

Collections of Thrips from Kauai and Hawaii¹

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ONE of the authors (NLHK) collected thrips on the island of Kauai during the period from January 6 to 20 in the midst of the rainy season, and on the island of Hawaii from April 11 to May 2, 1944 immediately after the rainy season; the other author (KS) examined the specimens.

Twenty-two lots of specimens involving 15 species were collected on Kauai at various localities from Haena to Mana along the coastal lowland and also at a high elevation at Kokee. The last previous collection had been made during the summer months of 1943 (11)³ but the present winter collection brought different species to attention and nine heretofore unrecorded species were found. The known species now total 37 which is the largest number known from a single island except Oahu. Species marked with an asterisk are new records for Kauai. *Thrips nigropilosus* Uzel was inadvertently omitted from the previous list (11).

The collection from Hawaii consisted of 26 lots involving 14 species collected mostly from the native forests at elevations up to 6,500 ft. at Kilauea, Mt. Hualalai, and Waimea. The species found in these upper forest zones are very interesting as regards the number of indigenous *Isoneurothrips*. Some collections were also made at several localities of the cultivated coastal areas.

The island of Hawaii is the only island, except Lanai, from which no extensive thrips collection had been made since the days of Dr. Perkins, and very little was known of its thysanopterous fauna. Yet, owing to its comparatively undisturbed vegetation and high elevation, this island has long been thought to be a very rich collecting ground for indigenous species of thrips, and now the initial attempt has been made to explore this little-known island. However, casual collections and observations had already recorded 16 species

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³Figures in parentheses refer to literature cited at end of paper.

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prior to the present collection which added ten more species to the list. A complete list of species now known from the island of Hawaii is given at the end of the paper.

THRIPS FROM KAUAI

**Organothrips bianchii* Hood

Lihue; Waimea: *Colocasia esculenta* (taro), petioles.

Moderate infestation was found at both of the commercial taro patches examined, which indicates that this species is as common on this unique host there as on the other Hawaiian islands. This is the first record reported from Kauai.

Recent observations on Oahu show that this species is always present on the wetland taros wherever they grow, in the lowland patches as well as among "wild" taro (aweu) growing along streams in the upper forests. However, the limited incidence observed shows that this species is not associated with the dryland taros, even when growing in a moist lower forest area. This may be due to little or no free water and slimy substance between the overlapping sinuses on the lower part of the petioles, or to the method of propagation of dryland taro which is unfavorable for dissemination of this insect. Dryland taro is propagated with a cormel or "oha" and not with a central bud cut or "huli", as is the case with wetland taro and it is on this central bud that the species feeds. Furthermore, this species has very little ability to fly. Another interesting point observed is that this species is quite specific in host preference. Many wild ape plants ([?] *Alocasia macrorrhiza*) examined in the forest area at Waikane did not show any sign of infestation in spite of the heavy infestation commonly present on "wild" taros growing together with ape. Ape plants growing in several gardens of the drier section of Honolulu also showed no infestation. Careful examinations at Waiiau of large numbers of several other paddy plants with growing habits similar to those of wetland taro showed no infestation although these plants were growing together with heavily infested wetland taros. The plants examined were water hyacinth (*Eichhornia crassipes*), arrowhead (*Sagittaria* sp.), and calla lily (*Zantedeschia aethiopica*).

Heliethrips haemorrhoidalis (Bouché)

Kokee: *Pelea* sp. (alani), leaves.

Incidental specimens were found on this native tree, a new host record, in the wet forest.

**Hercinothrips femoralis* (Reuter)

Lihue: *Emilia* sp. (pualele), leaves.

Sonchus oleraceus (sow thistle), leaves.

Crinum sp. (spider lily), flowers.

Moderate infestation was found on *Emilia* and *Sonchus* growing in open wasteland and incidental specimens were also found on *Crinum* flowers. These are further records of outdoor infestation and it is now certain that this species is one of the common outdoor thrips as well as a common feeder in greenhouses. This is the first record reported from Kauai and the latter two hosts are new. Incidentally, this species was recently found in unusual surroundings: a large colony of water hyacinth (*Eichhornia crassipes*), a new host record, at Waiiau, Oahu was uniformly and moderately infested on its fleshy petioles or leaves near the water line. Evidently this species prefers moist surroundings.

Chirothrips spiniceps Hood

Half Way Bridge: corn, leaves.

