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ON A COLLECTION OF THYSANOPTERA FROM RABUN COUNTY, GEORGIA

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A vacation of fifteen days spent in north-eastern Georgia during the latter part of August and the first days of September, 1922, gave the writer an opportunity to compare the thrips fauna of that region with that of Florida.

There are no records of any considerable collection of thrips from this region. The nearest localities that have been intensively studied are about Clarksville, Tenn., where Morgan has collected, and about Washington, D. C., where Hood has done much of his collecting.

Rabun County is in the north-eastern corner of Georgia. It is high and mountainous, the elevations ranging from about 2000 feet to 3900. As to the vegetation: here we found most of our boyhood friends (and enemies too—such as nettles and burdocks) of northern Ohio. But in the valleys one notes such southern plants as bitterweed (*Helenium tenuifolium*) and sweet gums and on the mountain sides the belated blossoms of the sourwood (*Oxydendron arboreum*) were conspicuous. On the whole the vegetation is much like that of southern Ohio or Kentucky.

The first observation to be made was the scarcity of thrips as compared with Florida. They are by no means such an important part of the fauna as with us. They do not force themselves upon one's attention. One must hunt for them, otherwise he would scarcely discover their existence.

The most productive collecting was, as usual, in flowers. Even such an unlikely blossom as the Indian pipe supplied us with one.

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But the Florida flower thrips (*Frankliniella bispinosa*) was entirely absent, its place being partly taken by its close relative *F. tritici*. But this insect was by no means as common as ours. It did not swarm in the blossoms, even of roses. Three or four per blossom was the maximum. Still this was the most common species. Numerous dissections of the heads of *Compositae* failed to discover any *Thrips abdominalis*, so common in the heads of composites in Florida.

Next after flowers these insects were most abundantly obtained by sweeping grass and weeds. Our most common species on grass, *Haplothrips graminis*, was entirely lacking. A new species of Haplothrips was obtained from grass but the most common species was *Frankliniella fusca*. This was much more common than in Florida, where it is known chiefly as a pest of tobacco, and nearly as common as its relative *F. tritici*.

Beating and sweeping shrubs brought in very few specimens. The most common was *Leptothrips mali*, the black hunter, a predaceous species that was quite apt to be found on any plant infested with plant lice. In vain were the young pines beaten for our pine thrips *Haplothrips pini*.

In all twenty-three species were taken, four of which proved to be new. *Thrips quinciensis*, *Haplothrips gracilis*, and *Hoplandrothrips flavoantennis* have hitherto been taken only in Florida. *Thrips impar* was described from Maryland and has not hitherto been reported elsewhere. *Frankliniella tenuicornis* has not heretofore been reported from America. Thus four species have had their known range considerably extended.

It is thus seen that the Thysanoptera, like the plants, show a mixture of southern and northern species.

A list of the species and their host plants follows:

THYSANOPTERA OF RABUN COUNTY, GEORGIA

<i>Species</i>	<i>Number taken</i>	<i>Host Plants</i>
<i>Aeolothrips bicolor</i> Hinds.....	3	Grass.
<i>Sericothrips variabilis</i> (Beach).....	1	Shrubs.
<i>Chirothrips insolitus</i> Hood.....	1	Grass.
<i>Malacothrips</i> (?)	1	Weeds.
<i>Heliethrips fasciapennis</i> Hinds.....	9	Grass (8), smartweed (<i>Polygonum</i>).
<i>Heliethrips haemorrhoidalis</i> (Bouche)	1	Shrub.
<i>Thrips quinciensis</i> Morgan.....	2	in blossoms of <i>Vernonia</i> and <i>Polygala</i> .

