

Notes on Hawaiian Thysanoptera, With Description of a New Species

By FRED A. BIANCHI

Experiment Station, H.S.P.A., Honolulu

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Suborder Tubulifera
Family Phloeothripidae Uzel
Subfamily Phloeothripinae Priesner

Nesothrips oahuensis Kirkaldy

In my paper "Nesothrips Kirkaldy Supersedes Oedemothrips Bagnall" (Proc. Haw. Ent. Soc., 12 [1]: 31, 1944) it was stated that "*Oedemothrips laticeps* Bagnall 1910 becomes *Nesothrips hawaiiensis* Kirkaldy 1907". This is a misstatement due to oversight and should read "*Oedemothrips laticeps* Bagnall 1910 becomes *Nesothrips oahuensis* Kirkaldy 1907".

In the redescription of *Nesothrips oahuensis* Kirkaldy, in the same paper, it is stated that the antennae are "approximate at base". It should have been stated that the antennae are inserted ahead of the anterior margin of the eyes and are separated by the frontal costa, which is fairly prominent, broadly emarginate in front and little narrower than the first antennal segments.

Haplothrips (Karnyothrips) flavipes (Jones)

Unlike the following thrips of this paper, this species has already been reported from Hawaii (Moulton, Proc. Haw. Ent. Soc., 11: 187, 1936) and is known elsewhere as an active predator on mites and perhaps other small organisms. In Hawaii, however, it is not a species commonly collected and it is of interest to record that during February and March of the current year a number of larvae and adults were found within old egg cases of the Chinese mantid (*Tenodera angustipennis* Sauss.) at the H.S.P.A. substation, Manoa Valley. Since these egg cases are of wide distribution and almost always become infested with mites and psocids soon after their eggs hatch—or perhaps even before they hatch—they probably provide an important reservoir of *H. flavipes* in the Territory, even when other environments are quite unfavorable for the maintenance of the species.

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Antennal segments:	1	2	3	4	5	6	7	8	Total
	.062	.071	.142	.133	.106	.080	.062	.044	.700

Macropterous male: Smaller than female (body length, partly distended, 2.46 mm.) but similar in color and shape. Differing as follows: prothorax longer in relation to head (20:35 instead of 17:40), its anterior margin heavily chitinized and thickened, continuous with the pronotal suture. Fore femora much more strongly incrassate and pronouncedly curved, its inner margin making an almost right angle near the base. Basal segment of fore tarsi produced inwardly to a strong wide tooth, which is about as long as the segment is wide.

Measurements of male in mm.: Head length .311; head width .204; prothorax length .178; prothorax width .356; epimeral setae .106; postangular setae .151; midlateral setae .115; anteroangular setae .062; anteromarginal setae .036; postocular setae .142; postocellar setae .089; tube length .320; width of tube at base .097; width of tube at end .044.

Antennal segments:	1	2	3	4	5	6	7	8	Total
	.057	.062	.124	.115	.097	.071	.053	.044	.623

Brachypterous forms: Not different from macropterous forms except for very short pad-like wings.

Described from the following material: August 24, 1943, on grass, Makiki, Honolulu, J. S. Rosa, coll., one macropterous female; January 1944, on person, Manoa Valley, Honolulu, F. A. Bianchi, coll., one brachypterous female; March 15, 1944, within old stem of wood rose (*Ipomoea tuberosa* Linn.), Makiki, Honolulu, O. H. Swezey, coll., four macropterous and one brachypterous females and two macropterous and one brachypterous males; April 1944, within dried and hollow stem of old papaya leaf, Makiki, Honolulu, F. X. Williams, coll., two macropterous males and three macrop-

Subfamily Megathripinae Priesner

Rhaebothrips major Bagnall (pl. XVII, figs. A, B, C)

This species was originally described from Samoa (Bagnall, *Insects of Samoa*, 7, [2] : 75, 1928) and later reported by Moulton from Fiji (Occ. Papers Bishop Museum, 17 [22] : 308, 1944). Comparison of specimens recently collected in Honolulu with the Fijian specimens determined by Dudley Moulton and now in the Bishop Museum leaves no question of their identity.

