northern Florida. Heretofore it has been regarded as a strictly tropical species.

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A BIG-EYED BUG PREDATOR OF THE POTATO PSYLLID[1]

GEORGE F. KNOWLTON[2]

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[3] 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

[1] Contribution from the Department of Entomology, Utah Agricultural Experiment Station.

[2] Associate Entomologist.

[3] "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° 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

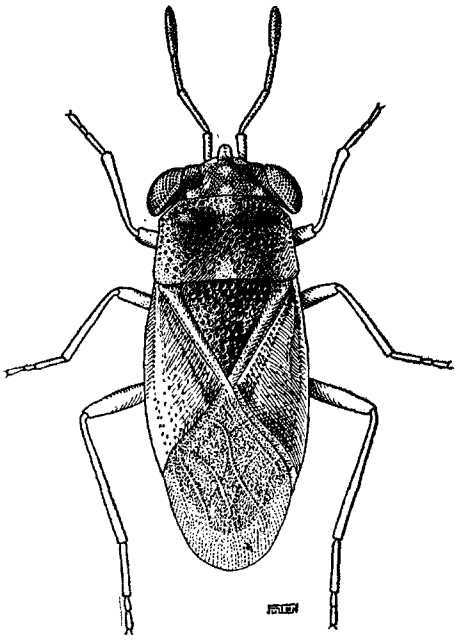

Fig. 1—Adult *Geocoris decoratus* Uhler.

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.

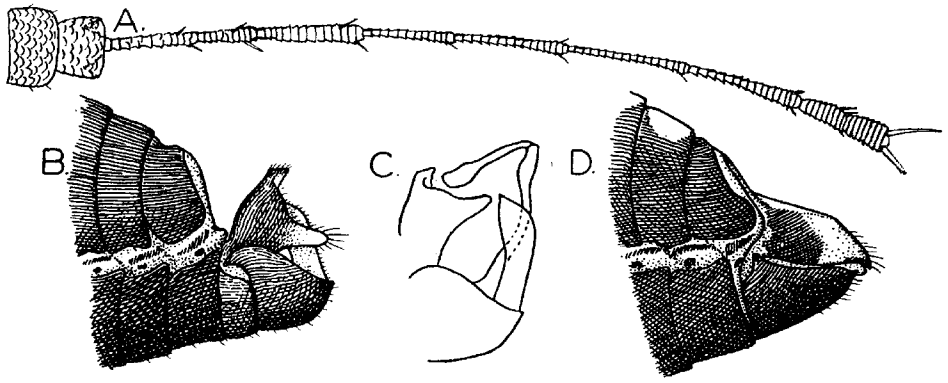

Fig. 2—Adult *Paratrioza cockerelli* (Sulc): A—antennae; B—external genitalia of male; C—male genitalia extended; D—external female genitalia.

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.

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.

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J. R. WATSON.

THYSANOPTERA OF THE GEENTON[1]

J. R. WATSON

For several years the writer has been giving some attention to the thysanopterous fauna of the geenton, a term coined by Sylvestri. Included in this term are materials lying on the surface of the soil, such as moulding and rotting leaves and wood, and dead and decaying grass, and also materials as bark and woody fungi, lichens, epiphytes, and ferns growing on limbs of trees. In such materials he has discovered a wealth of species hitherto unknown or rarely collected by ordinary means. These materials were placed in a modified Berlese funnel, without a water jacket, and collected in a dish of alcohol at the bottom of the funnel. In the South such material as moulding leaves from the forest floor often yields several hundred thysanoptera per bushel. This fauna seems to be essentially southern in distribution. Similar material from Tennessee, Ohio and other more northern states has yielded a thysanopterous fauna much poorer in species and individuals. Indeed, similar material from the main range of the Great Smoky Mountains in Eastern Tennessee yielded not a single thysanopteran. That this scarcity in the Great Smokies is partly due to heavy rainfall is indicated by the fact that similar material from Asheville, N. C., though not rich, yielded a fair number of species and individuals. In Florida, the heavy rain of summer greatly decreases their numbers as they do of all Thysanoptera. This fauna reaches its maximum in late spring before the beginning of the rainy season. The vast majority of the individuals of this fauna belong to the family Trichothripidae and most of them are yellowish or brownish yellow in color.

UROTHRIPIDAE

The two species of Urothripidae that have been found in Florida belong to this fauna.

Stephanothrips occidentalis Hood & Williams, a species described from the West Indies, occurs in moulding leaves in dense shade in the southern half of Florida. Its most northern locality is Winter Park, in Orange County. Other Florida localities are Cortez and Palmetto, in Manatee County, Ft. Lauderdale and Miami.