Thrips crenatus n. sp.....	3	Pine, <i>Lespedeza</i> , bitterweed.
Thrips impar Hood.....	6	Indian pipe, <i>Lespedeza</i> (4), grass.
Frankliniella fusca (<i>Hinds</i>).....	35	Grass (29), pine (2), <i>Lespedeza</i> (4).
Frankliniella minuta (<i>Moulton</i>) (?)..	1	Red Clover.
Frankliniella tenuicornis, <i>Uzel</i>	2	On grass (identified by R. C. Treherne).
Frankliniella tritici (<i>Fitch</i>).....	36	A variety of blossoms.
Heterothrips auranticornis n. sp.....	16	Blossoms of <i>Helanium</i> .
Haplothrips rabuni n. sp.....	5	Grass.
Haplothrips statices <i>Holiday</i>	4	Grass.
Haplothrips verbasci (<i>Osborn</i>).....	14	Mullein.
Haplothrips angustipennis n. sp.....	2	Grass.
Haplothrips gracilis <i>Watson</i>	1	
Leptothrips mali (<i>Fitch</i>).....	16	On many shrubs and herbs.
Hoplandrothrips flavoantennes(<i>Wats.</i>)	1	Oak.
Hoplandrothrips pergandei (<i>Hinds</i>)....	1	Grass.
Idolothrips armatus <i>Hood</i>	1	On wild cane (<i>Arundinaria</i>).

Thrips crenatus, n. sp.

Female. Length about 0.8 mm. (0.74 to 1 mm.). Color dark brown, thorax lighter with a little orange hypodermal pigment. Without prominent bristles except near the end of the abdomen.

Measurements: Head, length .075, width .105; Prothorax, length .113, width .15; Mesothorax, width .207; Abdomen, width .214; Antennae, total length .173 mm.

Antennal segment	1	2	3	4	5	6	7
Length	18	27	32	28	22	37	16 microns
Greatest width	19	21	18	18	15	16	7 microns

Head about a third wider than long and two thirds as long as prothorax into which it is deeply retracted. Cheeks very slightly arched. Plainly sculptured with transverse anastomosing lines, a row of minute bristles behind each eye. *Eyes* dark, large, occupying about two-thirds the length and .7 the width of the head; non pilose; facets large. *Ocelli* large, light brown; widely separated, posterior situated opposite the posterior two-thirds of the eyes; bordered by deep orange crescents. *Antennae* rather short, from twice to two and a third times as long as the head. Segments 1 and 2 but little lighter than the head; 3-5 varying from yellowish brown (lighter at the base) to dark brown concolorous with the others; 6 and 7 dark brown. 1 cylindrical, about as wide as long; 2 urn-shaped with a very broad base, conspicuously wider than any of the others; 3 urn-shaped, abruptly narrowed to a slender pedicel; 4 oval, 5 smaller, urn-shaped; 6 cylindrical; 7 conical. Sense cones and bristle all short, colorless, almost invisible; a sense cone on the outer apical angle of segment 3 thick and heavy.

Prothorax large, sides convex and diverging posteriorly, without sculpture, a short, colorless bristle on each posterior angle.

Mesothorax sculptured in the middle of the dorsal surface, sides bulging. Metathorax with nearly straight but diverging sides. *Legs* almost uniformly brown, but little lighter apically. *Wings* uniformly brown except for a small colorless area about .2 the length from the base. Costal fringe of hairs scanty, absent from basal half. Veins rather prominent; costal bearing from 23 to 26 bristles, the others from 5 to 7, scale 5.

Abdomen with a few short, brown bristles on segments 9 and 10. Dorsal surface faintly sculptured. The posterior margin of each segment is bordered with a series of about 20 rounded lobes. On the posterior segments these are more difficult to detect.

Male not seen.

Described from three females taken in Rabun Co., Ga., on *Lespedeza*, pine and bitterweed (*Helenium*). Readily recognized by the dark color, short intermediate antennal segments and crenated posterior borders of abdominal segments.

Type in the author's collection. Paratype in the National Museum.

Heterothrips auranticornis, n. sp.

Female. Color of the body a uniform deep brown, tip of fore femora, and both ends of others, and of all tibiae, and most of the tarsi, brownish yellow. Antennal segments 3 and 4 yellow, conspicuously shaded with orange.