The species is now mentioned from Hawaii for the first time and the opportunity is taken to redescribe it. Bagnall's original description, to judge by context, was based upon a single specimen and was stated to be a description of the female, whereas it is obviously a description of the male, the female not having been described up to now. My description of the species based on both sexes follows:

Macropterous female: Body length, partly distended, 2.89 mm. Color by transmitted light dark brown, with abdomen darker, almost black; fore tibiae and all tarsi light brown to yellow clouded with brown. All tarsi with brown macula distally. Antennal segment 3, basal three-fourths of 4, and basal third of 5 yellow. By direct light, eyes, ocellar crescents, internal pigmentation red. Striation very fine and visible only in clear specimens; transversely subreticulate on sides of head and most parts of body, longitudinally subreticulate on sides of metanotum.

Head slightly less than one and one-half times as long as wide; widening almost imperceptibly at basal third and gradually constricted thence to dark collar-like thickening at base. Vertex weakly and evenly convex between eyes. Eyes small, finely faceted, not protruding, placed on the angles of the head and about one-fourth as long as the head. Ocelli about twice the diameter of eye facets; posterior pair ahead of line through middle of eyes and not touching their inner margins; anterior ocellus forwardly directed on anterior declivity of vertex. Postocular spines almost one-third of eye-length back of their inner angles, about one and one-half times as long as eyes. Postocellar setae a little more than one-half the length of postoculars and set slightly

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terous females; April 1944, within dry pod of pigeon pea, Makiki, Honolulu, O. H. Swezey, coll., one macropterous male.

In the stems of papaya and wood rose this species is found in small colonies comprising eggs and larvae as well as adults.

Suborder Terebrantia

Family Thripidae Uzel

Subfamily Chirothripinae Karny

Aptinothrips rufus (Gmelin) var. **connaticornis** Uzel

Thrips rufa Gmelin, *Caroli a Linné*, Syst. Nat. : 2224, 1788.

Aptinothrips rufa (Gmelin) var. *connaticornis* Uzel, *Mon. Ord. Thys.* : 154, 1895.

A complete bibliography of this species is given by Priesner (*Die Thysanopteren Europas* : 156, 1926). In various varieties and forms it is known from Europe, North America, and India. Like the next two species discussed, it is an inhabitant of grasses, hitherto unreported in Hawaii, and probably more or less recently introduced. Eight females and three larvae on two heads of barley (?) were found by the writer at Kilauea, Hawaii, June 22, 1944.

Subfamily Sericothripinae Karny

Tribe Anaphothripini Priesner

Anaphothrips secticornis (Trybom)

Thrips secticornis Trybom, *Öfv. Vet. Akad. Förh.*, 8 [8] : 620, 1896.

Complete bibliography in Priesner's "*Die Thysanopteren Europas*" : 189. Identified by the writer from a single female collected with the preceding species on the flower heads of an introduced grass, probably barley, near the main entrance to the Bird Park, Kilauea, Hawaii, June 22, 1944. Known in North America and Europe.

Anaphothrips obscurus (Müller)

Thrips obscura Müller, *Zool. Dan. Prodr.* : 96, 1776.

A full bibliography of this species is given in "*Die Thysanopteren Europas*" : 183. It is a notorious enemy of grasses in the United States, Canada, Europe and Australia and it is not surprising to record it now from Hawaii. It is strange, rather, that it had not been found earlier and that it has not appeared again in our collections after the instance here recorded.

Identified by the writer from numerous winged females collected from sugar cane and Sudan grass grown for experimental purposes in open greenhouses, Experiment Station, H.S.P.A., Honolulu, during January of 1941. Great numbers of winged females, larvae, and eggs were to be found on the two host plants and the damage

to both, had it not been artificially checked in time, would have obliterated the results of the experiments. On Sudan grass the damage appeared in the usual "silvering" of the leaves, while on young cane the edges of the leaves became red or reddish in longitudinal areas and partly curled back upon themselves.

Subfamily Thripinae

Docidothrips Priesner supersedes *Stulothrips* Moulton

In 1940, suspecting the identity of *Stulothrips trespinus* Moulton and *Docidothrips pandani* Kurosawa, I sent some specimens of *trespinus* to Mikio Kurosawa for comparison with his types. In reply to my suggestion Mr. Kurosawa stated that comparison of our material did not bear out my surmise of specific identity but that it did demand placing of both species in the same genus. By comparing my material, including paratypes borrowed from the Hawaiian Entomological Society, with the generic descriptions I am led to agree with Mr. Kurosawa. Therefore, since *trespinus* is the genotype of Moulton's genus and is antedated by *Docidothrips*, I propose that *Docidothrips* Priesner (Konowia 12 [3, 4] : 314, 1933) shall supersede *Stulothrips* Moulton (Proc. Haw. Ent. Soc., 8 [3] : 499, 1934).