Extremely small thrips populations were found in a large planting of young corn in fairly moist surroundings of this well forested area. Five different species were found among the eight specimens caught within the rolled heart leaves. A single specimen of this species was found on this new host plant.

***Anaphothrips (Chaetanaphothrips) sp.**

Half Way Bridge: corn, leaves.

This is the second species found on young corn; a single specimen was collected. This is a new species closely related to and often found together with *A. orchidii* (Moulton). Its description will be published elsewhere. Its distribution is not restricted to Kauai for several specimens have been previously collected from parsley, several gingers (*Alpinia purpurata*, *Hedychium flavum*, and *Zingiber Zerumbet*†), bougainvillea (*Bougainvillea spectabilis parviflora*), and ricegrass (*Paspalum orbiculare*), in moist surroundings near the lower forests on Oahu.

***Frankliniella flavens** Moulton

Half Way Bridge: corn, leaves.

This is the third species found on corn and two specimens were collected. Since 1927, when the type specimens were collected (2), this species has not been reported from any other island besides Oahu, so apparently this is a new record for Kauai. This species, essentially a grass thrips having a narrow host range, is always found in large numbers on corn, a preferred host, wherever it grows, and is a predominating thrips on this plant. This thrips breeds freely in the folds of rolled heart leaves of young plants as well as in the interspace, usually at the basal portion of the ear, between the overlapping husks of the young or mature ears. Thus,

†At the request of the senior author, the capitalization of botanical specific names in this paper follows the recommendation made in the International Rules of Botanical Nomenclature, 1935 [Ed.].

it is not uncommon to find a colony of this thrips on green corn in the market. It appears that moist surroundings, such as wet areas near the lower forests and well-irrigated or damp areas of the open lowlands, are the preferred habitat and that increase in populations occurs in the winter months. Collections, all during the winter, have been made at the following localities on Oahu: Waialae, upper Palolo Valley, Manoa Valley, Waiawa, Waipahu, Waipio Camp A, Wahiawa, Kaaawa, and Kahaluu. Milo (*Sorghum vulgare* var.) is another cultivated host plant, while panicum grass (*Panicum purpurascens*), on which the thrips populations are very much lower than those on corn, is the only alternative wild host yet known.

Thrips hawaiiensis (Morgan) and **T. hawaiiensis** f. **imitator** Pr.

Haena: *Hippobroma longiflora* (Star of Bethlehem), flowers.

Lihue: *Pandanus* sp. (lauhala), flowers.

Crinum sp. (spider lily), flowers.

Nawiliwili: *Crinum* sp. (spider lily), flowers.

This common flower thrips, a winter or wetland species, was found abundantly on Kauai. *Frankliniella* sp., a dryland flower thrips, which was found there abundantly in the summer months (11) was not found during this trip. On lauhala this species was associated with the predominating *Stulothrips trespinus* Moulton. Among 66 specimens examined, four had non-segmented, 27 had partially segmented, and 26 had fully segmented styles, but nine had anomalous antennae.

Thrips saccharoni Moulton

Half Way Bridge: corn, leaves.

This is the fourth species found on corn; three specimens were collected. One of them had typical coloration but the other two were quite different from the type which is "uniformly dark greyish brown, thorax sometimes a little lighter" (2). This atypical form is dark greyish brown on abdomen, but light brownish yellow with greyish tinge on head and thorax. The antennal coloration is different from the typical form. Segments I and II are light greyish brown being somewhat concolorous with head and lighter than those of the typical form; III is light yellow like the typical form; IV and V are light yellow on the basal half but light greyish brown on the apical half, whereas in the typical form IV is totally yellow; VI and VII are dark greyish brown being concolorous with abdomen except slightly lighter on the basal third of VI compared to the yellow of the basal half of VI in the typical form. Immaturity of specimens cannot account for these color variations, as the abnormality is specific for certain portions of the body only. Nine paratype specimens available in Honolulu were examined for this atypical form

but it was not found present. However, both forms are frequently mixed in a single colony, the atypical form usually in incidental number. The following data are available from the collections made on sugar cane on Oahu: 38 typical forms and three atypical at (wet) Pauoa Flat in May, 36 typical and two atypical at (dry) Kunia in May, and three typical and one atypical at (wet) upper Palolo Valley in August. This species prefers to feed within the rolled young leaves of cane or other hosts.