Measurements: Total length, females 1.2, male .8; head length, females .112, males .107; width, females .15, males .133; Prothorax, length, females .13, males .128, width, females .22, males .18; Mesothorax, width, females .23, males .20; Abdomen, width, females .30, males .14; total, females .25, males .22.

Antennal segments	1	2	3	4	5	6	7	8	9
Length	20	30	55	39	28	32	24	20	19 microns
Width	19	26	53	35	27	28	19	18	15 microns

Head about a third wider than long, widest behind the eyes. Cheeks arched, roughened, and bearing a few short, stiff bristles. All the dorsal surface behind the eyes striated with a half dozen anastomosing lines. Frontal costa deeply emarginate. A row of four minute bristles behind each eye and posterior ocellus. One in front of each posterior ocellus and a minute one near the inner anterior angle of each eye, opposite the anterior ocellus. *Eyes* dark, very large, occupying about .7 the length and .8 the width of the head, non-protruding, pilose, facets very large. Posterior ocelli very large, situated opposite posterior third of the eyes and touching their margins. Anterior about half the diameter of the posterior and about the size of the facets of the eyes; situated on the edge of the frontal emargination and directed forward. *Mouth cone* reaching about half way across the prosternum; sides almost straight up to the prolonged but rounded apex. Antennae 9-segmented, 2.2 as long as the head. Segment 1 short and thick, concolorous with the head; 2 lighter; 3 and 4 yellow with considerable orange pigment; 5 at least two-thirds yellow but dark brown at the extreme

base and apex; 6 brown but yellowish on basal half; 7-9 dark brown. 3 long wedge-shaped with a narrow base; 4 and 6-9 barrel-shaped; 5 oval; 4-6 with short broad pedicels; margins, especially of 3 and 4, conspicuously crenate. Hairs and sense cones very pale, short and inconspicuous. A distal ring of sensoria on segments 3 and 4.

Prothorax but little longer than the head and 1.7 as wide as long; widest posteriorly. Anterior margin and sides nearly straight; posterior margin much arched. Dorsal surface striated posteriorly. A short, thick spine on each anterior angle and two on each posterior; a row of eight minute ones along the anterior margin and about a score of others scattered over the dorsum. *Legs* rather slender. Fore femora but little thickened. Membranes of fore wings dark brown except two minute areas near the base; .075 mm. wide at the base (exclusive of scale); rather abruptly narrowed at about a third of their length to half the sub-basal width; length ten times that of the sub-basal width. Costal vein with about 31, anterior with 24 and posterior vein with 20 bristles.

Abdomen not pubescent but provided with a number of short bristles, a row along the posterior margin of each segment being especially prominent.

Males similar to the females but smaller. Fore femora considerably enlarged.

Described from fourteen females and two males taken from the heads of a composite (*Helenium*) in Rabun County, Ga. Type in the author's collection. Paratypes in the National Museum and in that of the University of Florida.

Haplothrips rabuni, n. sp.

Female. Length about 1.5 mm. Color dark brown to black with some reddish hypodermal pigment; antennal segment 3 and usually (but not always) fore tarsi and apical inner portion of fore tibiae yellowish brown.

Measurements: Head, length .20, width .166; Prothorax, length .122, width .241; Pterothorax, width .277; Abdomen, width .273; Tube length .108; width at base .054, at apex .031 mm. Antennae, total length .27 mm.

Segment	1	2	3	4	5	6	7	8
Length	21	40	41	46	42	40	37	26 microns
Width	27	26	22	29	27	27	26	14 microns

Head longer than wide, broadest at the middle, cheeks gently arched, slightly convergent posteriorly; vertex rounded, slightly produced. Post-ocular bristles fairly long but, like all the other bristles of head and thorax, almost or quite colorless and difficult to detect. *Eyes* medium sized, occupying slightly more than a third of the length of the head, not protruding, not pilose. Ocelli large, yellowish, the anterior on the extreme vertex of the head and directed forward, the posterior pair opposite the anterior third of the eyes. *Antennae* about a third longer than the head. Segment 1 (and sometimes 2) concolorous with the head; 3 yellowish brown; 4 and 5 light brown without yellowish bases; 6-8 darker brown; 1 short-

cylindrical; 2 urn-shaped; 3-6 oblong elliptical, 3 quite markedly pedicellate, 4-6 with broader, shorter pedicels; 7 barrel-shaped, truncate at the apex and broadly united with 8; 8 sub-conical. Sense cones and bristles short, colorless and inconspicuous. *Mouth cone* blunt, reaching past the middle of the prosternum.