Taeniothrips cyperaceae sp. nov. (pl. XVII, figs. D, E)

Macropterous female: Color by direct light, cadmium-yellow; by indirect light, orange-yellow with brownish mottling particularly abundant on sides; legs paler; wings weakly and uniformly washed with yellow; extreme end of tenth abdominal segment often orange; ocellar crescents red to orange; eyes purplish to black. Antennal segment 1 pale yellow, often nearly colorless; other segments uniformly greyish yellow, darker than 1 but always lighter than body.*

Head wider than long; vertex weakly concave next to eyes, weakly convex in middle; cheeks almost straight, weakly or not at all convergent; occiput inconspicuously striate transversely. Frontal costa deeply, roundly excavate at apex. Eyes somewhat protruding, occupying about half the head length, with about eight facets on outer outline and some coarse, colorless spines among the facets. Ocelli larger than facets; set close together on a mound equidistant from the front and hind margins of the eyes. Interocellar setae pale but conspicuous and nearly one-half as long as head; set within the ocellar triangle, just ahead of the posterior ocelli. A series of three or four short, colorless setae arching back of each eye from the postocellars, which are only slightly, if at all, longer. Mouth cone shorter than the rest of head exclusive of frontal costa, broadly constricted in the middle and broadly rounded at the end; labrum not surpassing labium and brown at tip; maxillary palpi relatively strong, the second and third segments of about equal length.

*The color as given is that of specimens that have apparently bleached somewhat in the mounting fluid; living specimens suspended in glycerine are yellow with the sub-hypodermal pigment appearing through as darker orange mottling, with the head lighter, not mottled; legs still lighter and not mottled but lightly washed with grey; antennal segments 3 to 8 definitely grey, light at base of 3 and 4; antennal segment 2 concolorous with head, and antennal segment 1 as described above; a transverse band of brown along the median two-thirds of hind margin on abdominal segments 2 to 5; larger setae on head and body from yellow to light brown; wings yellowish grey.

Antennae shaped as illustrated, about three times as long as head; characterized by the relative paleness of segment 1; by the small, straight, sharp, forked sense cones on segments 3 and 4; by the deeply rounded notch at the apex of the inter-antennal costa; and by the shape of segment 3, which is conspicuously constricted at about one-fifth of its length above the pedicel and is sharply divided from the pedicel by a thin overhanging fold which appears under magnification as a dark line. Segment 5 with a small sense cone outwardly; 6 with a small cone outwardly and a longer one inwardly. Antennal hairs pale and inconspicuous, one-third the length of longest segment.

Prothorax almost straight on back and front margins; the sides weakly arched and slightly divergent; the hind angles rounded. Paired setae on posterior angles pale but long and strong, nearly half the length of the prothorax. A small seta between each postero-angular pair, four others on the hind margin, and several others on the sides and disk of the prothorax, relatively long but very pale and difficult to distinguish. Pterothorax normal, wider than prothorax; mesoscutum with a pair of setae at each side near hind margin; metascutum with one seta at each fore angle near anterior margin and a stronger pair medianly and removed from anterior margin by little less than their own length; all of these setae pale and difficult to distinguish.

Legs normal, beset with rather long, thin, colorless hairs; posterior tibiae on their inner edge with a row of about eight stiff thornlike setae which end in a pair longer and thicker than the others; tarsi with the usual dark distal macula.

Wings long and narrow; veins of fore wing hardly apparent; fore vein with seven setae basally and two close together near distal end of wing; hind vein with 14 equally spaced; costa with about 18. Scale with five setae on anterior margin and one on disk near base. Vein of hind wing slightly darker than disk from about basal fifth of wing to near tip. Hind fringe of both wings long and wavy. Front fringe rather sparse on both wings and beginning at about basal fourth on fore wing.