***Thrips tabaci* Lind.**

Anahola: cabbage, leaves.

Wailua: broccoli, leaves.
cauliflower, leaves.
pea, leaves.

Medium to heavy infestations were found on these host plants. It is interesting to note that all these specimens were of the dark form which usually appears in the winter months or in the wetter districts of the Hawaiian Islands.

****Thrips (Isoneurothrips) williamsi* (Moulton)**

Although this species was not collected during the present trip, a few specimens were identified from the lot collected on koa (*Acacia Koa*) flowers at the edge of Waimea Canyon during the previous trip in 1937 (8). For details, see page 328.

***Plesiothrips panicus* (Moulton)**

Half Way Bridge: corn, leaves.

This is the fifth species found on corn; a single specimen was collected. The host is a new record for this species.

****Stulothrips trespinus* Moulton⁴**

Lihue: *Pandanus* sp. (lauhala), male flowers.

A very heavy infestation was found on a tree growing in a yard. The type specimens of this Hawaiian species were collected on Oahu in 1930 (3) but this species has never been reported from any other island, and evidently this is the first record for Kauai. This is a specific feeder on laulaha and is always present in large numbers on its flowers. Several captures in the wind traps at Kunia indicate that this species upon the wilting of host flowers migrates to other fresh ones; this is one of the thrips common in flight.⁵

****Hoplothrips flavitibia* Moulton**

Haena: *Eugenia Cumini* (Java plum), under bark of log.

⁴See p. 283 of this issue [Ed.].

⁵See also Carter, W. Populations of *Thrips tabaci*, with special reference to virus transmission. Jour. Animal Ecol., 8: 261-276, 1939.

Waimea: *Prosopis chilensis* (kiawe), under bark of fallen tree.
Lihue: no host record.

This common phloeophilous species was found to be widely distributed on Kauai, where it had not been recorded before. Extremely large colonies were found in the forest areas at both Haena and Waimea. It is interesting to note that this species was breeding on a fleshy fungus, "pepeiao" or "Jew's ear fungus" (*Auricularia* sp.), attached to a rotten log in the wet Waikapu Valley on Maui in April 1944 (1). This type of food has not been known; its usual food is rotten plant tissue and possibly microscopic fungi growing under bark.

Haplothrips gowdeyi (Frank.)

Haena: *Hippobroma longiflora* (Star of Bethlehem), flowers.

Lihue: sweeping.

Mana: *Brassica* sp. (shirona), leaves.

***Haplothrips (Hindsiana) sakimurai** Moulton

Waimea: no host record.

Attention was called to this species by F. A. Bianchi who found a single specimen among other insects collected there on the present trip. This native species was first collected on Oahu in 1930 and many specimens were subsequently caught in wind traps in 1935 (4); it has never been reported from the other islands. Although the species was once collected on *Emilia sonchifolia* which is suspected to be an accidental shelter plant, the true host was not known until Bianchi recently found this thrips common on nutgrass (*Cyperus rotundus*).

***Dichaetothrips setidens** (Moulton)

Lihue: *Casuarina* sp. (ironwood), dead branches.

Psidium Guajava (guava), dried fruits.

Three specimens of this giant spore-feeder, about 4 mm. long and one of the largest Hawaiian species, were caught by beating the dead branches of fallen ironwood and also by searching within small dry guava fruits still attached to branches. Both sites were moderately shaded but far from the native forest, yet these general areas were well covered with shade trees, wind breaks or border plantings. A single specimen of this species was also caught recently in a wind trap standing among the pineapple fields of the Kunia section, Oahu, in April 1944. Kunia is on the open, cultivated Wahiawa plain, miles away from the native forest. However, the nearby gulches support suitable type of vegetation for this spore-feeder and it is quite certain that this specimen must have been feeding there and not directly blown down from the forest. The type specimen was collected in Manoa Valley also during April.

The collections therefore seem to indicate that the open lowland is probably also a normal habitat of this species at least during the wet winter months, in addition to the native forest at the higher elevation.