Prothorax small, about .6 the length of the head and, including coxae, twice as wide as long. Coxa bears a short but thick and brown bristle, the only conspicuous one on the anterior portion of the body, others colorless, mostly blunt at apex; a pair on each posterior angle of medium length.

Pterothorax considerably wider than prothorax. Sides slightly converging posteriorly. *Wings* rather short, membrane reaching but little past the middle of the abdomen; colorless except for a decidedly brown area at the base of the primaries; primaries markedly narrowed in the middle, fringe rather sparse, of medium length, with 6 or 7 interlocated hairs. *Legs* rather slender, except fore tarsi and tibiae, concolorous with the body; fore femora but slightly enlarged; fore tarsus with a small, short, acute tooth.

Abdomen rather long and slender, bristles rather short, light brown to colorless and pointed. Tube rather short, terminal bristles but little longer than the tube.

Male not seen.

Described from four females taken from grass and sedges along a small stream at Clayton, Rabun County, Ga. Type in the author's collection. Paratypes in the National Museum and in that of the University of Florida.

Close to *H. graminis* Hood, but differs in the shorter and darker antennae, darker color, smaller prothorax, larger pterothorax, longer, more slender abdomen, longer intermediate antennal segments and colorless bristles.

Haplothrips angustipennis, n. sp.

Female. Body length about 1.3 mm. (from 1.14 to 1.46). Color almost uniformly dark mahogany brown, fore tibiae and tarsi and intermediate antennal segments yellowish brown.

Measurements: Head, length .185, width .151; Prothorax, length .12, width .25; Mesothorax, width .25; Abdomen, width .227; Tube, length .106; width at base .061, at apex .031. Antennae, total length .29 mm.

Segment	1	2	3	4	5	6	7	8
Length	26	37	45	50.5	44	40	38.5	26 microns
Width	26	24	20	25	23	23	21	16 microns

Head about a third longer than broad. Cheeks slightly arched, converging slightly posteriorly, somewhat roughened and bearing a few short bristles. Postocular bristles conspicuous, pointed, nearly as long as eyes. Eyes large, occupying nearly half the length of the head, not pilose, facets large. *Ocelli* large, larger than facets of the eyes, brownish yellow, posterior pair situated opposite the anterior .4 of eyes and contiguous with their

margins; anterior directed forward. *Mouth cone* reaching about half way across the prothorax, abruptly constricted near the base but very broadly rounded at the apex. *Antennae* 8-segmented. Segment 1 cylindrical, concolorous with the head; 2 urn-shaped, abruptly constricted to a very broad pedicel, concolorous with the head except the yellowish brown apex; 3 obovate, narrower than either 2 or 4, gradually narrowed to a broad base, yellowish brown, darker along the sides and with a broad, colorless band at the apex, usual sense cones present but colorless and inconspicuous; 4 ovate with a short, broad pedicel, basal third concolorous with 3, but remainder darker, the colorless collar at the apex narrow; 5 and 6 barrel-shaped, pedicel shorter and narrower than in 4, dark brown; 7 cylindrical, sides but slightly arched and converging slightly apically; 8 unusually large, margin conspicuously crenate. All antennal bristles thin, pale brown and inconspicuous.

Prothorax (including coxae) about twice as wide as long, trapezoidal in outline, much widened posteriorly, posterior margin arched, posterior angles abruptly rounded and bearing a pair of sharp-pointed, light colored bristles of medium length; coxae each bearing one short, dark, thick bristle and a pair of very short, thorn-like spines; anterior angle with a short heavy bristle.