Abdomen relatively long and narrow, with sides practically parallel from segment 3 to 8, thence suddenly converging to end of 10 which is roundly blunt. Abdominal setae all colorless and all inconspicuous except those on segments 9 and 10. Segment 10 without suture or cleft dorsally and segment 8 without distal fringe.

Measurements of female holotype in mm.: Head length .098; head width .155; prothorax length .143; prothorax width .192; outer seta on hind angle of prothorax .069; inner seta on hind angle of prothorax .069; interocellar setae .049; postocellar setae .012; dorsal setae on 9th abdominal segment .086; lateral setae on 9th abdominal segment .090; distal setae on 10th abdominal segment .114; total body length 1.26 (fully distended 1.49).

Described from the holotype and 11 female paratypes collected by J. S. Rosa in a jar full of nutgrass (*Cyperus rotundus* Linn.) cut on the grounds of the Experiment Station, H.S.P.A., Honolulu, August 28, 1940; two females collected by the writer in the same manner and place on December 13 of the same year; and two females collected by the writer on leaves of *Solanum nigrum* Linn. at Waialua Plantation, Oahu, on January 27, 1941. The male is unknown.

I have compared this new species with Mr. Moulton's holotype of *Taeniothrips leptospteron*, from New Guinea and also collected on a sedge, and find the two species closely related but not identical.

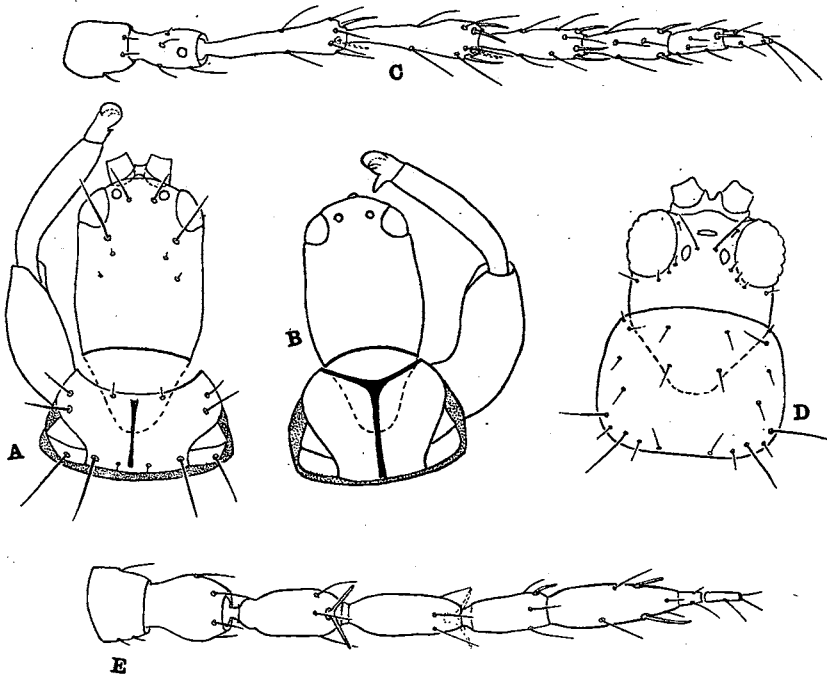


PLATE XVII

A—*Rhaebothrips major* Bagnall. Head, prothorax and left fore leg of macropterous female.

B—*R. major*. Head, prothorax and right fore leg of macropterous male, with all setae omitted.

C—*R. major*. Left antenna of female, dorsal view.

D—*Taeniothrips cyperaceae* sp.n. Head, prothorax and basal antennal segments of macropterous female.

E—*T. cyperaceae*. Left antenna of female, dorsal view with some minor setae omitted.

They are similar in size, general color and shape, but can be distinguished as follows:

1. The wings of *leptospteron* are distinctly brown and several shades darker than the wings of *cyperaceae*.

2. The forked sense cones of *leptospteron* are long, strong and more or less curved in the usual manner of most *Taeniothrips*. In *cyperaceae* they are short, thin, and practically straight out at right angles from the longitudinal axis of the antenna, as shown in the accompanying illustration.

3. In *leptospteron* there is a straight, transverse series of four nearly equal setae just back of the fore margin of the metascutum. In *cyperaceae* the median pair is somewhat stronger than the outer pair and is set much farther back from the fore margin of the sclerite.