This species was described from a single female collected on Oahu in 1927 (2), and later collected also from three other South Pacific islands: Marquesas in 1929 (7), Mangareva in 1934 (5), and Fiji in 1938 (6). Evidently this is a native, rather common species widely distributed in this region. The present lot is the second collection from the Hawaiian Islands but the first from Kauai. The four specimens are the first males to be taken; a brief description of these follows:

Size and color same as female; no further conspicuous thickening or enlargement of prothorax, fore femora or fore tarsal teeth than in female, abdomen conically tapered from segment II to tube, base of tube slightly more swollen. Measurements (in μ): Body length 3,600-4,500; head length 450-470, width 250-290; prothorax length 225-262, width excluding coxae 440-562; pterothorax width 625-725; abdominal segments width II 662-750, VIII 325-350, IX 225-250; tube length 460-550, width at base 125-140, at tip 56-59. Antennae: length (width); I, 59-65 (59); II, 75-79 (44); III, 144-147 (50); IV, 150-153 (50); V, 130-135 (44); VI, 94-100 (36); VII, 72-79 (29); VIII, 45-50 (21); total length 780-825. Fore tarsal teeth length 44-50; number of double fringe hairs on fore wing 42-46. Spines, postocular 162-180; antecellar 38-50; postocellar 59-80; back of postocular spine 38-123; on anterior margin of prothorax 65-85; on anterior angles 100-120; mid-lateral 97-121; prominent on coxae 65-75; on posterior angles inner 138-150, outer 144-160; on abdominal segment IX, 460-520; at tip of tube 303-323; at base of fore wing 53-61, 100-162, 188-210.

THRIPS FROM HAWAII

Heliethrips haemorrhoidalis (Bouché)

Hilo: azalea, leaves.

Kilauea: rose, leaves.

Hualalai, 6,000-6,500 ft.: *Styphelia* sp. (maiele), leaves.

Waimea: no host record.

Pepeekeo Forest Reserve: *Vaccinium* sp. (ohelo), leaves.

This species was common throughout the wetter part of the island. Infestation was medium to heavy on both of the cultivated plants. Moderate populations were found on the native plants in the rain forest at the lower altitude as well as near the upper limit of the forest zone at extremely high altitude. The first three hosts are new records.

Selenothrips rubrocinctus (Giard)

Hilo: azalea, leaves.

An incidental number of this species was found among the previous species on this ornamental plant in a park. This is the first record from Hawaii and is a new host record.

Anaphothrips (Chaetanaphothrips) orchidii (Moulton)

Waimea: *Heimerliodendron Brunonianum* (papala kepau), flowers.

Light infestation was found on this native tree growing in the open gulch at the lower edge of the native forest (2,000 ft.). The present data and a series of others recently collected on Oahu clearly show that this introduced species is now well naturalized and rather common in the Hawaiian Islands; it is not only found on the various cultivated plants and weeds of the lowland but also on the grasses and other native or naturalized plants in the lower forest area. This species prefers moist surroundings and increases in populations are seen during the winter months. This is the first record from Hawaii and is a new host record.

The life cycle of this species feeding on the foliage of *Emilia sonchifolia* was found to be less than 33 days during January and February. The same length of life cycle feeding on citrus fruits during October and November has also been reported from Florida (12). All indications suggest that this species reproduces parthenogenetically in Hawaii. It bred parthenogenetically under confinement, and of 234 offspring all were females; furthermore a fairly large number of specimens collected from various sources were all females. The rate of multiplication on *Emilia* was much lower than that of *Thrips tabaci* which is a fast multiplying species.

Taeniothrips alliorum Pr.

Ahualoa: green onion, leaves.

Moderate populations, associated with subincidental populations of *Thrips tabaci* Lind., were found in a truck farm in this wet area. This is the first record from Hawaii and now this species is known from every Hawaiian island.

Taeniothrips simplex Mörison

Ahualoa: gladiolus, leaves.

Heavy infestation was found among a few escaped plants growing along a moist roadside.

Thrips hawaiiensis (Morgan) and **T. hawaiiensis f. imitator** Pr.

Kilauea: *Astelia Menziesiana* (kaluaha), flowers.

Hualalai, 6,000-6,500 ft.: *Styphelia* sp. (maiele), flowers.

Holualoa: *Aleurites moluccana* (kukui), flowers.

Ahualoa: Hubbard squash, flowers.

Easter lily, flowers.

Malama Ki Forest Reserve, Puna: *Wikstroemia* sp. (akia), flowers.