Mesothorax broad, with very acute anterior angles and nearly straight sides which converge slightly posteriorly. *Mesothorax* somewhat narrower, sides more arched and more constricted posteriorly. *Wings* rather weak, membrane scarcely reaching the eighth abdominal segment, quite narrow except at the extreme base, unusually deeply constricted for a Haplothrips, to a diameter about half that nearer the apex. Fringing hairs moderately long, seven interlocated ones. *Legs* rather slender, dark, fore femora but little thickened; fore tarsus with a small tooth.

Abdomen long and slender, destitute of conspicuous bristles, those of the ninth segment shorter than the tube. Tube of moderate size, sides slightly concave, terminal bristles about as long as the tube.

Male not seen.

Described from two females taken from coarse marsh grasses at Clayton. Type and paratype in the author's collection.

Hoplandrothrips flavoantennis (Wats.)

The female only was originally described. (*Liothrips flavoantennis*, Ent. News, March 1916, p. 129.) A male was collected in Georgia.

Male. Color uniformly dark brown except antennal segments 3-8, which are bright yellow. (In some females also segment 8 is yellow, also segment 2 may be brown.)

Measurements: Total length 1.7 mm.; head, length .235 mm., width .18 mm.; prothorax, length .13 mm., width including coxae .29 mm.; meso-

(Continued on page 47)

The question of continuing the joint meetings with the Horticultural Seminar was discussed and referred to the Executive Committee.

Under "Brief and Timely Notes" Prof. Watson spoke of observations on the Mexican Bean Beetle in Rabun County, Georgia, and the capture of the greenhouse thrips out of doors. Mr. Goodwin reported the discovery of European Foul brood in Seminole County.

The address of the evening was given by Dr. J. S. Rogers, on the Museum of Zoology of the University of Michigan. This is a research museum rather than an exhibition museum. Dr. Rogers spoke of the progress made in surveys of the different groups, particularly insects. The talk was very interesting and showed that Dr. Rogers is doing a great part in the carrying out of their plans by working up the family Tipulidae (crane flies) of the order Diptera.

November 1. The Society met in joint meeting with the Horticultural Seminar, Major Floyd in the chair.

Members present: Montgomery, O'Byrne, Chaffin, Beyer, Lord, Watson, Berger, Stirling, Merrill, and Stone. Mr. E. R. Mezglar of Hightown, N. J., was elected to membership.

The paper of the evening was by Professor Floyd on "A Proposed Score Card for Judging Citrus Lands". It was freely discussed by members present.

A. H. BEYER, Secretary.

ON A COLLECTION OF THYSANOPTERA FROM RABUN COUNTY, GEORGIA

(Continued from page 39)

thorax, width .29 mm.; abdomen, greatest width .29 mm.; tube, length .16 mm., width at base .064 mm., at apex .034 mm. Antennae, total length .44 mm.; segment 1, 27; 2, 50; 3, 77; 4, 77; 5, 69; 6, 67; 7, 55; 8, 29 microns.

Head about 1.5 times longer than wide. *Eyes* large, occupying nearly a third the length of the head and fully a third of the width, slightly protruding, non-pilose, red by reflected light. *Ocelli* large, yellowish, situated far forward. The anterior on the large frontal lobe between the bases of the antennae and directed forward. The anterior margins of the posterior pair about opposite the anterior margins of the eyes. *Mouth cone* long, tapering, almost reaching the mesosternum. *Antennae* long and slender,

nearly twice as long as the head. Segment 1 and base of 2 concolorous with the head, apex of 2 lighter brown; remaining segments clear bright yellow. Abdomen long and slender, tapering gradually to the 8th segment and then more abruptly; bristles on the posterior angles of the segments progressively longer, those on the 9th nearly as long as the tube. Tube long and slender. Otherwise identical with the female.

Described from a single male taken from oak at Clayton.

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