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[1] Contribution from the Department of Entomology, Fla. Ag. Exp. Sta.

Trachythrips watsoni Hood

This species seems to be associated chiefly with decaying pine needles on the ground. In some collections of pure pine needles it has been the most common thysanopteron.

It has been taken in Royal Palm Park, Dade County, Fla., west to Pass Christian, Miss. (Erdman West, coll.) north to Gatlinburg, Tenn. (Fla. Ent. Vol. XVI, p. 62) and near Petersburg, Va., and Green Ridge, Md. (J. W. Kea, coll.). In Winter Park, Fla., it was taken associated with the preceding species, the only instance of their being taken together.

Glyptothrips

Next to *Trichothrips pergandei* Hood, species of this genus are the most common thysanopterons in decaying leaves under trees.

The four species here described all differ from the generic description in having an 8-segmented antenna. However, they are so close, especially the first, to *G. flavescens,* the type of the genus, that it is plainly better to modify the generic description in that respect rather than create a new genus.

The writer has an apterous specimen of *G. flavescens* collected by Floyd Andre at Ames, Iowa, considerably west of its hitherto reported range.

Glyptothrips reticulatus n. sp.

APTEROUS FEMALE. Length about 1.2 mm., varying from 1 mm. to 1.5 mm. General body color brownish yellow, with much orange hypodermal pigment; abdomen, terminal antennal segment, and apical half of tube usually heavily tinged with brown; legs yellow.

Head about 1⅛ times as long as wide, dorsum deeply reticulated. Cheeks strongly arched (much more so than in *G. flavescens*), sharply contracted behind eyes, not spinose. Postocular bristles very short and inconspicuous (not over 16 μ long) situated far behind eyes. Eyes small, occupying about two-sevenths the length of the head, larger and more finely faceted than in *flavescens.* Antennae about 2.2 times as long as head. Segment 1 brownish yellow, concolorous with head; 3 somewhat darker; 2 decidedly darker; 4-8 progressively darker; pedicels of 3-5 yellow, of 6 yellowish brown. Segment 3 subglobose; 4-7 oval; 3-6 abruptly contracted to a narrow pedicel, that of segment 3 accounts for over a third the length of the segment, thin and curved outwardly. Segment 1 with longitudinal ridges. Sense cones and spines not as robust as in *flavescens.*

Prothorax .6 as long as head and, including coxae, more than twice as wide as long. A pair of short, thick, nearly colorless bristles on each posterior angle and a similar one midway of each lateral margin.

Pterothorax somewhat wider than prothorax, sides nearly straight and parallel. Legs short, fore pair conspicuously reticulated. Fore tarsus with a short recurved tooth at the apex of the basal segment. Abdomen thick and heavy. Bristles on segment 9 decidedly shorter than the tube. Tube

shorter than the head and less than half its width. Terminal bristles about half as long as tube.

Measurements: (Average of ten individuals). Length 1.2 mm.; head, length .16 mm., width .14 mm.; prothorax, length .10 mm., width (including coxae) .22 mm.; pterothorax, width .24 mm., abdomen, width .32 mm., tube, length .14 mm., width at base .06 mm., at apex .027 mm. Antennae, segment, length (width) I, 40 (42); II, 42 (31); III, 60 (28); IV, 53 (29); V, 56 (26); VI, 48 (23); VII, 30 (21); VIII, 33 (12) microns. Total length .345 mm.

MALE. Very similar to female but smaller, about 1. mm. in length. Abdomen more slender.

Described from over a hundred specimens collected from dead leaves. Many localities in Alachua and Marion counties, Levy County, Trenton, Fla. (A. N. Tissot, coll.); Birmingham, Ala. (H. E. Bratley, coll.); Petersburg, Va. (J. W. Kea, coll.); Asheville, N. C.

This species is found mostly in moulding leaves on the ground, both of deciduous leaves and pine needles. It occurs more commonly in drier situations than does *G. batesi*. It was the dominant species under sand pine *(Pinus clausus)* in Ocala National Forest.

In the shape of the intermediate segments the antennae of this species are very similar to those of *G. flavescens* Hood, the type of the genus, but differ in being 8-segmented. The tube also is much shorter than in *flavescens*.

(To be continued)

FOOD HABITS OF *LEPTOGLOSSUS GONAGRA*

This close relative of our common leaf-footed plant-bug (*L. phyllopus*) in early November became very abundant in a citrus grove near Sebring, Fla. The insects bred on the citron (*Citrullus vulgaris*) so common in citrus groves. From the citron it spread to oranges where it did considerable damage until collected by the owner of the grove. In the fall of 1931 a similar instance occurred in a grove near Waverly.

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