Populations were moderate at the upper limit of the forest zone on Hualalai and small near the seashore among the rugged lava fields at Puna. Small populations were also seen on flowers of kaluaha in a dense fern forest and on flowers of kukui along a roadside in the moist area. Infestations on squash and Easter lily were medium and heavy respectively. *Astelia*, *Styphelia*, and *Wikstroemia*, all native plants, are new host records. The segregation of forms is as follows: *hawaiiensis*—22, *imitator*—18, and with anomalous antennae—four. As on Kauai, the dryland flower thrips, *Frankliniella* sp., was as scarce as this wetland species was abundant.

Thrips nigropilosus Uzel

Waimea: *Arctium Lappa* (burdock or gobo), leaves.

A light infestation was found on a truck farm at an elevation of 2,000 ft. As shown in a previous paper (9), this species has been known since 1935 on Oahu, Kauai, and Maui and now Hawaii is added to its distributional list. The host is a new record for this species. This is a wetland species and heavy infestation is usually not seen on the dry lowland or during the dry summer months. Lettuce is sometimes injured in the uplands or in damp areas during the winter months. Serious injury to young seedlings of aster, as reported by F. G. Holdaway, was observed at Wailuku, Maui in February 1943. This is the first local case of damage reported on this ornamental plant.

Thrips tabaci Lind.

Ahualoa: green onion, leaves.

Moderate populations of the dark form were found.

Subgenus **Ioneurothrips**

The subgenus *Ioneurothrips* is locally represented by the largest number of species among the indigenous Terebrantia. There are nine species already described and still more new species remain undescribed. One of the authors (KS) has had special interest in this group for some time and has been assembling the material for completion of a monographic treatise of this subgenus. In addition to several species from Kauai and Molokai reported in previous papers (8, 10), a long series of specimens collected in the uplands of Oahu are on hand. The present collections have brought in extremely interesting material, involving five forms in 13 different lots, all collected on native plants at high elevations in the Kilauea, Hualalai, and Waimea districts.

Thrips (*Isoneurothrips*) *antennatus* (Moulton)

Kilauea: *Vaccinium* sp. (ohelo), leaves.

Astelia Menziesiana (kaluaha), flowers.

Waimea: *Metrosideros* sp. (lehua), flowers.

Populations were large on kaluaha growing in a dense tree fern forest and were small on ohelo in a lehua forest, as well as on lehua on the lower edge of native forest, at 2,000 ft. The first two hosts are new records; this is the first record from the island of Hawaii.

Although these specimens have several features different from the type of *antennatus*, described from a single male in 1928 (2), they are tentatively identified as *antennatus*. However, the final conclusion is withheld for the monographic work. The unidentified specimens collected on *Broussaisia* sp., near Waikolu Valley, Molo-kai, (10) are identical with the present specimens, here assumed to be *antennatus*. The species identical with the present specimens is also common on various host plants in the upper forests of Oahu.

Thrips (*Isoneurothrips*) *williamsi* (Moulton)

Kilauea: *Sophora chrysophylla* (mamani), flowers.

Hualalai, 6,500 ft.: *Myoporum sandwicense* (naio), young leaves.

Small populations were found on mamani flowers in the dense forest at the Bird Park, and also on terminal leaf buds of naio trees in the open forest near the upper limit of the forest zone. These two hosts, both native, are new records. Although not recorded since the types were collected on Mt. Tantalus in 1926 (2), many specimens have been collected from widely scattered localities on Oahu. This is one of the common *Isoneurothrips* feeding on various flowers in the moist upper and lower forest areas. Its distribution and host range are not restricted to the forest areas or native plants. It was occasionally found on the floor of deep valleys, or on common weeds growing in the forests and introduced trees or vegetables growing in the city. As mentioned previously this species was also collected from Kauai, and is here recorded for the first time from the island of Hawaii.

Thrips (*Isoneurothrips*) sp.

Kilauea: *Vaccinium* sp. (ohelo), leaves.

Sophora chrysophylla (mamani), flowers.

Urera sandwicensis (opuhe), flowers.

Hualalai, 6,500 ft.: *Myoporum sandwicense* (naio), young leaves.

Unidentified composite, flowers.

Hualalai, 6,000-6,500 ft.: no host record.

Rubus hawaiiensis (akala berry), flowers.

Populations were small on ohelo in a lehua forest, and on mamani and opuhe growing together in a dense growth at the Bird

Park. At extremely high elevations on Mt. Hualalai, populations were small on naio but medium on akala berry, both growing in open forest; only incidental specimens were collected from the other two hosts. All specimens belong to a single group except the ones from akala berry which are slightly different in minor features from the rest. Upon comparison with the paratype, it was found that both forms are very closely related to but definitely different in several features from *I. fullawayi* which seems to be a variable or unstable species. So this species is tentatively determined as a species close to *fullawayi*. These atypical forms do not seem to be regional forms as they are also common on Oahu where the type specimens of *I. fullawayi* were collected. Although these three groups, one typical and two atypical forms, are probably in a varietal relationship, the final conclusion on the nomenclature will appear in the proposed monographic work later. Incidentally, *I. fullawayi* is one of the common *Isoneurothrips* in the forest areas and many native as well as introduced plants are known to be its hosts.

Thrips (*Isoneurothrips*) sp.

Hualalai, 6,000-6,500 ft.: *Styphelia* sp. (maiale), flowers.

Moderate populations were found on this shrub growing in an open forest near the upper limit of the forest zone. This species is remotely related to *I. fullawayi* but is definitely a different and unrecorded species.

Hoplothrips flavitibia Moulton

Hualalai, 4,500 ft.: rotten fence post.

Glenwood, Puna: under bark of fence post.

Small and moderate populations were found on the rotten fence posts along the pastures within the wet forest areas. This is the first record of its collection on Hawaii.

(?) **Haplothrips sp.**

Kilauea: *Metrosideros* sp. (lehua), leaves.

Two specimens were collected in a lehua forest. Further studies are needed for a specific determination.

LIST OF THRIPS KNOWN FROM HAWAII

Terebrantia

Organothrips bianchii Hood

Heliiothrips haemorrhoidalis (Bouché)

***Selenothrips rubrocinctus* (Giard)

Limothrips cerealium Hal.

***Anaphothrips (Chaetanaphothrips) orchidii* (Moult.)

Frankliniella sp.

- ***Taeniothrips alliorum* Pr.
Taeniothrips simplex Morison
Thrips hawaiiensis (Morgan) and *T. hawaiiensis* f. *imitator* Pr.
- ***Thrips nigropilosus* Uzel
Thrips tabaci Lind.
- ***Thrips (Isoneurothrips) antennatus* (Moult.)
Thrips (Isoneurothrips) multispinus Bagn.
- ***Thrips (Isoneurothrips) williamsi* (Moult.)
- ***Thrips (Isoneurothrips)* sp.
- ***Thrips (Isoneurothrips)* sp.

Tubulifera

- Dermothrips hawaiiensis* Bagn.
Hoplothrips barbatus (Bagn.)
Hoplothrips coprosmae Moult.
Hoplothrips dubius (Bagn.)
- ***Hoplothrips flavitibia* Moult.
Hoplothrips lanaiensis (Bagn.)
Hoplothrips laticornis (Bagn.)
Haplothrips gowdeyi (Frank.)
Haplothrips (Hindsiana) williamsi Moult.
- ** (?) *Haplothrips* sp.

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**Heretofore unrecorded from Hawaii.

Additional Notes:

A small lot of thrips collected by W. C. Look at Hilo, Hawaii (one collection at Kilauea) during February and March, 1945 was forwarded while this paper was in press. Since this material is directly related to the subject matter of this paper, the following notes on the collection are added here:

Heliothrips haemorrhoidalis (Bouché). A colony was found on leaves of rhododendron at Kilauea.

Selenothrips rubrocinctus (Giard). A colony was found on leaves of passion fruit.

Scolothrips sexmaculatus (Perg.). A single specimen was collected from the colony of *S. rubrocinctus* mentioned above. This is the first record of its collection from Hawaii.

Thrips hawaiiensis (Morgan) and *T. hawaiiensis* f. *imitator* Pr.

This was abundant on various flowers during the rainy season. Flowers of gardenia and *Dendrobium* orchid were heavily infested. Other flowers infested were *Vanda* orchid, *Cattleya* orchid, macaranga, avocado pear, and pole bean.

Stulothrips trespinus Moulton. Hundreds were found on leaves of sugarcane and "ti" and in houses in one specific area. This swarming must have occurred during migration. This is the first record from Hawaii.

Haplothrips gowdeyi (Frank.). A colony was found on flowers of *Emilia sonchifolia*.

(?) *Haplothrips* sp. A single specimen was collected from macaranga. This specimen differs from any species heretofore recorded from the Hawaiian Islands, including the one mentioned on page 329, and further studies are needed for a specific determination.